UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JUL 17 2013

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Adoption of the U.S. Navy's *Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151/DESC1306) Environmental Assessment*

LOCATION: Naval Base Point Loma, San Diego, California

SUMMARY: The Navy will conduct a fuel pier replacement project to demolish and replace an existing pier that is significantly past its design service life and does not meet current construction standards. The project includes the installation and extraction of steel pipe piles by vibratory and impact pile driving.

The Navy prepared a comprehensive Environmental Assessment to evaluate the environmental effects of the action including effects on marine mammals. Based on the low intensity of the action, as well as implementation of appropriate mitigation and monitoring measures documented in the EA and included in the Incidental Harassment Authorization (IHA), the Navy's action, and the National Marine Fisheries Service' issuance of an IHA, will not result in significant impacts to the human environment.

RESPONSIBLE OFFICIAL: Donna S. Wieting, Director
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Hwy, F/PR
Silver Spring, MD 20910
(301) 427-8400

Printed on Recycled Paper

NMFS reviewed the Navy's EA and determined it adequate to support issuance of the IHA. The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA), prepared by the Navy, is enclosed for your information. Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

Patricia Montanio
NOAA NEPA Coordinator

Enclosure

Final

ENVIRONMENTAL ASSESSMENT

Naval Base Point Loma (NBPL)
Fuel Pier Replacement and Dredging
(P-151/DESC1306)
San Diego, California



June 2013

NAVSUP
NAVAL SUPPLY SYSTEMS COMMAND
FLEET LOGISTICS CENTER
SAN DIEGO

Navy Region Southwest
One Team. One Voice. One Mission

NAVAL BASE POINT LOMA

[This Page Intentionally Left Blank]

Acronyms and Abbreviations

µg/kg	microgram per kilogram
µg/m^3	micrograms per cubic meter
µm	micron(s)
µPa	microPascal
ac	acre
ACM	asbestos-containing material
ADT	Average Daily Traffic
AMEC	AMEC Earth & Environmental, Inc.
ANSI	American National Standard Institute
APE	Area of Potential Effect
BLS	U.S. Bureau of Labor Statistics
BMP	Best Management Practice
C & D	construction and demolition (waste)
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CASHPO	California State Historic Preservation Officer
CATEX	Categorical Exclusion
CCC	California Coastal Commission
CCR	California Code of Regulations
CD	(CCC) Consistency Determination
CDC	Child Development Center
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CH3D	Curvilinear Hydrodynamics in Three Dimensions
CH_4	methane
CNEL	Community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPP	contaminated petroleum product
CRFS	California Recreational Fishing Survey
CSLC	California State Lands Commission
CV	coefficient of variation
CWA	Clean Water Act
cy	cubic yards
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DEH	Department of Environmental Health
DFM	diesel fuel marine
DFSP	Defense Fuel Support Point
DHS	Department of Homeland Security
DMM	discarded military munitions
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERL	effects range low
ERM	effects range median
ESA	Endangered Species Act
ESQD	Explosives Safety Quantity Distances
ESS DR	Explosives Safety Submission Determination Request
ESS	Explosives Safety Submission
FICUN	Federal Interagency Committee on Urban Noise
FLC	Fleet Logistics Center
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FOR	Fuel Oil Reclamation
ft	feet/foot
FY	fiscal year
GHG	greenhouse gas
GIS	geographic information system
HAP	hazardous air pollutants
HAPC	Habitat Area of Particular Concern
hp	horsepower
Hz	hertz
I-	Interstate
ICP	Integrated Contingency Plan
IHA	Incidental Harassment Authorization
IMPLAN	Impact Analysis for Planning
in	inch
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
JP-5	jet fuel
kHz	kilohertz
km	kilometers
km^2	square kilometers
LBP	lead-based paint
Ldn	Day-night average sound level
LDUUV	Large Displacement Unmanned Undersea Vehicle (Program)
Leq	Energy equivalent levels
lf	linear feet
Lmax	maximum sound level
LOS	Level of Service
LPD	landing platform dock
m	meter(s)
MBTA	Migratory Bird Treaty Act
Metro PA	Metro San Diego Programmatic Agreement
mg/L	milligrams per liter

mg/m^3	milligrams per cubic meter
mi	mile(s)
MILCON	Military Construction
ml	milliliter
MLLW	Mean Lower Low Water
MMO	marine mammal observer
MMP	Marine Mammal Program
MMPA	Marine Mammal Protection Act
MNB	Moffatt & Nichol-Blaylock
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
MOU	Memorandum of Understanding
MPN	most probable number
MSDS	Material Safety Data Sheet
MWR	Morale, Welfare, and Recreation
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standard
NAB	Naval Amphibious Base
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSUP	Naval Supply Systems Command
NB	North Bay
NBC	Naval Base Coronado
NBPL	Naval Base Point Loma
NBSD	Naval Base San Diego
NEPA	National Environmental Policy Act
NMAWC	Naval Mine and Anti-Submarine Warfare Command
NMFS	National Marine Fisheries Service
NMSDD	Navy Marine Species Density Database
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOSSA	Naval Ordnance Safety and Security Activity
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRSW	Navy Region Southwest
NSR	New Source Review
NTC	Naval Training Center
NTU	nephelometric turbidity units
O_3	ozone
OPNAVINST	Chief of Naval Operations Instruction
PAH	polycyclic aromatic hydrocarbons
Pb	lead
PCB	polychlorinated biphenyl
PFMC	Pacific Fishery Management Council
PLECA	Point Loma Ecological Conservation Area
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
ppe	personal protective equipment
ppm	parts per million
RA	Relocation Area
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
REC-1	waters designated for contact recreation beneficial uses
RHA	Rivers and Harbors Act
rms	root-mean square
ROG	reactive organic gases
ROI	region of influence
ROI	region of influence
RONA	Record of Non-Applicability
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SCB	Southern California Bight
SCM	special conservation measure
SDAB	San Diego Air Basin
SDCAPCD	San Diego Air Pollution Control District
SDCDEH	County of San Diego Department of Environmental Health
SDUPD	San Diego Unified Port District
SEL	sound exposure level
sf	square feet
SIO	Scripps Institution of Oceanography
SIP	State Implementation Plan
SISS	Swimmer Interdiction Security System
SO_2	sulfur dioxide
SOx	sulfur oxide
SPL	sound pressure level
SSC	Space and Naval Warfare Systems Center
SSTC	Silver Strand Training Complex
SSTC-S	Silver Strand Training Complex - South
SWRCB	State Water Resources Control Board
T-AKE	Dry cargo and ammunition resupply vessel
T-AKR	Large, medium speed roll-on/roll-off ship
T-AO	Military sealift replenishment "oiler" vessel
T-AOE	Fast combat support ship
TDI	Tierra Data, Inc.
TL	transmission loss
TSS	total suspended solids
TTS	temporary threshold shift
U.S.	United States
UCSD	University of California San Diego
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
UST	underground storage tank
UWR	Universal Waste Rule
V/C	volume to capacity
VOC	volatile organic compound
WMP	Waste Management Plan
WSDOT	Washington State Department of Transportation
ZOI	Zone of Influence

DRAFT ENVIRONMENTAL ASSESSMENT
NAVAL BASE POINT LOMA (NBPL)
FUEL PIER REPLACEMENT AND DREDGING (P-151/DESC1306)
SAN DIEGO, CALIFORNIA

ABSTRACT

The United States (U.S.) Navy has prepared this Environmental Assessment (EA) in accordance with the 1969 National Environmental Policy Act (NEPA) (42 United States Code [USC] § 4321, as amended), The Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Chief of Naval Operations Instructions for Implementing NEPA (OPNAVINST 5090.1C, CH-1).

The EA addresses the issues related to the current deficiencies of the existing Naval Base Point Loma (NBPL) Fuel Pier (Pier 180). It evaluates the environmental effects of two action alternatives that would correct the deficiencies and provide for the fueling needs of existing and future Navy ships. A No-Action Alternative is also evaluated.

Point of Contact:
NBPL Fuel Pier Replacement
Department of the Navy
NAVFAC Southwest, Coastal IPT
2730 McKean Street, Building 291
San Diego, CA 92136-5198

[This Page Intentionally Left Blank]

EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321, as amended); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500-1508, 1 July 1986); and Navy Procedures for Implementing NEPA (32 CFR § 775).

The United States (U.S.) Navy proposes to demolish the aging and seismically deficient Fuel Pier (Pier 180) at Naval Base Point Loma (NBPL), construct a new enhanced Fuel Pier with optimum capability to support current and projected fueling needs of the Navy and Department of Homeland Security (DHS), and perform associated dredging. Project demolition, construction, and dredging would occur simultaneously during an approximately 4-year period starting in September 2013 and ending in January 2017.

This EA addresses the potential environmental impacts of Alternative 1, Alternative 2, and the No-Action Alternative.

PURPOSE AND NEED FOR THE PROPOSED PROJECT (ALSO REFERRED TO HEREIN AS THE PROPOSED ACTION)

The fuel pier at NBPL is critical to the mission of the Navy and is the largest active Navy fueling facility in the southwest region. More than 42 million gallons of fuel are stored at Naval Supply Systems Command (NAVSUP) Fleet Logistics Center (FLC) Fuel Facility and more than 11 million gallons of fuel are issued and received every month to an average of 43 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier strike groups, National Oceanic and Atmospheric Administration (NOAA), DHS, foreign, and small craft.

The proposed project is needed to provide improved safety features and improved fuel receipt and delivery capability at the FLC Fuel Facility NBPL to service existing and future classes of naval vessels. As described in Section 1.1, *Introduction/Background*, there is a need for this project because: (1) portions of the existing fuel pier are over 100 years old and past designed service life; (2) the existing fuel pier is not consistent with the modern standards (including seismic safety standards) set out in the California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) regulations; (3) the existing fuel pier lacks adequate deep water berthing capability, thus cannot safely accommodate all of the existing and future classes of vessels; (4) portions of the existing turning basin are too shallow to safely accommodate current and future deep draft berthing capabilities; (5) improved fueling features and capabilities are needed to service the current and projected future demand of vessels, which is expected to increase by 30 to 35 percent by 2018; and (6) Navy and DHS need adequate and safe ship fueling facilities now and in the future to accomplish their missions of security and national defense.

The purpose of the proposed project is to replace the aging, seismically deficient, and increasingly dysfunctional and obsolete fuel pier (Pier 180) at NBPL with a new pier that would

meet CSLC MOTEMS, meet projected ship fueling requirements, and enable the Navy and DHS to meet their national security and defense missions.

ALTERNATIVE 1 PIER REPLACEMENT AND ASSOCIATED DREDGING

The scope of Alternative 1 would include the five key elements listed below.

- ***Temporary Relocation of the Navy Marine Mammal Program (MMP) –*** Before the pier replacement activities begin, the Navy MMP would be temporarily relocated to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL that is over 3 kilometers (km) away from the fuel pier. Limited construction at NMAWC would occur and Navy marine mammal enclosures would be towed from the existing facilities to the temporary NMAWC site. After completion of the new fuel pier, the Navy marine mammal enclosures and animals would be moved back to their original location adjacent to the fuel pier and the temporary facilities at NMAWC would be removed.
- ***Phased Demolition and Removal of the Existing Fuel Pier –*** Demolition and removal of the existing fuel pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed.
- ***Phased Construction of a Replacement Fuel Pier –*** A new, double-deck fuel pier would be constructed that would provide flexibility in fueling multiple vessel types, meet MOTEMS requirements for seismic performance, and have a total area that is 5,315 square feet (sf)/0.12 acre (ac) smaller than the area of the existing fuel pier. There would be no pile driving or other in-water construction or demolition during the least tern breeding season (from 1 April through 15 September) of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.
- ***Regulated Navigation Zones –*** The existing U.S. Coast Guard (USCG) Security Zone would be amended as needed to provide adequate security zone to the east for the proposed new fuel pier alignment. A temporary Security Zone would be established to a distance of 100 feet (ft) offshore from the proposed temporary Navy marine mammal relocation site at NMAWC for the period that the Navy marine mammals are present.
- ***Dredging and Sediment Disposal –*** Dredging and sediment disposal are needed to deepen an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities. Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE), but USEPA specified beneficial reuse for nearshore replenishment as the appropriate placement. The dredged sediments would be disposed in the nearshore area at Naval Amphibious Base (NAB) Coronado Silver Strand Training Complex (SSTC). Under Alternative 1, dredging could be done before, during, or shortly after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. It is anticipated that dredging would take approximately 3 months to complete. However,

there would be no dredging during the California least tern breeding season, 1 April to 15 September.

Although not an element of the P-151 NBPL Fuel Pier Replacement Project, the P-151 EA addresses the temporary relocation of the Everingham Brothers San Diego Bay bait barges during the portion of each project year when pile driving is occurring (generally between 16 September 16 and 31). The Navy is not relocating the bait barges. The viable bait barge relocation options and potential environmental impacts of relocating the bait barges are discussed in this EA. Following adoption of a Finding of No Significant Impact (FONSI) for this project, the Everingham Brothers Bait Company and the CSLC would be expected to execute a lease for a temporary relocation site.

ALTERNATIVE 2 DELAYED DREDGING ALTERNATIVE

Implementation of Alternative 2 would be the same as described under Alternative 1, except that dredging would occur years after completion of the fuel pier replacement effort, independent of the pier replacement demolition and construction and independent of the Navy marine mammal relocation. There would be no dredging during the California least tern breeding season (Apri1 1 to September 15) while the project is ongoing. As with Alternative 1, it is anticipated that dredging would take approximately 3 months to complete and the dredged material would be transported the SSTC beach beneficial reuse area and deposited in the nearshore zone. As with Alternative 1, after completion of the replacement fuel pier, the Navy marine mammal enclosures would be moved back to their current site. The Navy marine mammal relocation period is required only for the duration of demolition and construction activities. The same temporary relocation of the Everingham Brothers Bait Company bait barges as described for Alternative 1 would occur under Alternative 2.

PREFERRED ALTERNATIVE

The Navy has identified Alternative 1 (Pier Replacement and Associated Dredging) as the Preferred Alternative.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the Navy would not implement the demolition of the existing Fuel Pier, construction of the new fuel pier facility, or dredging activities. The seismic structural deficiencies of the existing fuel pier would remain out of conformance with the current MOTEMS. Notwithstanding the remaining seismic deficiencies, current and future demand for a fuel pier to safely accommodate deep draft vessels would not be met. Under the No-Action Alternative, the Navy MMP would not be temporarily relocated to NMAWC and the two Everingham Brothers Bait Company San Diego Bay bait barges would not be temporarily relocated. Although the fuel pier itself would not be demolished, Buildings 110 and 140 on the existing pier would be taken down, and a new onshore control tower would be constructed as part of military construction project P-401, an on-going project that is modernizing the existing FLC Fuel Facility Point Loma bulk fuel storage and distribution facility.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Project as required under the CEQ regulations (40 CFR 1502.14[d]). However, it does provide a measure of the baseline conditions described in Chapter 3, against which the potential adverse impacts of the Project can be compared.

AGENCY CORRESPONDENCE AND PUBLIC INVOLVEMENT

Regulatory agencies participating in this project include USEPA, USACE, USFWS, NMFS, RWQCB, CSLC, USCG, and the CCC as described in Section 1.6. Appendix A documents the correspondence between the Navy and the regulatory agencies involved in this project.

Regarding the public involvement process, a public meeting notice was published in the San Diego Union Tribune on 28 April 2012 that initiated a 30-day public scoping period. The 30-day public scoping period began on 28 April 2012 and ended on 28 May 2012. A public meeting was held on 3 May 2012 at the Loma Portal Elementary School. A Notice of Availability (NOA) for the Draft EA was published in in the San Diego Union Tribune on 20 October 2012 to initiate a 30-day public review of the Draft EA. The public review period of the Draft EA was 30 days beginning on 20 October 2012 and ending on 19 November 2012. A public meeting was held on 14 November 2012 at Portuguese Hall, San Diego. The Draft EA was made available to the public via the Navy website at www.piersystem.com/go/doc/4275/1355631/ and at the following local libraries: San Diego Central Library, Point Loma/Hervey Branch Library, and Ocean Beach Branch Library. Appendix B of this EA contains concerns raised by the public during the scoping and Draft EA public review periods, public comments received on the Draft EA, and responses to the comments. The FONSI/FEA were made available to the public at the Point Loma/Hervey Branch, Ocean Beach Branch, and Pacific Beach/Taylor public libraries and via the Navy website: www.piersystem.com/go/doc/4275/1355631/.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts have been analyzed for the following resources: biological resource habitats and communities; fisheries; birds; marine mammals; threatened and endangered species; water resources; hazardous materials and wastes; noise; air quality; transportation and circulation; and socioeconomics and environmental justice. Table ES-1 summarizes determinations of environmental consequences followed by the respective avoidance and minimization measures/special conservation measures (SCMs) for Alternative 1, Alternative 2, and the No-Action Alternative. Chapter 3 provides a detailed discussion of the environmental consequences. As described in Table ES-1, implementation of Alternative 1, Alternative 2, or the No-Action Alternative would not result in significant impacts to any resource area.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Biological Resource Habitats and Communities	Other than the incremental deepening of deep subtidal habitat by dredging the high spot in the turning basin, no permanent change would result from dredging, temporary relocation of the Everingham Brothers Bait Company bait barges, or the temporary relocation of the Navy MMP. Minor and short-term impacts to vegetated and nonvegetated soft bottom benthic habitat would occur. The temporary relocation of the bait barges would not result in any impacts to habitats or communities because the relocation sites are in the same deep subtidal habitat as the existing location. Impacts to eelgrass from the proposed fuel pier would be minor (approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass) and would be offset by using the Navy's established eelgrass mitigation bank. Eelgrass impacts from the temporary relocation of the Navy MMP would be minor (approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass), temporary, and would be offset by using the established eelgrass mitigation bank. The structural habitat of the existing pier would be removed but largely replaced by that of the new pier; differences would be inconsequential. Organisms occurring in the immediate area may be lost or displaced directly by project activities (equipment or noise) or indirectly by short-term changes to suspended sediments, turbidity, dissolved oxygen, and light diffusion. Some invertebrates and fish within the dredge footprint would be lost to mortality due to entrainment during the dredging process. However, organisms are expected to return to the project area upon project completion, and epifauna are expected to recolonize the new fuel pier from nearby, undisturbed areas within a relatively short time period. Therefore, through the use of the preventative measures described below, the minor and short-term impacts to biological resource habitats and communities would not be significant. **Avoidance and Minimization Measures/Special Conservation Measures (SCMs):** Before proceeding with the project, the Navy would obtain the required Clean Water Act (CWA) Section 404/Rivers and Harbors Act (RHA) Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to biological resource habitats and communities. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	for use during the proposed activities to reduce the potential to impacts to habitats and communities. Fisheries, Birds, Marine Mammals, and Threatened and Endangered Species resource sections contain additional Avoidance and Minimization Measures applicable to those specific resources. • Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein is occurring. The Navy would report any violation of authorized impacts to the National Marine Fisheries Service (NMFS) within 24 hours of its occurrence. • The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	would not be used for any purpose.		
Fish	Fish communities and habitats would be temporarily affected by in-water construction and demolition. Temporary relocation of the bait barges would have no net effect because the barges would remain in the same habitat they currently occupy. The potential for injury to fish would exist at close ranges to impact pile driving. Within the corresponding Zones of Influence (ZOIs), fish are likely to move away from the pile being driven. Disturbance to fish is possible at greater ranges, but, if anything, only temporary behavioral reactions would be anticipated, without long-term consequences for fish populations. Impacts would not be significant. In conjunction with the NEPA process, the Navy consulted informally with National Oceanographic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS). An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action. Approximately 0.05 ac of eelgrass habitat as of 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. This area represents a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively) and would be offset by using the Navy's established eelgrass mitigation bank. The proposed temporary relocation site for the Navy MMP would temporarily impact 0.67 ac of eelgrass surveyed in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass; this temporary impact at NMAWC would be offset by using the established eelgrass mitigation bank. As such, implementation of Alternative 1 would not result in any significant impacts to fisheries or Essential Fish Habitat (EFH). **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following: • Sheet piles beneath the existing pier would be left in place to minimize sediment and eelgrass disturbance. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to fisheries. Under Alternative 2, the same NOAA Fisheries Conservation Recommendation will be integrated into the Proposed Action as for Alternative 1. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed at an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence. The following avoidance and minimization measures would be followed during the proposed pile driving and dredging activities. • Soft Start - The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows: *"The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated two additional times. If an impact hammer is used, contractors*		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."		
Birds	Alternative 1 may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring. However, any impacts would be short-term, localized, and would not impact bird populations. Birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Hence, project-related noise is not expected to be a novel disturbance or to have strong effects on migratory birds. Indirect impacts to breeding because of reduced visibility or changes in prey distribution in response to noise or turbidity would similarly be localized, intermittent, and less than significant. No in-water demolition, construction, or dredging activities would occur during the least tern breeding season (1 April through 15 September). Temporary relocation of the bait barges would have no impact on bird populations because other structures provide suitable perch sites throughout the northern bay, and the barges would remain in the same habitat. Therefore, the Proposed Action would not have a significant impact under the Migratory Bird Treaty Act (MBTA) and there would be no significant impacts on other non-migratory marine bird habitat or populations. **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities. Avoidance and minimization measures to protect California least terns are provided in the Threatened and Endangered Species resource section.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to birds. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Marine Mammals	The Proposed Action would not result in any injuries or mortalities (Level A takes) of marine mammals. Temporary relocation of the bait barges outside of the underwater noise zone of influence would greatly reduce the exposure of marine mammals to project-related underwater noise. The Proposed Action has the potential, however, to result in minor behavioral effects (Level B takes) to four marine mammal species from underwater noise associated with impulsive or vibratory pile driving, construction, and demolition. One of the four species (harbor seal) may also be subject to behavioral effects from airborne noise. Considering the 6.5-month work windows for all 3 years combined, total Level B behavioral harassments (takes) are expected as follows: California sea lions – 2,405; harbor seals – 270; gray whales – 45; and coastal bottlenose dolphins - 2,016. Marine mammals that are taken (harassed) may change their normal behavior patterns (e.g., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. As such, the Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** In conjunction with the NEPA process, the Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A). . The Navy will abide by all conditions of the approved IHA. Section 3.4.3.2 details the avoidance and minimization measures set in place to lessen the impacts to mammals, which include avoidance and minimization measures for pile driving, a discussion of the avoidance and minimization measure effectiveness, monitoring, and reporting.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, except that dredging would not take place until years after the completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the Navy will abide by all conditions of the approved IHA. Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Threatened and Endangered Species	<u>California Least Tern</u> Conservation measures established in the Memorandum of Understanding (MOU) Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No effects would be associated with the temporary relocation of the bait barges, which would occur outside of the breeding season. No persistent effects on breeding conditions are expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at Naval Air Station (NAS) North Island. The Navy made a no effect determination on the California least tern. There would be no significant impact on the California least tern. <u>Green Sea Turtle</u> Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area; sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Furthermore, no sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures would be implemented to avoid potential impacts to green sea turtles from pile driving activities. No effects to sea turtle movements or habitat use are anticipated from the temporary relocation of the bait barges. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to threatened and endangered species. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	(refer to Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles. Therefore, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the green sea turtle. There would be no significant impact on the green sea turtle. Programmatically, the Navy will continue to consult informally with NMFS on other Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles and to agree upon related avoidance and minimization measures. These measures would support a programmatic "may affect, not likely to adversely affect" finding that would be subject to the regulator's written concurrence. <u>Western Snowy Plover</u> Since the western snowy plover is not known or expected to occur in the project area, there would be no effect on individuals or potential habitat for this species. The Navy made a no effect determination on the western snowy plover. Therefore, there would be no significant impact to western snowy plovers. <u>Other Special Status Species</u> The project sites are not in proximity to important breeding, resting, or breeding areas for bird species, and similar habitats are abundant throughout San Diego Bay. No impacts are anticipated from the temporary relocation of the bait barges as they would be located within the same deep subtidal habitat. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, with implementation of Alternative 1 there would be no adverse effect on these species' populations or habitats. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species:		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September). • The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2). • In conjunction with marine mammal monitoring (Section 3.4.3.2 of this EA) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the limit of potential Level B behavioral harassment, specifically to the underwater 160 decibels (dB) re 1 microPascal (µPa) (root mean square [rms]) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 µPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound pressure level [SPL] [rms] ≤ median ambient rms), whichever is less. A 10-meter (m) buffer zone will also be monitored during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities. • If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. • Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.		
Water Resources	There would be no impact to bathymetry from temporary relocation of the Navy MMP, the Everingham Brothers Bait Company bait barges, and pier demolition and construction. The impact to bathymetry from dredging the high spot in the existing turning basin would be less than significant because most of the area, surrounding the proposed dredge footprint is already deeper than the proposed dredge depth (-40 ft mean lower low water level). Use of dredge sediments for nearshore replenishment at SSTC beach would be a beneficial impact. There would be minor, short-term localized increases to	Under Alternative 2, dredging would be done years after the pier replacement effort is completed. Thus under this Alternative, there would be no potential intermittent overlap of increased	Under the No-Action Alternative, no in-water demolition, construction dredging, and sediment beneficial reuse activities would occur and existing water resources would not

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	circulation in San Diego Bay in the project areas caused by vessel movement, in-water demolition, construction, and dredging; these increases would cease when each particular activity ends. The in-water structures to be installed (the new fuel pier and the temporary Navy MMP facilities) would not form barriers to the natural movement of water in San Diego Bay. Temporary relocation of the Everingham Brothers Bait Company bait barges would not involve in-water construction, dredging, or other activity that would affect movement of water in San Diego Bay. Increased turbidity because of sediment resuspension during demolition and construction would be short-term and limited to the demolition/construction areas around the fuel pier. Increased turbidity while dredging with either a hopper or clamshell dredge would be short-term as well, because the dredge material is larger-grained material (sand) that tends to settle quickly. The Navy MMP is covered under NBPL's overall National Pollutant Discharge Elimination System (NPDES) permit, which would be amended for the temporary relocation of the Navy MMP to NMAWC. Based on analytical testing, the physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size (sand) and low concentrations of contaminants. These results indicate contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts to water quality as a result of turbidity from sediment resuspension would not be significant. It is not anticipated that bacteria loading from Navy marine mammals alone would exceed San Diego Basin Plan waters designated for contact recreation beneficial uses (REC-1) water quality limits at the proposed 100 ft-security barrier that would be established around the temporary MMP facilities; therefore, significant impacts to water quality would not occur. However, the Navy would monitor water quality while the MMP occupies the temporary relocation site at NMAWC. If the monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy would employ adaptive management measures in consultation with California Coastal Commission (CCC) staff (described below under Avoidance and Minimization Measures/SCMs). The new fuel pier would have stormwater management	turbidity associated with demolition and construction activities. With the exception of when dredging would occur, Alternative 2 is the same as Alternative 1, Alternative 1. Under Alternative 2 there would be a beneficial impact to bathymetry due to use of dredged sediments for nearshore replenishment at SSTC beach; There would be no significant impacts to circulation and water quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	be affected. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	capabilities that would comply with current NBPL permit requirements. All rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be captured and pumped to NBPL's fuel oil reclamation facility for treatment. Basewide and site-specific Best Management Practices (BMPs) to prevent impacts to surface water would be followed at the new fuel pier. Therefore, with implementation of Alternative 1, no significant impacts to water quality would occur. During demolition, construction, dredging, and sediment beneficial reuse, protective measures would be implemented to minimize impacts to marine water quality. Protective measures for demolition and construction would include the use of catch devices and sheeting to prevent the release of debris and hazardous materials/waste into San Diego Bay, and the NBPL Emergency Response Action Plan to minimize the effect of any spills that might occur. As a protective measure to prevent turbidity, the sheet pile beneath the existing fuel pier would be retained. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the San Diego Regional Water Quality Control Board (RWQCB) and Section 404/Section 10 permits from the USACE. For the reasons listed in the preceding paragraphs, with implementation of Alternative 1 there would be no significant impacts to bathymetry, circulation, and water quality within San Diego Bay. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce impacts to below a level of significance: • Sheet piles beneath the existing fuel pier would be left in place to minimize sediment and eelgrass disturbance. • The demolition and construction contractors would be required to prepare and implement a Construction Demolition Plan that would cover all phases of the work to be done. The contractors' plan would be required to specify materials, equipment, and procedures to be used to contain all construction and demolition waste and debris. • Contractors would be required to use catch devices and sheeting to capture and contain debris.		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Before demolition begins, the contents of each pipeline would be pumped out. The pipelines would be cleaned to minimize accidental release of pipeline residue during demolition activities. Pipeline contents and cleaning water would be captured and properly disposed. • Per the NBPL Emergency Response Action Plan, any petroleum release or petroleum sheen observed on the water surface would be reported to the National Response Center and other agencies as required. • Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup measures appropriate to the nature and extent of the spill would be implemented. These procedures would minimize the potential for contaminants related to project activities to enter marine waters. • Potential adaptive management measures to reduce bacteria concentrations in the waters surrounding the proposed NMAWC temporary relocation site for the Navy MMP could include: housing 27 of the Navy MMP 30 sea lions in the southernmost enclosures, where bay circulation is greater; removing solid sea lion scat from walkways and enclosures before pressure washing; transferring some of the animals back to the existing Navy MMP location (near the fuel pier) during non-pile driving activities; and installing ultraviolet treatment systems or aeration equipment to enhance bacterial degradation. • Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system. All BMPs specific to the fuel pier would also be followed. • A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	in-water components of the project.		
Hazardous Materials and Wastes	Through the use of the preventive measures described below and implementation of the procedures described in the Emergency Response Action Plan in the event of an accidental release, no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would occur with implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes. Through adherence to Navy Region Southwest (NRSW) recycling and waste minimization requirements and reuse of the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would not have a significant impact to solid waste and regional landfill capacity. **Avoidance and Minimization Measures/SCMs** • The Navy would characterize all hazardous wastes associated with demolition of the existing fuel pier (building materials falling under the Universal Waste Rule, coal tar coating on the steel superstructure, lead-based paint (LBP), asbestos-containing materials (ACMs) (if determined to be present), and treated wood waste for proper disposal at an appropriately-permitted facility. • Construction contractors would be required to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. • Catch devices and sheeting would be used to capture and contain debris, and floating booms would be placed around the work site to confine any potential release to a minimal area. • Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the NRSW Waste Management Plan (NRSW 2007). In addition, demolition and construction contractors would implement BMPs designed to minimize the potential for hazardous	Under Alternative 2, the same project components would occur as for Alternative 1, involving the same types and volumes of hazardous and non-hazardous materials and wastes. Therefore, no significant impacts associated with hazardous materials, hazardous wastes, public health and safety, and solid waste would occur. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, fueling operations currently being conducted at the existing fuel pier would continue. Therefore, there would be no change from the existing conditions. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	material releases during demolition and construction activities. • Emergency procedures in Section 5 of the NRSW Waste Management Plan would be followed upon discovery of any spill or release either in or outside the work area. • A safety buffer zone would be established between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint. All contractors' equipment and vessels would remain outside the safety buffer zone. • Before the fuel pier is demolished, all fuel, lubricating oil, and contaminated petroleum product inside the pipelines on the fuel pier would be pumped out and the pipelines would be cleaned. • In the event of an accidental spill or release of oil or hazardous substance, the procedures in the NBPL Emergency Response Action Plan would be followed to contain the release and minimize impacts. • The proposed project would be required to prepare and follow a Navy-approved Explosives Safety Submission Determination Request (ESS DR) that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential discarded military munitions (DMM), and NRSW Explosive Ordnance Disposal (EOD) Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths, and use of the above-referenced safety plans and procedures there would be no significant impact from DMM. • The USCG and CSLC would continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines and fuel pier operations when the new pier is completed. The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. • The oily water pipeline for the new fuel pier would be		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	designed and tested in accordance with the requirements of California Code of Regulations (CCR) Title 22, Chapter 15-Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems and the applicable guideline standards in the American Petroleum Institute Standard 650 Welded Tanks for Oil Storage. • Hazardous wastes that would be generated at the new fuel pier would continue to be managed according to federal, state, and county regulations, and be recycled/disposed of appropriately by licensed contractors. The San Diego County Department of Environmental Health would continue their regulatory oversight of hazardous waste activities at the new fuel pier.		
Airborne Noise	Pile driving would be the dominant noise-generating activity associated with the proposed project. All pile driving would take place during daylight hours (nominally 7:00 A.M. to 4:00 P.M. on weekdays). During pile driving, outdoor airborne noise levels in residential areas beyond the NMAWC boundary and in the La Playa neighborhood north of NBPL would not exceed City of San Diego construction noise ordinances (75 decibels A-weighted [dBA]). During pile driving at NMAWC, the indoor noise levels at schools and day care centers beyond the NMAWC boundary would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dBA). Since the pile driving would be intermittent during the school day these levels would be considered acceptable and therefore, would not result in a significant noise impact. During pile driving at NBPL, the indoor noise levels with windows closed at the Child Development Center (CDC) at Building 377 at NBPL would be slightly greater than the classroom criteria levels for effective hearing (35 dBA). Since the pile driving would be intermittent during the school day, and there would be 5.5 months without pile driving (during the least tern breeding season), these noise levels would be considered acceptable and therefore, would not result in a significant noise impact. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce noise impacts to below a level of significance:	Under Alternative 2, the noise impacts associated with the demolition, construction, and dredging activities would be the same as those discussed under Alternative. 1. However, dredging would take place years after construction was completed, so noise from dredging would occur in the absence of other project-related noise. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and	Under the No-Action Alternative, industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, there would be no noise impacts associated with the No-Action Alternative. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative,

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Construction activities, including pile driving, would only occur during daylight hours (nominally 7:00 A.M. to 4:00 P.M., Monday through Friday). • The educational facilities listed in Tables 3.8-1 and 3.8-2 of this EA would be informed of the dates of pile driving and advised to close classroom windows during the pile driving intervals. The following additional avoidance and minimization measures/SCMs could be implemented as part of Alternative 1 to further attenuate noise levels if a greater reduction is desired. • Noise monitoring for classroom criteria. • Acoustic blankets around the pile driver. • Pile cushions could be used to reduce noise levels.	minimization measures/SCMs would be the same as those for Alternative 1.	avoidance and minimization measures/SCMs would not be necessary.
Air Quality	Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, the air quality analysis focuses on construction activities required to replace the pier. Estimated annual construction emissions with implementation of Alternative 1 would be below the *de minimis* threshold levels for Clean Air Act (CAA) conformity. In addition, Alternative 1 would conform to the San Diego Air Basin Shore State Implementation Plan (SIP) and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Appendix G of this EA). No health effects would be anticipated from emission of hazardous air pollutants (HAPs) because the majority of project activities occur in restricted areas where there are no sensitive receptors (i.e., residents, schools, hospitals, etc.). Therefore, with implementation of Alternative 1, significant impacts to air quality would not occur. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measure/SCM would be implemented as part of Alternative 1 to ensure that	Impacts associated with Alternative 2 would be the same as those for Alternative 1 with the exception that dredging would take place years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to air quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the avoidance and minimization measure /SCM would be the same as for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to operate the NBPL fuel pier without replacement of and without implementation of safety improvements. There may be additional air quality impacts should vessels be required to wait until the pier is available and conduct additional maneuvering for safety purposes. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	impacts are reduced to below a level of significance: • All necessary construction or operationally-related permits would be authorized by the San Diego County Air Pollution Control District (SDCAPCD) before project implementation occurs.		would not be necessary.
Transportation and Circulation	Proposed demolition and construction associated with replacement of the NBPL fuel pier would cause temporary and less than significant changes to traffic and circulation in the region of influence (ROI) during the demolition/construction period. Temporary changes to traffic and circulation associated with temporary relocation of the Navy MMP to NMAWC would also be less than significant. Operations at the new fuel pier would not result in additional vehicle traffic to the pier because the number of workers and work vehicles would not change. Implementation of Alternative 1 would not result in any change to baseline Level of Service (LOS) on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, impacts to transportation and circulation would not be significant. **Avoidance and Minimization Measures/SCMs:** The following potential avoidance and minimization measure/SCM could be implemented as part of Alternative 1 to facilitate site access if it is desired to further reduce the volume of project traffic on Rosecrans Street during project construction. • If needed, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. In order to avoid potential cumulative impacts relative to marine traffic, the following minimization measure is recommended: • To ensure safety of all vessels using San Diego Bay, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including temporary relocation of the Navy marine mammals and the Everingham Brothers Bait	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would be delayed until completion of construction of the pier. Under Alternative 2, there would be no significant impacts to Transportation and Circulation. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the potential avoidance and minimization measure/SCM would be the same as for Alternative 1.	Under the No-Action Alternative, roadway and vessel traffic conditions would remain unchanged. Therefore, no significant impacts to transportation and circulation would occur. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	Company bait barges, dredging and sediment disposal.		
Socioeconomics, Environmental Justice, and Growth Inducement	There would be an overall beneficial impact to the economy of San Diego County from the fuel pier replacement and dredging project. Economic benefits associated with construction activities would more than offset potential reductions in economic activity in industries related to recreational fishing, leading to a net beneficial economic impact to San Diego County during the life of the project. No low-income or minority populations would be disproportionately or adversely affected, so no environmental justice impacts would occur. There would be no housing development or need for an in-migrating construction workforce, nor would any constraints to growth be removed, so there would be no impacts associated with induced growth.	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the replacement fuel pier. Under Alternative 2, there would be no significant impacts to socioeconomics or environmental justice and no impacts associated with induced growth.	Under the No-Action Alternative, socioeconomic conditions would remain unchanged. Therefore, no significant impacts to socioeconomics or environmental justice would occur.

NAVAL BASE POINT LOMA (NBPL) FUEL PIER REPLACEMENT AND DREDGING (P-151) ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

ACRONYMS ..... **After Front Cover**

ABSTRACT ..... **i**

EXECUTIVE SUMMARY **ES-1**

CHAPTER 1 PURPOSE AND NEED FOR THE PROJECT **1-1**

1.1 INTRODUCTION/BACKGROUND 1-1
1.2 PROJECT LOCATION 1-4
1.3 PURPOSE OF AND NEED FOR THE PROJECT 1-5
1.4 DECISION TO BE MADE 1-7
1.5 SCOPE OF THE ANALYSIS 1-7
1.6 INTERGOVERNMENTAL COORDINATION 1-9
1.7 PUBLIC AND AGENCY PARTICIPATION 1-9
ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT 1-10

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES **2-1**

2.1 REASONABLE ALTERNATIVES SCREENING FACTORS 2-1
2.2 ALTERNATIVES CONSIDERED 2-2
2.2.1 Alternative 1 Pier Replacement and Associated Dredging 2-2
2.2.2 Alternative 2 Delayed Dredging Alternative 2-47
2.2.3 No-Action Alternative 2-47
2.2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis 2-48
2.3 PREFERRED ALTERNATIVE 2-50
2.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES 2-50

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES **3-1**

3.1 BIOLOGICAL RESOURCE HABITATS AND COMMUNITIES 3-12
3.1.1 Definition of Resource 3-12
3.1.2 Affected Environment 3-13
3.1.3 Environmental Consequences 3-20
3.2 FISH 3-26
3.2.1 Definition of Resource 3-26
3.2.2 Affected Environment 3-26
3.2.3 Environmental Consequences 3-31
3.3 BIRDS 3-46
3.3.1 Definition of Resource 3-46

3.3.2 Affected Environment 3-47
3.3.3 Environmental Consequences 3-48
3.4 MARINE MAMMALS 3-51
3.4.1 Definition of Resource 3-51
3.4.2 Affected Environment 3-51
3.4.3 Environmental Consequences 3-65
3.5 THREATENED AND ENDANGERED SPECIES 3-101
3.5.1 Definition of Resource 3-101
3.5.2 Affected Environment 3-101
3.5.3 Environmental Consequences 3-105
3.6 WATER RESOURCES 3-108
3.6.1 Definition of Resource 3-108
3.6.2 Affected Environment 3-109
3.6.3 Environmental Consequences 3-114
3.7 HAZARDOUS MATERIALS AND WASTES 3-130
3.7.1 Definition of Resource 3-130
3.7.2 Affected Environment 3-132
3.7.3 Environmental Consequences 3-139
3.8 AIRBORNE NOISE 3-148
3.8.1 Definition of Resource 3-148
3.8.2 Affected Environment 3-149
3.8.3 Environmental Consequences 3-151
3.9 AIR QUALITY 3-160
3.9.1 Definition of Resource 3-160
3.9.2 Affected Environment 3-162
3.9.3 Environmental Consequences 3-166
3.10 TRANSPORTATION AND CIRCULATION 3-171
3.10.1 Definition of Resource 3-171
3.10.2 Affected Environment 3-172
3.10.3 Environmental Consequences 3-173
3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE 3-179
3.11.1 Definition of Resource 3-179
3.11.2 Affected Environment 3-180
3.11.3 Environmental Consequences 3-188

CHAPTER 4 CUMULATIVE IMPACT ANALYSIS 4-1

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS 4-1
4.1.1 Past Projects 4-1
4.1.2 Present Projects 4-6
4.1.3 Reasonably Foreseeable Projects 4-8
4.2 APPROACH TO CUMULATIVE IMPACTS ANALYSIS 4-10
4.2.1 Context and Intensity 4-10
4.2.2 Acute Impacts and Lingering Impacts 4-10

4.2.3 Quantitative Analysis for Cumulative Impacts 4-12
4.3 CUMULATIVE IMPACTS ANALYSIS 4-13
4.3.1 Habitats and Communities 4-13
4.3.2 Fish 4-14
4.3.3 Birds....4-16
4.3.4 Marine Mammals 4-16
4.3.5 Threatened and Endangered Species....4-17
4.3.6 Water Resources 4-17
4.3.7 Hazardous Materials and Wastes 4-20
4.3.8 Airborne Noise....4-21
4.3.9 Air Quality....4-24
4.3.10 Transportation and Circulation....4-26
4.3.11 Socioeconomics and Environmental Justice 4-27
4.4 CUMULATIVE IMPACTS CONCLUSION 4-28

CHAPTER 5 OTHER NEPA CONSIDERATIONS 5-1

5.1 POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS 5-1
5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES....5-1
5.3 RELATIONSHIP BETWEEN SHORT-TERM ENVIRONMENTAL IMPACTS AND LONG-TERM PRODUCTIVITY 5-1
5.4 GROWTH INDUCEMENT 5-5

CHAPTER 6 AGENCIES, ENTITIES AND PERSONS CONTACTED....6-1

CHAPTER 7 PREPARERS AND CONTRIBUTORS....7-1

7.1 PREPARERS....7-1
7.1.1 Cardno TEC Santa Barbara 7-1
7.1.2 Cardno TEC San Diego....7-1
7.1.3 Cardno TEC Boise 7-1
7.1.4 Cardno TEC Honolulu....7-1
7.1.5 TEC Subcontractors....7-2
7.2 CONTRIBUTORS....7-2

CHAPTER 8 REFERENCES 8-1

List of Appendices

APPENDIX A: AGENCY CORRESPONDENCE

APPENDIX B: PUBLIC INVOLVEMENT

APPENDIX C: UNIFIED FACILITIES CRITERIA (UFC)

APPENDIX D: SAMPLING AND ANALYSIS REPORT FOR NAVAL BASE POINT LOMA FUEL PIER REPLACEMENT AND DREDGING (MILCON PROJECT P-151)

APPENDIX E: MARINE BIOLOGICAL RESOURCES

Appendix E.1: Essential Fish Habitat Assessment for NBPL Fuel Pier Replacement and Dredging (MILCON P-151)

Appendix E.2: Memorandum of Understanding Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California

Appendix E.3: Approval for Use of Established Eelgrass Mitigation Bank Credits

Appendix E.4: Acoustic Transmission Loss Model for Pile Driving

Appendix E.5: Ambient Underwater Sound Measurements in San Diego Bay

APPENDIX F: AIRBORNE NOISE MODELING DATA

APPENDIX G: RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY (RONA) AND AIR QUALITY DATA

APPENDIX H: TRAFFIC COUNT DATA

APPENDIX I: FINAL REPORT NAVAL BASE POINT LOMA FUEL PIER AND SSC MARINE MAMMAL RELOCATION AREA WATER AND SEDIMENT QUALITY INVESTIGATION SAN DIEGO BAY, SAN DIEGO, CALIFORNIA

List of Figures

Figure		Page
1-1	Regional Location – Pier 180 Replacement, Naval Base Point Loma – Point Loma Complex	1-2
1-2	Project Site Map	1-3
1-3	Views of Existing Fuel Pier 180	1-6
2-1	Navy Marine Mammal Program Current and Proposed Temporary Relocation Sites	2-3
2-2	Limit of Potential Underwater Noise Disturbance and Proposed Temporary Relocation Sites for Navy Marine Mammal Program and Bait Barges	2-4
2-3	Contractors' Laydown Area	2-17
2-4	Demolition and Construction Phasing Plan	2-20
2-5	Navigation/Construction Zone	2-21
2-6	Proposed New Fuel Pier and Turning Basin Dredge Footprint	2-24
2-7	View of Proposed New Fuel Pier	2-28
2-8a	Regulated Navigation Zones NOAA Navigation Chart	2-32
2-8b	Regulated Navigation Zones Aerial Imagery	2-33
2-9a	Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607 NOAA Navigation Chart	2-35

2-9b Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607 2010 Aerial Imagery 2-36
2-10 Proposed P-151 Dredge Material Beneficial Reuse Site....2-39
2-11 Potential Bait Barge Temporary Relocation Sites Initially Considered Bay-Wide 2-43
2-12 Potential Bait-Barge Temporary Relocation Sites Considered Harbor Island....2-45
3-1 View Looking West From Vessel in San Diego Bay 3-4
3-2 View Looking Northeast from Fort Rosecrans National Cemetery....3-5
3.1-1 Project Area Bathymetry....3-14
3.1-2 Point Loma Ecological Conservation Area and Eelgrass Beds in the Vicinity of the Proposed Fuel Pier....3-16
3.1-3 Eelgrass Beds in the Vicinity of the Proposed Temporary Navy Marine Mammal Enclosure Relocation Site....3-21
3.2-1 Underwater Sound from Impact Pile Driving, 36-48" Steel Piles (Source = 195 dB rms) 3-34
3.2-2 Underwater Sound from Vibratory Pile Driving, 36-48" Steel Piles (Source = 180 dB rms) 3-35
3.2-3 Underwater Sound from Impact Pile Driving, 24" Concrete Piles (Source = 176 dB rms) 3-36
3.2-4 Underwater Sound from Impact Pile Driving, 16" Fiberglass-Concrete Piles (Source = 173 dB rms) 3-37
3.2-5 Underwater Sound from Impact Pile Driving at Marine Mammal Relocation Site, 18" Concrete Piles (Source = 173 dB rms)....3-38
3.2-6 Underwater Sound from Vibratory Steel Pile Extraction (Source = 172 dB rms) 3-39
3.2-7 Underwater Sound from Vibratory Non-Steel Pile Extraction (Source = 160 dB rms) ..3-40
3.4-1 Marine Mammal Survey Routes 3-52
3.4-2 Marine Mammal Occurrences in the Project area (Navy Surveys)....3-54
3.4-3 Structures Used as Haulouts by Sea Lions....3-57
3.4-4 Ambient Underwater Sound Locations....3-71
3.5-1 California Least Tern Nesting Sites and Breeding Areas Identified in the Tern MOU Within the Vicinity of the Proposed Project....3-103
3.11-1 Environmental Justice Low-Income Population Area....3-186
3.11-2 Environmental Justice Minority Population Area....3-187
Figure 3.11-3. Jobs Impact, 2013-2016....3-198
Figure 3.11-4. Labor Income Impact, 2013-2016....3-199
Figure 3.11-5. Economic Output Impact, 2013-2016....3-200
4.1-1 Locations of Past, Present and Reasonably Foreseeable Cumulative Projects....4-2

4.1-2 Comparison (overlap) of Estimated Construction Time Periods for Present and Reasonably Foreseeable Cumulative Projects to the Construction Time Period of the Proposed Action 4-3

Figure 4.3-1 Combined Underwater Construction Sound Contours for the Proposed Naval Base Point Loma Fuel Pier Replacement (195 dB) and the Scripps Marine Facility Replacement Pier (175 dB) 4-15

List of Tables

Table **Page**

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures ES-5

Table 2-1. Navy Marine Mammal Program (MMP) Potential Relocation Sites Considered but Eliminated 2-8

Table 2-2. Construction Phase Summary 2-12

Table 2-3. Existing Fuel Pier (Pier 180) Information 2-13

Table 2-4. Existing Fuel Pier (Pier 180) Pipeline Diameters and Contents 2-14

Table 2-5. Existing Fuel Pier (Pier 180) Piles to be Removed 2-15

Table 2-6. New Fuel Pier Above Deck Equipment Heights 2-25

Table 2-7. Proposed Replacement Fuel Pier Pilings to Be Installed 2-27

Table 2-8. New Pier Fueling Stations 2-29

Table 2-9. Proposed Dredging Volume 2-34

Table 2-10. Sediment Distribution Comparison, Proposed NBPL Dredging and Beneficial Reuse Areas 2-40

Table 2-11. Potential Bait Barge Bay-wide Temporary Relocation Areas Initially Considered 2-42

Table 2-12. Potential Bait Barge Harbor Island Relocation Sites 2-46

Table 2-13. Approximate Open Water Distances Between Proposed Potential Temporary Bait Barge Locations and Points in San Diego Bay 2-46

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures 2-51

Table 3.2-1. Fish Species with EFH Likely to Occur in the Proposed San Diego Bay Project Area 3-29

Table 3.2-2. Port of San Diego Average Annual Vessel Traffic 3-30

Table 3.2-3. Interim Criteria for Fish Injury and Disturbance by Underwater Sound from Pile Driving 3-42

Table 3.2-4. Calculated ZOIs Corresponding to Interim Criteria for Fish 3-43

Table 3.4-1. Marine Mammals Occurring in the Vicinity of Naval Base Point Loma 3-53

Table 3.4-2. Definitions of Acoustical Terms 3-67

Table 3.4-3. Injury and Disturbance Thresholds for Underwater and Airborne Sounds 3-68

Table 3.4-4. Representative Noise Levels of Anthropogenic Sources 3-69

Table 3.4-5. Underwater Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities 3-87

Table 3.4-6. Calculated Areas of ZOIs Corresponding to MMPA Thresholds 3-89

Table 3.4-7. Airborne Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities....3-90
Table 3.4-8. Calculated Distances to the Marine Mammal Noise Thresholds in Air from Pile Driving....3-90
Table 3.4-9. Calculated Area Encompassed (Per Pile) by the Marine Mammal Noise Thresholds In-air from Pile Driving....3-90
Table 3.4-10. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During First 12-Month Period....3-94
Table 3.4-11. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Second 12-Month Period....3-94
Table 3.4-12. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Third 12-Month Period....3-95
Table 3.4-13. Number of Potential Exposures Constituting Takes of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During First 12-Month Period....3-96
Table 3.4-14. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Second 12-Month Period....3-97
Table 3.4-15. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Third 12-Month Period....3-97
Table 3.4-16. Summary of Potential Exposures Constituting Takes for All Species, All Years....3-98
Table 3.5-1. Federally Threatened and Endangered Species Occurring or Having the Potential to Occur in the Vicinity of the Proposed Project Area....3-102
Table 3.8-1. Proposed Navy Temporary MMP Relocation NMAWC Site Airborne Outdoor Construction Noise Levels at Representative Receptor Points....3-153
Table 3.8-2. Indicator Piles and Mooring Dolphin Airborne Outdoor Construction Noise Levels at Representative Receptor Points....3-155
Table 3.8-3. Approach Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points....3-156
Table 3.8-4. North Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points....3-157
Table 3.8-5. South Pier Dolphin Installation and Existing Pier Demolition Airborne Outdoor Construction Noise Levels at Representative Receptor Points....3-158
Table 3.8-6. Existing Pier Airborne Outdoor Demolition Noise Levels at Representative Receptor Points....3-158
Table 3.9-1. Ambient Air Quality Standards....3-161
Table 3.9-2. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity –Alternative 1....3-169
Table 3.9-3. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity – Alternative 2....3-170

Table 3.10-1. Traffic Conditions Associated with LOS Ratings 3-171
Table 3.11-1. Population, 1990-2010 3-180
Table 3.11-2. Population, 2010 and Population Projections, 2020-2030 3-181
Table 3.11-3. Race, Alone or in Combination[1], 2010 3-181
Table 3.11-4. Educational Attainment[1], 2010 3-182
Table 3.11-5. Household Characteristics 3-182
Table 3.11-6. Labor Force, Employment, and Unemployment, 1990, 2000, and 2010 3-183
Table 3.11-7. Employment by Industry in San Diego County 2000 and 2010 3-184
Table 3.11-8. Average Annual Pay[1], 2001-2010 3-185
Table 3.11-9. San Diego County[1] Industries Related to Recreational Fishing, 2007 3-185
Table 3.11-10. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, 2013-2016 3-189
Table 3.11-11. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, by Type of Expenditure 3-189
Table 3.11-12. Anticipated Bait Barges' Location, by Month 3-191
Table 3.11-13. Bait Barge Utilization, 2011 3-191
Table 3.11-14. Monthly Breakdown of Individual Fishing Trips 3-192
Table 3.11-15. Percentage of Individual Fishing Trips Occurring While Bait Barges are Relocated 3-192
Table 3.11-16. Estimated Reduction in Private/Rental Fishing Trips, Annual 3-193
Table 3.11-17. Estimated Reduction in Party/Charter Fishing Trips, Annual 3-193
Table 3.11-18. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2000 3-194
Table 3.11-19. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2011 3-194
Table 3.11-20. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2010 3-194
Table 3.11-21. Estimated Annual Reduction in Private/Rental Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars 3-195
Table 3.11-22. Estimated Annual Reduction in Party/Charter Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars 3-195
Table 3.11-23. Total Estimated Annual Reduction in Recreational Fishing Trip Expenditures Due to Potential Bait Barge Relocation 3-196
Table 3.11-24. Annual Reduction in Recreational Fishing Expenditures by Industry, 2011 Dollars 3-196
Table 3.11-25. Direct Expenditures Input into IMPLAN Model, Constant 2011 Dollars 3-197
Table 3.11-26. Jobs[1] Impact, 2013-2016 3-197

Table 3.11-27. Labor Income Impact, 2013-2016, Constant 2011 Dollars....3-198
Table 3.11-28. Economic Output Impact, 2013-2016, Constant 2011 Dollars....3-199
Table 4.2-1. Cumulative Noise Levels at La Playa and NBPL CDC....4-23
Table 4.2-2. Cumulative Construction Emissions for NBPL Fuel Pier Replacement – Alternative 1 and Scripps Pier Replacement Project....4-25
Table 4.2-3. Estimated Annual GHG Emissions – Alternative 1....4-26
Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls....5-2

CHAPTER 1
PURPOSE AND NEED FOR THE PROJECT

1.1 INTRODUCTION/BACKGROUND

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321, as amended); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500-1508, 1 July 1986); and Navy Procedures for Implementing NEPA (32 CFR § 775).

The existing fuel pier is located on San Diego Bay at Naval Base Point Loma (NBPL) (Figures 1-1 and 1-2). It currently serves as a fuel depot for loading and unloading tankers and United States (U.S.) Navy underway replenishment vessels that refuel ships at sea ("oilers") fueling Navy, Department of Homeland Security (DHS), Department of Defense (DoD), and foreign navy vessels, as well as transferring fuel to the local replenishment vessels and other small craft operating in San Diego Bay. The fuel pier at Fleet Logistics Center (FLC) Fuel Facility NBPL is critical to the mission of the Navy and is the largest active Navy fueling facility in the southwest region. More than 42 million gallons of fuel are stored at FLC Fuel Facility NBPL and more than 11 million gallons of fuel are issued and received every month to an average of 43 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier strike groups, National Oceanic and Atmospheric Administration (NOAA), DHS, foreign, and small craft.

The approach (portion that connects to shore) and north segments are over 100 years old, constructed in 1908 as the La Playa Coaling Wharf. The south segment was constructed in 1942. The average design service life of this kind of structure in a marine environment is typically considered to be about 50 years (Navy 2010a). The pier, as such, is significantly past its designed service life. Further, the pier does not meet current California State Lands Commission (CSLC) - Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) Level 1 (operational) and Level 2 (spill prevention) seismic criteria (Navy 2010a, 2010b). According to the Structural Evaluation and Seismic Analysis (Navy 2010b) conducted for this project, the existing fuel pier is not structurally sufficient to comply with the following Level 2 Seismic Performance Requirements:

- Controlled inelastic structural behavior with repairable damage.
- Prevention of structural collapse.

Because of the structural deficiencies, significant damage in a moderate earthquake is considered to be likely, with potential catastrophic failure of the pile foundations occurring in a major seismic event (Navy 2010a).

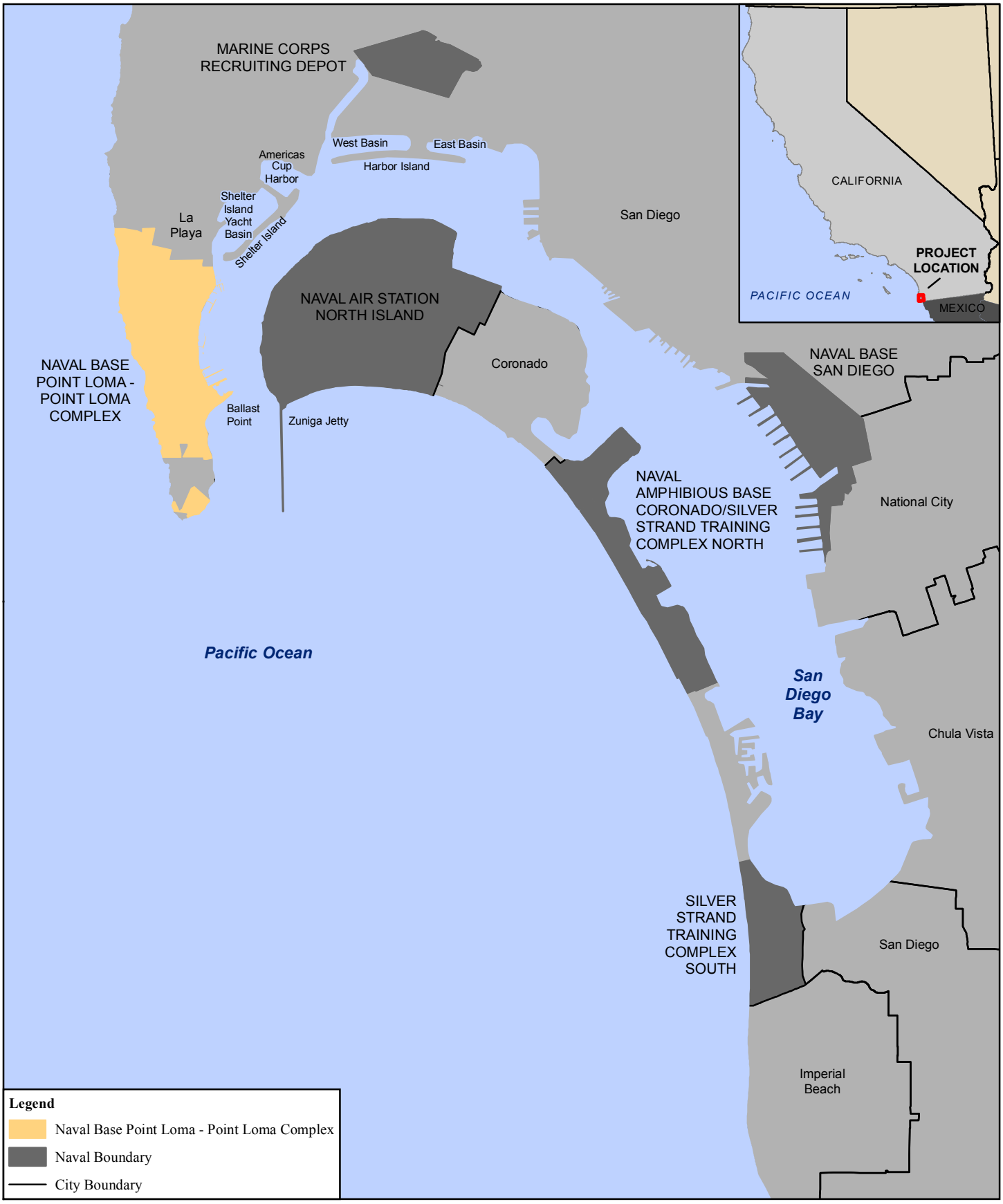
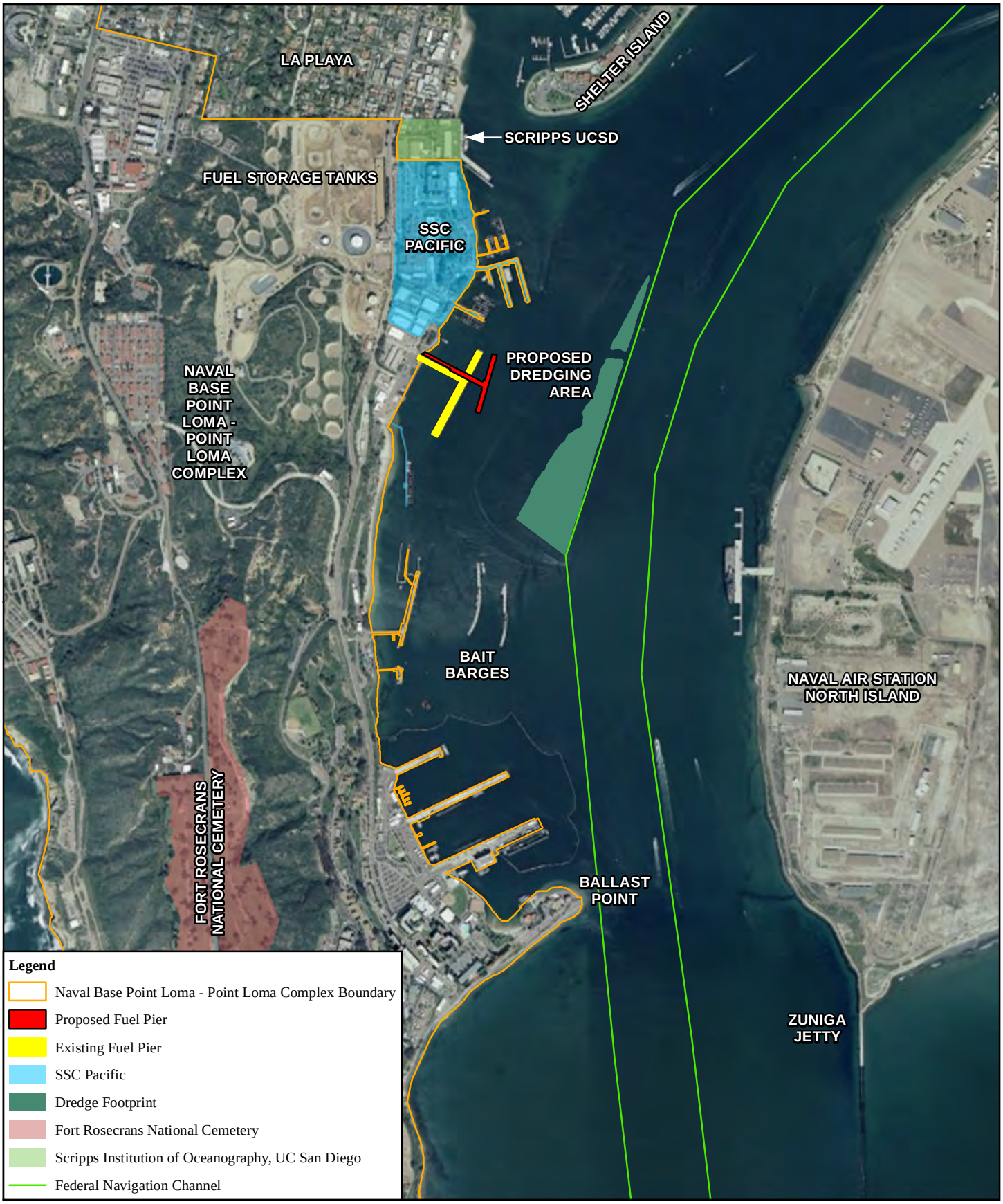


Figure 1-1
Regional Location - Pier 180 Replacement
Naval Base Point Loma - Point Loma Complex

Source: Navy, NAVFAC Southwest, and Port of San Diego 2010



Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a

Figure 1-2
Project Site Map

The State of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria. The Navy has agreed to comply with the California MOTEMS requirements for the fuel pier. However, the existing fuel pier is not consistent with the MOTEMS seismic criteria. The poor condition of the existing fuel pier has also been noted in the Navy Region Southwest (NRSW), Port Operations Shore Infrastructure Plan, dated April 2009 (Navy 2010a). Per the Defense Readiness Reporting System, an overall rating of "F4" has been assigned to the existing fuel pier facility. The F4 rating translates into "Facility has deficiencies that prohibit or severely restrict use of its designated functions." The Port Operations Shore Infrastructure Plan has listed P-151 "Replace Pier 180" as a planned project affecting port operations for NRSW. Additionally, the existing fuel pier is situated in waters where the natural bottom depth is between 30 to 40 feet (ft) thus requiring maintenance dredging because San Diego Bay has an open hydrologic circulation system that causes infill around piers and infrastructure. Dredging occurred most recently in 1999 to keep the pier accessible for larger vessels.

To support the fueling needs of the Navy and DHS, the FLC Fuel Facility NBPL must be able to provide adequate services, i.e., receive and issue fuel, to multiple ships at a time. To meet this requirement, ships and barges are received on both the inboard and outboard sides of the existing pier. The inboard south side of the pier is primarily used for fuel issues to small cutters, mine sweepers, and barges. The inboard north side is used for fueling small craft. The outboard side of the pier is currently used to issue and receive fuel from large ships, i.e., tankers, oilers, transport ships, dock landing ships, ocean going barges, and various other Navy and DHS vessels. When included with scheduling requirements, the demand of the existing pier has exceeded the facility capacity. In addition, the existing fuel pier has reached a maximum capacity for the deeper outer berth, resulting in the need to turn vessels away due to lack of available docking and mooring space.

It is anticipated that future classes of ships would generally be more multi-purpose, require more frequent fueling, and further increase the fuel capacity loading requirement for the new replacement fuel pier (Navy 2010a). The existing fuel pier lacks deep water berthing capability and is therefore limited in the range of vessels that can be accommodated (Navy 2010a).

The Proposed Action would generally allow the future year fueling of newer and larger ships. However, no specific new ship fueling, homeporting, or operational actions with any relationship to the Proposed Action are currently planned or foreseen. As any future proposals for ship fueling, homeporting, and operations are developed over the next decade, they will be appropriately addressed in NEPA documentation at that time. There is no element of the Proposed Action that would add vessel traffic (public or federal).

1.2 PROJECT LOCATION

The project site is located at the FLC Fuel Facility NBPL in the Point Loma Complex, San Diego, California. NBPL-Point Loma Complex is located on the west side of San Diego Bay, near the mouth of the bay directly opposite Naval Air Station (NAS) North Island as shown in Figure 1-1. NBPL-Point Loma Complex includes Space and Naval Warfare Systems Center (SSC) Pacific. The Point Loma Complex is bordered to the north by Scripps Institution of

Oceanography (SIO) University of California San Diego (UCSD); the communities of La Playa and Sunset Cliffs, to the east by the San Diego Bay; to the west by the Pacific Ocean; and to the south by Cabrillo National Monument and the Pacific Ocean. Fort Rosecrans Military Cemetery runs down the middle of the peninsula (see Figure 1-2). The shoreside of Pier 180 connects with NBPL roadways (Figure 1-3a). Figure 1-3b presents a view of the existing Fuel Pier 180 looking toward the northeast. All of the land within the NBPL boundaries is restricted from general public access. The adjacent waters of San Diego Bay are heavily used by the public and the Navy.

SIO repaired a portion of its pier on the land adjacent to the north of NBPL in December 2012, and plans to replace its pier and other waterfront infrastructure concurrent with the Navy's fuel pier replacement project. The two Scripps projects are discussed in Sections 4.1.1.8 and 4.1.3.1 of this EA, respectively.

1.3 PURPOSE OF AND NEED FOR THE PROJECT

The Project is needed to provide improved safety features and improved fuel receipt and delivery capability at FLC Fuel Facility NBPL Pier 180 to service existing and future classes of naval vessels. As described in Section 1.1, *Introduction/Background*, there is a need for this project because: (1) portions of the existing fuel pier are over 100 years old and past designed service life; (2) the existing fuel pier does not meet MOTEMS seismic criteria for marine oil terminals; (3) the existing fuel pier lacks adequate deep water berthing capability, thus cannot safely accommodate all of the existing and future classes of vessels; (4) portions of the existing turning basin are too shallow to safely accommodate current and future deep draft berthing capabilities; (5) improved fueling features and capabilities are needed to service the current and projected future demand of vessels, which is currently expected to increase by about 30 to 35 percent by 2018; and (6) Navy and DHS need adequate and safe ship fueling facilities now and in the future to accomplish their mission of national defense.

Bringing this aging structure up to compliance levels with repairs or modifications to meet these needs is not economically feasible given the existing structural system and the condition of the structure. New pier construction would provide a safe, secure, and environmentally compliant facility with a service life that can be expected to exceed 50 years.

The purpose of the project is to replace the aging, seismically deficient, and increasingly dysfunctional and obsolete fuel pier (Pier 180) at NBPL with a new pier that would meet current CSLC MOTEMS, and meet projected ship fueling requirements and enable the Navy and DHS to meet their national security and defense missions.



a) Aerial View of Existing Fuel Pier 180



b) View of Existing Fuel Pier 180 to the northeast

Figure 1-3
Views of Existing Fuel Pier 180

1.4 DECISION TO BE MADE

The decision to be made as a result of the analysis in this EA is first to decide if an Environmental Impact Statement (EIS) needs to be prepared. An EIS would need to be prepared if it is anticipated that the Proposed Action would have significant impacts on the human or natural environment. Should an EIS not be deemed necessary, then a Finding of No Significant Impact (FONSI) would be prepared. If a FONSI is prepared and executed, then the Navy may decide to move ahead with the Proposed Action or one of the analyzed alternatives in the EA without further procedures pursuant to NEPA.

1.5 SCOPE OF THE ANALYSIS

NEPA, CEQ regulations, and Navy procedures for implementing NEPA specify that an EA should address only those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact. Relevant pre-planning studies that determined the scope of analysis include:

- Sampling and Analysis Report for NBPL Fuel Pier Replacement and Dredging (Naval Facilities Engineering Command [NAVFAC] Southwest 2011b).
- United States Environmental Protection Agency (USEPA) determination of NBPL Fuel Pier Replacement and Dredging suitability of dredge sediments for aquatic disposal (USEPA 2011).
- Sediment Grain Size Distribution and Mean Grain Size - Offshore Disposal Sites compared to Pier 180 Dredging Site (Tierra Data, Inc. [TDI] 2012a).
- Acoustic Transmission Loss Model for North San Diego Bay (Dahl and Farrell, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle. January 2011. Unpublished data presented as Appendix E-4 of this EA).
- Marine Mammal Surveys in the Vicinity of the Point Loma Naval Complex, San Diego, California. Final Report. Prepared for NAVFAC Southwest (Merkel & Associates, Inc. 2008).
- Marine Mammal Surveys. February-April 2012. Unpublished data. Prepared under contract to NAVFAC Southwest (TDI 2012b).
- Marine Mammal Surveys of North San Diego Bay - Unpublished data and reports prepared by C. Johnson. (U.S. Pacific Fleet June 2009, October 2009, February 2010, April 2010, November 2010, March 2012).

Resources carried forward for detailed analysis in this EA include: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Several resource areas have not been carried forward for detailed analysis in this EA since potential impacts were considered non-existent or negligible. The resources not carried forward for analysis, and the rationale for not carrying these resources forward are discussed below.

Geological Resources – Minimal surficial modifications associated with the proposed project would not result in impacts to geology and topography, and the proposed new fuel pier and associated infrastructure would be designed and constructed in accordance with Unified Facilities Criteria (UFC) and MOTEMS seismic standards.

Cultural Resources – No known archaeological or cultural resources sites at NBPL or NMAWC would be affected by the proposed project, and the Navy would implement archaeological monitoring during excavation activities within a portion of the project area at NBPL that is identified to have buried archaeological potential.

Land Use – Land use at NBPL and NMAWC would not change, and the temporary changes to uses of the waters offshore from NMAWC and Harbor Island during the relocation of the Navy Marine Mammal Program (MMP) and the bait barges, respectively, would not affect recreational or commercial navigation in San Diego Bay. Permanent amendments to the U.S. Coast Guard (USCG) Security Zone to provide an adequate security zone for the proposed new pier alignment would not affect recreational or commercial navigation because there would still be 700 ft of open water between the new Security Zone Boundary and the federal navigation channel. The Navy consulted with the California Coastal Commission (CCC) on all project components. The CCC found the proposed project-to-be consisted, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).

Recreation and Recreational Navigation – Pier demolition and construction, and dredging would not have significant impacts to recreation and recreational boaters because these project activities would not occur in highly used recreational areas and waters. The Everingham Brothers Bait Company barges would not anchor at the temporary location during the busiest recreational sailing period (summer), and most bait barge operations take place overnight when recreational boaters are not active.

Aesthetics – The proposed new fuel pier would be consistent with its surroundings in a military industrial waterfront. The proposed temporary relocation of the Navy MMP and the Everingham Brothers Bait Company facilities would be visually consistent with the temporary relocation sites. Under the Marine Mammal Protection Act (MMPA) Section 101(a) (4), private property owners may deter marine mammals from hauling out onto docks and/or vessels and potentially damaging private property.

Public Services and Utilities – No new public services would be constructed and the utility infrastructure and fuel system for the proposed new fuel pier would be accommodated without significantly affecting the NBPL system/network capacity.

Public Health and Safety – The storage and handling of bulk fuels, water quality, and construction safety are all extensively regulated to minimize risk. Public Health and Safety with respect to hazardous materials, hazardous wastes and explosives safety is analyzed in Section 3.7. The proposed potential bait barge relocation sites under consideration southeast of Harbor Island were selected because they avoid bird-aircraft strike hazards for Navy, USCG, and Lindbergh Field (San Diego International Airport) aircraft (NRSW 2012, USCG 2012). Under the Marine Mammal Protection Act (MMPA) Section 101(a) (4), private property owners may deter

marine mammals from hauling out onto docks and/or vessels and potentially endangering personal safety.

1.6 INTERGOVERNMENTAL COORDINATION

The Navy is working with the following agencies to obtain the necessary authorizations, concurrences, or permits for implementation of the project (in progress unless otherwise noted):

- USEPA and U.S. Army Corps of Engineers (USACE): Suitability for Unconfined Aquatic Disposal Determination (completed).
- USACE: Clean Water Act (CWA) Section 404, and Rivers and Harbors Act (RHA) Section 10, permits (the permit application has been submitted and the Navy anticipates an approved permit).
- U.S. Fish and Wildlife Service (USFWS): Concurrence on the informal Endangered Species Act (ESA) Section 7 consultation.
- National Marine Fisheries Service (NMFS): In compliance with the MMPA, the Navy would obtain an Incidental Harassment Authorization before implementation of in-water demolition and construction activities. Reauthorization would be needed for each 12-month period of activity. (The Incidental Harassment Authorization has been accepted.)
- NMFS: Concurrence on the Essential Fish Habitat (EFH) analysis and determination Regional Water Quality Control Board (RWQCB): CWA 401 Water Quality Certification. (EFH analysis has been accepted.)
- California Coastal Commission (CCC): The Navy consulted with the CCC on all project components. The CCC found the proposed project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).
- San Diego Air Pollution Control District (SDAPCD) potential permits: (to be obtained by the construction contractor before construction activities).
- USCG amendment to Security Zone 165.1102 for new pier headline and establishment of a temporary Security Zone for the Navy MMP at NMAWC.
- CSLC: lead agency for California Environmental Quality Act (CEQA) documentation.

1.7 PUBLIC AND AGENCY PARTICIPATION

Regulatory agencies participating in this project include USEPA, USACE, USFWS, NMFS, RWQCB, CSLC, USCG, and the CCC as described in Section 1.6. Appendix A documents the correspondence between the Navy and the regulatory agencies involved in this project.

Regarding the public involvement process, a public meeting notice was published in the San Diego Union Tribune on 28 April 2012 that initiated a 30-day public scoping period. The 30-day public scoping period began on 28 April 2012 and ended on 28 May 2012. A public meeting was held on 3 May 2012 at the Loma Portal Elementary School. A NOA for the Draft EA was published in in the San Diego Union Tribune on 20 October 2012 to initiate a 30-day public

review of the Draft EA. The public review period of the Draft EA was 30 days beginning on 20 October 2012 and ending on 19 November 2012. A public meeting was held on 14 November 2012 at Portuguese Hall, San Diego. The Draft EA was made available to the public via the Navy website at www.piersystem.com/go/doc/4275/1355631/ and at the following local libraries: San Diego Central Library, Point Loma/Hervey Branch Library, and Ocean Beach Branch Library. Appendix B of this EA contains concerns raised by the public during the scoping and Draft EA public review periods, public comments received on the Draft EA, and responses to the comments. The FONSI/FEA were made available to the public at the Point Loma/Hervey Branch, Ocean Beach Branch, and Pacific Beach/Taylor public libraries and via the Navy website: www.piersystem.com/go/doc/4275/1355631/.

ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

Following Chapter 1, this EA is organized as follows: Chapter 2 describes the Proposed Action and alternatives; Chapter 3 describes the affected environment and the environmental consequences of each alternative; Chapter 4 describes the cumulative impacts of the Proposed Action and alternatives in conjunction with other past, present, and reasonably foreseeable projects in the area. Chapter 5 describes various other considerations required by NEPA. This is followed by persons, entities and agencies contacted (Chapter 6), a list of preparers and their qualifications (Chapter 7) and references (Chapter 8).

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

This chapter includes the reasonable alternative screening criteria, a description of the Proposed Action and alternatives, and alternatives considered but not carried forward for detailed analysis. It also includes a brief summary of the anticipated environmental impacts that would occur from each alternative.

2.1 REASONABLE ALTERNATIVES SCREENING FACTORS

The screening factors used to select reasonable alternatives that would allow mission, operational, and support functions to be fulfilled for modern United States (U.S.) Navy ships are as follows:

- Location within a U.S. Coast Guard (USCG) Security Zone in waters offshore of Naval Base Point Loma (NBPL) where the pier fuel supply lines will align with shoreside access to Fleet Logistics Center (FLC) Fuel Facility NBPL fuel storage tank facilities. The new pier location must be such that minimal onshore excavation and construction are needed to connect the pier to the new fuel storage facilities that are in the process of being replaced on NBPL under military construction project P-401.
- New pier footprint achieving a minimum approach segment (the portion of the pier that connects to the shore) width of 50 feet (ft) while minimizing overall square footage and associated potential risks and effects to biological resources such as Essential Fish Habitat (EFH) and eelgrass beds and encroachment into navigable waters.
- Ability to accommodate mooring and fueling of all classes of Navy and Department of Homeland Security (DHS) vessels other than those that are nuclear-powered, e.g., the nuclear-powered class aircraft carriers and the nuclear-powered submarines. The fuel pier must be able to fuel one of the following vessels: military sealift replenishment "oiler" vessel (T-AO [649 ft long]); large, medium speed roll-on/roll-off ship (T-AKR [956 ft long]); or landing platform dock (LPD [684 ft long]) (Naval Facilities Engineering Command [NAVFAC] Southwest 2011c). To accommodate the T-AO the pier must have a minimum 1,095 ft of outboard mooring length with sufficient water depth (-40 ft mean lower low water [MLLW]).
- Provide greatest versatility in accommodating the wide range of vessels that use the fuel pier. A higher elevation fuel pier deck would be better suited to handle the larger vessels, with their higher top deck elevations (Navy 2010a). The height would provide additional reach for fuel load arms to safely reach fuel transfer points on the majority of larger Navy and DHS classes of ships, such as the new double hulled commercial tankers, dry cargo/ammunition ships (T-AKEs,) and older fast combat support ships (T-AOEs) (Navy 2010c).
- Pier design to maximize separation of fuel pipelines from pier deck vehicles and activities.

- Pier dimensions that meet Department of Defense (DoD) Unified Facilities Criteria (UFC). UFC are facility planning, design, construction, operations, and maintenance criteria for DoD components and participating organizations (Appendix C). As directed by the Office of the Deputy Under Secretary of Defense letter dated May 2001 and DoD Directive 4270.5 dated 12 February 2005, UFC apply to all DoD construction, repair, and maintenance projects (DoD 2006). UFC require a minimum of 50 ft of open deck width to ensure a safe operating area for personnel, forklifts, cranes, and fuel hose storage during fueling operations.
- Maintain operational capabilities at the existing fuel pier with no more than 45 days total downtime during the duration of the construction contract, which is estimated to require 4 years to complete (Navy 2012a). Operational requirements are defined by 2-4 fuel replenishment vessels per month (oilers), 5-7 U.S. Navy fuel oil barges per month, 8-10 Navy and/or DHS vessels per month, and 13-20 small craft per month.
- Configuration to meet Navy Region Southwest (NRSW) anti-terrorism/force protection requirements as well as 33 Code of Federal Regulations (CFR) Part 6.01.5 and 33 CFR 165.1104, with a security zone of 500 ft on all sides as defined by 33 CFR 154.735(v).

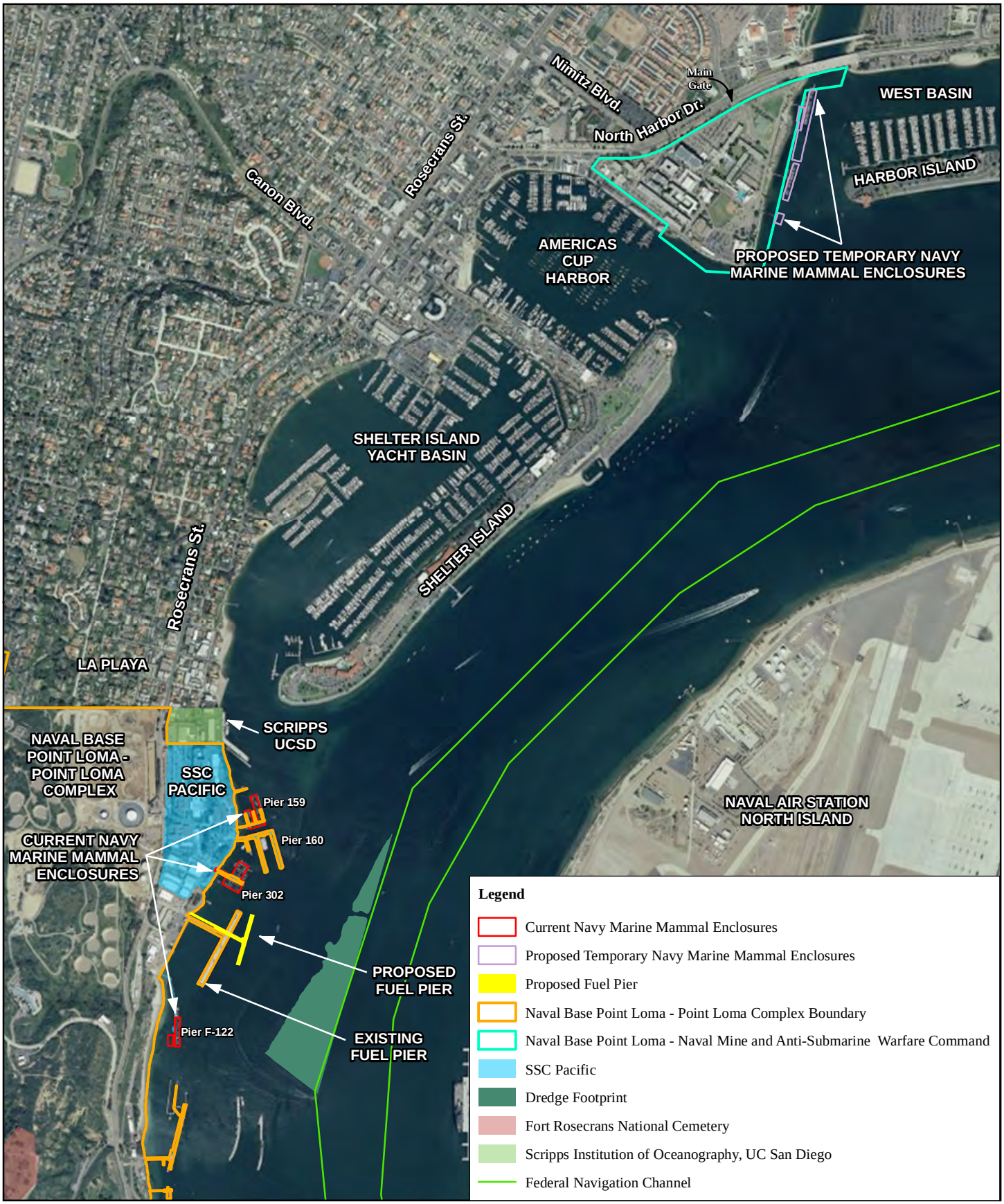
2.2 ALTERNATIVES CONSIDERED

Three alternatives are carried forward for detailed analysis in this Environmental Assessment (EA): Alternative 1 Pier Replacement and Associated Dredging; Alternative 2 Delayed Dredging Alternative; and the No-Action Alternative. Section 2.2.4, Alternatives Considered but Not Carried Forward for Detailed Analysis describes in detail why no other pier designs were carried forward for detailed analysis in this document.

2.2.1 Alternative 1 Pier Replacement and Associated Dredging

The scope of Alternative 1 would include the following five key elements, which are described in greater detail in the subsections shown.

- ***Temporary Relocation of the Navy Marine Mammal Program (MMP) (Section 2.2.1.1) –*** Before the pier replacement activities begin, the Navy MMP, which is administered by Space and Naval Warfare Systems Center (SSC) Pacific, would be temporarily relocated to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL that is over 3 kilometers (km) away from the fuel pier (SSC Pacific 2011a) (Figures 2-1 and 2-2). Limited construction at NMAWC would occur. The floating enclosures and the Navy marine mammals would be moved incrementally from the existing MMP location to the temporary NMAWC location. After completion of the new fuel pier, the Navy marine mammal enclosures and the animals would be moved back to their original location adjacent to the fuel pier, and the temporary facilities at NMAWC would be removed.



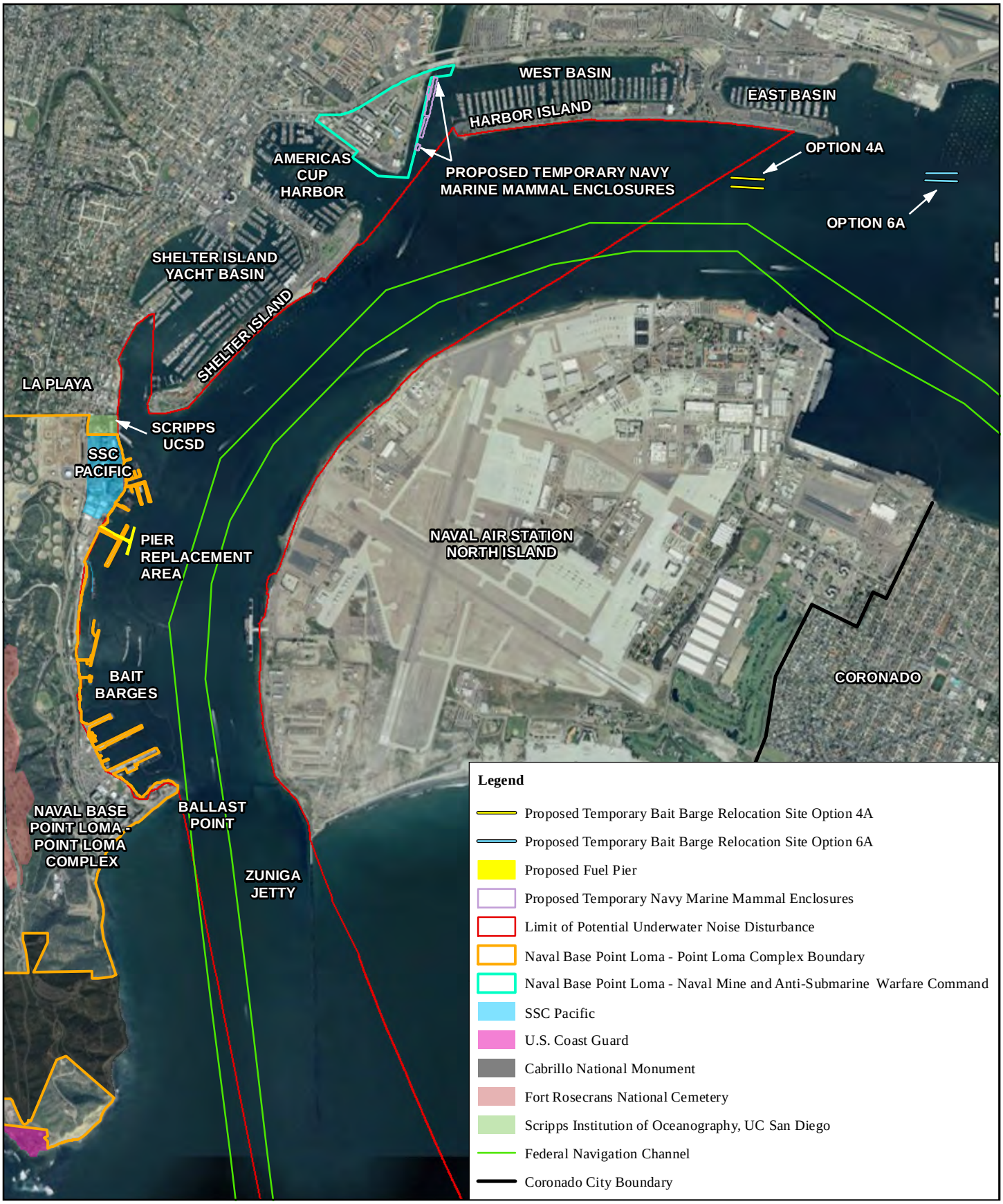
0 0.2 0.4 Kilometers

0 0.2 0.4 Miles

Source: NAVFAC Southwest 2011a

Figure 2-1
Navy Marine Mammal Program Current and Proposed Temporary Relocation Sites

N



0 0.2 0.4
Kilometers
Miles
0 0.2 0.4

Figure 2-2
Limit of Potential Underwater Noise Disturbance and Proposed Temporary Relocation Sites for Navy Marine Mammal Program and Bait Barges

Source: NAVFAC Southwest 2011a, 2012a; Navy 2007

- ***Phased Demolition and Removal of the Existing Fuel Pier (Section 2.2.1.2) –*** Demolition and removal of the existing Fuel Pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. The fuel pier has sufficient staff qualified to carry out fueling operations throughout the demolition and construction period, and to operate the new pier when it becomes operational. No additional personnel would be assigned to the new fuel pier (Navy 2012b).
- ***Phased Construction of a Replacement Fuel Pier (Section 2.2.1.3) –*** A new, double-deck fuel pier would be constructed that would provide flexibility in fueling multiple vessel types, meet MOTEMS requirements for seismic performance, and have a total area that is 5,315 square ft (sf)/0.12 acre (ac) smaller than the area of the existing fuel pier. There would be no pile driving or other in-water construction or demolition during the least tern breeding season, from 1 April through 15 September of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.

  Regulated Navigation Zones (Section 2.2.1.4) – The existing USCG Security Zone would be amended as needed to provide an adequate security zone to the east for the proposed new fuel pier alignment. A temporary Security Zone would be established to a distance of 100 ft offshore from the proposed temporary Navy marine mammal relocation site at NMAWC for the period that the Navy marine mammals are present.
- ***Dredging and Sediment Disposal (Section 2.2.1.5) –*** Dredging and sediment disposal are needed to deepen a high spot in an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities. Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE), but USEPA specified beneficial reuse for nearshore replenishment as the appropriate placement. Under Alternative 1, dredging in the existing turning basin to accommodate deep-draft berthing capability could be done before, during, or shortly after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. However, there would be no dredging during the California least tern breeding season (1 April to 15 September). The resource-specific analysis in this EA is based on dredging occurring concurrently with pier replacement.

Temporary Relocation of Everingham Brothers Bait Company Bait Barges – Although not an element of the P-151 NBPL Fuel Pier Replacement Project, the P-151 EA addresses the temporary relocation of the Everingham Brothers San Diego Bay bait barges. The Navy is not relocating the bait barges. The viable bait barge relocation options and potential environmental impacts of relocating the bait barges are discussed in this EA. Following adoption of a Finding of No Significant Impact (FONSI) for this project, the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) would be expected to execute a lease for a relocation site.

2.2.1.1 Temporary Relocation of Navy Marine Mammal Program

The Navy MMP in-water animal enclosures, which house its military working dolphins and sea lions, are located at Piers 159, 160, and 302 to the north of the fuel pier, and Pier F-122 to the south (see Figure 2-1).

The Navy is authorized to hold its marine mammals under the Defense Authorization Act of 1987, *Marine Mammals: Use for National Defense Purposes* (10 U.S. Code [USC] 645 Section 7524). Similar to other military working animal programs, the Navy MMP maintains a program of animal care that meets or exceeds U.S. Department of Agriculture Animal and Plant Health Inspection Service regulations in accordance with the Animal Welfare Act. However, as a U.S. government organization, the Navy MMP does not require a license from the Animal and Plant Health Inspection Service and is not subject to inspections. Rather, per DoD Directive, the Navy MMP is accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International, a private nonprofit organization that promotes the humane treatment of animals in science through a voluntary accreditation program. This organization evaluates facilities that use animals in research, teaching, or testing and accredits those that exhibit excellence in animal care. In addition, the Navy MMP is a member of the Alliance of Marine Mammal Parks and Aquariums, a nonprofit organization of the world's preeminent marine mammal facilities that together have significant influence in shaping the current and future domestic and international regulatory and policy framework. The Alliance has developed standards and guidelines for animal care, personnel training, and education that are increasingly being adopted as the world standard for the marine mammal community. Per 10 USC 645 Section 7524, the Navy's authorization to hold marine mammals applies without regard to the provisions of the Marine Mammal Protection Act (MMPA) administered by the U.S. Department of Commerce National Marine Fisheries Service (NMFS), and its animals are not a coastal resource under the Coastal Zone Management Act (CZMA) (Navy 2007). The Navy's marine mammals are being relocated so that they will not be affected by noise and vibrations associated with demolition/construction-related activities. Temporary relocation of the existing MMP is also needed to safely maintain the Navy's program of excellence in marine mammal care during the fuel pier demolition and construction activities.

The Navy investigated 13 sites (including the chosen NMAWC site) at various locations around San Diego Bay to find a suitable temporary location for the MMP. An engineering study was prepared for the development of alternatives, including concept level plan and rough-order-cost estimate for each alternative (Moffatt & Nichol–Blaylock [MNB] 2011a [*FY 2013 MCON P-151 Replace Fuel Pier, NBPL Rough Order Magnitude (ROM) Cost – Mammal Pier Relocation Five Alternatives plus Optional Sites]* available for review at the NBPL Public Affairs Office). The study addressed pros and cons for each alternative; all impacts to existing site conditions, and a discussion of method of relocation and associated construction timeline. The sites were evaluated according to distance to the existing SSC Pacific site; security; SSC Pacific operational criteria; distance to open ocean; capacity to relocate all the Navy marine mammals at a single consolidated site; existing infrastructure that includes a veterinarian clinic, food freezers, and specialized operational equipment and onshore space; adequate water depth, wave conditions,

water hydraulic conditions; and other criteria for the animals. Table 2-1 presents the alternative relocation sites that were evaluated, but determined to be unsuitable.

Because Navy-owned sites offer advantages in terms of security and real estate that non-Navy property does not, the temporary relocation site was selected from the four Navy-owned sites. Described below are the two best alternative Navy sites that were considered but eliminated.

Naval Amphibious Base Coronado Pier 21 with Explosive Ordnance Disposal (EOD) Mobile Unit 3/Naval Air Station (NAS) North Island Pier E – This site offers improved security, the need for minimal in-water improvements, and adequate water depth for the marine mammal enclosures (MNB 2011a). However, the SSC Pacific marine mammals would be separated into two groups: one located at NAB Coronado Pier 21 and the other at NAS North Island Pier E MNB 2011a). Furthermore, there is not enough available land near either of the sites to support all of the SSC Pacific onshore activities. At NAB Coronado, the SSC Pacific landside facilities would have to be placed on a sports field that is not adjacent to the Pier 21 area (MNB 2011a). NAS North Island Pier E has a similar lack of nearby onshore laydown space. The NAB Coronado Pier 21/NAS North Island Pier E site is also too far from the existing SSC Pacific marine mammal facility and the open ocean, exposed to boat wakes/waves, and may have water quality issues (MNB 2011a).

NBPL November Pier - Pier 5003 is the northernmost berthing pier at NBPL Submarine Base, about 0.6 mi south of the fuel pier, and is typically referred to as the "November" pier. The site offers improved security, proximity to existing SSC Pacific landside facilities, proximity to open ocean, and adequate water depth. However, there is insufficient available landside space for the SSC Pacific infrastructure. Parking space in the vicinity is extremely limited as well. Further, the facility is inside the Submarine Base floating security barrier, which would present an obstacle to the SSC Pacific daily boat operations.

Before demolition of the existing fuel pier, SSC Pacific would move the Navy marine mammal enclosures, associated equipment, and the animals from the existing location to the NMAWC property on the north side of San Diego Bay (SSC Pacific 2011a). Pier 619, recreational Marinas 548 and 607, Building 549, Building 606 (Navy Sailing Center Building) and associated parking spaces and open areas are suitable for temporary relocation of the Navy MMP and would be modified for use by the Navy MMP. There would be a 12-month design period, beginning in March 2012, followed by approximately 6 months of procurement processing and 6 months of concurrent landside and waterside construction involved with preparing the NMAWC site and relocating the marine mammals ([Moffatt, Nichol-Blaylock] MNB 2012a).

Table 2-1. Navy Marine Mammal Program (MMP) Potential Relocation Sites Considered but Eliminated

Site	*Facility Category*	*Landside Space for Navy MMP Activities and Laydown Area*	*Impacts to Existing Civilian Uses?*	*Security Level*	*Additional Rationale for Elimination*
NAB Coronado Pier 21/ NAS North Island Pier 3	Navy	Insufficient	No	High, Sufficient	• Too far from SSC Pacific NBPL and open ocean* • Exposure to waves/boat wakes and lacks developed utility infrastructure • Potential water quality issues
NAS North Island, near Berths J and K	Navy	Insufficient	No	High, Sufficient	• Site lacks existing infrastructure • Exposed to waves/boat wakes
NBPL November Pier (Pier 5003), North Side	Navy	Insufficient and extremely limited	No	High; Sufficient	• Necessary waterside improvements would be extensive • Facility is inside the Submarine Base's floating security barrier, an obstacle to SSC Pacific daily small boat operations
Tuna Harbor, South of G Street Mole Pier	Non-Navy	Insufficient	Yes	Minimal	• Too far from SSC Pacific NBPL and open ocean*
Harbor Island East (Adjacent to the former Ruben E. Lee Restaurant)	Non-Navy	Insufficient	Yes	Minimal	• No existing waterside improvements • Construction of a pile-supported stub pier long enough for a davit crane to lift mammals would impact eelgrass
Shelter Island Fishing Pier	Non-Navy	Insufficient	Yes	Minimal	• Required floats and guide piles may intrude into the navigable waterway
Driscoll's Wharf, Adjacent to NMAWC	Non-Navy	Sufficient	Yes	Minimal	• Facility is in poor condition • Limited depths may eliminate use of near-shore portions of the facilities
Grape Street Piers	Non-Navy	Insufficient	Yes	Minimal	• Pier 2 is in poor condition and would require structural rehabilitation • Too far from SSC Pacific NBPL and open ocean*
Embarcadero Wharf	Non-Navy	Insufficient	Yes	Minimal	• Too far from SSC Pacific NBPL and open ocean*
Former Campbell Shipyard Site	Non-Navy	Insufficient	Yes	Minimal	• Mammal pen layout would need to avoid the shallow marine habitat pier • Too far from SSC Pacific NBPL and open ocean*
Embarcadero Marina Park	Non-Navy	Insufficient	Yes	Minimal	• Would require considerable waterside infrastructure development • Too far from SSC Pacific NBPL and open ocean*
Crosby Street Pier, Adjacent to 10th Avenue Marine Terminal	Non-Navy	Insufficient	Yes	Minimal	• Site access is problematic, crossing a Burlington Northern Santa Fe rail track • Too far from SSC Pacific NBPL and open ocean*

Note: *Proximity to existing SSC Pacific site needed to transport food and other needed supplies/equipment to the temporary relocation site.
Source: MNB 2011a.

Navy Morale, Welfare, and Recreation (MWR) operates the facilities at Building 606 and Marinas 548 and 607 (MNB 2011a). It is anticipated that these facilities would be vacated for use by the Navy MMP (MNB 2011a). Building 549 (MWR waterfront rental cottage located onshore west of Pier 548) would be vacated and closed. The Navy MMP would use the shoreside area around Building 549 and free-standing restrooms, but not the building interior. Some of the privately-owned boats at Marinas 548 and 607 may relocate to the Navy MWR facility at Fiddler's Cove Navy Marina at Naval Amphibious Base (NAB) Coronado or the MWR marina facility at Camp Pendleton; others may relocate to other marinas in San Diego Bay or Mission Bay. Some owners may elect to remove their boats from the water. The Navy MMP would remain at the temporary facilities at NMAWC for approximately 4 years and would return to the existing SSC Pacific site when fuel pier construction is complete.

The Navy EOD Training and Evaluation Unit One uses Pier 619 (NAVFAC Southwest 2012b). This EOD unit would exchange places with another EOD unit, Mobile Unit 1, that uses a pier at NBPL. EOD Mobile Unit 1 is associated with the Navy MMP, so their temporary transfer to NMAWC would be compatible with the proposed SSC Pacific use (NAVFAC Southwest 2012b). NMAWC land use in the area surrounding the proposed temporary relocation facilities includes classroom training, barracks, and the Admiral Kidd Club conference center (NAVFAC Southwest 2011d). Temporary use of the Navy marina facilities and Pier 619 by SSC Pacific would be compatible with these surrounding uses.

With the complete relocation of the current occupants from the NMAWC site and use of the existing landside and waterside improvements (e.g., all three piers, Building 606, and the lawn and parking areas) there would be sufficient space to relocate the Navy marine mammal facilities to NMAWC (MNB 2011a). The proposed arrangement also results in the Navy marine mammal enclosures being placed as close to the shoreline as the water depth would allow, which would avoid impact to eelgrass offshore from NMAWC while minimizing intrusion into the bayside channel used by Harbor Island West boat traffic (MNB 2011a). The relocated marine mammal enclosures at NMAWC are proposed to have a 100 ft-wide security zone. This 100 ft-wide security zone is also in place at the existing SSC Pacific location.

A total of 204 SSC Pacific personnel associated with the Navy MMP would be temporarily stationed at the NMAWC (SSC Pacific 2011b). Of these, approximately 174 would be present during peak hours (SSC Pacific 2011b). The landside facilities required for the Navy MMP at NMAWC include: parking spaces for 174 vehicles, temporary locker room facilities for 204 personnel, restroom facilities for 174 personnel, dive lockers and equipment storage, and a concrete pad and associated pump intake infrastructure to support shoreside Navy MMP quarantine pools (MNB 2011a, SSC Pacific 2011a). There would be a net increase of 5 to 30 parking spaces at NMAWC, depending on the final structure layout. Navy MMP Food preparation facilities and the veterinary clinic would not be relocated (NAVFAC Southwest 2011d). Space in the existing Navy-owned parking lot on the north side of North Harbor Drive, at the intersection of Nimitz Boulevard and North Harbor Drive, would be available for Navy MMP personnel (NAVFAC Southwest 2011d). Some of the MWR landside grass areas may be used to locate storage units and other portable and temporary infrastructure (MNB 2011a).

Minor shoreside construction, including trenching, may be necessary to expand or upgrade the existing electrical distribution system to support the increased requirements of the Navy MMP.

No natural beach shoreline would be disturbed or shadowed at NMAWC, where the shoreline is reinforced with rock rip-rap. There would be minimal in-water construction at the NMAWC site (MNB 2011a). It is anticipated that 32 (13 12-inch [in] square and 19 16-in diameter) existing guide piles at NMWAC would be relocated (i.e., removed and re-driven), and 46 new 16-in diameter guide piles would be installed (MNB 2013). The guide piles would be installed with an impact hammer pile driver (steam or diesel) that meets the criteria for the bearing capacity of the foundation soils (MNB 2013). Four of the new 16-in diameter piles would be placed approximately 3 ft east (bayward) of the marine mammal enclosures, with signs advising the public of the 100 ft security zone.

The piles would be transported to the NMAWC site by barge (MNB 2011b). The guide piles would function as anchors for the floating enclosures and walkways. After the guide piles are installed at NMAWC, the floating enclosures and walkways would be disconnected from their current locations at the piers north and south of the existing fuel pier (Figure 2-1), towed to the NMAWC site, and connected to the piers and guide piles at the NMAWC site (MNB 2011c). Some welding would be done when installing the brackets to connect the floating walkways and enclosures to the piles (SSC Pacific 2011a).

The suitable portions of existing waterside infrastructure (access brows, floats, guide piles, utilities and miscellaneous appurtenances) located at NMAWC would be expanded as described above. The SSC Pacific waterside mammal facilities that would be relocated to the NMAWC site include:

- Existing 60 ft x 90 ft floating dolphin "pod" enclosures (14 total pods). The 60 ft x 90 ft elements are composed of 30 ft-square basic elements.
- Existing 30 ft x 30 ft dolphin enclosures (11 total). These are typically used to connect larger enclosures.
- Existing approximately 8,000 sf floating training lagoon.
- Existing 30 ft x 30 ft floating sea lion enclosures (8 total).
- Existing floating walkways (marina-type floats). These are used as workspace and to connect enclosures to piers or guide piles. SSC Pacific has 8 ft x 20 ft floating walkways that can be relocated (10 total).
- Existing 30 ft x 30 ft floating equipment huts (8 total).

The following new equipment would be constructed at the NMAWC site:

- One 4-ft minimum (interior clear width) aluminum access gangway to be located at Pier 548 to reach the floating walkways. The existing gangway at NMAWC Pier 607 is adequate. The gangway located at Pier 619 would remain.
- One new 1-ton (minimum) davit crane to remove the animals from the water, with a concrete pier support structure adjacent to the outboard end of Pier 548. The new pier structure support structure would have a minimum of 225 sf of laydown area for animal transfer.

- Two new high capacity pumps and 220 volt/3-phase electrical power. These pumps would be used to intake seawater used for the shipboard pool simulators.
- Conventional float-supported electrical and potable water service.
- Lighting to support night-time operations.

The Navy marine mammal enclosures would be moved in conjunction with favorable tides. As enclosures are being moved, the animals that were living in those enclosures would be temporarily housed in the remaining existing enclosures (SSC Pacific 2011a). To avoid crowding, a few enclosures would be moved at one time, completely re-installed and made ready for the animals, and then those animals would be relocated to NMAWC. This incremental process would be repeated until all the enclosures and animals have been transferred to the NMAWC site. Up to four 25 ft–long small boats with dual 225 horsepower outboard engines would be used for towing the floating structures to NMAWC, and for maneuvering them into position (SSC Pacific 2011a). It is anticipated that approximately 90 days would be required to move all the enclosures and animals to NMAWC (SSC Pacific 2011a). The Navy MMP use of the NMAWC site would include feeding, training, and housing the animals inside the enclosures; transferring them into and out of the water with the crane; and training them in onshore shipboard pool simulators. Navy MMP personnel would also operate their small boats inside and outside the proposed 100-ft wide security zone, and clean their boats and the animals' enclosures with potable water.

The temporary Navy marine mammal enclosures would extend about 150 ft beyond the NMAWC boundary into state waters, and a the proposed 100-ft wide temporary security zone would be established around them (see Section 2.2.1.4). However, approximately 358 ft of open water would remain for navigation between the temporary security zone and dock facilities on West Harbor Island. There would be about 480 ft of open water between the temporary security zone and the western end of West Harbor Island.

While the Navy MMP is at the NMAWC site, the current location next to the fuel pier would be generally vacant except for transporting food and equipment to and from the relocation site (NAVFAC Southwest 2011e). At the end of the construction period, the floating walkways, enclosures, and the animals would be moved back to the current Navy MMP location beside the new fuel pier following the incremental process described above. After all the floating walkways and enclosures are removed, the guide piles would be extracted by a barge-mounted crane, placed on the barge, and towed away to a recycle/resell site (MNB 2011c). One tug boat would be needed to move the barge. It is estimated that the guide piles would be removed within 1 week (MNB 2011c). The contractor would likely reinstall the guide piles at other marina locations, so there would be no demolition debris (MNB 2011c). A small landside crane would offload the piles at the recycle/reinstall site (MNB 2011c).

2.2.1.2 Phased Demolition and Removal of the Existing Fuel Pier

Demolition and construction would occur in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. Each of the utilities, systems, and pier features would be demolished as described in this section, but on a segment-by-segment basis to allow for continuous fueling operations during demolition and construction. Table 2-2

summarizes the work that would be done in each phase, and the durations of each phase. Details of the demolition and construction work follow Table 2-2.

Table 2-2. Construction Phase Summary

PHASE ONE (approximately 3 years)	
1	Initial mobilization of equipment to the site, set up temporary office space
2	Temporary relocation of Navy MMP to NMAWC
3	Temporary relocation of Everingham Brothers Bait Company bait barges
4	Indicator Pile Program - Drive approximately 12 piles (several of them will be driven twice: once to the tip elevation, and again after 48 hours to check the set-up strength)
5	Construct temporary mooring dolphin south of existing fuel pier
6	Demolish north segment of the existing fuel pier
7	Construct abutments at landside end of approach segment for the new fuel pier
8	Construct portions of landside utilities and relocations
9	Construct the new pier: ramped approach pier (lower and upper deck), two northern mooring dolphins, and double deck fueling pier
10	Connect/construct fueling lines to new pier and begin fueling at the new fuel pier
PHASE TWO (approximately 1 year)	
1	Construct southern berthing dolphin and mooring dolphin
2	Demolish remainder of existing fueling pier (approach and south segments)
3	Complete abutment construction
4	Remove temporary mooring dolphin
5	Complete grading, paving, and landside utility work
6	Demobilize equipment from site, remove temporary offices

Notes: Under Alternative 1, dredging could be done any time before, during, or shortly after construction of the new fuel pier. Under Alternative 2, dredging would be done years after construction of the new fuel pier is completed. Total duration of demolition/construction is estimated to be approximately 4 years. Under either alternative, no dredging would take place during the least tern breeding season, 1 April to 15 September.

Source: MNB 2012b.

Facilities to Be Removed

Alternative 1 would include demolition and removal of the existing fuel pier and its associated fueling systems. The majority of the work would be conducted over water and would include removal of the pier, pilings, plastic camels, and fenders. All utility infrastructure would be removed, including water and sewer pipelines, lighting systems, and wiring. The fueling systems, including piping and pipe supports, would also be removed. Facility information for the existing fuel pier is included in Table 2-3.

Table 2-3. Existing Fuel Pier (Pier 180) Information

Existing Pier 180	*Pier Specifications*
Installation	NBPL, San Diego, California
Activity	Naval Supply Systems Command (NAVSUP) FLC Fuel Facility
Facility Name	Fuel Pier (Pier 180)
Pier Area	71,180 sf
Description	T-shaped fuel pier, consisting of three sections with concrete deck
Approach Segment	Built in 1908, Size: 34 ft x 500 ft, timber support piles, steel caissons and superstructure, plastic fender piles
North Segment	Built in 1908, Size: 50 ft x 349 ft, timber support piles, steel caissons and superstructure, plastic fender piles
South Segment	Built in 1942, Size: 60 ft x 598 ft, concrete support piles and superstructure, plastic fender piles
Function	Loading and off-loading of fuels and contaminated petroleum products (CPP)
Current Ship Loading	Average: 43 ships/month
Condition of Facility	Facility is aging, is in poor condition, and is seismically deficient
Major Structural Repairs	Repairs to four undermined caissons on the Approach Pier in 1957 and two additional undermined caissons in 1987. The 1987 repairs included the installation of a submerged steel sheet pile bulkhead to prevent further undermining of the caissons.

Source: Navy 2010a.

The fuel pier is part of FLC Fuel Facility NBPL, a bulk fuel storage and transfer facility that includes administrative and support facilities, fuel storage tanks, pumphouses, and pipelines (NAVFAC 2009). Figure 1-2 shows the FLC Fuel Facility NBPL storage tanks located onshore northwest of the fuel pier. Fuel is supplied to FLC Fuel Facility NBPL by an onshore pipeline and tank vessels, and can be issued by the same systems (NAVFAC 2009). Table 2-4 lists the existing pipelines that run from the onshore FLC Fuel Facility NBPL storage facilities to the fuel pier (NAVFAC 2009). The fuel pier is also equipped with an 8-in diameter pipeline for offloading contaminated petroleum product (CPP) (a mixture of fuel and water) to be processed at the NBPL Defense Fuel Support Point (DFSP) Fuel Oil Reclamation (FOR) system (NAVFAC 2009).

Storage tanks, piping, and supporting infrastructure at the FLC Fuel Facility NBPL are in the process of being replaced under the P-401 construction project (Navy 2010a). Fifty-four existing underground and aboveground storage tanks are being replaced with eight new, DoD multi-product, aboveground bulk fuel storage tanks with the same storage and operational capacity as the existing tanks (42 million gallons). The new fuel storage facility is being rebuilt at the same location because of established access to existing supply pipelines and to the fuel pier (Navy 2007). P-401 improves onshore fuel and piping and transfer systems between the new storage tanks under construction and the fuel pier (existing and proposed) (Navy 2007). Pumping, piping, and discharge requirements would be in accordance with 33 CFR 157.11, *Pumping, Piping and Discharge Arrangements* (Navy 2010c).

Table 2-4. Existing Fuel Pier (Pier 180) Pipeline Diameters and Contents

Pipeline Diameter (inches)	*Contents*
16	JP-5
16	DFM
10	DFM
8	JP-5
8	CPP
6	Lubricating oil

Notes: DFM = diesel fuel marine, JP-5 = jet fuel, CPP = contaminated petroleum products.
Source: NAVFAC 2009.

The P-401 demolition and construction project also includes removal of eight aboveground lubricating oil storage tanks located beside the quay wall immediately north of the fuel pier. The P-401 project has completed a new lubricating oil facility elsewhere on NBPL, including approximately 2,000 linear ft (lf) of piping to connect it to the proposed new fuel pier (Navy 2007).

Also included in the fuel storage facility replacement project are demolition of Buildings 110 (two-story wooden control tower) and 140 (single-story wooden storage building) on the fuel pier (Navy 2007, 2010d). As part of P-401, a new control tower is being constructed onshore on the site vacated by the removal of the existing lubricating oil storage tanks (Navy 2007). The domestic water and sewer lines that serve the existing control tower Building 140 on the fuel pier would be cut and capped at the shore under P-401 (Navy 2010c). The abandoned water and sewer utilities would be removed during the demolition of the fuel pier.

In addition to fueling vessels, FLC Fuel Facility NBPL supplies JP-5 (jet fuel) to NAS North Island across San Diego Bay to the east through two underwater pipelines (NAVFAC 2009). The NAS North Island pipelines are not included in the fuel pier or fuel storage facility replacement project (Navy 2007, 2010a). However the NAS North Island pipelines are in the fuel pier replacement project area, both onshore and offshore. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the demolition and construction work zone footprint and would ensure that all contractors' equipment and vessels remain outside the buffer zone during demolition and construction.

Demolition Process

Hazardous Material Abatement. In 2009, Ninyo and Moore conducted a visual hazardous materials survey at the fuel pier (Navy 2010d). Hazardous materials described in Section 3.7.2 were identified and confirmed through laboratory analyses. Hazardous lead paint removal and asbestos-containing material (ACM) abatement would be completed by licensed contractors before demolition, as described in Section 3.7.3. The construction contractor would use the Navy's manifesting procedures for hazardous wastes.

Mechanical and Electrical Utilities. Shoreside, all water and sewer laterals connected to the fuel pier would be cut and capped at the mains to prevent the formation of dead-end pipes in the water and sewer systems. Underground utilities would be located before performing any

drilling or excavation work at the site. All electrical and mechanical utilities would be properly terminated before demolition. Demolition of utilities under the pier would occur with a hydraulic crane from the pier topside, or a barge mounted crane. Salvageable piping and electrical materials would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

Fueling System and Pipelines. All liquids, solids, or sludges would be evacuated from the fuel and CPP systems, and the systems and pipelines would be cleaned. The same procedure would be applied to the potable water and sewer lines that supply Building 140 on the fuel pier. All pipelines would then be properly terminated at the shoreline and dismantled topside. Salvageable metal would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

Cleat and Bollard Bases. This work would be performed with a mini-excavator with a concrete breaker. All bollards and cleats would be hauled away for recycling. This operation would occur concurrently with the removal of the pier deck.

Plastic Fendering System. This work would be performed from a barge-mounted crane. Salvageable materials from this demolition process would be loaded onto flatbed trucks and hauled away for recycling. All other materials removed from the fendering system would be sized and hauled away to an approved disposal facility. This work would occur concurrently with the hazardous material abatement.

Concrete Deck and Pier Pilings. Typical pier demolition takes place bayward to landward and from the top down. Table 2-5 lists the types and numbers of piles to be removed. First, the fender piles and exterior appurtenances (such as utilities and the fuel piping systems) would be demolished above and below the pier deck. Then, the deck would be demolished using concrete saws and a barge-mounted excavator equipped with a hydraulic breaker (MNB 2011d). Next, structural and fender piles would be demolished.

Table 2-5. Existing Fuel Pier (Pier 180) Piles to be Removed

Pile Type	*Number*
Concrete structural	569
Concrete fender	105
16-in steel pipe filled with concrete	24
Plastic fender	34
Wood	741
Total	**1,471**

Source: MNB 2011e.

An attempt would first be made to dry-pull the entire length of each pile with a barge-mounted crane. A vibratory hammer or a pneumatic chipper may be used to loosen the piles. Jetting (the application of a focused stream of water under high pressure) would be another option to loosen piles that could not be removed through the previous procedures. Piles that could not be pulled entirely would be cut at the mudline. Once extracted, the piles would be loaded on to a

support barge where they would be floated over to the quay wall. On shore, the debris would be crushed onsite or hauled to a concrete recycling facility.

Figure 2-3 shows the location of the contractors' laydown area for materials, equipment, and concrete recycling. The contractor may also stage some equipment and materials on barges (NAVFAC Southwest 2011a).

The Navy would require the contractor to prepare and implement a comprehensive debris management plan that would address the types of construction and demolition debris, expected separation and retrieval methods, and disposal methods. The contractor would be required to use catch devices and sheeting to capture and contain debris and materials that may be produced by project activities. Accidental releases of debris to San Diego Bay would be prevented by placing floating booms around the site to provide a complete barrier to floating debris. Debris from work on demolition and construction barges would also be captured on-board the barges. All captured material would be swept and disposed of in accordance with the debris management plan.

To minimize impacts to eelgrass and minimize sediment disturbance, steel sheet pile bulkheads along the south side of the approach segment and the outboard side of the north segment would not be removed. The bulkheads protrude about 10 ft above the mudline, and preserve a remnant soil mound that lies beneath the approach pier and main pier structure (Terra Costa Consulting Group, Inc. 2010). This remnant soil mound was created by dredging the bay floor adjacent to the pier (Terra Costa Consulting Group, Inc. 2010). Original engineering plans for the sheet pile bulkhead indicate that it was covered in rock rip-rap (Terra Costa Consulting Group, Inc. 2010).

Discarded Military Munitions (DMM)

DMM may be present in the project footprint due to historical ammunition handling at the fuel pier. The construction contract would require the preparation of a Navy-approved Explosives Safety Submittal (ESS) to support all construction and demolition. An ESS is a document that details how Navy explosives safety standards are applied to ensure protection of personnel and Navy assets in the event of unintentional detonation.

Demolition Debris

The Navy's goal is to recycle 52 percent of project debris waste, which would be diverted from landfill disposal. All of the concrete debris (100 percent) would be recycled.

Four major types of debris would result from the demolition of the fuel pier: concrete, wood, steel, and plastic. Alternative 1 would be in accordance with the DoD Low-Impact Development Initiative requiring all demolition projects that take place after 2011 to recycle and divert materials from local landfills to the maximum extent practicable. Materials would be reused or recycled as appropriate. Materials that cannot be reused or recycled would be transported to a permitted landfill. No special permits would be required for disposal of non-hazardous solid waste. Debris would not be allowed to fall into the San Diego Bay.



0 25 50
Meters
Feet
0 100 200

Source: NAVFAC Southwest 2011a

Figure 2-3
Contractors' Laydown Area

N

Concrete debris would comprise the largest volume of demolition material, approximately 4,280 cubic yards (cy) (Navy 2010e). Concrete debris not crushed for onsite reuse would be hauled to an offsite concrete recycling facility and processed for reuse as bulk construction material such as roadway fill.

Wood debris, comprising approximately 741 potentially creosote-treated timber support piles, would be disposed at Miramar landfill in accordance with the NRSW special waste management policy (MNB 2011e, NRSW 2007).

Approximately 680 tons of steel debris and 4 tons of wiring (e.g., 34,000 lf of utility wires estimated at 4 ft per pound in weight [Navy 2010e]) would also be recycled or appropriately disposed as a requirement of the demolition contract (NAVFAC Southwest 2011f). Steel debris that could not be recycled would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill (NAVFAC Southwest 2011g).

Approximately 3,100 lf of plastic fender material would be removed from the fuel pier (Navy 2010e). Reuse or recycling of the plastic fenders would be determined as appropriate. Any material not suitable for reuse or recycling would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill (NAVFAC Southwest 2011g).

Demolition/Construction Equipment and Phasing

To avoid impacts to California least tern breeding habitat during the breeding season, in-water demolition and construction activities that generate underwater noise and/or turbidity that impact tern breeding would not occur from 1 April to 15 September. Details of the least tern season avoidance plan for Phase 1 and Phase 2 demolition activities are listed below.

Demolition of the Existing Pier North Segment (Phase 1)

- During least tern breeding season, the demolition activities would be limited to removal of the deck, underdeck, fender piles (pulled only, no vibratory or jetted removal), and all of the deck hardware.
- The removal of the caissons (6-ft diameter steel with 13 wood piles each [25 caissons and 325 12-in diameter wood piles total] and concrete topping) would take place outside the least tern breeding season. The caisson elements could be removed with a barge-mounted derrick crane. The crane can be used to grasp and lift large components such as caissons and piles with attachments such as wire slings or clamshell buckets (i.e., dredge buckets). When a wooden pile cannot be completely pulled out, the pile may be cut at the mudline using crane-attached hydraulic jaws and/or a diver-operated underwater chainsaw.

Demolition of the Remainder of the Existing Pier Approach and South Segments (Phase 2)

- During least tern breeding season, the demolition activities would be limited to removal of the deck, underdeck, fender piles (pulled only, no vibratory or jetted removal), and all of the deck hardware.
- The removal of the caissons in the approach segment (6-ft diameter steel with 13 wooden piles each [32 caissons with 416 12-in diameter wood piles total] and concrete

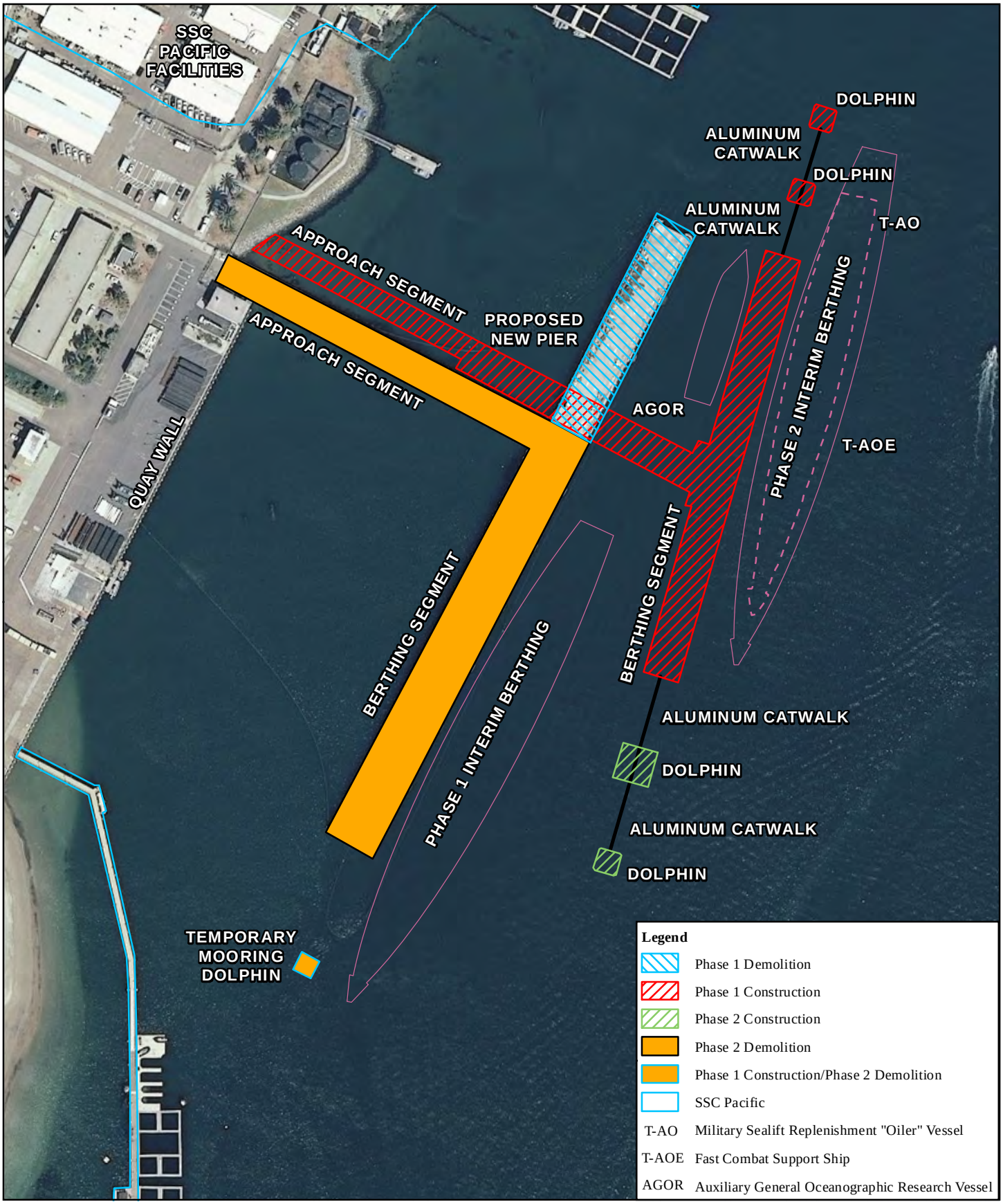
topping) would be accomplished outside the least tern breeding season and would be removed with a crane and attachments as described above, hydraulic jaws, and/or underwater diver-operated chainsaws to cut off the wooden piles at the mudline.

Demolition and construction work (including pile driving) would occur between the hours of 7:00 A.M. and 4:00 P.M., Monday through Friday (weekdays, daylight hours only). Demolition and construction contract specifications would provide work day and hour restrictions that are consistent with City of San Diego noise ordinances (MNB 2012b).

The new fuel pier would be constructed concurrently with demolition of the existing pier. The north segment of the existing pier would be demolished first while the existing approach and south segment would remain operational. Fueling capabilities would be provided by the south segment. During the estimated construction period of approximately 4 years, fuel pier operations would continue with no more than 45 days total downtime (Navy 2012a). As described below, the two phases are designed with some overlap to maintain operational capability and make full use of the available construction timeframe. Figure 2-4 shows the parts of the existing pier that would be demolished and the proposed new pier that would be constructed during the two phases of demolition/construction. As shown on this figure, the proposed project area at NBPL is a developed waterfront where no natural beach shoreline would be disturbed during demolition and construction.

To maintain continuous fueling capability, access to the existing south pier would be required as the project gets underway. Access to the new north pier would be required in later phases for both construction and fueling activities (MNB 2011d). According to engineering estimates there would be approximately 500 to 700 ft of open water between the pier construction activity and the dredging activity (MNB 2011d). Figure 2-5 shows the construction and navigation zones. In the event that construction and dredging take place concurrently, there would be sufficient space to accommodate both operations and normal nonmilitary boat traffic (Figure 2-5).

Construction and dredging activities would take place outside the federal channel. The new fuel pier construction zone is approximately 1,200 ft from the channel. The dredge footprint, where the dredge vessels would operate, lies outside the channel. Most of the vessels involved with the project would transit the channel intermittently, with the exception of the sediment transport barges that may make more frequent trips to the nearshore dredged material beneficial reuse site (described in Section 2.2.1.5).



0 25 50
Meters
Feet
0 100 200

Source: MNB 2012b

Figure 2-4
Demolition and Construction Phasing Plan

N



Sources: NAVFAC Southwest 2011a; NOAA 2012

Figure 2-5
Navigation/Construction Zone

Phase 1 – Fuel Pier Construction: Project Indicator Pile Program, Temporary Mooring Dolphin, and North Segment Demolition (350 lf). A temporary mooring dolphin would be constructed to allow vessels to berth and load/unload fuel while the north segment of the existing pier is under demolition. Similar pile driving equipment and barges used to construct the temporary mooring dolphin would later be used to construct the new fuel pier (MNB 2012b). Approximately 12 steel pipe indicator piles (36-in and 48-in diameter, exact mix to be determined later) would be driven in the new pier alignment. The purpose of the indicator piles is to verify the driving conditions and establish the final driving lengths prior to fabrication of the final production piles that would be used to construct the new pier (MNB 2012b).

The north segment would be demolished by water access using barges to provide a working area for the crane and equipment (MNB 2011d). The demolition waste would be placed on two barges and hauled offsite for processing, recycling, and disposal. Water access is preferable for the heavy equipment and demolition waste to keep the existing pier operational during the demolition phase (MNB 2011d). Access to the existing pier is necessary for laborers, trucks, and removal of pier appurtenances. Some equipment used for demolition may include hydraulic hammers mounted to back-hoes for breaking concrete, front-end loaders, fork-lifts, concrete saws, steel cutting torches, and excavators with hydraulic thumb shears (MNB 2011d). The floating barges would be supported by tug boats and small work boats (MNB 2011d). While demolition of the north segment of the existing fuel pier is underway, the steel piles for the new pier approach segment would be fabricated offsite and transported to NBPL. Other construction equipment needed for Phase 2 would be mobilized to NBPL within this time.

Phase 1 – Construction of Approach Pier (Connection to Shore) (700 lf), Berthing Segment and North Mooring Dolphins 1,100 lf total for segment plus two dolphins). The new approach segment, berthing segment, and two north mooring dolphins would be constructed concurrently. It is not necessary to wait for the complete demolition of the existing pier north segment to begin construction. The approach pier construction would begin after the piles have been fabricated offsite and delivered (MNB 2012b). The piles would likely be delivered by barge (MNB 2012b). The approach pier construction would require two barge-mounted cranes, one with a pile driving rig and one for constructing the pier (MNB 2011d). Two additional barges would be used to store the piles, concrete formwork, steel reinforcement, and precast concrete deck sections. The floating barges would be supported by tug boats and small work boats. Construction from shore and/or the remaining fuel pier approach segment is a possibility for a small percentage of the work (MNB 2011d). Additional equipment would include front-end loaders, fork-lifts, steel welding and cutting equipment, concrete placement and finishing equipment, concrete saws and drills, and carpentry tools for building formwork (MNB 2011d). Materials delivered by truck may include concrete, reinforcing steel, utility pipes, and other miscellaneous construction materials. When the new berthing segment and mooring dolphins are completed, aluminum catwalks would be constructed to connect them.

Phase 2 – Construction of South Dolphins, and Demolition of Existing Approach Pier, South Pier, and Temporary Mooring Dolphin. Construction of the south berthing and mooring dolphins would begin after the new approach and berthing segments and north dolphins from Phase I are operational. Aluminum catwalks would be constructed connecting the south dolphins to the

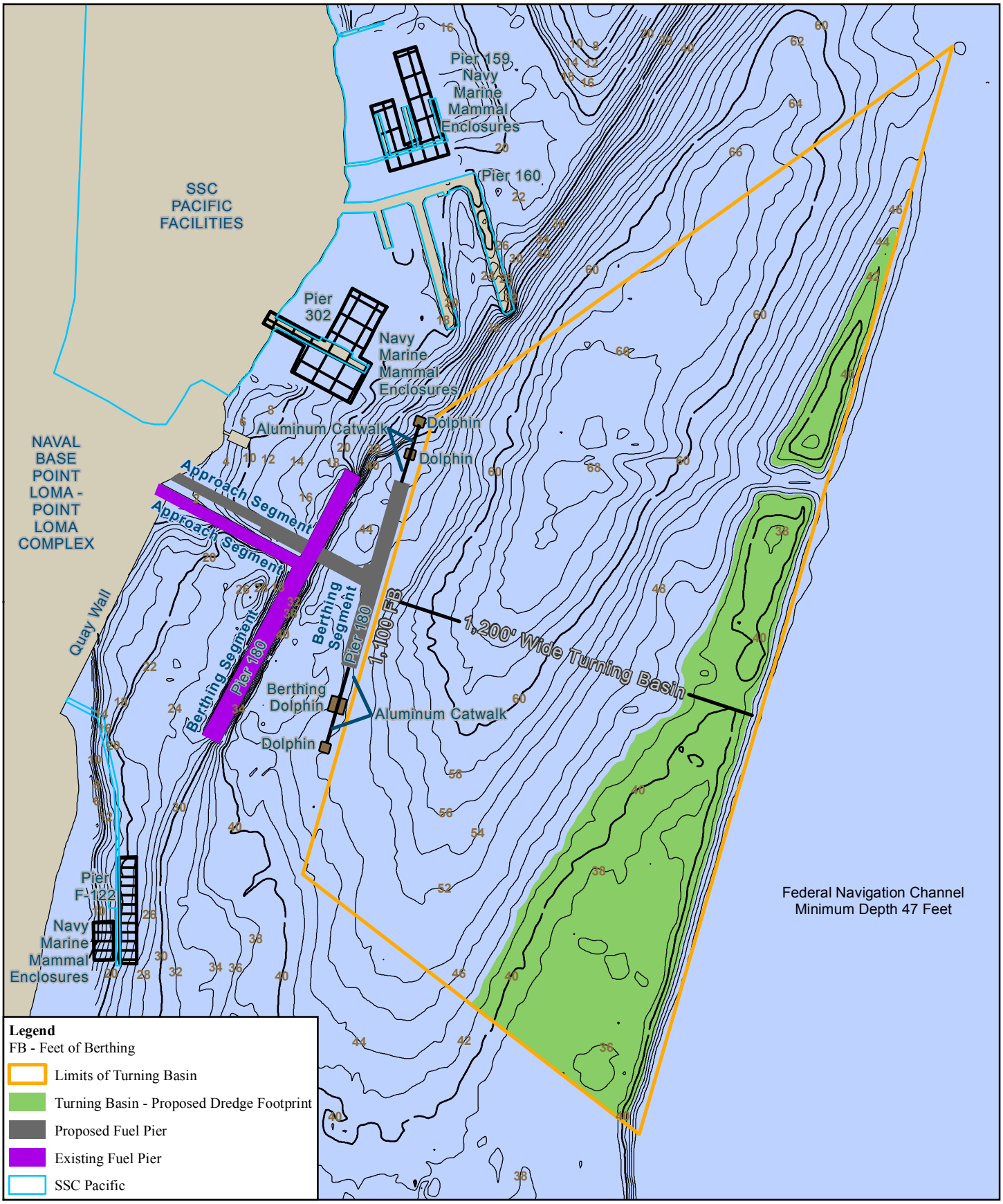
berthing segment. The existing south pier, approach pier, and the temporary mooring dolphin would be demolished concurrently with construction of the new south dolphins. The old south pier and old approach pier demolition would begin after the new south pier is operational (MNB 2011d). The temporary mooring dolphin near the north pier would also be demolished at this time, and the debris would be recycled along with the south pier demolition debris. This phase would require two barge-mounted cranes to expedite the demolition of the existing pier. The other equipment used would be the same as Phase 1 (MNB 2011d).

Turning Basin Dredging. Dredging for the turning basin could occur any time before, during, or shortly after the construction process (MNB 2011d). There would be no dredging during the least tern breeding season, 1 April to 15 September. There is no specific intent for the Navy MMP to remain at its existing location during the dredging phase. However, under Alternative 1, should dredging take place separately from the pier replacement effort (i.e., either before or after construction and demolition), the Navy MMP could occupy its current location if the assumptions listed in Section 2.2.2 are met (NAVFAC Southwest 2011h). A description of dredging equipment and timing is listed in Section 2.2.1.5.

2.2.1.3 Phased Construction of a Replacement Fuel Pier

During development of the new pier design, several measures were adopted to minimize impacts to eelgrass near the existing fuel pier. These measures include: pier alignment positioned to minimize eelgrass disturbance, pier extended into deeper water to minimize dredging, existing sheet piling left in place to minimize sediment and eelgrass disturbance, and use of mooring dolphins to reduce the size of new pier footprint and minimize bay shading.

The approach segment of the new fuel pier from shore bayward would be 700 ft long as compared with 500 ft for the existing fuel pier. The new fuel pier north and south berthing segments would be 50 ft wide, the same as the existing pier. The approach segment would be constructed approximately 5 ft north of the existing pier to minimize disturbance to eelgrass and to facilitate connecting the pier with pipelines to onshore FLC Fuel Facility NBPL fuel storage facilities. The new north/south berthing segments would be angled allowing vessels to align more easily at the pier, compared to the "T" shape of the existing fuel pier (Figure 2-6). Due to the angled alignment, the new pier berthing segment north end would extend about 100 ft beyond the existing fuel pier, and the berthing segment south end would extend bayward about 300 ft beyond the existing fuel pier (MNB 2012c). However, as with the existing fuel pier, the new fuel pier would lie entirely within a USCG navigation Restricted Area.



Sources: NAVFAC Southwest 2011a; NOAA 2012

Figure 2-6
Proposed New Fuel Pier and
Turning Basin Dredge Footprint

As discussed in Section 2.2.1.4, the Restricted Area would be amended to allow for the bayward additional length of the new pier and there would still be approximately 700 ft of open water available between the Restricted Area and the navigation channel for use by civilian vessels.

The new pier approach segment would connect to shore as a single deck with a ramp leading to the upper deck of the double deck berthing segment. The berthing segment would be 605 ft long by 50 ft wide, supplemented with three mooring dolphins and one berthing dolphin to extend berthing length to 1,100 ft. The added 200 ft of approach pier length places the berthing segment of the new pier in a deeper, previously dredged location where most of the area to be used by vessels approaching the pier already meets the minimum depth requirement of 40 ft (MNB 2012b). This placement would accommodate a wider variety of ships than is currently possible at the existing fuel pier where depths are 30 to 40 ft (see Figure 2-6). No dredging would be needed alongside the pier during construction, and the need for future maintenance dredging along the pier would be reduced or eliminated.

The top of the lower deck would be set at 13 ft MLLW, approximately 5 ft above extreme high tide. The new pier upper deck elevation would be 28 ft above MLLW and 20 ft above extreme high tide. The upper deck would have sufficient height needed for the pier fuel loading arms to safely reach fuel transfer points on the majority of larger ships (Navy 2010a) as described in Section 2.1. There would be a 3.5 ft-high concrete barrier around the upper deck perimeter, so the combined double deck structure would stand at 31.5 ft MLLW.

Table 2-6 lists the height of equipment that would be mounted on the proposed new fuel pier upper deck and approach segment.

Table 2-6. New Fuel Pier Above Deck Equipment Heights

Deck	*Feature Name*	*Feature Height (ft)*	*Number to be installed*	*Height of feature installed on pier (ft above MLLW)*[1]
Upper	Fuel Loading Arm	30	6 (4 on the outboard side of the pier and 2 on the inboard side)	58
Upper	Loading Station via Hose	5	6	33
Upper	Pole lighting[2]	25	7	56.75
Lower (Approach single level)[3]	Pipe rack	6	One rack supporting 11 pipes	19
Lower (Approach single level)	Pole lighting	25	6	29.25

Notes: [1] Lower pier deck elevation would be +13 ft MLLW; upper deck would be +28 ft MLLW.
[2] Pole lighting would be installed on top of the 3.75 ft-high barrier on the upper deck.
[3] Pole lighting would be installed on top of the 1.25 ft-high barrier on the lower deck.
Sources: Burns and McDonnell 2012a, NAVFAC Southwest 2011e.

The 1,100 ft berthing length was chosen to provide flexibility in fueling multiple types of vessels at the proposed new fuel pier, including the T-AKR that requires the 1,100 ft berthing length (MNB 2012b). The inner berths provide two additional berthing areas, the south and north inner berths. The south inner berth would accommodate vessels up to 500 ft long and the north inner berth would provide a small craft berthing area for vessels up to 400 ft long. The existing fuel pier total area is 71,180 sf/1.63 ac. The total area of the new pier (including the 700 ft long approach segment and dolphins) would be 65,865 sf/1.51 ac (MNB 2012b). This would be a decrease of 5,315 sf/0.12 ac of bay shading compared to the area of the existing fuel pier (MNB 2012b).

The replacement pier structure, including the mooring dolphins, would consist of steel pipe piles, supporting concrete pile caps and cast-in-place concrete deck slabs. Concrete material may be delivered from either trucks or barges (MNB 2012b). The upper 10 ft of the steel wall pipe piles of the lower deck would be filled with concrete as part of the connection between the piles and the lower pier deck. Approximately 554 total piles would be installed (MNB 2012b). Concrete pilings are not suitable to support the double-deck pier due to the structural seismic forces, so steel structural pilings would be used (MNB 2012b). Design of the fuel pier takes into account seismic loading, vessel loading, gravity loads, and functionality of the overall system. The State of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria, and the Navy has agreed to comply with the California marine oil terminal requirements for this facility. The design of the piles is governed by loading conditions that include seismic loads (MNB 2011f). The structural analysis performed has determined that concrete piles of sizes available in southern California cannot develop sufficient strength and stiffness to withstand the design loads considering the water depth at the site, the geotechnical conditions, and with the deflection limitations needed for the fuel operations (MNB 2011f). The sizes of the steel piles are dependent on water depth, subsurface soil conditions, and the mass of the deck structure. In most areas, a 36-in diameter steel pile is adequate to meet the criteria (MNB 2011f). In other areas, a 48-in diameter pile is necessary (MNB 2011f).

The new steel piles would be protected from seawater corrosion with a combination of coating and cathodic protection systems with anodes (aluminum) that would require replacement approximately every 20 years (Burns and McDonnell 2012b). The existing sheet pile system would continue to be protected from corrosion with its existing (protected/reconnected) impressed current cathodic protection system (Burns and McDonnell 2012b). The service life of the entire pier structure would be 75 years (Burns and McDonnell 2012b).

Table 2-7 lists the types and numbers of pilings to be installed. The project construction schedule limits pile driving to four "windows" of opportunity that would occur in Phase 1 and Phase 2. There would be no pile driving or other in-water construction or demolition during the least tern breeding season, from 1 April through 15 September of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.

Table 2-7. Proposed Replacement Fuel Pier Pilings to Be Installed

Pile Type	*Number*
48-in diameter x 1-in steel wall pipe piles	77
36-in diameter x 1-in steel wall pipe piles	228
24-in diameter x 1-in prestressed concrete piles	165
16-in diameter concrete-filled fiberglass piles	84
Total	**554**

Source: MNB 2012b.

It is assumed that the contractor would drive approximately two steel piles per day, and five concrete or fiberglass piles per day. Each pile is assumed to require up to 2 hours of driving. Steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile driver. Working assumptions are 1-1.5 hours of vibratory pile driving and up to 0.5 hour of impact pile driving for each steel pile. Concrete piles would be jetted and then driven with an impact pile driver only. The fiberglass fender piles do not need to be embedded as deeply into the subsurface as the steel wall and concrete structural piles, so they would be driven with the impact hammer for the entire length (MNB 2012b). The fender system for the pier would include foam-filled fenders at the berths and plastic log camels.

The currently proposed construction schedule includes the following non-overlapping, consecutive episodes of pile driving within the first year:

- Relocation of 32 existing and installation of 46 new concrete guide piles to support the relocated facilities of the Navy MMP to NMAWC. Pile driving is estimated to occur over an 8-week period.
- Installation of steel indicator piles to occur over 17 days.
- Installation of steel temporary dolphin piles to occur over 5 days.
- Installation of 24 steel abutment piles to occur over 13 days.
- Installation of approximately 26 steel structural piles over 15 days.

During the second year of construction there would be several non-overlapping episodes of pile driving, including:

- Steel structural piles for the access pier, 45 days.
- Fiberglass-concrete secondary fender piles for the access pier, 10 days. This would occur in the same timeframe as concrete pile driving (below).
- Steel structural piles, 45 days.
- Steel mooring dolphin piles, 12 days.
- Concrete primary fender piles, 15 days.

During the third year of construction there would be several episodes of pile driving, including:

- Concrete primary fender piles, 15 days.
- Fiberglass-concrete secondary fender piles, 12 days.
- Steel mooring dolphin piles, 12 days.
- Steel abutment piles, 10 days.

The abutment piles and mooring dolphin piles would be driven within the same timeframe, over a combined 12-day period.

Figure 2-7 provides an artist rendering of the proposed new fuel pier when completed.



Figure 2-7
View of Proposed New Fuel Pier

The contract specifications would provide construction work day restrictions that are consistent with City of San Diego construction noise ordinances (MNB 2012b). Pile driving would occur during normal working hours (7:00 A.M. to 4:00 P.M. on weekdays) (MNB 2012b).

Aluminum catwalks would connect the berthing and mooring dolphins to the main pier (see Figure 2-6). The approach segment would be of similar construction to the berthing pier. The main pier decks would be designed for a 50 ton mobile crane, 20 ton truck load, and 10 ton forklifts (5 ton forklift on the lower deck); heavy equipment would not be operated on the berthing or mooring dolphins (MNB 2012b).

There would be fueling stations on the upper and lower decks of the new fuel pier berthing segment. Each fueling station would have the capability to supply diesel fuel marine (DFM) and JP-5 turbine (jet) fuel to vessels. The upper deck would be used for offloading fuel from tankers to the tank farm and for supplying fuel to higher profile vessels. The lower deck would be used for fueling smaller profile vessels. Table 2-8 lists the fueling stations on the two decks of the berthing segment of the new fuel pier.

Table 2-8. New Pier Fueling Stations

Deck	*Side*	*Product*	*Number of Stations*
Upper	Outboard	Fuel	4
Upper	Outboard	Lube Oil	2
Upper	Inboard	Fuel	4
Upper	Inboard	Lube Oil	1
Lower	Outboard	Fuel	4
Lower	Outboard	Lube Oil	1
Lower	Inboard	Fuel	3
Lower	Inboard	Lube Oil	0

Source: NAVFAC Southwest 2011e.

The upper deck would also have six piping connections to receive ballast water from fleet tankers and other larger ships (Burns and McDonnell 2012b). An 8-in diameter oily water pipe would be used to transfer the ballast water to the NBPL FOR facility. The ships could either pump directly to the oily water receipt tank at the treatment system or transfer to the smaller collection tank located on the pier (Burns and McDonnell 2012b). A pump at the collection tank would then transfer the oily water to the receipt tank at the treatment system (Burns and McDonnell 2012b).

Pier deck design is such that all rainfall accumulating on the lower deck, as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier, would be collected on the pier and sent to the FOR receipt tank for treatment. The upper deck would be equipped with underflow scuppers that would permit a portion of the runoff from greater than the 85th percentile storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay and also allow the "first flush" to be sent to the FOR Receipt Tank in such storms.

The pier operations would be supported by two pipelines for each fuel product and two for lube oil. There would be a 16-in and an 8-in pipeline for loading/unloading JP-5. For loading and unloading DFM, there would be a 16-in and a 10-in pipeline. There would be two 6-in pipelines for loading lube oil. The 16-in pipes would support the fueling stations on the outboard side while the 8-in JP-5 and 10-in DFM pipes would support the fueling stations on the inboard side.

The 50 ft top-of-deck width is the minimum requirement for a fuel pier per DoD UFC. The new fuel pier would provide adequate deck space on the berthing segment by using a double deck structure to separate the fuel lines from operations on the berthing segment and provide containment for fuel pipelines and utilities. On the berthing segment, the pipelines and utilities would be hung beneath the upper deck. Utilities would be in a dedicated vault separate from the pipelines. On the approach segment, fuel lines would be stacked in pipe racks running along one side of the lower deck. Where the approach and berthing segments meet, the fuel lines' orientation would transition from horizontal along the lower deck to vertical to reach the upper deck, then horizontal again beneath the upper deck (NAVFAC Southwest 2011e).

Concrete containment curbs would be incorporated into the pier deck design surrounding all fueling arms, fueling risers, and fuel pipes. There would be sumps in curbed containment areas in both pier decks to capture spilled fuel as well as rain water. Sumps located in the upper deck would be fitted with drains that would be piped to a collection tank on the lower deck. Sumps in the lower deck would connect to the FOR. There would be a 1.25-ft-high concrete curb around the perimeter of the lower deck and 3.75-ft-high concrete barrier around the upper deck.

The total fuel volume of the new pier pipelines would be 49,000 gallons, an increase of 22,960 gallons (approximately 88 percent) from the existing pipeline capacity of 26,040 (Burns and McDonnell 2012c). The dual piping configuration would allow fueling operations to take place on both sides of the pier simultaneously, and include a cross-over capability so that fuel could be transferred from one side of the pier to the other should one side shut down temporarily (MNB 2010).

The following would all be upland work. An existing underground trench containing piping from the onshore fuel storage facilities would be extended to the pipelines on the new pier. The connection for the new pipelines would be located between 35 and 65 ft from the existing pier abutment. With the exception of some electrical duct bank work, shoreside excavation would take place near the abutments of the existing pier and the proposed new pier. In addition to the fuel pipelines, a 12-in diameter fire suppression water line would be installed on the proposed pier and connected to the onshore potable water supply system (Burns and McDonnell 2012c).

The total disturbed area on shore would be less than 1 ac, comprising previously disturbed areas that are paved and unpaved. The paved area northwest of the existing fuel pier would be excavated (an area approximately 20 ft long, 6 ft wide, to a depth of about 5 ft) to extend the underground pipeline trench to the new pier and to install underground utilities and subsequently re-paved. The existing 12-in diameter stormwater outfall located immediately north of the existing fuel pier abutment would be relocated to the north side of the new pier abutment. A portion of the landscaped area between the existing fuel pier and lube oil storage

tanks would be paved as part of the new pier landside abutment. Three palm trees would be removed from the landscaped area. A new security fence with a motorized gate would be constructed at the entrance to the new pier.

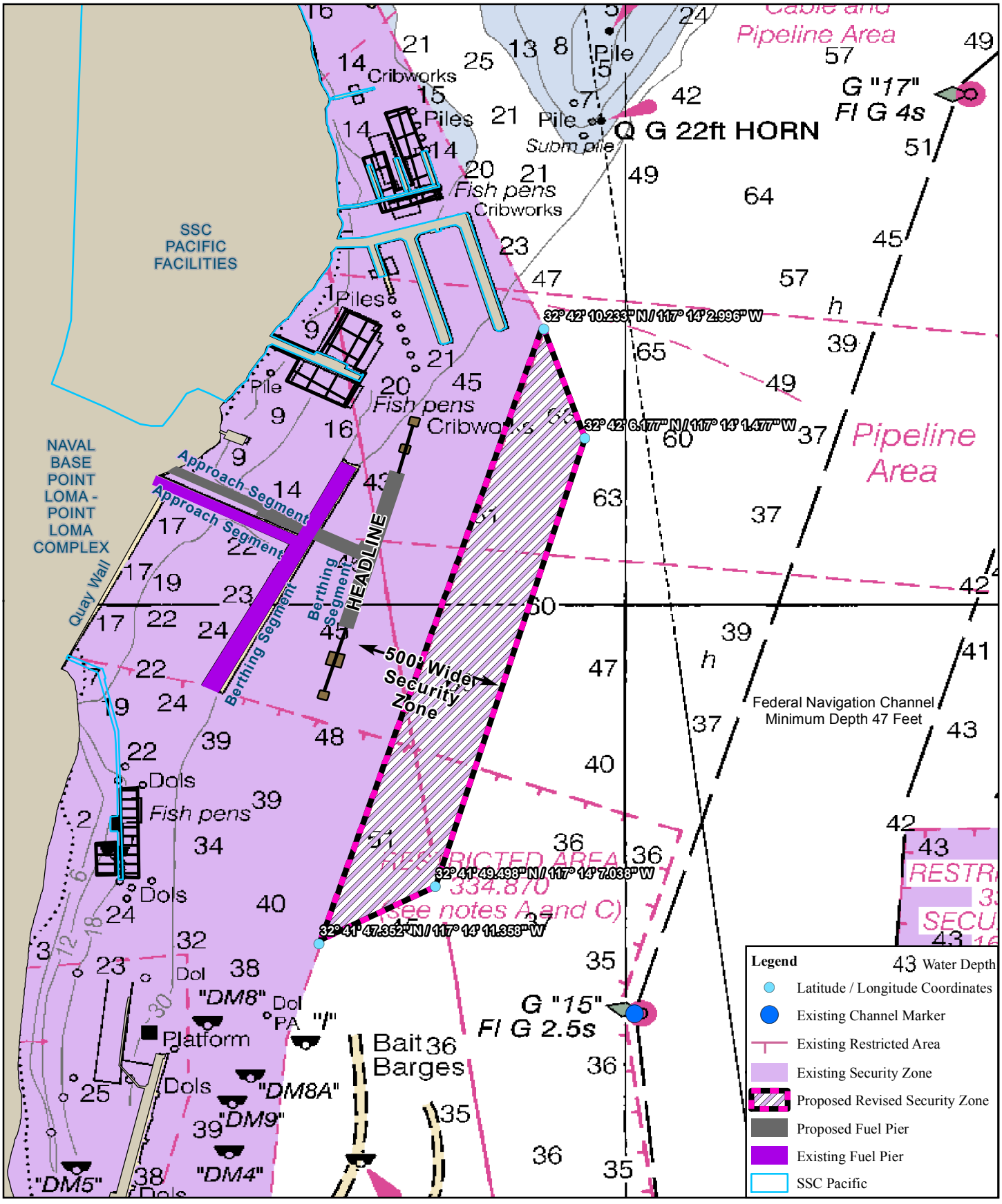
After the new pier is completed, the quay wall at the entrance to the old fuel pier would be rebuilt. This work would include the placement of approximately 100 cy of concrete to repair the quay wall (MNB 2011g). There would also be some grading and asphalt repairs in this area (MNB 2011g). Repairs to the quay wall would also include removal of two closed underground storage tanks (USTs) (Tanks 115A and 115B; see Section 3.7.2.7) (Burns and McDonnell 2012b).

The connection between the new and old pier abutments would be constructed by placing closely-spaced 48-in diameter steel pipe piles along the base of the new and existing bulkhead. The gaps between the piles would be closed by welding steel "wings" between the piles. A concrete cap would be placed at the top of the piles to support the new pier approach and provide a continuous surface. All the work would be performed above mean higher high water.

2.2.1.4 Regulated Navigation Zones

The approach segment of the new fuel pier from shore bayward (east) would be 700 ft long as compared with 500 ft for the existing fuel pier. The new pier berthing segment north end would be about 100 ft further east into San Diego Bay than the existing fuel pier, and the south end would be about 300 ft further bayward (MNB 2012c). While the new pier would not extend beyond the existing Security Zone east of the pier, there would not be sufficient distance between the new pier headline and the Security Zone boundary. The Navy Anti-Terrorism/Force Protection-required Security Zone for the fuel pier is 500 ft (Navy 2012c). The Navy has coordinated with the USCG to amend the Security Zone east of the pier by 250 ft (200 ft for the additional approach length and 50 ft for the berthing pier width) to provide an adequate Security Zone of 500 ft for the proposed new fuel pier alignment. The new pier would also extend beyond Navy waters into waters that are under the jurisdiction of the CSLC. Following completion of the National Environmental Policy Act (NEPA) process, Navy counsel would provide written notification to CSLC of the extension of Navy facilities into state waters (NAVFAC Southwest 2010). Regulated Navigation Zones in the vicinity of the fuel pier are shown in Figures 2-8a and 2-8b.

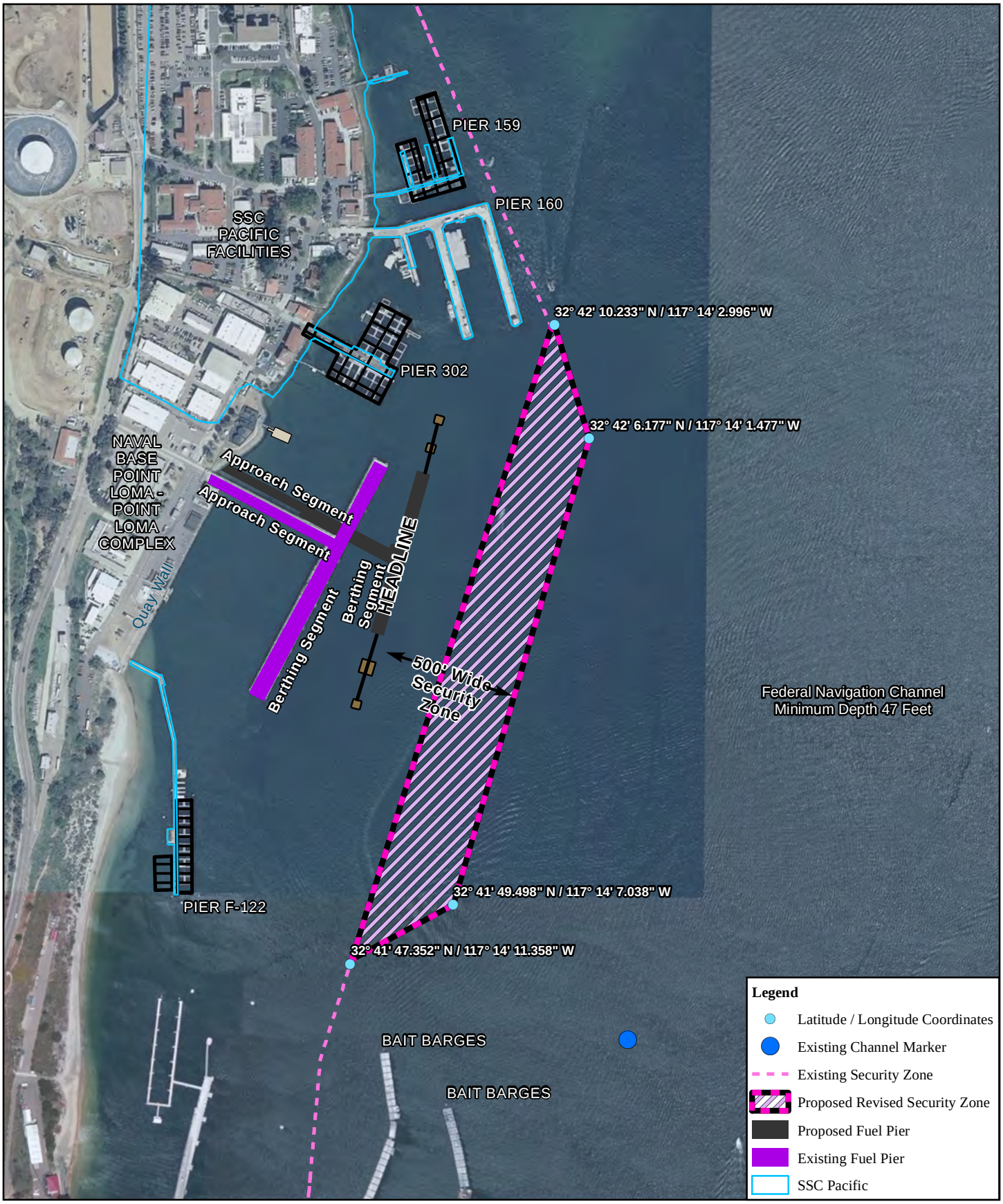
The distance from the new pier headline to the navigation channel would be 1,200 ft (the same width as the proposed turning basin). The proposed amended Security Zone would be 500 ft wide, leaving approximately 700 ft of open water between the Security Zone and the navigation channel for civilian vessels.



0 50 100
Meters
Feet
0 250 500

Figure 2-8a
Regulated Navigation Zones
NOAA Navigation Chart

Sources: NAVFAC Southwest 2011a; Navy 2012b; NOAA Chart 18773 San Diego (NOAA 2012)



0 50 100
Meters
Feet
0 250 500

Figure 2-8b
Regulated Navigation Zones
2010 Aerial Imagery

N

Sources: NAVFAC Southwest 2011a; Navy 2012b; NOAA Chart 18773 San Diego (NOAA 2012)

The Navy would also coordinate with the USCG to establish a temporary Security Zone that would extend 100 ft bayward from the temporary Navy marine mammal facilities to ensure civilian craft do not interfere with restricted maneuverability of Navy small boats operating within the immediate vicinity of Navy marine mammal enclosures (SSC Pacific 2012). Signs would be posted alerting vessels that entry into the temporary Security Zone is prohibited without permission of the Captain of the Port. There would be approximately 358 ft of open water for civilian boat traffic to navigate between the proposed temporary Security Zone and the dock facilities on west Harbor Island, and about 480 ft of open water between the temporary Security Zone and the western end of Harbor Island (Figures 2-9a and 2-9b). The temporary Security Zone would be removed when the Navy MMP has returned to its existing location. The U.S. Coast Guard (USCG) is processing an amended security zone for NBPL and a new temporary security zone for NMAWC.

2.2.1.5 Dredging and Sediment Disposal

Vessel traffic moves in and out of San Diego Bay via the federal channel that is maintained at a depth of -47 ft MLLW by the USACE (Figure 2-6) (National Oceanic and Atmospheric Administration [NOAA] 2012). Large vessels approaching the fuel pier in the channel from the south (inbound) require an area of open water with sufficient depth, known as a turning basin, to safely align at the pier. The proposed new pier layout would include a minimum 1,200 ft wide turning basin between the outboard (eastern) side of the pier and the navigation channel, to provide safety for the berthing operations of the large vessels being serviced at the facility. The north and south limits of the turning basin would be bounded by the existing channel markers located to the northeast and southeast of the fuel pier. The design depth for the turning basin would be -40 ft MLLW (38 ft vessel draft plus 2 ft under keel). An additional 2 ft of dredge depth would be included as overdredge allowance, or tolerance that could vary depending on the precision of the dredging contractors' equipment and methods. Thus, the maximum project dredge depth would be -42 ft MLLW, but the entire overdredge volume might not be recovered if the contractor is able to excavate to 40 ft with less than 2 ft of tolerance.

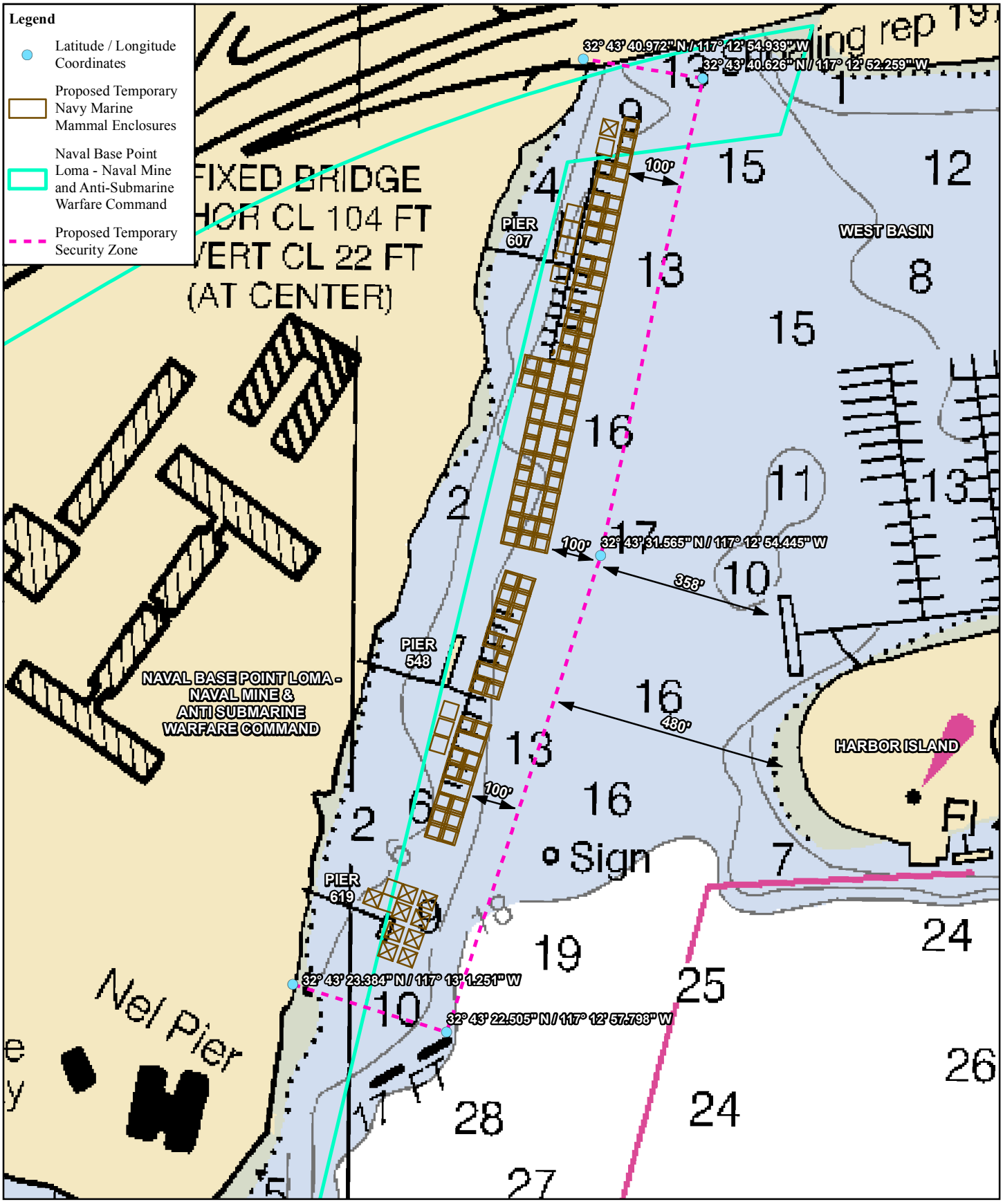
The majority of the existing bathymetry is deep enough to accommodate safe vessel operation. However, there is a wedge-shaped high spot about 1,200 ft east of the existing fuel pier where bottom depths rise from -40 to -36 ft MLLW (see Figure 2-6). This wedge-shaped area (approximately 463,000 sf/10.6 ac) would need to be excavated to bring it to a minimum of -40 ft MLLW. The proposed dredge footprint would be located approximately 700 ft east of the new fuel pier, as illustrated in Figure 2-6. The dredge footprint would be limited to the area shown in green on Figure 2-6.

The estimated volume of dredging required is shown in Table 2-9.

Table 2-9. Proposed Dredging Volume

Site	*Design Depth (-40 ft MLLW)*	*Overdredge (2 ft)*	*Total*
Turning Basin	40,000 cy	40,000 cy	80,000 cy

Note: cy = cubic yards
Source: MNB 2012b.



0 25 50
Meters
Feet
0 50 100

Figure 2-9a
Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607
NOAA Navigation Chart

N

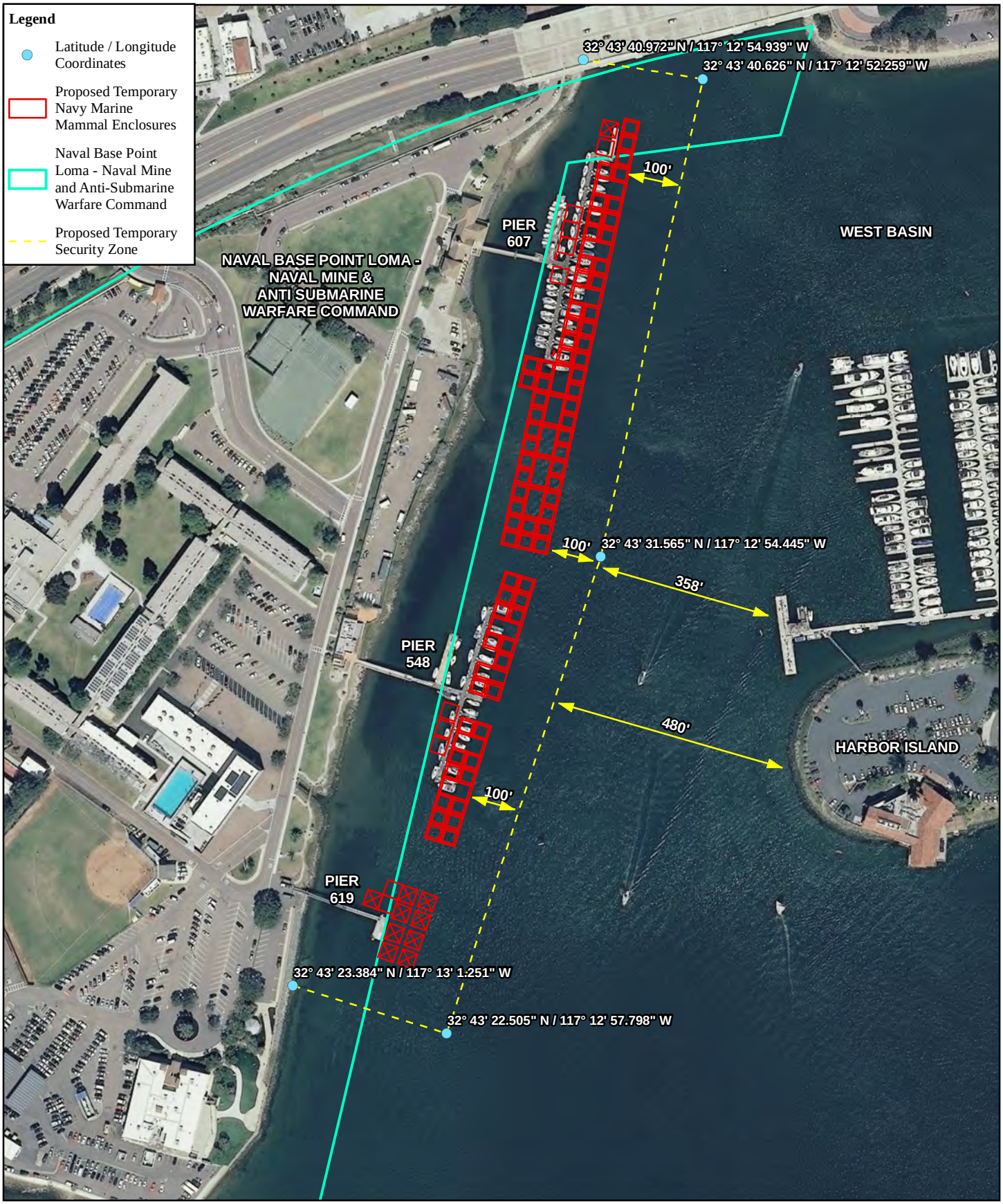


Figure 2-9b
Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607
2010 Aerial Imagery

As stated above in Section 2.2.1.2, underwater pipelines that supply jet fuel to NAS North Island are in the project area. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the dredge footprint and would ensure that all contractors' vessels and equipment remain outside the buffer zone during dredging operations.

Sediment samples from the dredge footprint were collected in November 2010 and tested in accordance with regulations contained in Title 40 CFR Parts 220-228. The sediment characterization report is included as Appendix D of this EA. The full laboratory results, including method detection limits for the sediment analyses are available for review at the NBPL Public Affairs Office. The sediment characterization report was provided to USEPA and USACE for review and comment on potential sediment disposal options. The agencies determined that the dredged material is suitable for unconfined aquatic disposal (refer to Appendix A) (USEPA 2011).

Depending on availability, a hopper (hydraulic) dredge or a medium size, 8-12 cy bucket, barge-mounted clamshell dredge could be used (MNB 2012d, Navy 2010f). If a clamshell dredge is used, the specific make and model of the bucket would be determined by the selected contractor and permit conditions.

The Draft EA evaluated the nearshore zone at Imperial Beach as the proposed location for beneficial reuse of dredged sediments from the Proposed Action. In the interval between the Draft and the Final EA, the decision was made to reuse dredged sediments instead in the nearshore zone at Silver Strand Training Complex (SSTC) at NAB Coronado (Figure 2-10).

Sediment sampling transects were deployed by divers at the STCC receiver site. Three paired samples were collected from the surficial sediments (top 6-in.) at the STCC nearshore area. Sample locations were equally spaced along the sampling transect in 20-m intervals with two separate samples collected. Sediment samples were transferred with a completed chain of custody to Calscience Environmental Laboratories in Garden Grove, CA for geotechnical analysis using the EPA approved laser diffraction method.

The reconnaissance level survey results indicate that on a geotechnical basis, the dredged material and potential receiver site grain sizes are compatible (Table 2-10). Average grain size for all samples tested for the STCC site was 0.182 millimeter compared with 0.250 millimeter at the Pier 180 site. In addition, the greater than 80 percent coarse grain size fractions found within the dredged material samples (86.5 percent for pier 180 composite areas), further suggests that this material is suitable for nearshore disposal. The Navy believes the data collected is of sufficient resolution to facilitate regulatory review for a suitability determination of Pier 180 sediments for beneficial reuse at the STCC area. USEPA and USACE expressed support for the Navy's updated P-151 dredged material beneficial reuse proposal (refer to Appendix A). NMFS found that the STCC site is acceptable for beneficial reuse of the project dredge sediments (refer to Appendix A).

Similar to Imperial Beach, the SSTC beach has become eroded due loss of sand from natural sources (Navy 2011). The SSTC beach is one of four coastal segments recommended and approved for sediment replenishment (San Diego Association of Governments [SANDAG] 2009, USACE 2012). The USACE brought dredge sediments from its San Diego Harbor Maintenance

Dredging Project to an adjacent section of the SSTC nearshore zone (USACE 2012, NAVFAC Southwest 2013). The proposed sediment beneficial reuse area is approximately 1,200 ft offshore, contained within NAB Coronado SSTC Boat Lanes 8 and 9 (Figure 2-10). The detailed protocol used in the previous USACE channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with training operations.

If a clamshell dredge is used, dredge material would be loaded into a 5,000-10,000 cy capacity barge and transported to the nearshore beneficial reuse site at the SSTC beach, where it would be placed in the nearshore zone (MNB 2012b). Two barges would likely be used in rotation to allow uninterrupted dredging. Alternately, if a hopper dredge is used, the dredge material would be stored within the dredge vessel, which would periodically travel to the beneficial reuse site at SSTC and discharge the sediment. One tug would assist each dredge vessel and barge.

Table 2-10 compares the sediments at the proposed dredge and beneficial reuse sites.

Dredging would halt temporarily while the hopper dredge is en route to and from the beneficial use site. Daily dredge production, including transport and placement at the beneficial reuse site can be assumed to be 2,000-4,000 cy. Maintaining an average production rate of 2,000 cy per day would enable up to 80,000 cy of material dredged from the turning basin to be dredged and placed at the beneficial reuse site in approximately 3 months (Navy 2010f). Dredging and beneficial reuse for nearshore replenishment of dredged materials would comply with USACE requirements for dredging and sediment disposal. The sediment in the proposed dredging area is classified as fine sand; as such it is similar to sediments at the beneficial reuse site at SSTC (Tierra Data, Inc. [TDI] 2012a).

2.2.1.6 Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The two Everingham Brothers Bait Company San Diego Bay bait barges are anchored on Navy property about 1,800 ft south of the existing fuel pier and are oriented side-by-side (Figure 1-2). The Everingham Brothers Bait Company would need to move the bait barges before pile driving activities begin; this would accompany the Navy fuel pier replacement project but is not an element of the proposed project as such. Relocating the bait barges outside of the zone of influence (ZOI) for pile driving noise would reduce the exposure of wild marine mammals to sound levels above thresholds for injury and behavioral disturbance (Levels A and B thresholds, respectively). In addition, moving the bait barges would help avoid potential damage to the commercial bait fish that are important to the local fishing industry. This section discusses the bait barges, their operations, and proposed temporary relocation sites for the barges (Figure 2-2). The bait barges would anchor at the temporary site during the portion of the year that least terns do not forage (September 16 through March 29) while project activities are ongoing.



0 150 300
Meters
Feet
0 500 1,000

Source: NAVFAC Southwest 2012

Figure 2-10
Proposed P-151 Dredge Material
Beneficial Reuse Site

N

Table 2-10. Sediment Distribution Comparison, Proposed NBPL Dredging and Beneficial Reuse Areas

Site Location	*Sample Number*	*Units*	*Sediment Sizes*									*Total Silt + Clay*	*Mean Grain Size (mm)*	*Sample Description*
			Gravel	*Very Coarse Sand*	*Coarse Sand*	*Medium Sand*	*Fine Sand*	*Very Fine Sand*	*Total Sand*	*Silt*	*Clay*			
SSTC Beneficial Reuse Area	NBC-3-1	%	0	0.2	3.46	9.41	49.78	32.29	95.14	3.94	0.93	4.87	0.175	Fine Sand
	NBC-3-2	%	0	0.26	4.24	10.9	43.2	33.9	92.5	6.51	1	7.51	0.177	Fine Sand
	NBC-3-3	%	0	0.29	2.86	8.62	46.33	35.42	93.52	5.47	1.01	6.48	0.166	Fine Sand
	NBC-3-4	%	0	0.26	3.48	11.7	60.08	21.19	96.71	2.44	0.85	3.29	0.191	Fine Sand
	NBC-3-5	%	0	0.18	3.18	12.29	60.55	20.68	96.88	2.28	0.84	3.12	0.190	Fine Sand
	NBC-3-6	%	0	0.1	3.11	12.4	61.3	19.9	96.81	2.33	0.86	3.19	0.190	Fine Sand
Proposed NBPL Dredge Footprint	Area 1	%	0.03	2.38	5.95	30.18	41.55	6.75	86.81	10.54	2.62	13.2	0.220	Fine Sand
	Area 2	%	0.24	8.23	19.2	33.97	18.55	6.72	86.67	10.41	2.69	13.1	0.320	Medium Sand

Source: Tierra Data, Inc. (TDI) 2012a.

Each bait barge primarily consists of two rows of large wooden compartments tied together, called "receivers." One barge is equipped with a single-story shelter for personnel and equipment (Everingham Brothers Bait Company 2012). California sea lions and several species of seabirds frequently rest on top of the bait barges.

The wooden receivers hold live bait fish in underwater cages. Each of the 102 receivers is 28 ft long, 14 ft wide, and 12 ft high, although the lower 10 to 11 ft remain under water. At present, the western bait barge measures approximately 750 ft from buoy to buoy and 1,045 ft from mooring to mooring; the eastern bait barge is about 630 ft from buoy to buoy and 930 ft from mooring to mooring. The barges have several location requirements, including:

- Bait fish require a maximum water temperature of 70 degrees Fahrenheit and a linear current flow to maintain sufficient oxygen levels in the cages.
- The barges must be located away from the strong winds and waves outside the bay to prevent damage.
- Water depth must be in the range of 35 ft below MLLW so that there is sufficient clearance between the bottom of the 11 ft-high receivers and the bay bottom that movements of swells at high and low tides do not push the receivers onto the bay bottom and break them.
- A minimum distance of 460 ft to shallow water is necessary to prevent the barges from being damaged by hitting the sea floor when moved by winds or currents.
- A minimum distance of 460 ft of open water is needed between the two barges to allow customer and Everingham Brothers Bait Company vessels adequate space to safely maneuver to and access the barge's compartments. Customers must be able to access both sides of both barges.

Due to the year-round demand for live bait fish in San Diego Bay, the bait barges operate 24 hours per day, 7 days per week, throughout the year to provide live bait for their customers (Everingham Brothers Bait Company 2012).

Depending on the size of the barge, a 3,000-or 5,000-pound anchor is used. An anchor is dropped into the water at each end of the barge, a total of four anchors for the two barges. The anchor is shackled to one end of a 1.5-inch thick chain. The other end of the chain is shackled to a buoy ball that is attached to the barge with a cable. The chain is very heavy, so it drops to the bottom within a few feet of the barge. The chain is about 80 feet long, so the distance between the barge and the anchor is about 70 ft, accounting for the water depth.

Repair and maintenance of the wooden receivers that support the bait cages is a critical component of the bait barge operations for two reasons: a) because the wooden receivers do not last more than 2 years in the marine environment; and b) nearly all the boxes must be continually in use to provide enough bait to meet customers' needs. Therefore, receivers are repaired one by one, year-round. The receivers must be removed from the water for repair and were serviced onshore until the 1990s when the Port of San Diego and Mission Bay Parks terminated the company's leases for the onshore repair areas (Everingham Brothers Bait Company 2012). Since then the company has used its own maintenance barge that operates

alongside the two bait barges. The crane on the maintenance barge hauls each box on the maintenance barge's deck for inspection. Sections needing repair are cut out, replaced with new wood, and repainted with vinyl antifouling paint; the receiver is then returned to its place in the bait barge. Each receiver takes 4 days to repair onsite. In a typical year without any additional storm damage to the barges, the company's dedicated four-person repair crew works 200 days, often 6 days, occasionally 7 days per week in two shifts, to keep the barges functional (Everingham Brothers Bait Company 2012). The ongoing, onsite unit-by-unit maintenance process is necessary and the added time, manpower, and cost to transport the receivers elsewhere for maintenance would be prohibitive (Everingham Brothers Bait Company 2012).

Based upon the operational requirements discussed above, multiple locations around San Diego Bay were considered as possible temporary relocation sites for the bait barges. Other factors also restrict the bay-wide potential site options, such as bird air strike hazards for aircraft at potential sites near airfields and the presence of eelgrass. Table 2-11 presents the potential bay-wide sites considered and the reasons why they were found to be unsuitable for temporary relocation of the bait barges. Figure 2-11 presents the locations of the potential bay-wide sites.

Table 2-11. Potential Bait Barge Bay-wide Temporary Relocation Areas Initially Considered

Initial Consideration	*General Location*	*Owner*	*Site Restrictions*
CSLC 1	East of Zuniga Jetty	CSLC	• Depth and swell issues.
CSLC 2	South of Ballast Point	CSLC	• Depth and swell issues.
NBC 3	NAS North Island (north)	Navy	• Bird air strike hazard for NAS North Island aircraft
NBC 4	NAS North Island (northeast)	Navy	• Bird air strike hazard for NAS North Island aircraft
NBPL 5	America's Cup Harbor, adjacent to NMAWC	Navy	• Eelgrass is present. • Ownership boundary issues.
SDUPD 6	*Harbor Island (southeast)*	*Port of San Diego*	• *No site restrictions. SDUPD 6 was carried forward for additional development, resulting in the options shown in Table 2-12.*
SDUPD 7	Harbor Island (central)	Port of San Diego	• Within the 120 dB Zone of Influence for underwater construction sound

Notes: CSLC = California State Lands Commission, NBC = Naval Base Coronado, NBPL = Naval Base Point Loma, SDUPD = San Diego Unified Port District, NAS = Naval Air Station, dB = Decibel, ZOI = Zone of Influence.

Source: NAVFAC Southwest 2012c; Everingham Brothers Bait Company 2012.



Figure 2-11
Potential Bait Barge Temporary Relocation Sites Initially Considered Bay-Wide

Of the seven bay-wide areas initially considered, only the area southeast of Harbor Island (Option San Diego Unified Port District [SDUPD] 6) was found to offer a range of water, wave, and depth conditions most likely to be suitable to the bait fish and bait barge operations in combination with safety for Navy aircraft operations. From the general area of initial consideration site SDUPD 6, seven site options around the southeastern end of Harbor Island were evaluated to determine the most feasible location to relocate the bait barges. Figure 2-12 and Table 2-12 present the eight Harbor Island sites initially proposed for relocating the bait barges. Options 4A and 6A on CSLC lands are the only sites being considered for temporary relocation of the bait barges (Figure 2-12). These two potential relocation sites have been approved by NRSW Port Operations (NRSW 2012). Following adoption of a FONSI for this project, the Everingham Brothers Bait Company and the CSLC would be expected to execute a lease for a temporary relocation site. Before moving the barges, the barge owners would deter sea lions from hauling out on the barges with sprinklers or other non-injurious methods, which is permissible under Section 109(h) of the MMPA and would not constitute harassment.

The two bait barge temporary relocation sites under consideration are very close to one another. As they are required to maintain the health of the bait fish and support bait barge operations, by definition they have the same physical conditions and surroundings. Therefore, for the purposes of analysis in this EA, it is assumed that temporary relocation of the bait barges would have the same impact(s) at either of the sites.

As described above in Section 2.2.1.2 under the subheading *Demolition/Construction Equipment and Phasing*, there would be no in-water demolition and construction during the least tern breeding season (1 April to 15 September). It is anticipated that it would be possible for the Everingham Brothers Bait Company to move the two bait barges back to their current position south of the fuel pier on approximately 1 April and return to the temporary relocation site by September 15 while project activities are ongoing. The current plan is for the Everingham Brothers Bait Company to return the barges to their existing site after the proposed new pier is constructed. In everyday operations, a skiff is used to tow the barges. A ¾"-thick nylon rope is tied to the corners of the barge and attached to the skiff. To move the barges from their existing location to the proposed temporary location, it is anticipated that the barges would be moved incrementally. Eight of the wooden bait compartments ("receivers") would be chained together and towed on a 75-foot long, 1.5"-thick line. The Everingham Brothers Bait Company seiner would be used as the tow vessel. At the temporary location, the first set of eight bait receivers would be anchored as described above, and additional sets of eight receivers would be towed, chained to the previous set(s) and anchored. When the bait barges are temporarily relocated during the fuel pier construction period, the barges' existing anchors will be left in place. The barges will use a different set of 4 anchors at the selected temporary relocation site during the annual in-water construction window (16 September through 31 March) while the project is ongoing. When the new fuel pier is completed and the barges return to their existing location, The Everingham Brothers Bait Company will remove the anchors at the temporary location.

Table 2-13 shows how much open water there would be for recreational navigation between the bait barges at either of the two proposed potential relocation sites and several points around San Diego Bay.



Figure 2-12
Potential Bait Barge Temporary Relocation Sites Considered Harbor Island

Table 2-12. Potential Bait Barge Harbor Island Relocation Sites

Option	*Location*	*Layout*	*Owner*	*Site Restrictions*
1	Southeast Harbor Island, parallel to Harbor Island Drive	End-to-end	Port of San Diego	• The side closest to Harbor Island would not be operational for both bait barges • The eastern bait barge would overlap eelgrass • Potential depth issues for both barges • Potential impacts to the C Level restaurant • Within the 120 dB ZOI
2	Southeast Harbor Island, parallel to Harbor Island Drive	Side-to-Side	Port of San Diego and CSLC	• One side of one bait barge would not be operational • The northern bait barge would overlap eelgrass • Potential depth issues for the northern barge • Potential impacts to the C Level restaurant
3	Southeast Harbor Island, parallel to Harbor Island Drive, west of Option 2	Side-to-Side	Port of San Diego and CSLC	• One side of one bait barge would not be operational • Potential eelgrass overlap • Potential depth issues for the northern barge • Within the 120 dB ZOI for underwater construction sound
4	West of Option 4A	Side-to-Side	CSLC	• Within the 120 dB ZOI for underwater construction sound
4A	*See Figure 2-2*	*Side-to-Side*	*CSLC*	• *Under consideration*
5	West of Option 6	Side-to-Side	CSLC	• Plotted underwater cable corridor in area • Proximity to viewfront of Harbor Island restaurant
6	East of Option 6A	Side-to-Side	CSLC	• Proximity to commercial boating facilities and underwater cables
6A	*See Figure 2-2*	*Side-to-Side*	CSLC	• *Under consideration*

Notes: CSLC = California State Lands Commission. NBC = Naval Base Coronado. NBPL = Naval Base Point Loma. SDUPD = San Diego Unified Port District. NAS = Naval Air Station. dB = Decibel. ZOI = Zone of Influence
Source: NAVFAC Southwest 2012d, Everingham Brothers Bait Company 2012.

Table 2-13. Approximate Open Water Distances Between Proposed Potential Temporary Bait Barge Locations and Points in San Diego Bay

From	*To*	*Distance (feet)*
Option 4A	Harbor Island	1,000
	Federal Navigation Channel	800
	NAS North Island	2,400
	San Diego Bay East Shore	6,000
Option 6A	San Diego Bay North Shore (Coast Guard)	1,300
	San Diego Bay East Shore	1,800
	Federal Navigation Channel	2,900
	NAS North Island	3,800

2.2.2 Alternative 2 Delayed Dredging Alternative

Implementation of Alternative 2 would be the same as described under Alternative 1, except that dredging would occur years after completion of the fuel pier replacement. After completion of the pier replacement, the Navy marine mammal enclosures would be returned to their current site. The Navy MMP relocation period is required only for the duration of construction and demolition activities. As with Alternative 1, it is anticipated that dredging would take approximately 3 months to complete. Either a clamshell or a hopper dredge could be used, depending on availability, and the dredged material would be transported to the beneficial reuse site at SSTC.

With adoption of the following minimization measures, the Navy MMP could remain at its existing location and would not have to temporarily relocate during the dredge-only activities (NAVFAC Southwest 2011h).

- Dredging would occur during ebb tide when any turbidity that was actually caused would flow away from the Navy MMP facility.
- The dredging duration would be no more than 9 months.

The validity of laboratory analytical results for determination of suitability of dredge sediments for ocean disposal expires within approximately 3 years. Sediment characterization samples for Alternative 1 were collected and analyzed in November of 2010. If the turning basin dredging is not accomplished by late 2013/early 2014, it would be necessary to repeat the sampling and analysis to obtain current results. Therefore, should Alternative 2 be implemented, additional time (approximately 6 months) and funding would need to be built into the project to plan for another round of sampling, analysis, and coordination of second disposal suitability determination through USEPA and USACE.

All other components of Alternative 2 (i.e., demolition of the existing fuel pier, phased construction of a double deck and mooring dolphin replacement pier, and amendments to the security navigation zone) would be identical to those described under Alternative 1 and would begin in spring of 2014. Buildings 110 and 140 on the existing fuel pier would be demolished and a new onshore control tower would be constructed as part of military construction project P-401. Temporary relocation of the Everingham Brothers Bait Company bait barges would also occur, and the impacts would be the same as for Alternative 1.

2.2.3 No-Action Alternative

Under the No-Action Alternative, the Navy would not implement the demolition of the existing fuel pier, construction of the new fuel pier facility, or dredging activities. The Navy is making every effort to bring the existing fuel pier into compliance with Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements with the exception of geotechnical, structural, mooring/berthing, pipe stress, and other MOTEMS requirements (Navy 2012d). However, new construction is the only viable solution (Navy 2010a). To bring the existing structure into compliance with current standards is not feasible given the existing structural system and the condition of the structure. Structural, seismic, and operational deficiencies of the existing pier would continue, and would likely worsen due to deterioration

of the facility, portions of which are over 100 years old. Notwithstanding the remaining seismic deficiencies, current and future demand for a fuel pier to safely accommodate deep draft vessels would not be met.

Under the No-Action Alternative, the Navy MMP would not be temporarily relocated to NMAWC and the Everingham Brothers Bait Company barges would not be temporarily relocated southeast of Harbor Island. Although the fuel pier itself would not be demolished, Buildings 110 and 140 on the existing pier would be taken down, and a new onshore control tower would be constructed as part of military construction project P-401.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Proposed Action as required under Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14[d]). However, it does provide a measure of the baseline conditions described in Chapter 3, against which the potential adverse impacts of the Proposed Action can be compared. As such, the No-Action Alternative is carried forward for analysis.

2.2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis

Due to the requirement for the fuel pier to be located near the NBPL DFSP fuel storage facilities, an alternate shoreside access location for the new pier would not be viable and thus would not be considered a reasonable alternative. Five project design alternatives with the same shoreside access location as the existing pier were considered. As previously discussed, Alternative 1 was selected to be carried forward for detailed analysis in this EA. Application of the screening factors listed in Section 2.1 resulted in elimination of the other four design alternatives. The alternatives that were considered but not evaluated further in this EA due to specific screening factors for operational, safety, and natural resources constraints are discussed in the following paragraphs.

2.2.4.1 Full-Fixed Double Deck Pier (No Mooring Dolphins)

This alternative would provide a 1,500 ft by 50 ft fixed double deck berthing pier, with a 700 ft long approach segment. The top of the lower deck would be set approximately 5 ft above extreme high tide. The top of the upper deck would be set approximately 15 ft above the lower deck elevation. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, and would provide greatest versatility in accommodating the wide range of vessels requiring fueling berths at this facility. The upper deck would have sufficient height to safely reach fuel transfer points on the majority of larger ships (Navy 2010c) as described in Section 2.1. Fuel pipelines would be hung beneath the upper deck, providing maximum separation between pipelines and vehicles and deck operations. This alternative would also meet the majority of the other selection criteria. However, with an overall area of 110,000 sf, the full-fixed double-deck pier would have a larger footprint than Alternative 1 (65,865 sf). The 1,500 ft full-fixed pier would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. Therefore, this alternative was considered but eliminated from further evaluation.

2.2.4.2 Full-Fixed Single Deck Pier

This alternative would provide a single deck fuel pier, 1,500 ft long by 125 ft wide, with an area of 268,750 sf, including the 650 ft long approach segment. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, but would not have sufficient height for fuel load arms to safely reach fuel transfer points on vessels as described above in Section 2.1. In addition, the single deck pier would be unable to physically separate the fuel pipelines from on-deck operations. Fuel lines would be placed on the deck of the berthing pier between 1-ft high concrete berms. With deck widths of 125 ft and the greatest overall square footage of any of the potential design alternatives, the single deck pier would require the most in-water construction. Therefore, the single deck pier would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. For these reasons, this alternative would not meet the screening factors described in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.2.4.3 Single Deck Pier with Mooring Dolphins

This alternative would provide a new single deck fuel pier, 1,100 ft long by 125 ft wide. This alternative would extend the outboard berthing length to 1,500 ft by the addition of two 30 ft square mooring dolphins on each end of the pier. The total area, including the 650 ft long approach segment, would be 223,900 sf. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, with slightly less square footage than the full-fixed single deck pier alternative described above. Like the full-fixed single deck pier, this alternative would not have sufficient height needed for fuel load arms to safely reach fuel transfer points on larger vessels as described in Section 2.1.

Although the use of mooring dolphins for this alternative would reduce its area by 44,850 sf compared to the full-fixed single deck pier, it would be almost 158,035 sf larger than Alternative 1 and would require a correspondingly greater amount of in-water construction. This alternative would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. For these reasons, this alternative would not meet the screening factor described in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.2.4.4 Replace Fuel Pier "In-Kind"

This alternative would provide an "In-Kind" replacement fuel pier of a similar configuration. The replacement main pier would be a single deck pier, 950 ft long by 50 ft wide with a 600 ft long approach segment for a total of 77,500 sf. As such, it would only provide 950 ft of berthing on the outboard face and would not accommodate fueling of the T-AKR. Increasing the pier's feet of berthing to 1,050 ft, with a larger deck or by the addition of mooring dolphins would provide the required UFC berthing length for these vessels. As a single deck pier, this alternative would not have sufficient height needed for fuel load arms to safely reach fuel transfer points on larger vessels as described in Section 2.1. All 16 pipelines would have to be placed on top of the single deck between 1-ft high concrete curbs, leaving a narrow center lane less than 15 ft wide that would severely restrict mobile crane and forklift operations on the berthing deck. This alternative does not meet the UFC criterion of a 50-ft wide minimum deck

work space for a fuel pier berthing deck as described in Section 2.1. This alternative would replace the existing fuel pier with a new pier 6,480 sf larger than the existing pier. However, Alternative 1 would replace the existing pier with a new pier that would be 11,635 sf smaller than the in-kind alternative and 5,315 sf smaller than the existing pier. Thus, the in-kind alternative would not meet the screening factor to reduce square footage and in-water construction. For these reasons, this alternative does not meet the selection screening factors in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.3 PREFERRED ALTERNATIVE

The Navy has identified Alternative 1 (Pier Replacement and Associated Dredging) as the Preferred Alternative.

2.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts have been analyzed for the following resources: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Resources that were not carried forward for analysis because impacts would be negligible or non-existent include: geology and topography, public services and utilities, aesthetics, land use, cultural resources, and public health and safety. The resources considered but eliminated from detailed analysis and the rationale for their elimination are presented at the beginning of Chapter 3 of this EA.

Table 2-14 provides a summary of environmental consequences for Alternative 1, Alternative 2, and the No-Action Alternative, by resource area. Chapter 3 provides a detailed discussion of the baseline (existing) conditions and the environmental consequences.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Biological Resource Habitats and Communities	Other than the incremental deepening of deep subtidal habitat by dredging the high spot in the turning basin, no permanent change would result from dredging, temporary relocation of the Everingham Brothers Bait Company bait barges, or the temporary relocation of the Navy MMP. Minor and short-term impacts to vegetated and nonvegetated soft bottom benthic habitat would occur. The temporary relocation of the bait barges would not result in any impacts to habitats or communities because the relocation sites are in the same deep subtidal habitat as the existing location. Impacts to eelgrass from the proposed fuel pier would be minor (approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass) and would be offset by using the Navy's established eelgrass mitigation bank. Eelgrass impacts from the temporary relocation of the Navy MMP would be minor (approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass), temporary, and would be offset by using the established eelgrass mitigation bank. The structural habitat of the existing pier would be removed but largely replaced by that of the new pier; differences would be inconsequential. Organisms occurring in the immediate area may be lost or displaced directly by project activities (equipment or noise) or indirectly by short-term changes to suspended sediments, turbidity, dissolved oxygen, and light diffusion. Some invertebrates and fish within the dredge footprint would be lost to mortality due to entrainment during the dredging process. However, organisms are expected to return to the project area upon project completion, and epifauna are expected to recolonize the new fuel pier from nearby, undisturbed areas within a relatively short time period. Therefore, through the use of the preventative measures described below, the minor and short-term impacts to biological resource habitats and communities would not be significant. **Avoidance and Minimization Measures/Special Conservation Measures (SCMs):** Before proceeding with the project, the Navy would obtain the required Clean Water Act (CWA) Section 404/Rivers and Harbors Act (RHA) Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed for use during the proposed activities to reduce the potential	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to biological resource habitats and communities. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to impacts to habitats and communities. Fisheries, Birds, Marine Mammals, and Threatened and Endangered Species resource sections contain additional Avoidance and Minimization Measures applicable to those specific resources. • Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein is occurring. The Navy would report any violation of authorized impacts to the National Marine Fisheries Service (NMFS) within 24 hours of its occurrence. • The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	would not be used for any purpose.		
Fish	Fish communities and habitats would be temporarily affected by in-water construction and demolition. Temporary relocation of the bait barges would have no net effect because the barges would remain in the same habitat they currently occupy. The potential for injury to fish would exist at close ranges to impact pile driving. Within the corresponding Zones of Influence (ZOIs), fish are likely to move away from the pile being driven. Disturbance to fish is possible at greater ranges, but, if anything, only temporary behavioral reactions would be anticipated, without long-term consequences for fish populations. Impacts would not be significant. In conjunction with the NEPA process, the Navy consulted informally with National Oceanographic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS). An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action. Approximately 0.05 ac of eelgrass habitat as of 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. This area represents a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively) and would be offset by using the Navy's established eelgrass mitigation bank. The proposed temporary relocation site for the Navy MMP would temporarily impact 0.67 ac of eelgrass surveyed in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass; this temporary impact at NMAWC would be offset by using the established eelgrass mitigation bank. As such, implementation of Alternative 1 would not result in any significant impacts to fisheries or Essential Fish Habitat (EFH). **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following: • Sheet piles beneath the existing pier would be left in place to minimize sediment and eelgrass disturbance. • In conjunction with a Caulerpa survey, a final pre-	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to fisheries. Under Alternative 2, the same NOAA Fisheries Conservation Recommendation will be integrated into the Proposed Action as for Alternative 1. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed at an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence. The following avoidance and minimization measures would be followed during the proposed pile driving and dredging activities. • Soft Start - The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows: *"The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated*		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."		
Birds	Alternative 1 may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring. However, any impacts would be short-term, localized, and would not impact bird populations. Birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Hence, project-related noise is not expected to be a novel disturbance or to have strong effects on migratory birds. Indirect impacts to breeding because of reduced visibility or changes in prey distribution in response to noise or turbidity would similarly be localized, intermittent, and less than significant. No in-water demolition, construction, or dredging activities would occur during the least tern breeding season (1 April through 15 September). Temporary relocation of the bait barges would have no impact on bird populations because other structures provide abundant perch sites throughout the northern bay, and the barges would remain in the same habitat. Therefore, the Proposed Action would not have a significant impact under the Migratory Bird Treaty Act (MBTA) and there would be no significant impacts on other non-migratory marine bird habitat or populations. **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities. Avoidance and minimization measures to protect California least terns are provided in the Threatened and Endangered Species resource section.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to birds. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Marine Mammals	The Proposed Action would not result in any injuries or mortalities (Level A takes) of marine mammals. Temporary relocation of the bait barges outside of the underwater noise zone of influence would greatly reduce the exposure of marine mammals to project-related underwater noise. The Proposed Action has the potential, however, to result in minor behavioral effects (Level B takes) to four marine mammal species from underwater noise associated with impulsive or vibratory pile driving, construction, and demolition. One of the four species (harbor seal) may also be subject to behavioral effects from airborne noise. Considering the 6.5-month work	Impacts associated with Alternative 2 would be the same as those for Alternative 1, except that dredging would not take place until years after the completion of the new fuel pier. Under Alternative 2, there would be no	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	windows for all 3 years combined, total Level B behavioral harassments (takes) are expected as follows: California sea lions – 2,405; harbor seals – 270; gray whales – 45; and coastal bottlenose dolphins - 2,016. Marine mammals that are taken (harassed) may change their normal behavior patterns (e.g., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. As such, the Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** In conjunction with the NEPA process, the Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A). The Navy will abide by all conditions of the approved IHA. Section 3.4.3.2 details the avoidance and minimization measures set in place to lessen the impacts to mammals, which include avoidance and minimization measures for pile driving, a discussion of the avoidance and minimization measure effectiveness, monitoring, and reporting.	significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the Navy will abide by all conditions of the approved IHA. Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Threatened and Endangered Species	<u>California Least Tern</u> Conservation measures established in the Memorandum of Understanding (MOU) Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No effects would be associated with the temporary relocation of the bait barges, which would occur outside of the breeding season. No persistent effects on breeding conditions are	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at Naval Air Station (NAS) North Island. The Navy made a no effect determination on the California least tern. There would be no significant impact on the California least tern. <u>Green Sea Turtle</u> Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area; sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Furthermore, no sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures would be implemented to avoid potential impacts to green sea turtles from pile driving activities. No effects to sea turtle movements or habitat use are anticipated from the temporary relocation of the bait barges. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter (refer to Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles. Therefore, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the green sea turtle, and is consulting informally with NMFS to request concurrence with this conclusion. There would be no significant impact on the green sea turtle. Programmatically, the Navy will continue to consult informally with NMFS on other Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles and to agree upon related avoidance and minimization measures. These measures would support a programmatic "may affect, not	threatened and endangered species. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	**Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	likely to adversely affect" finding that would be subject to the regulator's written concurrence. <u>Western Snowy Plover</u> Since the western snowy plover is not known or expected to occur in the project area, there would be no effect on individuals or potential habitat for this species. The Navy made a no effect determination on the western snowy plover. Therefore, there would be no significant impact to western snowy plovers. <u>Other Special Status Species</u> The project sites are not in proximity to important breeding, resting, or breeding areas for bird species, and similar habitats are abundant throughout San Diego Bay. No impacts are anticipated from the temporary relocation of the bait barges within the same deep subtidal habitat. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, with implementation of Alternative 1 there would be no adverse effect on these species' populations or habitats. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species: • Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September). • The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2). • In conjunction with marine mammal monitoring (Section 3.4.3.2 of this EA) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	limit of potential Level B behavioral harassment, specifically to the underwater 160 decibels (dB) re 1 microPascal (µPa) (root mean square [rms]) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 µPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound pressure level [SPL] [rms] ≤ median ambient rms), whichever is less. A 10-meter (m) buffer zone will also be monitored during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities. • If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. • Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.		
Water Resources	There would be no impact to bathymetry from temporary relocation of the Navy MMP, the Everingham Brothers Bait Company bait barges, and pier demolition and construction. The impact to bathymetry from dredging the high spot in the existing turning basin would be less than significant because most of the area, surrounding the proposed dredge footprint is already deeper than the proposed dredge depth (-40 ft mean lower low water level). Use of dredge sediments for nearshore replenishment at SSTC beach would be a beneficial impact. There would be minor, short-term localized increases to circulation in San Diego Bay in the project areas caused by vessel movement, in-water demolition, construction, and dredging; these increases would cease when each particular activity ends. The in-water structures to be installed (the new fuel pier and the temporary Navy MMP facilities) would not form barriers to the natural movement of water in San Diego Bay. Temporary relocation of the Everingham Brothers Bait Company bait barges would not involve in-water construction, dredging, or other activity that would affect movement of water in San Diego Bay. Increased turbidity because of sediment resuspension during demolition and construction would be short-term and limited	Under Alternative 2, dredging would be done years after the pier replacement effort is completed. Thus under this Alternative, there would be no potential intermittent overlap of increased turbidity associated with demolition and construction activities. With the exception of when dredging would occur, Alternative 2 is the same as Alternative 1, Alternative 1. Under Alternative 2 there would be a beneficial impact to	Under the No-Action Alternative, no in-water demolition, construction dredging, and sediment beneficial reuse activities would occur and existing water resources would not be affected. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to the demolition/construction areas around the fuel pier. Increased turbidity while dredging with either a hopper or clamshell dredge would be short-term as well, because the dredge material is larger-grained material (sand) that tends to settle quickly. The Navy MMP is covered under NBPL's overall National Pollutant Discharge Elimination System (NPDES) permit, which would be amended for the temporary relocation of the Navy MMP to NMAWC. Based on analytical testing, the physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size (sand) and low concentrations of contaminants. These results indicate contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts to water quality as a result of turbidity from sediment resuspension would not be significant. It is not anticipated that bacteria loading from Navy marine mammals alone would exceed San Diego Basin Plan waters designated for contact recreation beneficial uses (REC-1) water quality limits at the proposed 100 ft-security barrier that would be established around the temporary MMP facilities; therefore, significant impacts to water quality would not occur. However, the Navy would monitor water quality while the MMP occupies the temporary relocation site at NMAWC. If the monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy would employ adaptive management measures in consultation with California Coastal Commission (CCC) staff (described below under Avoidance and Minimization Measures/SCMs). The new fuel pier would have stormwater management capabilities that would comply with current NBPL permit requirements. All rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be captured and pumped to NBPL's fuel oil reclamation facility for treatment. Basewide and site-specific Best Management Practices (BMPs) to prevent impacts to surface water would be followed at the new fuel pier. Therefore, with implementation of Alternative 1, no significant impacts to water quality would occur. During demolition, construction, dredging, and sediment beneficial reuse, protective measures would be implemented	bathymetry due to use of dredged sediments for nearshore replenishment at SSTC beach; There would be no significant impacts to circulation and water quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to minimize impacts to marine water quality. Protective measures for demolition and construction would include the use of catch devices and sheeting to prevent the release of debris and hazardous materials/waste into San Diego Bay, and the NBPL Emergency Response Action Plan to minimize the effect of any spills that might occur. As a protective measure to prevent turbidity, the sheet pile beneath the existing fuel pier would be retained. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the San Diego Regional Water Quality Control Board (RWQCB) and Section 404/Section 10 permits from the USACE. For the reasons listed in the preceding paragraphs, with implementation of Alternative 1 there would be no significant impacts to bathymetry, circulation, and water quality within San Diego Bay. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce impacts to below a level of significance: • Sheet piles beneath the existing fuel pier would be left in place to minimize sediment and eelgrass disturbance. • The demolition and construction contractors would be required to prepare and implement a Construction Demolition Plan that would cover all phases of the work to be done. The contractors' plan would be required to specify materials, equipment, and procedures to be used to contain all construction and demolition waste and debris. • Contractors would be required to use catch devices and sheeting to capture and contain debris. • Before demolition begins, the contents of each pipeline would be pumped out. The pipelines would be cleaned to minimize accidental release of pipeline residue during demolition activities. Pipeline contents and cleaning water would be captured and properly disposed. • Per the NBPL Emergency Response Action Plan, any petroleum release or petroleum sheen observed on the water surface would be reported to the National Response Center and other agencies as required. • Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	measures appropriate to the nature and extent of the spill would be implemented. These procedures would minimize the potential for contaminants related to project activities to enter marine waters. • Potential adaptive management measures to reduce bacteria concentrations in the waters surrounding the proposed NMAWC temporary relocation site for the Navy MMP could include: housing 27 of the Navy MMP 30 sea lions in the southernmost enclosures, where bay circulation is greater; removing solid sea lion scat from walkways and enclosures before pressure washing; transferring some of the animals back to the existing Navy MMP location (near the fuel pier) during non-pile driving activities; and installing ultraviolet treatment systems or aeration equipment to enhance bacterial degradation. • Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system. All BMPs specific to the fuel pier would also be followed. • A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all in-water components of the project.		
Hazardous Materials and Wastes	Through the use of the preventive measures described below and implementation of the procedures described in the Emergency Response Action Plan in the event of an accidental release, no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would occur with implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes. Through adherence to Navy Region Southwest (NRSW) recycling and waste minimization requirements and reuse of	Under Alternative 2, the same project components would occur as for Alternative 1, involving the same types and volumes of hazardous and non-hazardous materials and wastes. Therefore, no significant impacts	Under the No-Action Alternative, fueling operations currently being conducted at the existing fuel pier would continue. Therefore, there would be no change from the existing conditions. **Avoidance and**

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would not have a significant impact to solid waste and regional landfill capacity. **Avoidance and Minimization Measures/SCMs** • The Navy would characterize all hazardous wastes associated with demolition of the existing fuel pier (building materials falling under the Universal Waste Rule, coal tar coating on the steel superstructure, lead-based paint (LBP), asbestos-containing materials (ACMs) (if determined to be present), and treated wood waste for proper disposal at an appropriately-permitted facility. • Construction contractors would be required to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. • Catch devices and sheeting would be used to capture and contain debris, and floating booms would be placed around the work site to confine any potential release to a minimal area. • Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the NRSW Waste Management Plan (NRSW 2007). In addition, demolition and construction contractors would implement BMPs designed to minimize the potential for hazardous material releases during demolition and construction activities. • Emergency procedures in Section 5 of the NRSW Waste Management Plan would be followed upon discovery of any spill or release either in or outside the work area. • A safety buffer zone would be established between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint. All contractors' equipment and vessels would remain outside the safety buffer zone. • Before the fuel pier is demolished, all fuel, lubricating oil, and contaminated petroleum product inside the pipelines on the fuel pier would be pumped out and the pipelines would be cleaned.	associated with hazardous materials, hazardous wastes, public health and safety, and solid waste would occur. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	**Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• In the event of an accidental spill or release of oil or hazardous substance, the procedures in the NBPL Emergency Response Action Plan would be followed to contain the release and minimize impacts. • The proposed project would be required to prepare and follow a Navy-approved Explosives Safety Submission Determination Request (ESS DR) that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential discarded military munitions (DMM), and NRSW Explosive Ordnance Disposal (EOD) Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths, and use of the above-referenced safety plans and procedures there would be no significant impact from DMM. • The USCG and CSLC would continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines and fuel pier operations when the new pier is completed. The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. • The oily water pipeline for the new fuel pier would be designed and tested in accordance with the requirements of California Code of Regulations (CCR) Title 22, Chapter 15-Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems and the applicable guideline standards in the American Petroleum Institute Standard 650 Welded Tanks for Oil Storage. • Hazardous wastes that would be generated at the new fuel pier would continue to be managed according to federal, state, and county regulations, and be recycled/disposed of appropriately by licensed contractors. The San Diego County Department of Environmental Health would continue their regulatory oversight of hazardous waste activities at the new fuel pier.		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Airborne Noise	Pile driving would be the dominant noise-generating activity associated with the proposed project. All pile driving would take place during daylight hours (nominally 7:00 A.M. to 4:00 P.M. on weekdays). During pile driving, outdoor airborne noise levels in residential areas beyond the NMAWC boundary and in the La Playa neighborhood north of NBPL would not exceed City of San Diego construction noise ordinances (75 decibels A-weighted [dBA]). During pile driving at NMAWC, the indoor noise levels at schools and day care centers beyond the NMAWC boundary would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dBA). Since the pile driving would be intermittent during the school day these levels would be considered acceptable and therefore, would not result in a significant noise impact. During pile driving at NBPL, the indoor noise levels with windows closed at the Child Development Center (CDC) at Building 377 at NBPL would be slightly greater than the classroom criteria levels for effective hearing (35 dBA). Since the pile driving would be intermittent during the school day, and there would be 5.5 months without pile driving (during the least tern breeding season), these noise levels would be considered acceptable and therefore, would not result in a significant noise impact. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce noise impacts to below a level of significance: • Construction activities, including pile driving, would only occur during daylight hours (nominally 7:00 A.M. to 4:00 P.M., Monday through Friday). • The educational facilities listed in Tables 3.8-1 and 3.8-2 of this EA would be informed of the dates of pile driving and advised to close classroom windows during the pile driving intervals. The following additional avoidance and minimization measures/SCMs could be implemented as part of Alternative 1 to further attenuate noise levels if a greater reduction is desired. • Noise monitoring for classroom criteria. • Acoustic blankets around the pile driver. • Pile cushions could be used to reduce noise levels.	Under Alternative 2, the noise impacts associated with the demolition, construction, and dredging activities would be the same as those discussed under Alternative. 1. However, dredging would take place years after construction was completed, so noise from dredging would occur in the absence of other project-related noise. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, there would be no noise impacts associated with the No-Action Alternative. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Air Quality	Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, the air quality analysis focuses on construction activities required to replace the pier. Estimated annual construction emissions with implementation of Alternative 1 would be below the *de minimis* threshold levels for Clean Air Act (CAA) conformity. In addition, Alternative 1 would conform to the San Diego Air Basin Shore State Implementation Plan (SIP) and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Appendix G of this EA). No health effects would be anticipated from emission of hazardous air pollutants (HAPs) because the majority of project activities occur in restricted areas where there are no sensitive receptors (i.e., residents, schools, hospitals, etc.). Therefore, with implementation of Alternative 1, significant impacts to air quality would not occur. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measure/SCM would be implemented as part of Alternative 1 to ensure that impacts are reduced to below a level of significance: • All necessary construction or operationally-related permits would be authorized by the San Diego County Air Pollution Control District (SDCAPCD) before project implementation occurs.	Impacts associated with Alternative 2 would be the same as those for Alternative 1 with the exception that dredging would take place years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to air quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the avoidance and minimization measure /SCM would be the same as for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to operate the NBPL fuel pier without replacement of and without implementation of safety improvements. There may be additional air quality impacts should vessels be required to wait until the pier is available and conduct additional maneuvering for safety purposes. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Transportation and Circulation	Proposed demolition and construction associated with replacement of the NBPL fuel pier would cause temporary and less than significant changes to traffic and circulation in the region of influence (ROI) during the demolition/construction period. Temporary changes to traffic and circulation associated with temporary relocation of the Navy MMP to NMAWC would also be less than significant. Operations at the new fuel pier would not result in additional vehicle traffic to the pier because the number of workers and	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would be delayed until completion of construction of the pier. Under	Under the No-Action Alternative, roadway and vessel traffic conditions would remain unchanged. Therefore, no significant impacts to transportation and circulation would occur. **Avoidance and**

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	work vehicles would not change. Implementation of Alternative 1 would not result in any change to baseline Level of Service (LOS) on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, impacts to transportation and circulation would not be significant. **Avoidance and Minimization Measures/SCMs:** The following potential avoidance and minimization measure/SCM could be implemented as part of Alternative 1 to facilitate site access if it is desired to further reduce the volume of project traffic on Rosecrans Street during project construction. • If needed, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. In order to avoid potential cumulative impacts relative to marine traffic, the following minimization measure is recommended: • To ensure safety of all vessels using San Diego Bay, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including temporary relocation of the Navy marine mammals and the Everingham Brothers Bait Company bait barges, dredging and sediment disposal.	Alternative 2, there would be no significant impacts to Transportation and Circulation. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the potential avoidance and minimization measure/SCM would be the same as for Alternative 1.	**Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Socioeconomics, Environmental Justice, and Growth Inducement	There would be an overall beneficial impact to the economy of San Diego County from the fuel pier replacement and dredging project. Economic benefits associated with construction activities would more than offset potential reductions in economic activity in industries related to recreational fishing, leading to a net beneficial economic impact to San Diego County during the life of the project. No low-income or minority populations would be disproportionately or adversely affected, so no environmental justice impacts would occur. There would be no housing development or need for an in-migrating construction workforce, nor would any constraints to growth be removed, so there would be no impacts associated with induced growth.	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the replacement fuel pier. Under Alternative 2, there would be no significant impacts to socioeconomics or environmental justice and no impacts associated with induced growth.	Under the No-Action Alternative, socioeconomic conditions would remain unchanged. Therefore, no significant impacts to socioeconomics or environmental justice would occur.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental conditions on and around Naval Base Point Loma (NBPL) for resources potentially affected by implementation of the alternatives discussed in Chapter 2. Information presented in this chapter represents baseline conditions and identifies potential impacts against which Alternative 1, Alternative 2, and the No-Action Alternative are evaluated.

In compliance with the National Environmental Policy Act (NEPA), Council of Environmental Quality (CEQ) regulations, and United States (U.S.) Navy procedures for implementing NEPA, the description of the affected environment and environmental consequences focuses only on those resources potentially subject to impacts. In addition, the level of analysis presented in this Environmental Assessment (EA) is commensurate with the anticipated level of impact. Accordingly, the discussion of the affected environment (and associated environmental analyses) focuses on the following resources: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Conversely, the following resource areas were not carried forward for analysis in this EA, as potential impacts were considered to be negligible or non-existent:

Geology and Topography. No changes to terrain would occur as a result of Alternative 1 or Alternative 2. The majority of the proposed construction would occur within previously developed areas at NBPL, Naval Mine and Anti-Submarine Warfare Command (NMAWC), and within the San Diego Bay. Minimal shoreside grading would be necessary at NMAWC to create a level surface for the temporary marine mammal pools. Since the replacement pier would be constructed just 5 feet (ft) from the existing pier, the shoreside excavation and finish grading necessary to accommodate the new fuel pier would be minimal as well. Localized excavation to extend the underground pipeline trench to the new pier, install underground utilities, and reroute the existing storm sewer would be minor. Additional grading and asphalt repairs would occur at the quay wall area. These minimal surficial modifications would not result in impacts to geology and topography. San Diego is a seismically active region, as is most of southern California. Seismic hazards can include landslides, ground shaking, surface displacement and rupture, liquefaction, and tsunamis. The new fuel pier, abutment, and associated shoreside facilities would be designed and constructed in conformance with Unified Facilities Criteria (UFC) and California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements to withstand the forces of earthquakes with a 50 percent probability of occurrence with minor or no structural damage, as well as the forces of earthquakes with a 10 percent probability of occurrence with controlled, repairable damage (Naval Facilities Engineering Command [NAVFAC] Southwest 2011a). Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact

to geology and topography. Disposal of dredged sediments in the offshore zone at Naval Amphibious Base (NAB) Coronado Silver Strand Training Complex (SSTC) would be a beneficial impact, because the sediments (fine sand) would reworked by natural wave and current action to preserve the sandy beach profile.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. The Navy Marine Mammal Program (MMP) and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. The existing fuel pier, which has exceeded its design life and is substandard for existing seismic regulations, would not be replaced. Therefore, no potentially significant seismic impacts would occur under the No-Action Alternative.

Public Services and Utilities. No new public services would be constructed under Alternative 1 or Alternative 2. Electrical and potable water service would be supplied as needed to the temporary Navy marine mammal enclosures constructed at the NMAWC marina piers, and would be removed when the marine mammals return to their existing location. Alternative 1 or Alternative 2 would include removal of all existing utility infrastructure and fueling systems and replacing the existing infrastructure with upgraded utility infrastructure and fuel pipeline systems to adequately service the ships. The new fuel pier would provide adequate deck space by using a double deck structure to completely separate the fuel lines from the fueling operations. The pipelines and utilities would be hung beneath the upper deck. Utilities would be in a dedicated vault separate from the pipelines. An existing sanitary sewer main that runs near the abutment for the new pier would be inspected for defects and structurally reinforced before pile driving begins, to protect the sewer main from potential vibration damage (NAVFAC Southwest 2011a). The stormwater outfall on the north side of the existing pier abutment would be rerouted to the north side of the proposed new pier abutment. The utility infrastructure and fuel system for the new fuel pier would be accommodated without significant change to the NBPL utility system/network capacity. There are no utility corridors in the proposed project area and the demolition/construction contractor would locate and avoid utility service lines. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to public services and utilities.

Under the No-Action Alternative, demolition, construction, and dredging activities would not occur. The Navy MMP and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. There would be no changes to the existing public services and utility connections to the existing Fuel Pier 180 or at NMAWC. Therefore, implementation of the No-Action Alternative would not have a significant impact to public services and utilities.

Aesthetics. The guide piles and floating walkways to be installed at the NMAWC marina piers would be similar to those already present and would not change the visual profile of the waterfront at NMAWC. When the temporary relocation period is over, the guide piles would be completely dismantled and removed, and the NMAWC waterfront would resume its original appearance.

The height of the existing Pier 180 is +15 ft mean lower low water (MLLW) (Terra Costa Consulting Group, Inc. 2010). Under Alternative 1 or Alternative 2, the new fuel pier upper

deck would be + 31.75 ft MLLW (28 ft deck elevation plus the 3.75 ft concrete barrier around the deck perimeter). The total elevation of the double-deck portion would more than twice as high as the existing pier. There would be five 30 ft-high fuel loading arms mounted on the upper deck floor, and seven 33-ft high light poles mounted on the concrete barrier. The mooring and berthing dolphins (+14 ft and +13 ft MLLW, respectively) would be about the same height as the existing pier (NAVFAC Southwest 2011a).

When viewed as one of a suite of piers within the bay, the new pier would be compatible with the visual characteristics of other piers in the surrounding area. The new fuel pier would have a smaller footprint than the existing pier, so the visual impact of this increase in height would be somewhat offset by the double deck pier occupying a smaller area overall than the existing pier (Figures 3-1 and 3-2). The beneficial impacts that would occur from removing the aging Pier 180 from the bay would also serve to balance the visual impact of the new pier. Views within San Diego Bay would remain consistent with the military and industrial nature of the surrounding area. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to aesthetics.

With respect to temporary relocation of the Everingham Brothers Bait Company bait barges, the bait barges are long, narrow low-lying vessels that resemble extended floating docks. The two bait barges have been in San Diego Bay for decades, and one section of San Diego Bay is essentially just like the rest: military, commercial, and recreational features are all simultaneously visible from every viewshed in and of the bay. San Diego Bay is characterized by wildlife occupation of marine structures such as docks and buoys, and recreational and commercial fishing visitors night and day. The barges are consistent with a waterfront or marina seascape and would not change the visual character of either of the proposed temporary relocation options 4A or 6A, south or southeast of Harbor Island, respectively. Further, within the timeframe of the proposed project, the two barges would not anchor at the relocation site during summer, and it is anticipated that they would return to their current location after the proposed new fuel pier is completed. While at the temporary relocation site, the barge owners would continue their efforts to deter marine mammals from hauling out on the barges. Section 101 (a) (4) of the Marine Mammal Protection Act (MMPA) allows private citizens and marina owners to deter California sea lions and Pacific harbor seals from hauling out onto docks and/or vessels and potentially damaging private property with non-lethal methods and techniques, such as: fencing, bull rails, closely-spaced posts, netting, swim step protectors, various noisemakers and visual repellents, high or low pressure water hoses, blunt tip "bull poles," and paint ball (non-toxic, water soluble paint only) or air soft guns (National Oceanic and Atmospheric Administration [NOAA] 2012a). Private owners of docks and vessels in the east Harbor Island area could use the potential deterrence methods for harbor seals and California sea lions as provided by NOAA (http://swr.nmfs.noaa.gov/deter/index.htm) if needed to deter animals from their property (NOAA 2012b). As allowed by Section 109 (h) of the MMPA, such deterrence does not constitute harassment, so there would be no significant impact to marine mammals. Therefore, implementation of Alternative 1 or Alternative 2 would not result in a significant aesthetics impact relative to temporary relocation of the two bait barges.



a) Existing Fuel Pier



b) Proposed Replacement Fuel Pier

Figure 3-1
View Looking West from Vessel in San Diego Bay



a) Existing Fuel Pier



b) Proposed Replacement Fuel Pier

Figure 3-2
View Looking Northeast from Fort Rosecrans National Cemetery

Under the No-Action Alternative, no demolition, construction, dredging and sediment disposal would occur. There would be no temporary relocation of the two Everingham Brothers Bait Company San Diego bay bait barges. There would be no changes to the existing views at NBPL and NMAWC, and San Diego Bay southeast of Harbor Island. Therefore, implementation of the No-Action Alternative would not have a significant impact to aesthetics.

Land Use. The current project land uses comprise Navy bulk fuel receiving and issuing at the fuel pier, recreational marina buildings and piers at the NMAWC site, recreational navigation (sailing and fishing) in San Diego Bay in the waters surrounding Harbor Island, and Navy training and limited public access at SSTC beach. Other than temporary use of the Navy's recreational piers by the MMP and amendment of the U.S. Coast Guard (USCG) Security Zone in the waters east of the fuel pier, no changes to land use would occur. Following construction of the new fuel pier, the Navy marine mammals would return to their existing location and recreational use of the NMAWC marina piers would resume. The existing military land use at the fuel pier would continue to support NBPL bulk fuel operations and no land use compatibility issues would occur. The Navy prepared a Coastal Consistency Determination (refer to Appendix A) and consulted with the California Coastal Commission (CCC) on all project components. The CCC found the proposed project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (refer to Appendix A). Amendments to the existing USCG Security Zone are needed to provide an adequate security zone of 500 ft for the proposed new fuel pier alignment (Navy 2012).

The area proposed for temporary relocation of the Everingham Brothers Bait Company bait barges (see Figure 2-2) comprises commercial, recreational, and military (USCG) shoreside and waterside uses, including privately-operated marinas. As stated in Section 3.11.3.1 of this EA, the Everingham Brothers Bait Company bait barges provide a service demanded by the local recreational fishing industry. As such, the Everingham Brothers Bait Company commercial bait supply operation would not be out of character with the surrounding uses. In addition, the bait barges would only occupy the temporary site for about 6.5 months out of the year, from September 16 through March 31. There is sufficient open water in the proposed relocation space for Everingham Brothers', their customers, and other vessels such as sail boats to maneuver (see Table 2-13 in Section 2.2.1.6). Existing shoreside and waterside uses would be able to continue during the months that the bait barges would be anchored at the temporary relocation site. The current plan is for the Everingham Brothers Bait Company to return the barges to their existing site after the proposed new pier is constructed. Therefore, with implementation of Alternative 1 or Alternative 2 no significant impact to land use would occur.

The Navy leases a portion of the land at SSTC from the State of California, including the beach at Boat Lanes 8 and 9, and the waters offshore between 100 to 500 ft from the ordinary high water mark (Navy 2011). The proposed sediment beneficial reuse area in SSTC Boat Lanes 8 and 9 is approximately 1,200 ft offshore, so it is outside the leased lands. Boat Lanes 8 and 9 and their onshore beaches are used for military training, however, public access for recreation is allowed when training operations are not taking place (Navy 2011). Sediment disposal would occur for a maximum of 3 months. The detailed protocol used in the previous U.S. Army Corps

of Engineers (USACE) channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with Navy training operations at SSTC . With respect to recreation, the sediment disposal vessel(s) in the nearshore zone would not affect onshore activities. As described below under Public Health and Safety and Recreation, there would be no beach closure affecting swimmers and surfers. Therefore, there would be no significant impact to land use associated with beneficial reuse of dredged sediments.

The Navy has coordinated with USCG to amend the Security Zone at the fuel pier 250 ft to the east as described in Section 2.2.1.4. There would be 700 ft of open water between the amended Security Zone boundary and the federal navigation channel so there would be sufficient space for recreational vessels. The new pier and the temporary marine mammal enclosures would extend beyond Navy waters into waters that are under the jurisdiction of the CSLC. Following completion of the NEPA process, Navy counsel would provide written notification to CSLC of the extension of Navy facilities into state waters. Because there would be adequate maneuvering space (358 to 480 ft for civilian vessels between the temporary 100-ft bayward Security Zone that would be established at NMAWC and West Harbor Island) and because the NMAWC Security Zone would be temporary, no significant impact to land use would occur at NMAWC. Therefore, with implementation of Alternative 1 or Alternative 2, no significant impact to land use would occur.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. The Navy MMP and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. There would be no changes to existing land and bay uses at NBPL or NMAWC. Therefore, implementation of the No-Action Alternative would not have a significant impact to land and bay use.

Cultural Resources. Implementation of Alternative 1 or Alternative 2 would not affect any archaeological sites or other cultural resources, as none are found within the Area of Potential Effect (APE), as defined under the Navy Region Southwest (NRSW) Metro San Diego Programmatic Agreement (Metro PA) (NRSW 2003, NAVFAC Southwest 2008). The Proposed Action is located more than 100 meters (m) from identified historic properties. Consistent with Stipulation 6.A of the Metro PA, the APE is defined as the discrete site of the undertaking and any associated staging or laydown areas. Construction laydown areas would be staged outside the 100-m APE buffer of identified historic properties in the Fort Rosecrans Historic District.

Previous cultural resources investigations confirm that no historic properties are present within the APE. The Defense Fuel Support Point (DFSP) Fuel Pier (Pier 180, built in 1908 and 1942) has previously been determined by consensus and consultation to be ineligible for the National Register of Historic Places because it lacks historic and architectural significance (California State Historic Preservation Officer [CASHPO] 2005, Schmidt and Byrd 2004). The area at NMAWC proposed for temporary relocation of Navy MMP during the construction of the fuel pier is composed of bay-fill and does not possess the potential to yield historic or archeological resources. A 1997 investigation inventoried and evaluated all of NMAWC and concluded that the installation contains no built properties or archaeological resources eligible for listing in the

National Register of Historic Places (KEA Environmental 1997). The State Historic Preservation Officer concurred with this determination in 2001.

While the project area has no known archaeological resources, its onshore quay wall lay-down area is on land that was created as a leveled platform cut-and-filled from original bay shore terrain (circa 1905) to provide for coal storage as part of the Navy's Point Loma Coaling Station (NAVFAC Southwest 2012). This, and a subsequent 1940s filling that raised and extended the quay wall, overlie a now-buried beach and adjacent tidelands of the original, late 18th and early 19th century port of San Diego. This area was referred to as La Playa and was originally used in the Spanish-Mexican-era hide trade with American merchant ships from New England (NAVFAC Southwest 2012). This now buried beach was the location of hide houses and a custom house, with residences and other associated structures set further back from the bay. From here, cargos were hauled by road to the Pueblo of San Diego (now Old Town San Diego) (NAVFAC Southwest 2012).

The circa 1905 filling over the La Playa beach was done using relatively low-energy, horse-drawn technology that represents a potential archaeological evidence of this historic maritime activity to be preserved beneath the fill. However, no investigations have ever been made for the presence of such features or deposits. Accordingly, the project-derived ground disturbance on this onshore area of the project provides a currently unknown potential for affecting buried archaeological deposits, assuming such exist. If preserved with sufficient integrity, such potentially surviving archaeological content would be historically significant, so likely eligible to the National Register and subject to compliance on effect under Section 106 of the National Historic Preservation Act (NAVFAC Southwest 2012).

Compliance with Section 106 for the P-151 military construction project (MILCON) proceeds under the Metro PA (NAVFAC Southwest 2012). Under Stipulation 6.C of the Metro PA for compliance with 36 Code of Federal Regulations (CFR) 800.4(a)(1), the NBPL Cultural Resources Program determined that the APE was the discrete project area, including lay down areas on the quay wall (NAVFAC Southwest 2012). However, while there are no identified built or archaeological historic properties within the APE, the written historic evidence identifies a buried archaeological potential under the quay wall fill. (NAVFAC Southwest 2012). Under Stipulation 9 of the Metro PA, the Navy "will provide for archaeological monitoring of ground disturbing activities within areas of known or provisional archaeological sensitivity" for identifying the presence or absence of any sub-surface archaeological deposits of features during construction (NAVFAC Southwest 2012). Monitoring would not be required for in-water project activities like dredging or pier demolition.

In accordance with the Metro PA, the project is therefore required to retain qualified contracted archaeological monitoring support to identify, and assist in quickly dealing with, any such features or deposits encountered during site preparation excavations on the quay wall portion of the APE (NAVFAC Southwest 2012). In consultation with the NBPL Cultural Resources Program Archaeologist, the contracted archaeological consultant would, prior to construction monitoring, prepare a Monitoring and Discovery Plan that would lay out monitoring protocols,

historic context, eligibility thresholds, and other required procedures for approval by the Navy (NAVFAC Southwest 2012).

In the absence of known historic properties, but with an identified archaeological potential, assessing effect in conformance with Stipulation 8.A of the Metro PA here requires that Section 106 compliance be as a conditional finding of "no historic properties affected" under 36 CFR 800.4(d)(1) (NAVFAC Southwest 2012). As such, the demonstration of Section 106 compliance here is provisional, pending results of the monitoring to be conducted during the ground disturbance site preparation phase described above (NAVFAC Southwest 2012).

If no historic-period deposits or features are identified during monitoring, or if those observed do not possess content or integrity sufficient to recommend their National Register of Historic Places eligibility, then the effects assessment under Stipulation 8 of the Metro PA would be "no historic properties affected" (NAVFAC Southwest 2012). If eligible deposits or features are found, but the project work would not adversely affect these, then the current "no adverse effect" would stand and the EA would remain unchanged (NAVFAC Southwest 2012). However, if newly-identified eligible deposits or features found would be adversely affected by project activities, then the project work affecting the deposits or features would stop for a period sufficient to provide for an expedited consultation to define resolution of the adverse effect, in accordance with 36 CFR 800.6, with the EA amended to reflect this change (NAVFAC Southwest 2012). This would require execution of a Memorandum of Agreement with the CASHPO, and possibly the Advisory Council on Historic Preservation, stipulating actions required for resolving the adverse effect (NAVFAC Southwest 2012). Project work would continue following completion of the stipulated actions (NAVFAC Southwest 2012). Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to cultural resources.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. Therefore, implementation of the No-Action Alternative would not have a significant impact to cultural resources.

Public Health and Safety. Existing regulations address the potential impacts to public health and safety by minimizing the risk of releases of bulk fuels, contact of stormwater with construction-related contaminants, and worker safety. There are strict federal and state regulations governing bulk fuel storage and handling, as described in Section 3.7.1 and 3.7.2. These regulations require that bulk fuel facilities have the appropriate containment and control components to prevent unexpected releases (NAVFAC 2009a). Federal and state regulations also require that bulk fuel facilities have contingency plans to minimize hazards to human health or the environment from fires, explosions, or any unplanned release of hazardous waste or constituents to air, soil, or surface water (NAVFAC 2009a). The contingency plan must describe the actions facility personnel would take, and must be carried out immediately whenever there is an incident that could threaten human health or the environment. In compliance with these regulations, the fuel pier has containment and control components to prevent releases, and NBPL has a contingency plan with an Emergency Response Action Plan that would be carried out to minimize the hazards to human health of any accidental release

from the fuel pier. (NAVFAC 2009a). These same plans and procedures would be implemented under Alternative 1 or Alternative 2.

Implementation of Alternative 1 or Alternative 2 would include observance of multiple safety guidelines and regulations. Worker safety is monitored through required crane inspections by the NAVFAC Public Works Center. Cranes are inspected to ensure that they are operating in accordance with the specifications in NAVFAC P-307, *Management of Weight Handling Equipment* (NAVFAC 2009b, NAVFAC Southwest 2011b). Additionally, contractors would be required to comply with safety requirements of the Occupational Safety and Health Administration, the most recent versions of USACE EM 385-1-1 *Safety and Health Requirements* (USACE 2008), and multiple other NAVFAC Southwest and U.S. Navy health and safety instructions (NAVFAC Southwest 2011b). All of these requirements and regulations address the potential risks to health and safety and would be followed. In addition, public health and safety is discussed in Section 3.7.1 and 3.7.2 as it relates to hazardous materials and wastes and explosives safety. To ensure safety of all vessels using San Diego Bay and nearshore waters, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including moving the Navy marine mammal enclosures and the Everingham Brothers Bait Company bait barges to their respective temporary relocation sites, dredging, and sediment disposal at the receiver site at SSTC.

Sediment disposal in the nearshore zone at SSTC would take place about 1,200 ft from shore (Figure 2-10 in Section 2.2.1.5) so there would be no beach closure affecting swimmers or surfers. As described in Section 2.2.1.5, sediment samples from the proposed dredge footprint were analyzed in November 2010 and the material from the proposed dredge area was found to be suitable for nearshore disposal. Therefore, health threats to swimmers would not occur from nearshore disposal of dredge sediments at SSTC. Temporary, intermittent increased turbidity would likely occur during sediment disposal. However, disposal would last no more than 3 months. Signs would be posted along the beach to notify swimmers of the sediment disposal vessel and activities, and potential for temporary increased turbidity. Therefore, with implementation of Alternative 1 or Alternative 2, no significant impacts to recreation at SSTC would occur.

With respect to temporary relocation of the bait barges, the potential bait barge relocation sites under consideration southeast of Harbor Island were selected because they avoid bird-aircraft strike hazards for Navy and Lindbergh Field (San Diego International Airport) aircraft (NRSW 2012). No hazardous materials/waste concerns have been identified for the Everingham Brothers Bait Company bait barge operations. Hazardous materials/waste aboard the barges are managed according to applicable state and county regulations and through the current Navy license conditions, which are expected to be repeated in the CSLC lease.

The USCG has indicated that with respect to public health and safety concerns, their order of preference for bait barge relocation alternatives is Alternative 4 (which has been eliminated from consideration as indicated in Table 2-12), followed by Option 4A, followed by Option 6A. The USCG does not have an existing formally established or written aircraft Accident Potential Zones or crash hazard zones for its Sector San Diego installation, but does have well established

aircraft operational approach and departure paths and did agree to consult with Naval Air Station (NAS) North Island air planners, existing NAS North Island Accident Potential Zone documentation, and/or NAVFAC Accident Potential Zone planners and then to provide a formal response with analysis on USCG operational preferences and safety requirements (USCG 2012a).

The USCG would issue a Notice to Mariners a few weeks before the bait barges move to the temporary relocation site, and the Notice would remain in effect for the duration of the barges' stay in that position (USCG 2012b). A Marine Information Radio Broadcast would be conducted for the first few days of the temporary relocation as well (USCG 2012b). The bait barges' operating procedures include full night-time illumination. While anchored at the temporary relocation site, the bait barges would comply with nighttime vessel navigation rules/restrictions as indicated by the USCG (Everingham Brothers Bait Company 2012). These regulations include carrying two unobstructed, all-round white lights visible to a distance of at least 1 nautical mile (USCG 2012b).

Before moving the bait barges to the temporary relocation site, the barge owners would deter marine mammals from hauling out on the barges with sprinklers or other non-injurious methods, and would continue to deter marine mammals from the barges while they are at the temporary location. Deterrence of nuisance animals is permissible under Section 109(h) of the MMPA and does not constitute harassment. Any potential animal-associated odors would be kept to a minimum on the bait barges, and would likely not be noticeable on shore (1,000 ft away at the closest point, Harbor Island north of Option 4A). Therefore, there would not be a significant public health and safety impact from any potential odors associated with the bait barges.

Section 101 (a) (4) of the MMPA allows private citizens and marina owners to deter California sea lions and Pacific harbor seals from hauling out onto docks and/or vessels and potentially damaging private property with non-lethal methods and techniques, such as: fencing, bull rails, closely-spaced posts, netting, swim step protectors, various noisemakers and visual repellents, high or low pressure water hoses, blunt tip "bull poles," and paint ball (non-toxic, water soluble paint only) or air soft guns (NOAA 2012a). Private owners of docks and vessels in the east Harbor Island area could use the potential deterrence methods for harbor seals and California sea lions as provided by NOAA (http://swr.nmfs.noaa.gov/deter/index.htm) if needed to deter animals from their property (NOAA 2012b). As allowed by Section 109 (h) of the MMPA, such deterrence does not constitute harassment, so there would be no significant impact to marine mammals. Therefore, implementation of Alternative 1 or Alternative 2 would not result in a significant health and safety impact relative to temporary relocation of the two bait barges.

For the reasons stated above (compliance with existing hazardous materials regulations, compliance with USCG nighttime vessel navigation rules/restrictions rules and use of Notices to Mariners, and deterrence of marine mammals to protect personal safety and minimize odors), implementation of Alternative 1 or Alternative 2 would not have a significant impact to public health and safety.

Under the No-Action Alternative, no demolition, construction, or dredging activities would occur. The Navy MMP would not be temporarily relocated to NMAWC and the Everingham Brothers Bait Company bait barges would not be temporarily relocated to one of the two proposed temporary relocation sites (Option 4A or 6A). Therefore, implementation of the No-Action Alternative would not have a significant impact to public health and safety.

Recreation. Demolition and construction would take place inside a navigation restricted zone that recreational vessels currently avoid (Figures 2-5 and 2-8a), so the majority of the project activities would not affect recreational navigation. Dredging is estimated to take 3 months. During this time, recreational boaters may need to detour around the dredge footprint; the temporary period when detours may be needed would not be a significant impact to recreational navigation.

The Everingham Brothers Bait Company barges would not anchor at the temporary location during the busiest recreational sailing period (summer), and most bait barge operations take place overnight when recreational boaters are not active. Certain sailboat race courses may choose to relocate their start/finish lines further to the west while the bait barges are at their temporary location. Potential temporary relocation site (Option 6A) was selected with consideration of recreational boating facilities. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to recreation or recreational navigation.

Signs would be posted at SSTC beach and the La Playa beach, advising the public of the potential for sediment disposal and underwater noise to occur in those areas, respectively. The signs would alert beachgoers and swimmers at the SSTC beach of the potential for increased turbidity to occur while sediment is being disposed into the nearshore zone, about 1,200 ft from shore. At the La Playa beach, the signs would advise the public that during the project in-water construction period (September 16 through March 31) pile driving would occur at the project area that would generate underwater noise extending to the area offshore of the La Playa beach. With Alternative 1 or Alternative 2 there would be no beach closure, therefore, with implementation of Alternative 1 or Alternative 2 there would be no significant impact to recreation.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal activities would occur. The Everingham Brothers Bait Company bait barges would not be temporarily relocated to one of the two proposed temporary relocation sites (Option 4A or 6A). Therefore, implementation of the No-Action Alternative would not have a significant impact to recreation.

3.1 BIOLOGICAL RESOURCE HABITATS AND COMMUNITIES

3.1.1 Definition of Resource

Biological resource habitats of San Diego Bay are differentiated by location, elevation or depth, substrate, and by man-made or natural features, including the associated biotic communities. For purposes of this EA, the general biotic features of different habitats, including assemblages of plants and invertebrates, are included in this section, whereas separate sections are provided

for fisheries (Section 3.2), birds (Section 3.3), marine mammals (Section 3.4), and threatened and endangered species (Section 3.5).

Habitats associated with the project area include an upland transition sandy beach; developed shoreline and artificial substrates such as the pier pilings and rock rip-rap; and marine benthic (bottom), water column, and open water habitats of varying depth as shown in Figure 3.1-1 (Merkel & Associates, Inc. 2009). Adjacent uplands include portions of the Point Loma Ecological Conservation Area (PLECA).

The marine habitats of the project area (seaward of the high tide line) are navigable waters of the U.S. under the Clean Water Act (CWA) (33 U.S. Code [USC] § 1344) and Rivers and Harbors Act (RHA) (33 USC § 403). Dredge and fill activities, as well as in-water work affecting the navigable waters, are regulated under these statutes by the USACE under Section 404 of the CWA and Section 10 of the RHA, respectively; regulations are at 33 CFR 320-330.

3.1.2 Affected Environment

This section is organized by habitat, with the exception that the proposed Navy marine mammal relocation site at NMAWC and the dredged material reuse site are discussed separately in concluding subsections. The description of existing conditions is based on the following references:

- The San Diego Bay Integrated Natural Resources Management Plan (INRMP) (NAVFAC Southwest 2000, NAVFAC Southwest and Port of San Diego 2011);
- The NBPL INRMP (NAVFAC Southwest 2002);
- The 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update (Merkel & Associates, Inc. 2009);
- The 2010 Characterization of Essential Fish Habitat (EFH) in San Diego Bay (NAVFAC Southwest 2010);
- Fish surveys conducted in San Diego Bay during 1994-1999 by Allen *et al.* (2002) and during 2005 and 2008 by Pondella and associates (Vantuna Research Group 2006, 2009);
- SSTC Environmental Impact Statement (EIS) (NAVFAC Southwest 2011);
- Other documentation relevant to the SSTC beneficial reuse site prepared for the Opportunistic Beach Fill Program (City of Encinitas *et al.* 2008) and the San Diego Regional Beach Sand Project II (San Diego Association of Governments [SANDAG] and USACE 2011); and
- Site reconnaissance and other sources as cited.

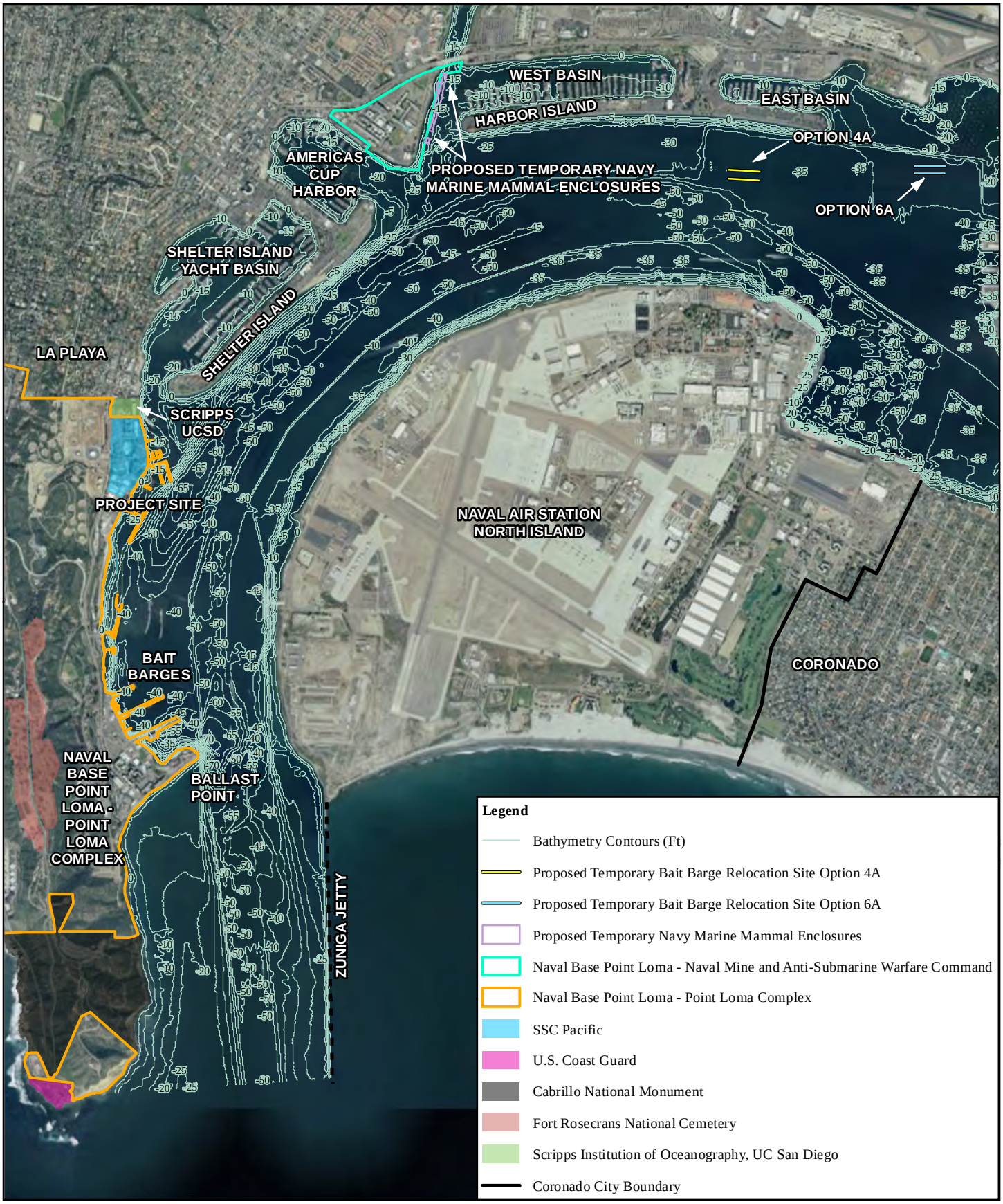


Figure 3.1-1
Project Area Bathymetry

3.1.2.1 Coastal Upland

Inshore of the fuel pier and extending southward along the shore, the beach and adjacent strand/coastal scrub vegetation are part of the PLECA (Figure 3.1-2). This area would not be directly affected by proposed construction and demolition activities. The wandering saltmarsh skipper butterfly (*Panoquina errans*, a federal species of concern), coast horned lizard (*Phrynosoma coronatum*, a federal species of concern), San Diego blacktailed jackrabbit (*Lepus californicus*), Nuttall's lotus (*Lotus nuttallianus*, California Native Plant Society [CNPS] rank 1B.1), coast horned lark (*Eremophila alpestris*), red sand verbena (*Abronia maritima*, CNPS rank 4.2), and coast woolly-heads (*Nemacaulis denudata* var. *denudata*, CNPS rank 1B.2) all occur here (NAVFAC Southwest 1994; Tierra Data, Inc. [TDI] 2007; NAVFAC Southwest and Port of San Diego 2011). Otherwise, the coastal upland area surrounding the proposed project is a developed industrial site and does not offer habitat for native flora. Rosecrans Street, on the western border of the project area, is lined with exotic landscaping. Structures along the shoreline and surrounding open waters are heavily used by gulls, brown pelicans, cormorants, and surf scoters (*Melanitta perspicillata*) (NAVFAC Southwest 1994, 2000; TDI 2011).

3.1.2.2 Intertidal (+7.8 to -2.2 ft MLLW)

The shoreline of the affected environment consists of both man-made and natural features. Immediately north of the fuel pier's access way, the shoreline consists of concrete and rock riprap. A quay wall, approximately 12 ft above mean sea level, extends approximately 750 ft south of the fuel pier's access way. A sandy flat lies south of the quay wall, adjacent to one of the Navy marine mammal piers.

Despite its relatively small size, the intertidal zone has the greatest variability of any area in the bay, and this variability can occur within centimeters. This is due, at least in part, to the fact that the zone is exposed to air on a regular basis, and most physical factors show a wider range in air than in water. Organisms must adapt to extremes of temperature and desiccation, as well as salinity stress, mechanical wash, and backwash of waves. These extremes are more pronounced on sandy shores, where there is less animal life than on muddy shores. The abundance and diversity of fauna of a typical sand flat can also vary by orders of magnitude within and among years (NAVFAC Southwest and Port of San Diego 2011).

Artificial substrates, such as the pilings and bulkheads for the fuel pier, rock riprap, floating docks, seawalls, and mooring systems support a wealth of invertebrates and seaweeds. Invertebrates comprise a significant portion of the organisms present in the San Diego Bay and serve as important components of bay habitats and essential food sources for marine life. Invertebrate species diversity, abundance, and biomass of infaunal invertebrates in the north bay region is significantly higher than that of the south bay region, particularly in rock riprap when riprap niches are not filled with concrete (NAVFAC Southwest 2010). California spiny lobster (*Panulirus interruptus*) and a variety of crabs, worms, mussels, barnacles, echinoderms (sea stars and sea urchins), sponges, sea anemones, and tunicates (sea squirts) inhabit artificial structures (NAVFAC Southwest and Port of San Diego 2011).

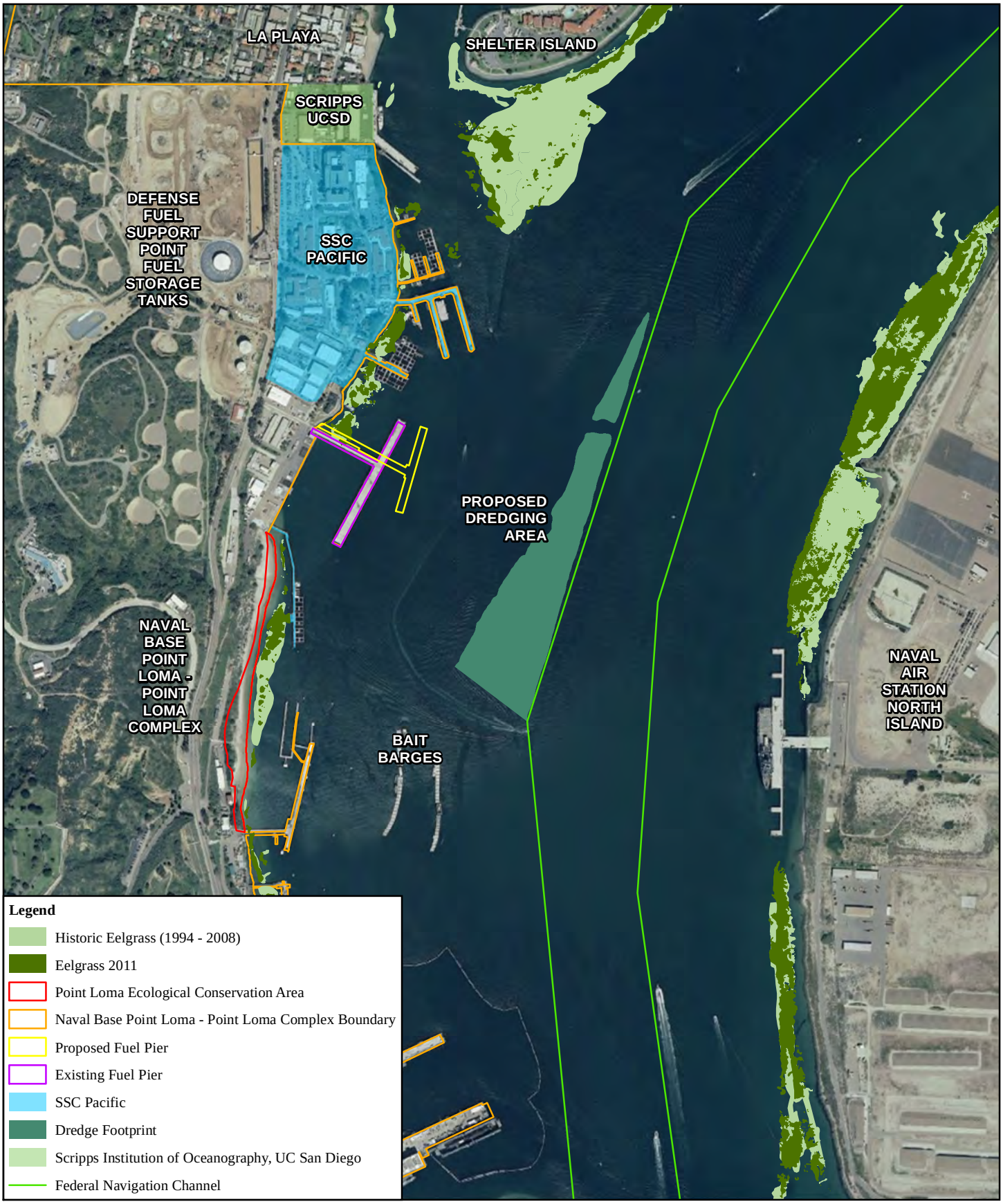


Figure 3.1-2
Point Loma Ecological Conservation Area and Eelgrass Beds
in the Vicinity of the Proposed Fuel Pier

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a, 2012

Since there are little to no natural hard surfaces in San Diego Bay, riprap and other artificial structures provide habitat that does not resemble any natural habitat in San Diego Bay. These structures provide microhabitats and support communities similar to those of natural rocky shores outside San Diego Bay. These areas may also provide refuge and feeding areas for juvenile and predatory fishes (NAVFAC Southwest and Port of San Diego 2011). Seventy-four percent (45.4 miles [mi]) of the shoreline of San Diego Bay is armored by man-made structures that protect developed sites (NAVFAC Southwest 2011).

Hardened shorelines can also provide elevated roosting sites for bay waterbirds, such as California brown pelicans (*Pelicanus occidentalis californicus*), cormorants, and gulls, which allow them to conserve energy and avoid harsh weather conditions. The surface roughness and complexity of a structure can affect its ability to provide refuge niches and allow water retention at low tides (NAVFAC Southwest and Port of San Diego 2011). The fuel pier covers 1.6 acres (ac) and is used for resting by waterbirds.

Sandy flats, such as the slim sand flat adjacent to the mammal enclosures south of the fuel pier, lack vegetation except for decomposing patches of washed-up algae or eelgrass. Beach hoppers, sand fleas, and isopods may be expected on the upper beach whereas polychaetes, clams, and other burrowing animals are prevalent on the lower beach. In intertidal areas, birds are more abundant and diverse on sandy flats than on rocky substrates (NAVFAC Southwest and Port of San Diego 2011).

3.1.2.3 Shallow Subtidal (-2.2 to -12 ft MLLW)

Vegetated shallow subtidal habitats are highly productive and important in San Diego Bay, in part due to the presence of eelgrass (*Zostera marina*) beds and algal mats on shallow sandy to muddy substrates in many areas of the bay (Merkel & Associates, Inc. 2009; NAVFAC Southwest 2000, 2002, 2011). Shallow soft-bottom areas, with their associated fauna and flora, were the primary subtidal habitat in San Diego Bay before its development (NAVFAC Southwest 2011). In the north bay, eelgrass grows at depths of 0 to -13 ft MLLW. Eelgrass is one of the few plants that inhabit this zone; its roots and rhizomes form an interlocking matrix that stabilizes the substrate and resists erosion. Near the mouth of San Diego Bay, a variant of eelgrass with wider blades grows from -16 to -23 ft MLLW (NAVFAC Southwest 2011). Eelgrass reduces water turbidity by trapping fine sediments and preventing their re-suspension, and its leaves cut down wave action and currents, further decreasing turbulence and causing more fine sediment to be deposited.

Due to their rapid growth rate and heterogeneous structure, eelgrass beds provide microhabitats for a wide variety of invertebrates and small fishes, primarily by increasing the available substrate surface and by providing effective refugia. Algae and invertebrates that grow on the leaf blades of eelgrass provide primary and secondary productivity for consumption by larval and juvenile fish. Fish produced from these beds are consumed by fish-eating birds, including the California least tern (*Sterna antillarum browni*). Waterfowl, especially surf scoter, scaup, and brant are present in high numbers in late fall and winter. Black brant, in particular, rely heavily on eelgrass of the central and south bay as they are one of the few birds that consume it directly (NAVFAC Southwest and Port of San Diego 2011).

Eelgrass is a Special Aquatic Site under Section 404 of the CWA (40 CFR § 230.3[q-1]). The deposition of dredged or fill material in Special Aquatic Sites is prohibited unless there is no other practicable alternative. Regarding EFH (Section 3.2 and Appendix E.1), eelgrass is also a Habitat Area of Particular Concern (HAPC). Although the analysis in Appendix E.1 illustrates Imperial Beach as the sediment beneficial reuse site, the site was later changed to the SSTC beach at Naval Amphibious Coronado (Figure 2-10). National Marine Fisheries Services (NMFS) concurs with the new location (see Appendix A). To mitigate impacts on eelgrass that cannot be avoided, the Navy has an approved mitigation bank comprising several eelgrass restoration sites in San Diego Bay (Appendix E.3).

Within and adjacent to San Diego Bay, there were 1,831 ac of eelgrass as of 2011 and an additional 868 ac of habitat that historically supported eelgrass. There were 0.05 ac of eelgrass at the proposed new fuel pier location as of 2011 and an additional 0.05 ac of habitat that historically supported eelgrass (Figure 3.1-2).

Infaunal benthic invertebrates are the most abundant invertebrate found in the soft bottom sediment of the Bay and include polychaete worms, crustaceans, mollusks, and unidentified species of oligochaete and nematode worms (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). During the Bight 1998 survey (Bay *et al.* 2000), a total of 1,172 megabenthic invertebrates, representing 43 taxa, were collected in San Diego Bay. The nonindigenous bivalve *Musculista senhousia* was present in more than 70 percent of the samples, making it the most widely distributed trawl-caught invertebrate in the Bay. Other common invertebrates that were present in at least one-third of the samples included two undescribed species of sponge, the ascidian *Microcosmus squamiger*, the bivalve *Argopecten ventricosus*, and the gastropod *Crepidula onyx*. *Musculista senhousia,* together with another nonindigenous species *Microcosmus squamiger*, accounted for over 50 percent of the total catch (USACE 2009).

The base of the food chain for the benthic community in soft-bottom, unvegetated shallow subtidal habitat is provided by organic detritus that originates in shallower water and drifts or sinks into deeper water. Fauna residing in subtidal benthic habitats (across all depths) include the warty sea cucumber (*Parastichopus parvimensis*) and a diversity of infaunal species, such as suspension feeders, burrowers, and tube builders. Feeding by nematode and polychaete worms, clams, gastropod mollusks, brittlestars, crabs, isopods, and a wide variety of smaller crustaceans serves to transform detritus and small invertebrates into usable food for larger invertebrates and fishes. The soft bottom benthos provides other functional roles besides serving as a prey base for fish and birds. The less conspicuous mollusks, polychaete worms, small crustaceans, and other invertebrates living at the bottom of the bay mineralize organic wastes as it accumulates, consume algae, and return essential chemicals and organic matter to the water column (NAVFAC Southwest and Port of San Diego 2011).

The area immediately to the north of the fuel pier and around the small boat dock is largely a shallow subtidal zone (see Figure 3.1-1). Approximately half of this area is between 0 and -13 ft MLLW. Eelgrass occurs in this area and along the coast further north (see Figure 3.1-2) (Merkel & Associates, Inc. 2009). The proposed project's access way would be constructed in this area.

Eelgrass also occurs adjacent to the Navy marine mammal enclosures to the south. Large eelgrass beds also occur approximately 1,100 ft to the north of the proposed fuel pier, along the southern tip of Shelter Island, and 1,400 ft across the bay along the western edge of North Island (see Figure 3.1-2).

3.1.2.4 Moderately Deep Subtidal (-12 to -20 ft MLLW)

Nearly half of the area between the fuel pier and the quay wall/shoreline is moderately deep subtidal (see Figure 3.1-1). Approximately 2,219 ac (17 percent) of bay surface area falls into the moderately deep category, primarily in the south-central bay and in inlets of the north bay (NAVFAC Southwest and Port of San Diego 2011).

For both the moderately deep and deep subtidal (see below) habitats, primary production by phytoplankton and zooplankton occurs in the overlying water column. No information specific to this intermediate depth exists for invertebrates or plankton, although benthic primary production is limited due to low light penetration. As such, algal mats and eelgrass beds are lacking.

Typical fish species include round stingray (*Urobatis halleri*), spotted sand bass (*Paralabrax maculatofasciatus*), California halibut, and barred sand bass (*Paralabrax nebulifer*). The endangered California least tern (*Sterna antillarum browni*) forages in the project area as do many other diving waterbirds (NAVFAC Southwest 2010, NAVFAC Southwest and Port of San Diego 2011).

3.1.2.5 Deep Subtidal (>-20 ft MLLW)

Deep subtidal habitat includes the overlying surface water, water column, and sediments for areas greater than 20 ft (6 m) in depth, constituting about 4,440 ac (34 percent) of the bay surface area and is associated primarily with navigational channels (Figure 3.1-1). All of the project area on the east side of the fuel pier is deep subtidal, ranging from 30 to 73 ft deep. Approximately half of the area west of the southern portion of the fuel pier is also deep subtidal, ranging from 20 to 28 ft (6 to 9 m) deep; the shallowest deep subtidal area is adjacent to the quay wall (Figure 3.1-1). The current bait barge location, as well as both proposed temporary bait barge relocation options, are within deep subtidal habitat. All of the 10.6 ac proposed to be dredged occur in deep subtidal habitat.

The deep subtidal water column is home to phytoplankton and zooplankton, including species that spend their entire lives (holoplankton), or only a portion of their life cycle, e.g., as eggs, larvae, or juveniles (meroplankton), in the plankton. For the meroplankton, which includes many fish and invertebrates, an important function of the deep subtidal environment is transport into and out of the relatively warm, sheltered waters of the bay, which provide nursery habitats. The most common fish species found here are round stingray, spotted sand bass, and bat ray (*Myliobatis californica*) (NAVFAC Southwest and Port of San Diego 2011).

Diving birds, including the California least tern, forage in the open water and especially along the bay margins where schooling fish concentrate. Other common bird species include cormorants, grebes, the surf scoter (*Melanitta perspicillata*), the elegant tern (*Sterna elegans*), and other tern species.

3.1.2.6 Proposed Temporary Relocation of the Navy MMP

The marine environment at the proposed temporary Navy marine mammal relocation site is similar to that of the existing location. Like the present site, the relocation site at NMAWC is previously developed and located in the north bay. All surrounding upland areas are fully developed as buildings, parking lots, or manicured lawns with no remaining natural habitat. The proposed relocation site is also similar to the existing and proposed fuel pier location, with the exception that marinas typically have lower concentrations of piles and more light availability (NAVFAC Southwest 2010). Marinas 548 and 607 are used for recreational purposes (e.g., small sailboats). Navy Explosive Ordnance Disposal (EOD) Training and Evaluation Unit One uses Pier 619.

As of 2011, there was 0.67 ac of eelgrass and an additional 0.32 ac of habitat that historically supported eelgrass located within the proposed temporary Navy marine mammal enclosure relocation site (Figure 3.1-3). This area is also within designated least tern breeding habitat. The closest known sea lion haulout location is at navigational buoy Green 1, approximately 1,500 ft south of the proposed temporary Navy marine mammal enclosure relocation site.

3.1.2.7 Dredged Material Beneficial Reuse Site

The proposed beneficial reuse site at the SSTC is similar to but more homogeneously sandy and with less cobble than the Imperial Beach site that was evaluated in the Draft EA. The SSTC site consists of subtidal soft-bottom/sandy habitat that experiences seasonally varying low to moderate wave energy (NAVFAC Southwest 2011). The sediment composition of this area is similar to that of the proposed dredge site (Table 2-10). Cobble substrate exists in deeper water offshore, but there are no indications of kelp offshore or in the proposed disposal area (NAVFAC Southwest 2011) and kelp beds have not occurred historically in this area (North and MBC Applied Environmental Sciences 2001). Species typical of open-coast, sandy subtidal habitats are present and the biological community is dominated by filter- and deposit-feeding invertebrates and their predators (NAVFAC Southwest 2011).

3.1.3 Environmental Consequences

3.1.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to biological resource habitats and communities based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.



Figure 3.1-3
Eelgrass Beds in the Vicinity of the Proposed Temporary Navy Marine Mammal Enclosure Relocation Site

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a, 2012

3.1.3.2 Avoidance and Minimization Measures

Before proceeding with the project, the Navy would obtain the required CWA Section 404/RHA Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed to be utilized during the proposed activities to reduce the potential impacts habitats and communities. Fisheries (Section 3.2), Birds (Section 3.3), Marine Mammals (Section 3.4), and Threatened and Endangered Species (Section 3.5) contain additional Avoidance and Minimization Measures applicable to those specific resources.

1) Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities.

2) In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage.

3) The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site.

4) Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water.

5) All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate.

6) During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence.

7) The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore would not be used for any purpose.

3.1.3.3 Alternative 1 Pier Replacement and Associated Dredging

Pier demolition, pier construction, and turning basin dredging activities for Alternative 1 would cause minor and temporary impacts to existing vegetated and nonvegetated soft bottom benthic

communities within the project area. Organisms occurring in the immediate area may be lost or displaced during demolition, construction, and dredging activities, either directly by equipment and noise associated with these activities or indirectly by exposure to temporary changes in suspended sediments, turbidity, dissolved oxygen, and light diffusion. As discussed in Section 3.7, *Hazardous Materials and Wastes*, resuspended sediments and associated high turbidity levels would decrease to background levels within a period of several hours after demolition or construction activities stop due to dilution and to particles settling and mixing. Potential impacts to plankton communities could include a localized decrease in primary productivity due to reduced photosynthesis. However, sediment resuspension, increased turbidity, or chemical changes would be limited to the areas of bottom disturbance and would persist for less than one hour following the disturbance. Therefore, the increased turbidity would not significantly impact benthic or water column habitats in the project area.

Pier demolition would impact benthic community resources (infauna and epifauna) by disturbing some organisms due to pile driving and removal. Some infaunal species (e.g., polychaete worms) and some epifaunal species (e.g., sea cucumbers) within the area would be disturbed or lost as a result of these activities, including pier piling epifauna (e.g., sea stars), due to pile removal. However, benthic species are expected to recolonize within a relatively short period of time from adjacent undisturbed areas, and new artificial structures would be available. Overall, the project would decrease the amount of bay shading by 5,315 square feet (sf)/0.12 ac, which represents less than 0.085 percent of the bay's 131 ac shaded by piers, docks, and marinas and 11 ac shaded by bridges (NAVFAC Southwest 2010). The amount of artificial habitat (pier pilings) would also be reduced. Pier demolition would have a low potential for mobilizing sediment contaminants into the water column; concrete, wood, steel, and plastic debris would be removed via barge cranes, then transported for recycling or disposed in a landfill. Therefore, implementation of Alternative 1 would not result in significant impacts to water quality or aquatic life due to pier demolition or construction.

The turning basin area to be dredged is, and would remain, deep subtidal habitat. As such, other than incrementally increasing the depth of the deep subtidal habitat, no permanent change would result from turning basin dredging. Any benthic flora within the immediate project area would be eliminated by the dredging activities because of site excavation and substrate removal. However, given the depths of dredging, no vegetation is expected to occur within the dredging footprint. Invertebrates within the dredging footprint would either be lost or relocated with the sediment and are expected to recover from the disturbance upon completion of dredging activities. Some of the lost invertebrates would likely be from mortality due to entrainment during the dredging process (Reine and Clark 1998). Any fish in the area should be capable of avoiding project equipment. Any impacts to marine algae and meioflora would be localized, minimal, and not significant. Dredged material would be moved to a previously permitted disposal site. Therefore, turning basin dredging may have some adverse, but less than significant, impacts to marine life.

A survey for the invasive alga *Caulerpa taxifolia* would be conducted before initiating in-water project activities, consistent with NMFS and California Department of Fish and Wildlife

(CDFW) requirements (NMFS 2008). If *Caulerpa taxifolia* is found in the study area during this survey, NMFS-approved *Caulerpa* Control Protocols would be followed. Therefore, Alternative 1 would not result in significant impacts to special aquatic sites due to *Caulerpa*.

Eelgrass is the only special aquatic site found in the project area. The nearest permanent eelgrass monitoring transect, North Bay (NB) 3, is approximately 490 ft southwest of the fuel pier, inshore of Pier F-122. Other nearby transects include NB4 on the south side of Shelter Island, approximately 1,540 ft northeast of the fuel pier, and NB2, on the opposite side of the harbor channel, approximately 3,020 ft to the east of the fuel pier. During development of the pier design, the pier alignment was positioned to minimize eelgrass disturbance. Similarly, sheet piling would be left in place to minimize sediment and eelgrass disturbance. However, not all eelgrass could be avoided, and approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded by construction of the new fuel pier. Eelgrass and additional habitat that historically supported eelgrass that would be shaded represent a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively). In conjunction with the *Caulerpa* survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Therefore, deconstruction of the fuel pier and construction of the proposed fuel pier would not result in significant impacts to marine plants and no significant effects to special aquatic sites would occur, and any loss would be applied against the established eelgrass mitigation bank.

Both proposed bait barge temporary relocation sites are located over deep subtidal habitat and would not shade any eelgrass. Therefore, the temporary relocation of the bait barges would not result in any impacts to habitats or communities.

The beach and adjacent strand/coastal scrub vegetation southward of the project site, which is also part of the PLECA, would not be used for any purpose. Therefore, implementation of Alternative 1 would not result in significant impacts to the PLECA, wandering skipper butterfly, or Nuttall's lotus. Similarly, neither upland nor shoreline habitat would be significantly impacted since all development that would occur is either on land previously developed or is within the marine environment. Therefore, implementation of Alternative 1 would not result in significant impacts to marine or terrestrial plants, habitats, or communities, including special aquatic sites.

Proposed Temporary Relocation of the Navy MMP and the Navy Marine Mammal Enclosures

Since the relocation of the marine mammal enclosures used for the Navy MMP is temporary, potential impacts resulting from such relocation would also be temporary. As stated in Section 3.1.2.6, Pier 619 and Marinas 548 and 607 are actively used. Furthermore, the surrounding upland area is fully developed with no remaining natural habitat and there is no designated critical habitat for any species in the project vicinity. The only HAPC is eelgrass (Figure 3.1-3), much of which is growing, or has previously grown, under the active pier and marinas. One permanent

eelgrass monitoring transect, NB5, is located between Pier 619 and Marina 548 (NAVFAC Southwest 2008). Since the bottom of the Navy marine mammal enclosures consists of mesh and is not an opaque, solid structure, any eelgrass underlying the enclosures would be only partially shaded. Approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass, would be partially shaded by the proposed temporary relocation of the Navy marine mammal enclosures. Temporary impacts at NMAWC would be offset by the Navy's established eelgrass mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. As such, the temporary relocation of the Navy MMP and the marine mammal enclosures would have no adverse effect on upland habitats or species, and impacts to marine habitats and species would be minor. Therefore, the temporary relocation of the Navy MMP and the marine mammal enclosures would not result in significant impacts to marine or terrestrial plants, habitats, or communities, including special aquatic sites.

Dredged Material Beneficial Reuse Site

The same conclusions apply to the SSTC site as were reached in the Draft EA for the Imperial Beach site. Sediment deposition at the beneficial reuse site would temporarily bury epifaunal/infaunal habitat and the associated organisms. The sediments would be similar in composition to and compatible with the naturally occurring sediments. Waves and currents would rapidly disperse the mound of deposited sediment, resulting in no long-term alteration of habitat conditions in the area of deposition. The inshore beach habitat would be enhanced by the addition of sand. The constituent species of the nearshore and beach environments are adapted to natural sand migration and episodes of burial/unburial, and are expected to locally redistribute in response to changes in depth such that no long-term effects on invertebrate or fish populations are expected (City of Encinitas *et al.* 2008, SANDAG and USACE 2011). No significant impact on habitats or communities would occur.

3.1.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on biological resource habitats and communities as a result of Alternative 2.

3.1.3.5 Mitigation Measures

Because potential impacts to biological resource habitats and communities would be localized, would cease upon completion of project activities, and, with the implementation of avoidance and minimization measures described previously, would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.1.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated

dredging of the turning basin would not occur and existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact on biological resource habitats and communities.

3.2 FISH

3.2.1 Definition of Resource

This section describes the fish species and their habitats that occur in the northern San Diego Bay project area. This section includes EFH as designated under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801).

3.2.2 Affected Environment

3.2.2.1 Fish Species

Numerous surveys have been conducted over the last few decades in the San Diego Bay region to quantify fish diversity and abundance; among the most comprehensive were surveys by Allen *et al.* (2002) and the Vantuna Research Group (2006, 2009). These and other works related to fish and EFH were characterized by Merkel & Associates, Inc. (NAVFAC Southwest 2010). Approximately 90 species of bottom living and open water fishes occur in the bay. There is a greater variety of fish species in the north bay area than in the south bay, and the greatest fish diversity can be found at artificial reefs. Increased levels of flushing found in the north bay also increases food availability, the supply of larval recruits, and water quality (NAVFAC Southwest 2010). Sandy floors and eelgrass have approximately two-thirds the species diversity of artificial reefs; piers and rock riprap have approximately one-half the fish diversity of artificial reefs. Marinas, launch ramps, and muddy bottoms have the least diversity of all areas in the north bay. The 10 most common fish species sampled in the north bay, each with over 500 individuals found between July 1994 and April 1999, make up approximately 98 percent of the total sample. These 10 fish species are:

- Northern anchovy (*Engraulis mordax*)
- Topsmelt (*Atherinops affinis*)
- Pacific sardine (*Sardinops sagax caeruleus*)
- Slough anchovy (*Anchoa delicatissima*)
- California grunion (*Leuresthes tenuis*)
- Shiner surfperch (*Cymatogaster aggregata*)
- Giant kelpfish (*Heterostichus rostratus*)
- Round stingray (*Urolophus halleri*)
- Bay pipefish (*Syngnathus leptorhynchus*)
- Cheekspot goby (*Ilypnus gilberti*)

The northern anchovy (62 percent) and topsmelt (22 percent) were the most abundant species. Additional fish species sampled with 100-500 individuals found, accounting for 1.5 percent of the total sample, include:

- Jacksmelt (*Atherinopsis californiensis*)
- Barred pipefish (*Syngnathus auliscus*)

- California halibut (*Paralichtyhys californicus*)
- Barred sand bass (*Paralabrax nebulifer*)
- Black surfperch (*Embiotoca jacksoni*)
- Kelp bass (*Paralabrax clathratus*)
- Dwarf surfperch (*Micrometrus minimus*)
- Spotted sand bass (*Paralabrax maculatofasciatus*)
- Queenfish (*Seriphus politus*)
- Bay blenny (*Hypsoblennius gentilis*)
- Spotted turbot (*Pleuronichthys ritteri*)

Just below the quay wall immediately south of the fuel pier access way, the water is approximately 10 to 14 ft deep; the depth increases to as much as 28 ft near the southern portion of the fuel pier. Water depth north of the fuel pier access way ranges from 0 ft along the rock riprap to as much as 16 ft near the northern portion of the fuel pier. The nearshore habitat along the seawall and rock riprap is expected to contain marine algae, invertebrates, and fish species typically associated with shoreline to deep subtidal habitats. Based on Allen *et al.* (2002), areas extending out from the seawall that are deeper than -18 ft MLLW are likely to contain:

- Dungeness crab (*Cancer magister*)
- Pacific rock crab (*Cancer anternnarius*)
- Red tube worm (*Surpula vermicularis*)
- Giant green anemone (*Anthopleura xanthogrammica*)

Typical fish species expected to be found in and around shallow water intertidal habitats include:

- Juvenile northern anchovy (*Engraulis mordax*)
- Pacific sardine (*Sardinops sagax*)
- California grunion (*Leuresthes tenuis*)
- Shiner surfperch (*Cymatogaster aggregata*)
- Round stingray (*Urolophus halleri*)
- Spotted sand bass (*Paralabrax maculatofasciatus*)
- Bat ray (*Myliobatis californica*)
- Topsmelt (*Atherinops affinis*)

Eelgrass beds, such as those that occur within the project area, are recognized as nursery habitat for many species. Typical fish species associated with eelgrass and subtidal unvegetated habitats include shiner surfperch, black surfperch, spotted kelpfish (*Gibbonsia elegans*), giant kelpfish, Pacific seahorse (*Hypocampus ingens*), bay blenny, dwarf surfperch, kelp bass, reef finspot (*Paraclinus integripinnis*), barred pipefish and bay pipefish. Although density and abundance of infaunal species are usually considerably higher in eelgrass beds than in unvegetated soft bottom habitats (NAVFAC Southwest 2000), Merkel & Associates, Inc. found the greatest abundance of infaunal species in the north bay among rock riprap (NAVFAC Southwest 2010).

Fish associated with deep subtidal habitats include California horned shark (*Heterodontus francisi*), shovelnose guitarfish (*Mustelus californicus*), bat ray, round stingray, Pacific sardine, northern anchovy, slough anchovy, jacksmelt, topsmelt, pipefish, basses, croakers, surfperches, Pacific mackerel (*Scomber japonicus*), and turbots (NAVFAC Southwest 2000).

While there is no commercial fishing within the bay, at least 15 fish species inhabiting the bay support commercial or recreational fisheries elsewhere in southern California waters. Examples of notable fishery populations found in the bay include California halibut and white seabass (*Atractoscion nobilis*) (Vantuna Research Group 2009). At least 58 species are involved in the recreational catch (NAVFAC Southwest 2011).

Fishes typical of southern California surf zone and shallow sandy habitats are expected at the SSTC reuse site, including small, active planktivores (e.g., anchovies, sardines, jacksmelt, queenfish); roving substratum feeders, especially croakers (Sciaenidae); benthic flatfishes (e.g., sanddab [*Citharichthy stigmaeus*] California halibut); beach spawners (California grunion); and piscivores (e.g., barred sand bass, sharks) (Allen and Pondella 2006).

3.2.2.2 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth the EFH provisions to identify and protect important habitats of federally managed marine and anadromous fish species. Section 305(b)(2) of the amended Magnuson-Stevens Act directs each Federal Agency to consult with the NMFS with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the Magnuson-Stevens Act. Implementing regulations for this requirement are at 50 CFR 600. Because the project area is located within an area designated as EFH for two Fishery Management Plans (FMPs) – the Pacific Coast Groundfish (Pacific Fishery Management Council [PFMC] 2011) and the Coastal Pelagic Species (PFMC 1998a) – and may adversely affect EFH, the U.S. Navy is required to consult with NMFS. As such, a complete, written assessment of the effects of the Proposed Action on EFH is provided in Appendix E.1 and is summarized in this EA.

The Pacific Coast Groundfish FMP manages at least 89 species, 5 of which are likely to occur within the San Diego Bay project area (NAVFAC Southwest 2000; Allen *et al*. 2002; Vantuna Research Group 2006, 2009; PFMC 2011), and the FMP for Coastal Pelagic Species includes five species, four of which are likely to occur in the San Diego Bay project area (PFMC 1998a). These species are listed in Table 3.2-1; additional details, such as life histories, are provided in Appendix E.1. Coastal pelagic species are those fish that live in the water column, from the surface to -3,300 ft MLLW. Although groundfish species are considered demersal and generally live on or near the sea floor, they occupy diverse habitats at all stages in their life histories.

Table 3.2-1. Fish Species with EFH Likely to Occur in the Proposed San Diego Bay Project Area

Common Name	*Scientific Name*
Coastal Pelagics	
Northern anchovy	*Engraulis mordax*
Pacific sardine	*Sardinops sagax*
Jack mackerel	*Trachurus symmetricus*
Pacific mackerel	*Scomber japonicas*
Groundfish	
Curlfin sole	*Pleuronichthys decurrens*
English sole	*Pleuronichthys vetulus*
California scorpionfish	*Scorpaena guttata*
Grass Rockfish	*Sebastes rastrelliger*
Leopard shark	*Triakis semifasciata*

In terms of EFH, the proposed SSTC reuse site is essentially the same as the Imperial Beach site evaluated in the Draft EA and in the EFH Assessment (Appendix E.1), although the SSTC site is more homogeneously sandy and has less cobble. As compared to the San Diego Bay project area, the same Coastal Pelagic Species are expected, whereas a larger number of managed groundfish species, especially rockfish and skates, occur and have EFH, in the sediment disposal/beneficial reuse area at the SSTC (Appendix E.1; NAVFAC Southwest 2011a). The bait barge relocation sites are the in the same (deep subtidal) habitat as the existing location of the barges.

EFH that is considered to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, may also be identified by NMFS as HAPCs. HAPCs may include high value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning and rearing of fish and shellfish. The Pacific Coast Groundfish FMP identifies several HAPCs (PFMC 2011), one of which, seagrass, occurs within the project area due to the presence of eelgrass (Merkel & Associates, Inc. 2009; NAVFAC Southwest 2012).

3.2.2.3 Vessel Traffic and the Ambient Underwater Soundscape

As illustrated by Table 3.2-2, San Diego Bay is heavily used by commercial, recreational, and military vessels, with an average of 82,413 vessel movements (in or out of the bay) per year. This equates to about 225 vessel transits per day, a majority of which are presumed to occur during daylight hours. The number of transits does not include the estimated 200,000 recreational boaters that use San Diego Bay (San Diego Harbor Safety Committee 2009).

Table 3.2-2. Port of San Diego Average Annual Vessel Traffic

Vessel Type	**Vessel Movements (Inbound And Outbound)**		
	Subtotal by Vessel Type		*Total*
	Cargo	*Others*	
Total Annual Movements for All Vessel Types			**82,413**
Deep Draft Commercial Vessel (Cargo plus Cruise)			1,175
Cargo Ships (largest vessel: 1,000 ft length, 106 ft beam, 41 ft draft)		740	
Bulk	20		
Container Ships	100		
General Cargo	180		
Roll On/Roll Off	440		
Cruise Ships (largest vessel: 1,000 ft length, 106 ft beam, 34 ft draft)		435	
Excursion Ships (largest vessel: 222 ft length, 57 ft beam, 6 ft draft)		68,000	68,000
Commercial Sportfishing (average vessel size: 123 ft length, 32 ft berth, 13 ft draft)		10,094	10,094
Military (largest vessel: 1,115 ft length, 252 ft beam (flight deck), 39 ft draft)		3,144	3,144

Note: Tug traffic was not included in the above statistics since inner harbor tug movements alone exceed 7,000 for a typical year.

Source: San Diego Harbor Safety Committee 2009.

Based on acoustic monitoring of ship noise in Glacier Bay, Alaska (Kipple and Gabriele 2007), sound source levels from a variety of vessel types and sizes are typically within the range of 160-170 decibels (dB) at 1 m. Ship noise occurs over a broad frequency range (roughly 100 hertz [Hz] to 35 kilohertz [kHz]), with peak noise at higher frequency for smaller vessels. Ship noise thus has the potential to obscure underwater sound that would otherwise emanate from the project site to locations farther up the bay or offshore through the mouth.

In the project area, extensive measurements were made of underwater noise levels during and April and June 2012 (Appendix E.5). Mean and median values were predominantly in the range of 120-130 dB referenced at 1 microPascal (abbreviated as re 1µPa), with substantially higher intermittent sound in excess of 150 dB re 1µPa due to passing ships, and sound energy concentrated between 100 Hz and 2 kHz, broadly overlapping the peak frequencies expected for pile driving.

3.2.3 Environmental Consequences

3.2.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to fisheries based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

Impacts to fisheries associated with Alternative 1 or Alternative 2 would be primarily from increased underwater noise and turbidity associated with demolition of the fuel pier, construction of the new fuel pier, and dredging of the turning basin. No impacts to fish associated with the movement of the bait barges between the existing and either proposed relocation site would occur. For pile driving and extraction associated with fuel pier construction, as well as pile driving at the proposed temporary Navy MMP relocation site, the Navy worked with researchers from the University of Washington to develop a rigorous model of underwater transmission loss, taking into account site-specific bathymetry and shoreline characteristics. The model's description, the duration of the activities upon which the model is based, and the model's results (predicted underwater sound contours) are summarized below. Additional details related to the analysis are provided in Appendix E.1, and Section 3.2.3.3 discusses the predicted impacts to fish based on this model.

Duration of Activities

In conjunction with MMPA compliance (Section 3.4), proposed in-water construction and demolition work has been broken down into three consecutive 1-year periods, beginning on 30 September 2013. The planned activities and their durations during each year are summarized below.

Year 1

Pile Driving. No work would begin on the Proposed Action until all required permits and approvals are in place. A total of 554 piles would be installed for the new pier (see Table 2-7). For the temporary facilities for the Navy MMP at NMAWC, 13 12-inch square and 19 16-inch diameter existing piles would be removed and repositioned; 46 new 16-inch diameter concrete piles would be installed as well. At both locations, pile driving would occur only during daylight hours, nominally 7:00 A.M. to 4:00 P.M, Monday through Friday.

It is assumed that the contractor will drive approximately two steel piles per day, and five concrete or fiberglass piles per day. Each pile is assumed to require up to 2 hours of driving. Steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile driver. Working assumptions are 1-1.5 hours of vibratory pile driving and up to 0.5 hour of impact pile driving for each steel pile. Concrete and fiberglass piles would be jetted, then driven with an impact pile driver only; sound levels are much lower for these types of piles.

The currently proposed construction schedule includes the following non-overlapping, consecutive episodes of pile driving:

- Removal and repositioning of 13 12--inch (in) square and 19 16-inch diameter concrete piles, as well as installation of 46 new16-inch diameter concrete pile to support the relocated facilities of the Navy MMP to NMAWC. Pile driving is estimated to occur over an 8-week period.
- Installation of steel indicator piles to occur over 17 days.
- Installation of steel temporary dolphin piles to occur over 5 days.
- Installation of 24 steel abutment piles to occur over 13 days.
- Installation of approximately 26 steel structural piles over 15 days.

Steel piles are assumed to be a mix of 36- and 48-in diameter. As noted above, pile driving would likely occur on only a few hours of each day.

Pile Extraction. Pile removal and driving at NMAWC is estimated to occur over an 8-week period. Demolition of the existing pier would occur at the rate of approximately five piles per day. Demolition of the north segment of the existing pier is scheduled to occur within the period of this Proposed Activity. There are no steel piles in the north segment; only 12-in timber piles, 18- and 24-in square concrete piles, and 13-in diameter plastic piles. Demolition of the north segment of the pier is scheduled to occur in 2014. That activity is estimated to require 84 days, with approximately one-fourth of the effort involving pile removal, a portion of which may involve the use of a vibratory extractor. For this analysis, it is assumed that vibratory pile extraction could occur on up to 21 days.

Year 2

Pile Driving. During the second year of construction, there would be several non-overlapping episodes of pile driving, including:

- Steel structural piles for the access pier, 45 days
- Fiberglass-concrete secondary fender piles for the access pier, 10 days. Since this would occur in the same timeframe as concrete pile driving (see below), which generates louder sound, this source does not need to be modeled.
- Steel structural piles, 45 days
- Steel mooring dolphin piles, 12 days
- Concrete primary fender piles, 15 days

Pile Extraction. No in-water demolition activities are scheduled during year 2.

Year 3

Pile Driving. During the third year of construction, there would be several episodes of pile driving, including:

- Concrete primary fender piles, 15 days
- Fiberglass-concrete secondary fender piles, 12 days

- Steel mooring dolphin piles, 12 days
- Steel abutment piles, 10 days

The abutment piles and mooring dolphin piles would be driven within the same timeframe, over a combined 12-day period.

Pile Extraction. Demolition of the remaining structure is estimated to require 154 days, with vibratory extraction occurring on approximately one-fourth of those days (39 days). It is assumed that removal of the 24 concrete-filled steel piles would require vibratory extraction on 6 of the 39 days.

Underwater Sound Model Description

Underwater sound levels received at a given distance from an acoustic source such as pile driving are a function of the source level and transmission loss (TL). Empirically measured source levels from similar pile driving events were used to estimate pile driving sound source levels for this project. TL underwater is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for TL is:

$$TL = B * \log10(R) + C * R, \text{ where}$$

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R = ratio of receiver distance to source reference distance (usually 1 m or 10 m)

As widely used in the evaluation of underwater sound from pile driving, linear loss (C) is assumed equal to zero, and "practical spreading" (B=15) is assumed, resulting in the formula for transmission loss is $TL = 15 * \log10(R)$. For this analysis, however, a site-specific model was developed for TL from pile driving at a central point at the project site. The model is based on historical temperature-salinity data and location-dependent bathymetry. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. For pile driving at the Navy MMP relocation site (NMAWC), no site-specific modeling was conducted, and practical spreading loss is assumed.

To estimate the sound exposure level (SEL) to which a fish at a given location would be exposed through multiple hammer strikes, a simple summation procedure is used where total SEL = Single Strike SEL + 10log (number of strikes), with a maximum of 100 repeat strikes per pile and 2 piles per day.

Model Results

The results of the model, predicted sound "contours" emanating from different sources, are shown in Figures 3.2-1 through 3.2-7. The figures reflect the conventional assumption of a "sound shadow" effect, wherein sound transmission from the source is truncated and not reflected where it intercepts a shoreline or structure. Although the influence of Zuniga Jetty was not modeled, it is reasonable to assume that project sound would not propagate east of the jetty (Dahl 2012). Hence, the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and narrower in reality than shown in the figures.



Figure 3.2-1
Underwater Sound from Impact Pile Driving,
36-48 " Steel Piles (Source = 195 dB rms)



Figure 3.2-2
Underwater Sound from Vibratory Pile Driving, 36-48” Steel Piles
(Source = 180 dB rms)



Figure 3.2-3
Underwater Sound from Impact Pile Driving,
24” Concrete Piles (Source = 176 dB rms)



Figure 3.2-4
Underwater Sound from Impact Pile Driving,
16” Fiberglass-Concrete Piles (Source = 173 dB rms)



Figure 3.2-5
Underwater Sound from Impact Pile Driving at Marine Mammal Relocation Site, 18" Concrete Piles (Source = 173 dB rms)



Figure 3.2-6
Underwater Sound from Vibratory Steel Pile Extraction
(Source = 172 dB rms)



Figure 3.2-7
Underwater Sound from Vibratory Non-Steel Pile Extraction
(Source = 160 dB rms)

Seaward of the entrance to the bay, underwater noise from vessels moving into and out of the bay would presumably fill in and dominate the underwater soundscape across the frequency range of pile driving, masking sound that is of lesser amplitude than typical vessel noise of 150-160 dB (Kipple and Gabrielle 2007). As such, the extension of the model 4-5 kilometers (km) south of the entrance is considered sufficient to cover all scenarios in which fish or marine mammals might reasonably be expected to respond to sound from pile driving or extraction.

3.2.3.2 Avoidance and Minimization Measures

Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following:

1) Sheet piling would be left in place to minimize sediment and eelgrass disturbance.
2) In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage.
3) The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site.
4) Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water.
5) During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence.

The following avoidance and minimization measure would be implemented during the proposed pile driving and dredging activities.

1) Prior to the start of pile driving or dredging each day, after each break of more than 30 minutes, and if any increase in the intensity is required, the Navy would use a ramp-up procedure. The procedure involves a slow increase in the pile driving to allow animals in the area to disperse.

3.2.3.3 Alternative 1 Pier Replacement and Associated Dredging

The primary impacts to fish communities and habitats in the project vicinity would be from pile installation and removal, which would result in increased underwater noise. Since many fish

use their swim bladders for buoyancy, they are susceptible to rapid expansion/decompression due to peak pressure waves from underwater noises (Hastings and Popper 2005). At a sufficient level, this exposure can be fatal. In 2008, NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), CDFW, and transportation agencies of California, Oregon, and Washington agreed in principle to assess project effects using Interim Criteria for Injury to Fish from Pile Driving Activities (Fisheries Hydroacoustics Working Group 2008). These interim criteria are provided in Table 3.2-3. The criteria were developed principally for endangered salmonids in the Northwest and are conservative, indicating the potential for the identified effect, rather than a likelihood of occurrence (Popper and Hastings 2009, Halverson *et al.* 2011). The Navy has not adopted these criteria.

Table 3.2-3. Interim Criteria for Fish Injury and Disturbance by Underwater Sound from Pile Driving

Effect	*Size of Fish*	*Underwater Impact Pile Driving Criteria*	*Underwater Vibratory Pile Driving Criteria*
Onset of Injury	All fish	206 dB peak re: 1µPa	N/A
	≥ 2 grams	187 dB SEL re: 1µPa^{2}sec	N/A
	< 2 grams	183 dB SEL re: 1µPa^{2}sec	N/A
Behavioral Impacts	All fish	150 dB rms re: 1µPa	150 dB rms re: 1µPa

Note: N/A = not available; rms = root mean square; SEL = sound exposure level.

Transmission losses based on the model or practical spreading were calculated and mapped with geographic information system Geographic Information System (GIS) data, resulting in the underwater sound contours provided above (Figures 3.2-1 through 3.2-7). Zones of Influence (ZOIs) corresponding to the interim criteria were then calculated for each of the project underwater sound sources (Table 3.2-4). The table also provides the maximum number of days per year for each activity and corresponding ZOI. In general, areas of potential injury are small and limited to the immediate area of pile driving, whereas the areas of potential behavioral effects, particularly for steel pile installation are relatively large, up to 10.8 square kilometers (km^2). The 206 dB injury threshold would only be exceeded during impact installation of the steel piles, and only encompassing 0.0022 km^2, within about 26 m of the pile driver. It is unlikely that fish would remain this close to the pile being driven after the ramp-up period. The areas encompassing the weight-based criteria for potential injury are somewhat larger (Table 3.2-4), but there is little evidence for injurious effects to fish at these SELs (Popper and Hastings 2009, California Department of Transportation [Caltrans] 2010, Halverson *et al.* 2011).

Since the relocation of the marine mammal enclosures used for the Navy MMP is temporary, potential impacts to fish resulting from such relocation would also be temporary. Fish up to a distance of 341 m from the pile driving location may be disturbed by underwater sound in excess of 150 dB, but the areas of potential injurious effects are very small (Table 3.2-4 and Figure 3.2-5), and fish would be expected to disperse away from or avoid the area during pile

driving rather than remain stationary and risk injury. Therefore, there would be no adverse effect from sound levels on fisheries or EFH under the Magnuson-Stevens Act from the temporary relocation of the Navy marine mammal enclosures to Pier 619 and Marinas 548 and 607.

Fish species occurring in the immediate areas identified could also be displaced during project activities indirectly by temporary changes in suspended sediments, turbidity, dissolved oxygen, and changes in light diffusion. However, fish present during project activities should be capable of avoiding project equipment and areas affected by increased turbidity and increased noise from pile driving, concrete removal, and turning basin dredging. Furthermore, most if not all of the fish species occurring in the area routinely experience turbid and noisy conditions due to natural processes and ship traffic within the bay.

Table 3.2-4. Calculated ZOIs Corresponding to Interim Criteria for Fish

Description	*Area of Potential ZOI (km²)*						
	Source, dB peak @ 10m	*Source, dB rms @ 10m*	*Source, dB SEL @ 10m*	*All Fish Injury – 206 dB peak*	*Fish ≥2g Injury – 187 dB SEL*	*Fish < 2g Injury - 183 dB SEL*	*All Fish Behavior 150 dB rms*
Impact driving steel piles	210	195	180	0.0022	0.1949	0.5718	10.8251
Vibratory driving steel piles	195	180	180	N/A	N/A	N/A	4.0519
Impact driving 24-in concrete piles	188	176	166	0	0.0010	0.0052	2.3583
Impact driving 16-in concrete-fiberglass piles	184	173	163	0	0.0003	0.0014	1.3123
Impact driving 18-in concrete piles at marine mammal relocation site	184	173	163	0	0.0002	0.0008	0.2397
Vibratory extraction – steel piles	180	172	172	N/A	N/A	N/A	1.0240
Vibratory extraction – non-steel piles	170	160	160	N/A	N/A	N/A	0.0240

Notes: All sound levels expressed in dB re 1 µPa rms. dB = decibel; in = inch; N/A = not applicable; rms = root-mean-square; µPa = micropascal pile driving sound sources based on Caltrans 2009; Washington State Department of Transportation (WSDOT) 2010, 2012; NMFS 2010. SELs for fish injury were calculated by assuming 200 hammer strikes per day.

Typically, environmental assessments for San Diego Bay projects have considered the addition of hard substrate an environmental benefit to fishes because the attached fouling community serves as forage for fish. As such, the reduction of hard substrate that would result from implementation of Alternative 1 could be considered an adverse effect. However, such a reduction would represent a minor portion of the artificial hard substrate found within the bay

and would not result in a significant impact. Furthermore, any adverse impact from artificial hard substrate reduction would be offset by the beneficial effect resulting from the decrease in pier shading and the corresponding increase in light availability.

Dredging would result in the behavioral displacement of bottom-dwelling invertebrates and fish as well as their removal (and likely mortality) by entrainment in the dredge (Reine and Clarke 1998). The fish species most common and likely to be affected include rays and flatfishes (NAVFAC Southwest 2010). The proposed dredging area comprises about 10 ac, which is roughly 0.25 percent of the deep subtidal habitat in San Diego Bay (TDI 2011). The effects on habitat as well as species' populations would be minimal in terms of percentages affected, and temporary as fish would recolonize the area following the cessation of disturbance. Similar conclusions were reached by the USACE and regulatory agencies in review of the much larger San Diego Harbor Maintenance Dredging Project (USACE 2012), which is contiguous with the proposed fuel pier dredging.

Greater potential for turbidity impacts would exist if there were substantial amounts of fine sediments and organisms in the potential dredging area. However, testing of samples of material to be dredged indicated that grain sizes are predominately of coarser beach compatible grain sands, which is consistent with areas that consistently generate currents during tidal flushing (NAVFAC Southwest 2010). This material settles quickly instead of remaining suspended in the water column. On the beneficial side, dredging could increase water circulation, indirectly benefit fish resources, and dredging activities can suspend infauna and epifauna to temporarily enhance fish feeding activities. However, any such changes would be negligible given that the boundaries, bathymetry, configuration, and use of the piers would remain essentially unchanged. Thus, any minor changes to water circulation or bathymetry would not result in an adverse impact on EFH per the Magnuson-Stevens Act or per NEPA.

The deposition of dredged sediments for nearshore sand replenishment at SSTC would have minor, temporary effects due to altered bottom topography and turbidity, but no persistent effects on the fish community, and no adverse effect on EFH. No significant impacts are associated with sediment disposal.

As described above, implementation of Alternative 1 would result in adverse impacts to fish species and communities. However, due to the temporary and limited nature of the project activities within a limited geographic area, and since fish species would return to the project area following the completion of in-water activities, implementation of Alternative 1 would not result in significant impacts to fish communities. Impacts to EFH under the Magnuson-Stevens Act are discussed in detail in Appendix E.1 and are summarized in the EFH section below.

Essential Fish Habitat

The Navy consults with NMFS regarding actions, such as the proposed project, that have the potential to adversely affect EFH. Appendix E.1 contains the detailed EFH Assessment, which supported consultation. The Navy has addressed NMFS concerns regarding EFH, and NMFS and the Navy have agreed on conservation measures to be implemented. The Conservation

Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action.

Of the approximately 90 species of fish previously identified in San Diego Bay, 9 are managed by the NMFS under two FMPs - the Coastal Pelagics and Pacific Groundfish Management Plans (PFMC 1998a, 1998b, 2011). Four are managed under the Coastal Pelagics FMP: northern anchovy, pacific sardine, pacific mackerel, and jack mackerel. Five species are covered under the Pacific Groundfish FMP and occur, although not in abundance, in San Diego Bay: California scorpionfish, grass rockfish, English sole, curlfin sole, and leopard shark (NAVFAC Southwest 2010, NAVFAC Southwest and Port of San Diego 2011).

Two species (northern anchovy and Pacific sardine) can be found throughout San Diego Bay. Jack mackerel were only found at the north bay survey area and Pacific mackerel were found at all but the southern survey station (Allen *et al.* 2002). All of these species are highly transient, are not tied to artificial substrates, and routinely experience turbid and noisy conditions due to natural processes and ship traffic within the bay.

Impacts from in-water project activities and the associated precautionary measures of either project alternative would be the same as described for other fish communities in the "Fisheries" section above. Namely, noise and turbidity associated with in-water construction and deconstruction activities would temporarily displace EFH species within a limited scope. Pier removal would reduce the algal and invertebrate production associated with encrusting communities on the pilings but would only impact eelgrass by increasing turbidity. When combined, these impacts would result in adverse effects per the Magnuson-Stevens Act but would not be considered significant under NEPA due to the temporary and limited nature of the impacts.

During development of the pier design, the pier alignment was positioned to minimize eelgrass disturbance and reduce the amount of eelgrass habitat shaded. However, not all eelgrass could be avoided. Approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. Eelgrass and additional habitat that historically supported eelgrass that would be shaded represent a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively). Thus, there would be a minimal, adverse effect to EFH from pier construction under the Magnuson-Stevens Act, although this impact would be minimized by using the Navy's established eelgrass mitigation bank. This impact would be further minimized by the increased abundance, diversity, and biomass found near the outer margins of pier structures compared to open water areas, as discussed in detail in Appendix E.1.

Approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass, would be partially shaded by the proposed temporary relocation of the Navy marine mammal enclosures. Temporary impacts at NMAWC would be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. As such, the temporary relocation of the Navy MMP and the marine mammal enclosures would have no adverse effect to EFH.

Both of the proposed bait barge temporary relocation sites are located over deep subtidal habitat and would not shade any eelgrass. Therefore, the temporary relocation of the bait barges would not result in any impacts to essential fish habitat.

Although there would be reduced artificial hard substrate, sunlight in the water column would be increased and the net effect of the reduced artificial substrate would be negligible. Over time, algae and invertebrates would be expected to colonize the new pier. To the extent that structural and/or shaded habitats would be preferred or avoided by certain species, utilization of the project sites by different fish species may shift slightly toward or away from the project site relative to the existing condition. Considering this, and the characteristics of the EFH species that may potentially occur in the project area and the habitat characteristics of the area itself, there would be no adverse effect to EFH from the small reduction of artificial hard substrate.

The use of dredged sediments for nearshore sand replenishment at SSTC would have minor, temporary effects on the substrate and water column, but no adverse effects on EFH (Appendix E.1).

3.2.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on fisheries as a result of Alternative 2.

3.2.3.5 Mitigation Measures

Because potential impacts to fisheries would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.2.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to fisheries.

3.3 BIRDS

3.3.1 Definition of Resource

This section describes birds within or adjacent to areas directly or indirectly affected by the proposed project. The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703 *et seq.*) and the Migratory Bird Conservation Act (16 USC 715 *et seq.*) of 18 February 1929 (45 Stat. 1222) are the primary legislation in the United States established to conserve migratory birds. These statutes

implement the United States' commitment to four bilateral treaties, or conventions, with Canada, Mexico, Russia, and Japan for the protection of a shared migratory bird resource. The MBTA prohibits the taking, killing, or possessing of migratory birds, or the parts, nests, or eggs of such birds, unless permitted by regulation. The species of birds protected by the MBTA are listed in Title 50, Section 10.13 (50 CFR 10.13) and represent almost all avian species found in North America. All of the species mentioned below are protected under the MBTA.

Migratory bird conservation relative to non-military readiness is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order (EO) 13186, signed 10 January 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The MOU between the Department of Defense (DoD) and the USFWS was signed on 31 July 2006. DoD responsibilities discussed in the MOU include, but are not limited to:

1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities.
2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents.
3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in INRMPs.
4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation.
5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds.
6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and if necessary, conferring with the service on revisions to these conservation measures.

Section 3.5, *Threatened and Endangered Species*, provides detailed information on the California least tern.

3.3.2 Affected Environment

The project area is located on the Point Loma side of northwestern San Diego Bay and includes man-made structures, nearshore habitat, and open water habitat. Bird abundance in shoreline areas ranges from 1-5 birds per hectare per month northeast of the fuel pier; 6-20 birds per hectare per month along the proposed Navy MMP temporary relocation site at NMAWC and to the north, south, and southeast of the fuel pier; and 101-292 birds per hectare per month near the bait barges. Bird richness ranges from 1-10 unique species east of the bait barges and southeast of the proposed Navy MMP temporary relocation site; and 11-25 unique species west of the bait barges, surrounding the fuel pier, and east of the proposed Navy MMP relocation site (NAVFAC Southwest and Port of San Diego 2011, TDI 2011). Bird abundance in open-water areas is throughout potentially affected portions of the northern bay, including the bait barge relocation sites, averaging 1-5 birds per hectare per month (TDI 2011).

San Diego Bay is part of a major bird migratory pathway, the Pacific Flyway, and supports large populations of over-wintering birds traveling between northern breeding grounds and southern wintering sites. More than 300 migratory and resident bird species have been documented to use San Diego Bay, including shore birds, gulls, marsh birds, and other waterfowl (NAVFAC Southwest and Port of San Diego 2011). Some of the most common waterfowl and seabird species in the bay include surf scoter (*Melanitta perspicillata*), eared grebe (*Podiceps nigricollis*), scaup species, bufflehead (*Bucephala albeola*), California brown pelican (*Pelecanus occidentalis californicus*), elegant tern (*Sterna elegans*), Heermann's gull (*Larus heermanni*), double-crested cormorant (*Phalacrocorax auritus*), Forster's tern (*Sterna forsteri*), California least tern (*Sternula antillarum browni*), mallard (*Anas platyrhynchos*), and great blue heron (*Ardea herodias*) (NAVFAC Southwest and Port of San Diego 2011, TDI 2011). Several species, as noted below, are considered sensitive by the USFWS or CDFW. See Section 3.5, *Threatened and Endangered Species*, for more detailed information on the California least tern.

Federal or state bird species of concern with the potential to occur in the project area include the double-crested cormorant, harlequin duck (*Histrionicus histrionicus*), California gull (*Larus californicus californicus*), common loon (*Gavia immer*), American merlin (*Falco columbiarus columbiarus*), osprey (*Pandion haliaetus carolinensis*), California brown pelican, black oystercatcher (*Haematopus bachmani*), elegant tern, great blue heron, black-crowned night heron (*Nycticorax nycticorax*), American peregrine falcon (*Falco peregrinus anatum*), and Forster's tern. Most of these species are considered sensitive only where breeding or nesting occurs, and there are no breeding seabirds in the project area. These birds use intertidal flats, shallow water habitat, or man-made structures for breeding or resting, similar to areas adjacent to the project area. However, the San Diego Bay National Wildlife Refuge, located at the southeast end of the bay, contains the greatest amount of intertidal mud flats and is well removed from the project area (NAVFAC Southwest and Port of San Diego 2011).

The bait barge relocation sites are in essentially the same habitat as the existing barges (deep subtidal), although farther from the mouth of the bay, and in similar proximity to the shoreline and areas of activity. The beach and nearshore waters at the SSTC reuse site are essentially identical to the nearby Imperial Beach site evaluated in the Draft EA in terms of use by shore- and waterbirds, respectively (NAVFAC Southwest 2011a, SANDAG and USACE 2011).

3.3.3 Environmental Consequences

3.3.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to birds based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

3.3.3.2 Avoidance and Minimization Measures

Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities (Section 3.1.3.2). Avoidance and minimization measures to protect California least terns are provided in Section 3.5.3.2.

3.3.3.3 Alternative 1 Pier Replacement and Associated Dredging

Nearshore waters are the primary breeding habitat for many seabird species. Project activities would result in increases in noise and human activity, and decreases in water quality in the project area, during demolition, construction, and turning basin dredging. These activities may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring.

Responses to noise from pile driving would be limited to short-term behavioral or physiological responses (e.g., alert response, startle response, and temporary increase in heart rate). Noise from pile driving close to shore could have a short-term adverse impact on nesting and nearshore breeding species. However, human activity such as vessel or boat movement, and equipment setting and movement, could cause seabirds to flee the activity area before the onset of pile driving. If seabirds were in the activity area, they would likely flee the area prior to, or just after, the initial strike of the pile at the beginning of the ramp-up procedure. In-air pile driving noise is not likely to disrupt major behavior patterns, such as migrating, breeding, feeding, and sheltering, or to result in serious injury to any seabirds.

Information regarding the impacts from acoustic sources on seabirds and the ability for seabirds to hear underwater is virtually unknown. The exposure to underwater sounds by seabirds, other than pursuit diving species, is likely to be very limited due to spending a very short time under water (plunge-diving or surface-dipping) or breeding only at the water surface. Pursuit divers may remain under water for minutes, increasing the chance of underwater sound exposure. However, assuming that a seabird disturbed by an underwater sound would avoid the stressor by swimming to the surface, a physiological impact, such as hearing loss, would only occur if a seabird is close to an intense sound source. Furthermore, birds are generally less susceptible to both temporary and permanent threshold shift than mammals (Saunders and Dooling 1974), so an underwater sound exposure would have to be intense and of a sufficient duration to cause temporary or permanent threshold shift. Avoiding the sound by returning to the surface would further limit the potential for extended or multiple sound exposures underwater. Therefore, any impacts would be short-term, localized, and would not impact bird populations.

Both of the proposed bait barge temporary relocation sites are similar to the existing location in that they are located over deep subtidal habitat. The temporary relocation of the bait barges may result in localized changes in bird densities but would otherwise not result in any impacts to birds. Area birds normally resting on the bait barges are not expected to follow the barges to their new (temporary) location at Harbor Island East. The birds on the bait barges are predominantly cormorants, western gulls, herons, and pelicans. The cormorants and herons nest in the eucalyptus trees at NBPL near the existing bait barge location. Pelicans nest in offshore islands. All three of these species are tightly tied to their nesting sites and would likely

remain at or near their nesting sites despite the relocation of their intermittent resting site on the bait barges. Since the primary activity for the birds at the bait barges is loafing and their primary breeding area is in the north bay and offshore, the birds are expected to stay in the north bay area and to find another intermittent resting location or locations. At NBPL, they may find such a resting location at Navy piers such as the Magnetic Silencing Pier or the beach area shoreward of that pier.

Dredging and in-water construction impacts would also alter fish behavior due to increased underwater noise levels (see Section 3.2, *Fisheries*), which may make fish more or less available as prey. However, impacts to marine birds are anticipated to be highly localized because marine birds are wide-ranging and have a large breeding habitat available in and around San Diego Bay relative to the breeding area that might be impacted by construction activities within the project area. Furthermore, these impacts would not be significant because of their limited duration and because birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Bird perches on the existing fuel pier would be lost. However, this is not expected to create a significant impact to migratory birds, as there are several other structures in San Diego Bay that could be used for this purpose and because migratory birds are expected to recolonize the new fuel pier once constructed. Additionally, no in-water demolition, construction, or dredging activities would occur during the least tern breeding season without the Navy first consulting with the USFWS.

Temporary relocation of the bait barges would have no impact on bird populations because other structures provide suitable perch sites throughout the northern bay, and the barges would remain in the same habitat.

Sediment deposition at the SSTC nearshore replenishment site would have minor, temporary, and hence non-significant effects on breeding and foraging conditions due the presence of the barge and turbidity.

In conclusion, implementation of Alternative 1 would not have a significant adverse effect under the MBTA and there would be no significant impacts on other non-migratory marine bird habitat or populations. Potential effects on California least tern are discussed in Section 3.5, *Threatened and Endangered Species*.

3.3.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on birds as a result of Alternative 2.

3.3.3.5 Mitigation Measures

Because potential impacts to birds would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.3.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to birds.

3.4 MARINE MAMMALS

3.4.1 Definition of Resource

This section describes marine mammals and the habitats in which they occur within areas directly or indirectly affected by the proposed project. Marine mammals are protected from "taking" under the Federal Marine Mammal Protection Act (MMPA) of 1972. Taking is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." The term harassment is defined under the MMPA as any act of pursuit, torment, or annoyance that has the potential to do one or both of the following:

- Injure a marine mammal or marine mammal stock in the wild
- Disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering

As the project may result in non-injury takes of marine mammals under the MMPA, the Navy is consulting with NMFS on methods to minimize potential takes and has applied for and will obtain an Incidental Harassment Authorization (IHA) for anticipated takes before beginning underwater demolition and pile driving activities.

3.4.2 Affected Environment

Recognizing that the results from regional offshore surveys for marine mammals are not representative of northern San Diego Bay, the Navy has conducted marine mammal surveys in the project area beginning in 2007 and continuing through March 2012 (Merkel & Associates, Inc. 2008; U.S. Pacific Fleet 2009-2012; TDI 2012). Boat survey routes (Figure 3.4-1) established in 2007, which enable the detection of all marine mammals throughout the project area, have been resurveyed on 16 occasions, 12 of which were during the seasonal window for in-water construction (16 September – 31 March) and are hence applicable to the assessment of potential occurrence during pile driving activities. The Navy's IHA application and this analysis rely primarily on these surveys for the baseline on the species and numbers of marine mammals that occur in the activity area.



Source: TDI 2012

Figure 3.4-1
Navy Marine Mammal Survey Routes

Figure 3.4-2 shows the locations of all marine mammals documented in the Navy's surveys of the project area. Of the approximately 41 marine mammal species that occur in southern California waters (Carretta *et al.* 2012), only 3 year-round species and 1 migratory species are expected to occur in the general area of northern San Diego Bay and/or the immediate offshore waters. These include two pinnipeds - the U.S. stock of California sea lion (*Zalophus californianus*) and California stock of harbor seal (*Phoca vitulina richardii*); and two cetaceans – the California coastal stock of bottlenose dolphin (*Tursiops truncatus*) and the Eastern North Pacific stock of the gray whale (*Eschrichtius robustus*) (Navy 2010, NAVFAC Southwest and Port of San Diego 2011). Other species that occur in the Southern California Bight (SCB) may have the potential for isolated occurrence within San Diego Bay or just offshore (Navy 2010), but are very unlikely to occur in the affected Project Area, are expected to have zero density within potential acoustic zones of influence, and hence are not considered further. None of the four species that are likely to occur are listed under the Endangered Species Act (ESA), whereas all are protected under the MMPA. The relative abundance of these species in the project area is summarized in Table 3.4-1.

Table 3.4-1. Marine Mammals Occurring in the Vicinity of Naval Base Point Loma

Species	*Stock Abundance*[1]	*Relative Occurrence in North San Diego Bay*	*Season(s) of Occurrence*	*Abundance in the Project Area (density)*[2]
California sea lion *Zalophus californianus* U.S. Stock	296,750	Abundant	Year-round	Average 63.0 individuals in ZOI (5.48/km^2)
Harbor seal *Phoca vitulina* California stock	30,196 (CV= 0.157)	Uncommon, localized	Year-round	≤ 3 individuals in ZOI (≤ 0.26/km^2)
Bottlenose dolphin *Tursiops truncatus* California coastal stock	323 (CV = 0.13)	Occasional	Year-round	Average 8.8 individuals in ZOI (0.77/km^2)
Gray whale *Eschrichtius robustus* Eastern North Pacific Stock	19,126 (CV = 0.071)	Rare visitor	Late winter	≤1 individual (≤ 0.09/km^2)

Notes: CV= coefficient of variation; km^2 = square kilometers; ZOI = zone of influence.

Sources: [1]NMFS marine mammal stock assessment reports (Carretta *et al.* 2012, Allen and Angliss 2010). [2]Abundances from Navy Marine Mammal Surveys and monitoring (Merkel & Associates, Inc. 2008; U.S. Pacific Fleet 2009-2012; TDI 2012; Jenkins 2012) sightings within the maximum ZOI for vibratory pile driving (11.49 km^2).



Figure 3.4-2
Marine Mammal Occurrences in the Project Area (Navy Surveys)

The U.S. stock of California sea lion and the California stock of harbor seal can be commonly found at haulout sites on the mainland and on navigation buoys, barges, and docks within California harbors. California sea lions and harbor seals do not typically haul out at the same location at the same time. Within and adjacent to San Diego Bay, California sea lions are the dominant and by far the most numerous pinniped observed, which may explain the absence of harbor seals from most of the area. California sea lions are especially abundant on the bait barges, which are relatively close to the fuel pier and are within the ZOI for potential harassment.

In the Navy's surveys, harbor seals have only been observed hauled out along the shore south of Ballast Point, outside of the ZOI for project pile driving activities, or elsewhere outside of the potential ZOI. However, harbor seals were observed in Navy monitoring of another project at Pier 122, roughly 250 m south of the fuel pier (Jenkins 2012; location shown on Figure 3.4-2). Therefore, harbor seals are considered potentially present and affected within the ZOI for harassment.

The Eastern North Pacific stock of gray whale occurs off southern California during their annual migration between summer feeding areas in the Bering and southern Chukchi seas and winter calving areas in Baja California and mainland Mexico. While gray whales may occasionally be found within a kilometer of shore during both their southward and northward migration periods, they are generally found farther offshore (Navy 2010). There has been only a single sighting of gray whales (one juvenile) during the Navy's surveys. Although this individual was outside of the ZOI for potential harassment by pile driving (TDI 2012; location shown on Figure 3.4-2), it likely crossed through the ZOI, and on rare occasions, individual gray whales have entered San Diego Bay and lingered for up to 2 weeks (NAVFAC Southwest and Port of San Diego 2011, Jenkins 2012). Therefore, the gray whale is considered potentially present and affected within ZOIs for behavioral harassment.

The California coastal stock of the bottlenose dolphin is a toothed whale (odontocete) that regularly inhabits the nearshore waters of southern California. This species regularly moves along the California coast and occasionally enters northern San Diego Bay. This particular stock has limited site fidelity and can be distributed anywhere between Monterey to northern Baja Mexico depending on localized prey abundance (Navy 2011). Bottlenose dolphins have been sighted with increasing regularity in San Diego Bay (TDI 2012, Jenkins 2012).

The species accounts that follow are drawn from the Navy's IHA Application, which provides additional detail.

3.4.2.1 California Sea Lion

Status and Management

The California sea lion is now considered to be a full species, separated from Galapagos sea lion (*Z. wollebaeki*) and the extinct Japanese sea lion (*Z. japonicus*) (Carretta *et al.* 2012). The breeding areas of the California sea lion are on the Channel Islands, western Baja California, and the Gulf of California. Mitochondrial DNA analysis of California sea lions has identified five genetically distinct geographic populations: (1) Pacific Temperate, (2) Pacific Subtropical, (3) Southern Gulf

of California, (4) Central Gulf of California, and (5) Northern Gulf of California. The Pacific Temperate population makes up the U.S. stock and includes rookeries within U.S. waters and the Coronado Islands just south of the U.S.-Mexico border. The U.S. stock of California sea lion is not considered strategic or depleted.

Distribution

More than 95 percent of the U.S. Stock breeds and gives birth to pups on San Miguel, San Nicolas, and Santa Barbara islands. Some movement has been documented between the U.S. Stock and Western Baja California, Mexico Stock, but rookeries in the United States are widely separated from the major rookeries of western Baja California. Smaller numbers of pups are born on San Clemente Island, the Farallon Islands, and Año Nuevo Island (Lowry *et al.* 1991). The California sea lion is by far the most commonly-sighted pinniped species at sea or on land in the vicinity of NBPL and northern San Diego Bay. In California waters, sea lions represented 97 percent (381 of 393) of identified pinniped sightings at sea during the 1998–1999 NMFS surveys (Carretta *et al.* 2000). They were sighted during all seasons and in all areas with survey coverage from nearshore to offshore areas (Carretta *et al.* 2000). Sea lions, while potentially present at-sea, are most commonly seen hauled-out on piers and buoys within and leading into San Diego Bay (Merkel & Associates, Inc. 2008). In a study of California sea lion reaction to human activity, Holcomb *et al.* (2009) showed that, in general, sea lions are rather resilient to human disturbance.

Population Abundance

The entire population cannot be counted because all age and sex classes are never ashore at the same time. In lieu of counting all sea lions, pups are counted when all are ashore, in July during the breeding season, and the number of births is estimated from pup counts (Carretta *et al.* 2012). The size of the population is then estimated from the number of births and the proportion of pups in the population. Based on these censuses, the U.S. stock has generally increased from the early 1900s, to a current estimate of 296,750, with a minimum estimate of 153,337 (Carretta *et al.* 2012). There are indications that the California sea lion may have reached or is approaching carrying capacity, although more data are needed to confirm that leveling in growth persists (Carretta *et al.* 2012).

San Diego Bay hosts a resident non-breeding population of California sea lions, numbers of which fluctuate as individuals move between the bay and rookeries on offshore islands. The Navy has conducted numerous marine mammal surveys overlapping the north San Diego Bay project area and the potential ZOI for impact and vibratory pile driving operations. California sea lions regularly occur on rocks, buoys and other structures, and especially on bait barges (Figure 3.4-3), although numbers vary greatly. Surveys were conducted along two survey routes through the northern part of the bay during 2007-2008 (Merkel & Associates, Inc. 2008). These transect surveys were recently repeated with minor modifications to thoroughly cover the northern part of the bay (U.S. Pacific Fleet 2009-2012, TDI 2012).

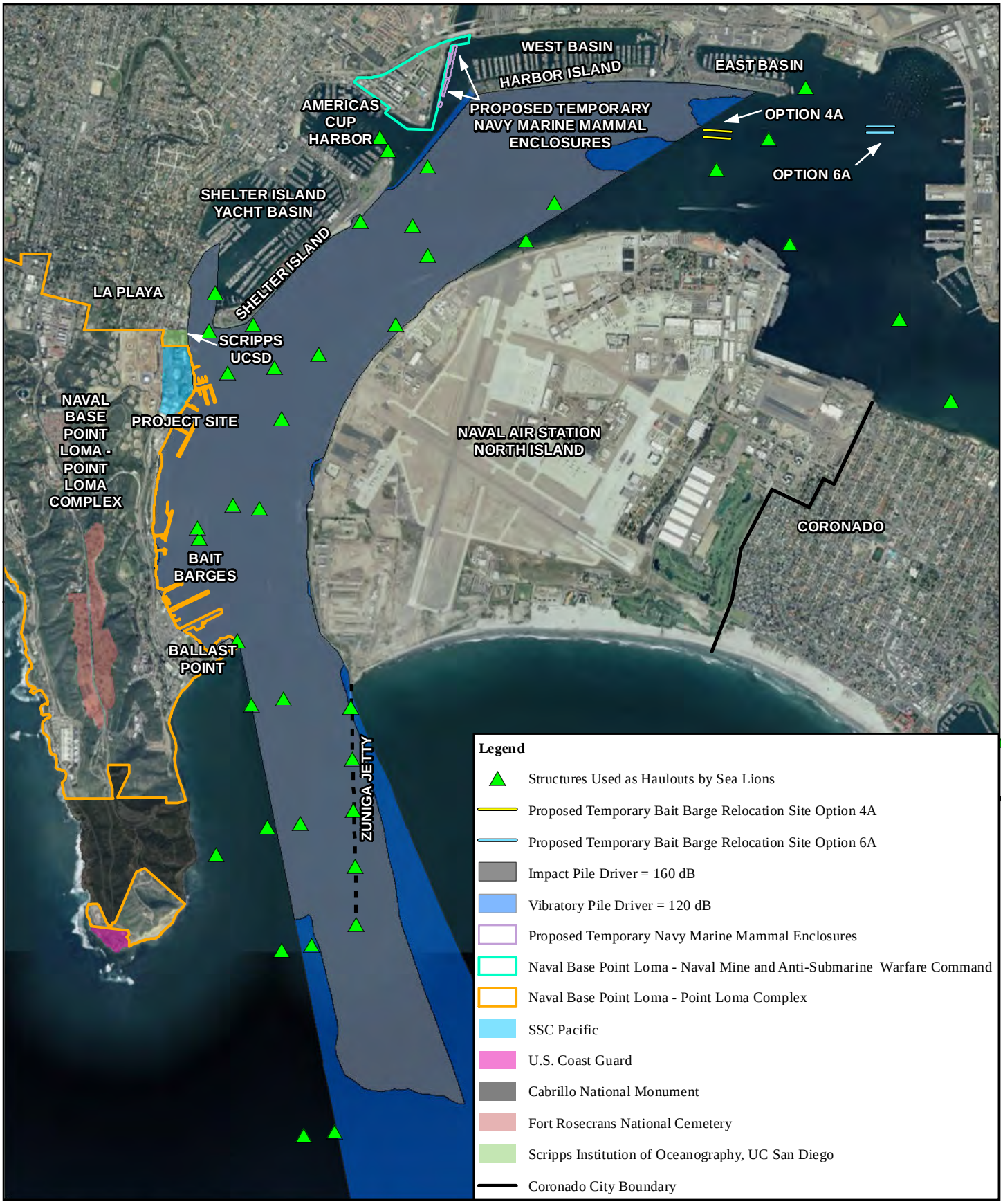


Figure 3.4-3
Structures Used as Haulouts by Sea Lions

Based on the survey results, the average abundance of sea lions within the maximum project ZOI in northern San Diego Bay is 63.00 individuals, which translates to a site-specific density estimate of 5.48 individuals/km^2.

Behavior and Ecology

California sea lions are gregarious during the breeding season and social on land during other times. California sea lions' food consists of squid, octopus, and a variety of fishes. While no studies have occurred of their diet in the bay, studies of food sources have been done in other California coastal areas (Antonelis *et al.* 1990, Lowry *et al.* 1990, Melin *et al.* 1993, Hanni and Long 1995, Henry *et al.* 1995). Fish species found in the bay that sea lions most likely feed on include spiny dogfish, jack mackerel, Pacific herring, Pacific sardine, and northern anchovy. They also eat octopus and leopard shark (NAVFAC Southwest and Port of San Diego 2011).

California sea lions show a high tolerance for human activity (Holcomb *et al.* 2009), modify their breeding in response to spatial and temporal variations in the availability of different prey species (Lowry *et al.* 1991), and make opportunistic use of almost any available structures as haulouts (NAVFAC Southwest and Port of San Diego 2011).

Acoustics

On land, California sea lions make incessant, raucous barking sounds; these have most of their energy at less than 2 kHz (Schusterman *et al.* 1967). Males vary both the number and rhythm of their barks depending on the social context; the barks appear to control the movements and other behavior patterns of nearby conspecifics (Schusterman 1977). Females produce barks, squeals, belches, and growls in the frequency range of 0.25 to 5 kHz, while pups make bleating sounds at 0.25 to 6 kHz. California sea lions produce two types of underwater sounds: clicks (or short- duration sound pulses) and barks (Schusterman *et al.* 1966, 1967; Schusterman and Baillet 1969), both of which have most of their energy below 4 kHz (Schusterman *et al.* 1967).

The range of maximal hearing sensitivity underwater is between 1 and 28 kHz (Schusterman *et al.* 1972). Functional underwater high frequency hearing limits are between 35 and 40 kHz, with peak sensitivities from 15 to 30 kHz (Schusterman *et al.* 1972). The California sea lion shows relatively poor hearing at frequencies below 1 kHz (Kastak and Schusterman 1998). Peak hearing sensitivities in air are shifted to lower frequencies; the effective upper hearing limit is approximately 36 kHz (Schusterman 1974). The best range of sound detection is from 2 to 16 kHz (Schusterman 1974). Kastak and Schusterman (2002) determined that hearing sensitivity generally worsens with depth—hearing thresholds were lower in shallow water, except at the highest frequency tested (35 kHz), where this trend was reversed. Octave band noise levels of 65 to 70 dB above the animal's threshold produced an average temporary threshold shift (TTS) of 4.9 dB in the California sea lion (Kastak *et al.* 1999). Center frequencies were 1 kHz for corresponding threshold testing at 1 kHz and 2 kHz for threshold testing at 2 kHz; the duration of exposure was 20 minutes.

3.4.2.2 Harbor Seal

Status and Management

Harbor seals, which are members of the family Phocidae ("true seals"), inhabit coastal and estuarine waters and shoreline areas from Baja California to western Alaska. For management purposes, differences in mean pupping date (i.e., birthing), movement patterns, pollutant loads and fishery interactions have led to the recognition of three separate harbor seal stocks along the west coast of the continental U.S. The three distinct stocks are: 1) inland waters of Washington State (including Hood Canal, Puget Sound, and the Strait of Juan de Fuca out to Cape Flattery), 2) outer coast of Oregon and Washington, and 3) California (Carretta *et al.* 2012). The California stock is the only stock that is expected to occur within the Project Area. The California Stock of harbor seal is not considered strategic or depleted under the MMPA.

Distribution

Harbor seals are considered abundant throughout most of their range from Baja California to the eastern Aleutian Islands. An unknown number of harbor seals also occur along the west coast of Baja California, at least as far south as Isla Asuncion, which is about 100 miles south of Punta Eugenia. Peak numbers of harbor seals haulout on land during late May to early June, which coincides with the peak of their molt. They favor sandy, cobble, and gravel beaches (Stewart and Yochem 1994), with multiple haulouts identified along the California mainland and Channel Islands (Carretta *et al.* 2012).

Population Abundance

Based on post-breeding counts of individuals at known haulouts, corrected for the proportion of the population that is out at sea, the population estimate for the California stock of harbor seal is 30,196 (coefficient of variation [CV] = 0.157). The minimum population size is estimated as 26,667, with numbers apparently stabilizing during the past decade (Carretta *et al.* 2012). Harbor seals are relatively uncommon within San Diego Bay. Sightings in the Navy transect surveys of northern San Diego Bay cited above were limited to individuals outside of the ZOI, on the south side of Ballast Point. Therefore, the use of transect data would result in a density estimate of zero, which is unrealistic given the known occurrence of harbor seals in the general vicinity and the likelihood that a small number of individuals could occur (TDI 2012; Jenkins 2012). The Navy Marine Species Density Database (Hanser *et al.* 2012) developed an estimate for all of the waters of the Southern California Range Complex during winter and spring of 0.0202/km^2. Recent observations suggest the occurrence of 3 individuals within the ZOI just south of the Fuel Pier for approximately 1 month during the early spring (Jenkins 2012). Rather than rely on regional density estimates, this EA conservatively assumes the presence of these individuals as recently observed within the ZOI, for up to 30 days during the period of in-water activities.

Behavior and Ecology

Harbor seals prefer sheltered coastal waters and feed on schooling benthic and epibenthic fish species in shallow water (Bonnell and Dailey 1993). While not studied in the bay, specific prey species have been studied in other California waters (Stewart and Yokem 1985, 1994; Oxman

1993; Henry *et al.* 1995). Of particular note to San Diego Bay are these potential prey species: specklefin midshipman, plainfin midshipman, jack mackerel, shiner surfperch, yellowfin goby, and English sole. Harbor seals also eat octopus, of which two species are found in the bay (NAVFAC Southwest and Port of San Diego 2011). Although their ecological niche in the bay has not been studied, this pinniped is not likely to play a significant role because of their low numbers (NAVFAC Southwest and Port of San Diego 2011). Harbor seals mate at sea and females give birth during the spring and summer, although the "pupping season" varies by latitude.

Acoustics

In air, harbor seal males produce a variety of low-frequency (<4 kHz) vocalizations, including snorts, grunts, and growls. Male harbor seals produce communication sounds in the frequency range of 100 to 1,000 Hz (Richardson *et al.* 1995). Pups make individually unique calls for mother recognition that contain multiple harmonics with main energy below 0.35 kHz (Bigg 1981, Thomson and Richardson 1995). Harbor seals hear nearly as well in air as underwater and had lower thresholds than California sea lions (Kastak and Schusterman 1998). Kastak and Schusterman (1998) reported airborne low frequency (100 Hz) sound detection thresholds at 65.4 dB re 20 µPa for harbor seals. In air, they hear frequencies from 0.25 kHz - 30 kHz and are most sensitive from 6 to 16 kHz (Richardson *et al.* 1995, Terhune and Turnbull 1995, Wolski *et al.* 2003).

Adult males also produce underwater sounds during the breeding season that typically range from 0.025 to 4 kHz (duration range: 0.1 s to multiple seconds; Hanggi and Schusterman 1994). Hanggi and Schusteman (1994) found that there is individual variation in the dominant frequency range of sounds between different males, and Van Parijs *et al.* (2003) reported oceanic, regional, population, and site-specific variation that could be vocal dialects. In water, they hear frequencies from 1 to 75 kHz (Southall *et al.* 2007) and can detect sound levels as weak as 60 to 85 dB re 1 µPa within that band. They are most sensitive at frequencies below 50 kHz; above 60 kHz, sensitivity rapidly decreases.

3.4.2.3 Gray Whale

Status and Management

The Eastern North Pacific stock of gray whale occurs off southern California during their annual migration between summer feeding areas in the Bering and southern Chukchi seas and winter calving areas in Baja California and mainland Mexico. The southward migration occurs during November-December, whereas the return northward migration occurs during February-May. In 1994, due to steady increases in population abundance, the Eastern North Pacific stock of gray whales was removed from listing under the ESA. This stock is not considered strategic or depleted under the MMPA.

Distribution

The Eastern North Pacific population is found from the upper Gulf of California (Tershy and Breese 1991), south to the tip of Baja California, and up the Pacific coast of North America to the Chukchi and Beaufort seas. There is a pronounced seasonal north-south migration. The eastern

North Pacific population summers in the shallow waters of the northern Bering Sea, the Chukchi Sea, and the western Beaufort Sea (Rice and Wolman 1971). The northern Gulf of Alaska (near Kodiak Island) is also considered a feeding area; some gray whales occur there year-round (Moore *et al.* 2007). Some individuals spend the summer feeding along the Pacific coast from southeastern Alaska to central California (Sumich 1984; Calambokidis *et al.* 1987, 2002). Photo-identification studies indicate that gray whales move widely along the Pacific coast and are often not sighted in the same area each year (Calambokidis *et al.* 2002). In October and November, the whales begin to migrate southeast through Unimak Pass and follow the shoreline south to breeding grounds on the west coast of Baja California and the southeastern Gulf of California (Braham 1984, Rugh 1984). The average gray whale migrates 4,050 to 5,000 nautical miles (7,500 to 10,000 km) at a rate of 80 nautical miles (147 km) per day (Rugh *et al.* 2001, Jones and Swartz 2002). Although some calves are born along the coast of California (Shelden *et al.* 2004), most are born in the shallow, protected waters on the Pacific coast of Baja California from Morro de Santo Domingo (28°N) south to Isla Creciente (24°N) (Urbán-Ramírez *et al.* 2003). The main calving sites are Laguna Guerrero Negro, Laguna Ojo de Liebre, Laguna San Ignacio, and Estero Soledad (Rice *et al.* 1981).

Peak abundance of gray whales off the coast of San Diego is January during the southward migration, and in March during the migration north; although females with calves, which depart Mexico later than males or females without calves, can be sighted from March through May or June (Leatherwood 1974, Poole 1984, Rugh *et al.* 2001, Stevick *et al.* 2002, Angliss and Outlaw 2008). Gray whales are infrequent migratory transients offshore of San Diego Bay only during cold-water months (Carretta *et al.* 2000). Migrating gray whales that might infrequently transit the nearshore waters would not be expected to forage, and would likely be present for minutes to less than 1 or 2 hours at typical travel speeds of 3 knots (approximately 3.5 miles per hour) (Perryman *et al.* 1999, Mate and Urbán-Ramirez 2003).

A mean group size of 2.9 gray whales was reported for both coastal (16 groups) and non-coastal (15 groups) areas around San Clemente Island. The largest group reported was nine animals. The largest group reported by U.S. Navy (in 1998) was 27 animals (Carretta *et al.* 2000). Gray whales are not expected in the project area except during the northward migration, when they are closest to the coast (Rice *et al.* 1981).

Population Abundance

The Eastern North Pacific stock has continued to increase at rate of approximately 2.5 to 3.3 percent per year on average, with the most recent estimate of abundance being 19,126 individuals (Allen and Angliss 2010). Gray whales can occur near the mouth of San Diego Bay, and occasionally enter the bay (NAVFAC Southwest and Port of San Diego 2011). However, their occurrence in San Diego Bay is sporadic and unpredictable. Estimates of regional cold season abundance and density in the offshore waters (Hanser *et al.* 2012) are not representative of the project area. Even though gray whale transitory occurrence near the mouth of San Diego Bay is infrequent, for the purposes of the Navy's IHA application prepared as part of the NEPA process for the proposed project, it is conservatively assumed that one individual would be present in the ZOI during up to 15 days of the northward migration.

Behavior and Ecology

Gray whales use their baleen to sift out crustaceans, molluscs, and other invertebrates that they suck from bottom sediments. Bay species of potential benefit to gray whales for food would include medium to large size bivalve molluscs and decapod crustaceans, depending on the spacing between the baleen elements. However, they are unlikely to be feeding in the bay.

Gray whales dive to 160 to 200 ft for 5 to 8 minutes when breeding. In the breeding lagoons, dives are usually less than 6 minutes (Jones and Swartz 2002), although dives as long as 26 minutes have been recorded (Harvey and Mate 1984). Gray whales may remain submerged near the surface for 7 to 10 minutes and travel 1600 ft or more before resurfacing to breathe when migrating. The maximum known dive depth is 560 ft (Jones and Swartz 2002). Migrating gray whales sometimes exhibit a unique snorkeling behavior—they surface cautiously, exposing only the area around the blow hole, exhale quietly without a visible blow, and sink silently beneath the surface (Jones and Swartz 2002). Mate and Urbán-Ramirez (2003) noted that 30 of 36 locations for a migratory gray whale with a satellite tag were in water <330 ft deep, with the deeper water locations all in the SCB within the Channel Islands. Whales in that study maintained consistent speed indicating directed movement. There has been only one study yielding a gray whale dive profile, and all information was collected from a single animal that was breeding off the west coast of Vancouver Island (Malcolm and Duffus 2000, Malcolm *et al.* 1996). They noted that the majority of time was spent near the surface on interventilation dives (<10 ft depth) and near the bottom (extremely nearshore in a protected bay with mean dive depth of 60 ft, range 46-72 ft depth). There was very little time spent in the water column between surface and bottom. Breeding depth on summer feeding grounds is between 160-200 ft (50-60 m) (Jones and Swartz 2002). Based on this very limited information, the following is a rough estimate of depth distribution for gray whales: 50 percent at <13 ft (surface and interventilation dives) and 50 at 13-59 ft. However, most gray whales would be expected at shallower depths during transit through southern California where breeding does not occur due to migration and limited suitable bottom prey habitat.

Acoustics

Au (2000) reviewed the characteristics of gray whale vocalizations. Gray whales produce broadband signals ranging from 100 Hz to 4 kHz (and up to 12 kHz) (Dahlheim *et al.* 1984, Jones and Swartz 2002). The most common sounds on the breeding and feeding grounds are knocks (Jones and Swartz 2002), which are broadband pulses from about 100 Hz to 2 kHz and most energy at 327 to 825 Hz. The source level for knocks is approximately 142 dB re 1µPa at 1 m (Cummings *et al.* 1968). During migration, individuals most often produce low-frequency moans (Crane and Lashkari 1996). The structure of the gray whale ear is evolved for low-frequency hearing (Ketten 1992). The ability of gray whales to hear frequencies below 2 kHz has been demonstrated in playback studies (Cummings and Thompson 1971, Dahlheim and Ljungblad 1990, Moore and Clark 2002). Gray whale responses to noise include changes in swimming speed and direction to move away from the sound source; abrupt behavioral changes from feeding to avoidance, with a resumption of feeding after exposure; changes in calling rates and call structure; and changes in surface behavior, usually from traveling to

milling (e.g., Moore and Clark 2002). Gailey *et al.* (2007) reported no apparent behavioral disturbance for Western Pacific Gray whales in response to low-frequency seismic survey.

3.4.2.4 Coastal Bottlenose Dolphin

Status and Management

The California coastal stock of bottlenose dolphin is distinct from the offshore population and is resident in the immediate (within 1 km of shore) coastal waters, occurring primarily between Point Conception, California, and San Quintin, Mexico. The California Coastal Stock of bottlenose dolphin is not considered strategic or depleted under the MMPA.

Distribution

The bottlenose dolphin California Coastal stock occurs at least from Point Conception south into Mexican waters, at least as far south as San Quintin, Mexico. In southern California, animals are found within 500 m of the shoreline 99 percent of the time and within 250 m 90 percent of the time (Hanson and Defran 1993). Occasionally, during warm-water incursions such as during the 1982–1983 El Niño event, their range extends as far north as Monterey Bay (Wells *et al.* 1990). Bottlenose dolphins in the SCB – the coastal waters between Point Conception and just south of the Mexican border - appear to be highly mobile within a narrow coastal zone (Defran *et al.* 1999), and exhibit little seasonal site fidelity to the SCB region (Defran and Weller 1999) and along the California coast; over 80 percent of the dolphins identified in Santa Barbara, Monterey, and Ensenada have also been identified off San Diego (Navy 2010).

Population Abundance

Based on photographic mark-recapture surveys conducted along the San Diego coast in 2004 and 2005, population size for the California Coastal Stock is estimated to be 323 individuals, with a 95 percent confidence interval of 259-430 (Carretta *et al.* 2012). If the 35 percent of animals encountered that lack identifiable dorsal fin marks were included within this stock, the true population size would be closer to 450-500 animals (Carretta *et al.* 2012). In the aforementioned surveys of San Diego Bay, numbers of coastal bottlenose dolphins were highly variable (from 0 to 40), with an average of 8.8 individuals within the maximum project ZOI.

Behavior and Ecology

The coastal stock utilizes a limited number of fish prey species with up to 74 percent being various species of surfperch or croakers, a group of non-migratory year-round coastal inhabitants (Defran *et al.* 1999, Allen *et al.* 2006). For southern California, common croaker prey species include spotfin croaker, yellowfin croaker, and California corbina, while common surfperch species include barred surfperch and walleye surfperch (Allen *et al.* 2006). The corbina and barred surfperch are the most common surf zone fish where bottlenose dolphins have been observed breeding (Allen *et al.* 2006). Defran *et al.* (1999) postulated that the coastal stock of bottlenose dolphins showed significant movement within their home range (Central California to Mexico) in search of preferred but patchy concentrations of nearshore prey (i.e., croakers and surfperch). Bearzi *et al.* (2009), in an analysis of coastal bottlenose dolphins in the vicinity of Santa Monica, also concluded that low individual re-sighting rates indicates a large coastal

bottlenose dolphin distribution influenced by prey distribution. After finding concentrations of prey, animals may then forage within a more limited spatial extent to take advantage of this local accumulation until such time that prey abundance is reduced; the dolphins then shift location once again to be over larger distances (Defran *et al.*1999, Bearzi *et al.* 2009). Specific prey items of bottlenose dolphins along the California coast were studied by Defran *et al.* (1986). San Diego Bay bottlenose dolphins forage on species such as jack mackerel, Cortez grunt, striped mullet, black croaker, white sea bass, white croaker, spotted croaker, yellowfin croaker, California corbina, queenfish, Pacific mackerel, Pacific bonito, and sierra (NAVFAC Southwest and Port of San Diego 2011).

Acoustics

Sounds emitted by bottlenose dolphins have been classified into two broad categories: pulsed sounds (including clicks and burst-pulses) and narrow-band continuous sounds (whistles), which usually are frequency modulated. Whistles range in frequency from 0.8 to 24 kHz but can also go much higher. Clicks and whistles have a dominant frequency range of 110 to 130 kHz and a source level of 218 to 228 dB re 1 µPa at 1 m (peak to peak levels; Au 1993) and 3.5 to 14.5 kHz with a source level of 125 to 173 dB re 1 µPa at 1 m, respectively (Ketten 1998). The bottlenose dolphin has a functional high-frequency hearing limit of 160 kHz (Au 1993) and can hear sounds at frequencies as low as 40 to 125 Hz (Turl 1993). Inner ear anatomy of this species has been described (Ketten 1992). Electrophysiological experiments suggest that the bottlenose dolphin brain has a dual analysis system: one specialized for ultrasonic clicks and the other for lower-frequency sounds, such as whistles (Ridgway 2000). The audiogram of the bottlenose dolphin shows that the lowest thresholds occurred near 50 kHz at a level around 45 dB re 1 µPa (Nachtigall *et al.* 2000; Finneran and Houser 2006, 2007). Below the maximum sensitivity, thresholds increased continuously up to a level of 137 dB re 1 µPa at 75 Hz. Above 50 kHz, thresholds increased slowly up to a level of 55 dB re 1 µPa at 100 kHz, then increased rapidly above this to about 135 dB re 1 µPa at 150 kHz. Scientists have reported a range of best sensitivity between 25 and 70 kHz, with peaks in sensitivity occurring at 25 and 50 kHz at levels of 47 and 46 dB re 1 µPa (Nachtigall *et al.* 2000).

TTS in hearing have been experimentally induced and behavioral responses observed in captive bottlenose dolphins (Ridgway *et al.* 1997; Schlundt *et al.* 2000, 2006; Nachtigall *et al.* 2003; Finneran *et al.* 2003, 2005, 2007). Ridgway *et al.* (1997) observed changes in behavior at the following minimum levels for 1 second tones: 186 dB re 1 µPa at 3 kHz, 181 dB re 1 µPa at 20 kHz, and 178 dB re 1 µPa at 75 kHz. TTS levels were 194 to 201 dB re 1 µPa at 3 kHz, 193 to 196 dB re 1 µPa at 20 kHz, and 192 to 194 dB re 1 µPa at 75 kHz. Schlundt *et al.* (2000) exposed bottlenose dolphins to intense tones (0.4, 3, 10, 20, and 75 kHz); the animals demonstrated altered behavior at source levels of 178 to 193 dB re 1 µPa, with TTS after exposures between 192 and 201 dB re 1 µPa at 1 m (though one dolphin exhibited TTS after exposure at 182 dB re 1 µPa). Nachtigall *et al.* (2003) determined threshold for a 7.5 kHz pure tone stimulus. No shifts were observed at 165 or 171 dB re 1 µPa, but when the sound level reached 179 dB re 1 µPa, the animal showed the first sign of TTS. Recovery apparently occurred rapidly, with full recovery apparently within 45 minutes following sound exposure. TTS measured between 8 and 16 kHz

(negligible or absent at higher frequencies) after 30 minutes of sound exposure (4 to 11 kHz) at 160 dB re 1 µPa (Nachtigall *et al.* 2004).

3.4.3 Environmental Consequences

3.4.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to marine mammals based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. An impact would be considered significant if it would permanently reduce the population (stock) size or distribution of a marine mammal.

Impacts to marine mammals associated with Alternative 1 or Alternative 2 would be primarily from increased underwater noise associated with demolition of the fuel pier, construction of the new fuel pier, and dredging of the turning basin. For pile driving and extraction associated with fuel pier construction, as well as pile driving at the proposed temporary Navy MMP relocation site, the Navy worked with researchers from the University of Washington to develop a rigorous model of underwater transmission loss, taking into account site-specific bathymetry and shoreline characteristics. The model's description, the duration of the activities upon which the model is based, and the model's results (predicted underwater sound contours) are summarized in Section 3.2.3.1. Additional details related to the underwater noise model's analysis are provided in Appendix E.4.

In addition to the underwater noise model, the predicted number of sea lions and bottlenose dolphins impacted, provided in Section 3.4.3.3, are also based on the spatial distribution of submergence both species, discussed below. The airborne sound propagation model and the take calculation are also discussed below.

Fundamentals of Sound

Sound is a physical phenomenon consisting of regular pressure oscillations that travel through a medium, such as air or water. Sound frequency is the rate of oscillation, measured in cycles per second or Hz. The amplitude (loudness) of a sound is its pressure, whereas its intensity is proportional to power and is pressure squared. The standard international unit of measurement for pressure is the Pascal, which is a force of 1 Newton exerted over an area of 1 square meter; sound pressures are measured in µPa.

Due to the wide range of pressure and intensity encountered during measurements of sound, a logarithmic scale is used, based on the dB, which, for sound intensity, is 10 times the $\log_{10}$ of the ratio of the measurement to reference value. For sound pressure level (SPL), the amplitude ratio in dB is 20 times the $\log_{10}$ ratio of measurement to reference. Hence, each increase of 20 dB in SPL reflects a 10-fold increase in signal amplitude (whether expressed in terms of pressure or particle motion). That is, 20 dB means 10 times the amplitude, 40 dB means 100 times the amplitude, 60 dB means 1,000 times the amplitude, and so on. Because the dB is a relative measure, any value expressed in dB is meaningless without an accompanying reference. In describing underwater sound pressure, the reference amplitude is usually 1 µPa, and is

expressed as "dB re 1 µPa." For in-air sound pressure, the reference amplitude is usually 20 µPa and is expressed as "dB re 20 µPa."

The method commonly used to quantify airborne sounds consists of evaluating all frequencies of a sound according to a weighted filter that mimics human sensitivity to amplitude as a function of frequency. This is called A-weighting and the decibel level measured is called the A-weighted sound level (dBA). Methods of frequency weighting that reflect the hearing of marine mammals have been proposed (Southall *et al.* 2007, Finneran and Jenkins 2012) and are being used in new analyses of Navy testing and training effects, but have not been adopted for pile driving and other non-explosive impulsive sounds (Marine Species Modeling Team 2012). Therefore, underwater sound levels are not weighted and measure the entire frequency range of interest. In the case of marine construction work, the frequency range of interest is 10 Hz to 10 kHz.

Table 3.4-2 summarizes commonly used terms to describe underwater sounds. Two common descriptors are the instantaneous peak SPL and the root mean square (rms) SPL. The peak pressure is the instantaneous maximum or minimum overpressure observed during each pulse or sound event and is presented in dB re 1 µPa. The rms level is the square root of the mean of the squared pressure (= intensity) level as measured over a specified time period. All underwater sound levels throughout the remainder of this application are presented in dB re 1 µPa unless otherwise noted.

Sound Exposure Criteria and Thresholds

Under the MMPA, NMFS has defined levels of harassment for marine mammals. Level A harassment is defined as "Any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild." Level B harassment is defined as "Any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding or sheltering."

Since 1997, NMFS has used generic sound exposure thresholds to determine when an activity in the ocean that produces sound might result in impacts to a marine mammal such that a take by harassment might occur (NMFS 2005). Recent studies of pile driving used to construct offshore wind turbines have validated the distances over which underwater sound from pile driving may exceed NMFS thresholds (Bailey *et al.* 2010), as well as behavioral responses of harbor porpoises (*Phocoena phocoena*) to intense sound from pile driving (Brandt *et al.* 2011, Thompson *et al.* 2010). Current NMFS practice regarding exposure of marine mammals to high level sounds is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB rms or above, respectively, are considered to have been taken by Level A (injurious) harassment.

Level A harassment is assumed to result in a "stress response," which refers to an increase in energetic expenditure that results from exposure to the stressor and which is predominantly characterized by either the stimulation of the sympathetic nervous system or the hypothalamic-pituitary-adrenal axis (Reeder and Kramer 2005). The presence and magnitude of a stress

response in an animal depends on the animal's life history stage, environmental conditions, reproductive state, and experience with the stressor (Navy 2010).

Table 3.4-2. Definitions of Acoustical Terms

Term	*Definition*
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for water is 1 microPascal (µPa) and for air is 20 µPa (approximate threshold of human audibility).
Sound Pressure Level, SPL	Sound pressure is the force per unit area, usually expressed in microPascals where 1 Pascal equals 1 Newton exerted over an area of 1 square meter. The SPL is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressure exerted by the sound to a reference sound pressure. SPL is the quantity that is directly measured by a sound level meter.
Frequency, Hz	Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as hertz (Hz). Typical human hearing ranges from 20 Hz to 20 kHz.
Peak Sound Pressure, dB re 1 µPa	Peak SPL is based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 Hz to 20 kHz. This pressure is expressed in this application as dB re 1 µPa.
Root-Mean-Square (rms), dB re 1µPa	The rms level is the square root of the mean of the squared pressure level(s) as measured over a specified time period. For pulses, the rms has been defined as the average of the squared pressures over the time that comprise that portion of waveform containing 90 percent of the sound energy for one impact pile driving impulse.
Sound Exposure Level (SEL), dB re 1 µPa2 sec	Sound exposure level is a measure of energy. Specifically, it is the dB level of the time integral of the squared-instantaneous sound pressure, normalized to a 1-sec period. It can be an extremely useful metric for assessing cumulative exposure because it enables sounds of differing duration, to be compared in terms of total energy.
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds).
Frequency Spectrum, dB over frequency range	The amplitude of sound at various frequencies, usually shown as a graphical plot of the mean square pressure per unit frequency ($\mu Pa^2/Hz$) over a frequency range (e.g., 10 Hz to 10 kHz in this application).
A-Weighting Sound Level, dBA	The SPL in decibels as measured on a sound level meter using the A- or C-weighting filter network. The A-weighting filter de-emphasizes the low and high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective human reactions to noise.
Ambient Noise Level	The background sound level, which is a composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160 dB rms for impulse sounds (e.g., impact pile driving) and 120 dB rms for continuous noise (e.g., vibratory pile driving), but below injurious thresholds. Behavioral harassment may or may not result in a stress response. The criteria for vibratory pile driving would also be applicable to vibratory pile extraction or the use of a pneumatic chipper. The application of the 120 dB rms threshold can sometimes be problematic because this threshold level can be either at or below the ambient noise level of certain locations. As a result, these levels are considered precautionary (NMFS 2009; 74 CFR 41684). NMFS is developing new

science-based thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall *et al.* 2007). The current Level A (injury) and Level B (disturbance) thresholds are provided in Table 3.4-3.

Table 3.4-3. Injury and Disturbance Thresholds for Underwater and Airborne Sounds

Marine Mammals	*Airborne Marine Construction Criteria (Impact and Vibratory Pile Driving) (re 20 µPa)*	*Underwater Vibratory Pile Driving Criteria (e.g., non-pulsed/ continuous sounds)(re 1 µPa)*		*Underwater Impact Pile Driving Criteria (e.g., pulsed sounds) (re 1 µPa)*	
	Disturbance Guideline Threshold (Haulout)[1]	*Level A Injury Threshold*	*Level B Disturbance Threshold*	*Level A Injury Threshold*	*Level B Disturbance Threshold*
Cetaceans (whales, dolphins, porpoises)	N/A	180 dB rms	120 dB rms	180 dB rms	160 dB rms
Pinnipeds (seals, sea lions, walrus; except harbor seal)	100 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms
Harbor seal	90 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms

Notes: [1]Sound level at which pinniped haulout disturbance has been documented. Not an official threshold, but used as a guideline. N/A = not applicable.

Limitations of Existing Noise Criteria

To date, there is no research or data supporting a response by pinnipeds or odontocetes to continuous sounds from vibratory pile driving as low as the 120 dB threshold. The 120 dB rms threshold level for continuous noise originated from research conducted by Malme *et al.* (1984, 1986) for California gray whale response to continuous industrial sounds such as drilling operations. The 120 dB continuous sound threshold should not be confused with the 120 dB pulsed sound criterion established for migrating bowhead whales in the Arctic as a result of research in the Beaufort Sea (Richardson *et al.* 1995, Miller *et al.* 1999). Southall *et al.* (2007) reviewed studies conducted to document behavioral responses of harbor seals and northern elephant seals to continuous sounds under various conditions, and concluded that those limited studies suggest that exposures between 90 dB and 140 dB re 1 µPa rms generally do not appear to induce strong behavioral responses.

Ambient Noise

Ambient noise by definition is background noise and it has no single source or point. Ambient noise varies with location, season, time of day, and frequency. Ambient noise is continuous, but with much variability on time scales ranging from less than 1 second to 1 year (Richardson *et al.* 1995). Ambient underwater noise in San Diego Bay is highly variable over time, largely because of anthropogenic sources that include vessel engines and cranes, generators, and other types of mechanized equipment on piers and wharves or the adjacent shoreline (Urick 1983).

Underwater sound levels are comprised of multiple sources, including physical noise, biological noise, and anthropogenic noise. Physical noise includes waves at the surface, earthquakes, ice, and atmospheric noise. Biological noise includes sounds produced by marine mammals, fish, and invertebrates. Anthropogenic noise consists of vessels (small and large), dredging, aircraft overflights, and construction noise. Known noise levels and frequency ranges associated with anthropogenic sources similar to those that would be used for this project are summarized in Table 3.4-4. Details of each of the sources are described in the following text.

Table 3.4-4. Representative Noise Levels of Anthropogenic Sources

Noise Source	*Frequency Range (Hz)*[1]	*Underwater Noise Level (dB re 1 µPa)*	*Reference*
Small vessels	250 – 1,000	151 dB rms at 1 m	Richardson *et al.* 1995
Tug docking gravel barge	200 – 1,000	149 dB rms at 100 m	Blackwell and Greene 2002
Vibratory driving of 72-in Steel Pipe pile	10 – 1,500	180 dB rms at 10m	Caltrans 2007
Impact driving of 36-in Steel Pipe pile	10 – 1,500	195 dB rms at 10m	WSDOT 2007
Impact driving of 66-in Cast in Steel Shells (CISS) piles	100 – 1,500	195 dB rms at 10 m	Reviewed in Hastings and Popper 2005

Note: [1]These are the dominant frequency ranges but there is often considerable energy outside these ranges.

In-water construction activities associated with the Project would include impact pile driving and vibratory pile driving. The sounds produced by these activities fall into one of two sound types: pulsed and non-pulsed (defined below). Impact pile driving produces pulsed sounds, while vibratory pile driving produce non-pulsed (or continuous) sounds. The distinction between these two general sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (e.g., Ward 1997 as cited in Southall *et al.* 2007).

Pulsed sounds (e.g., explosions, gunshots, sonic booms, seismic airgun pulses, and impact pile driving) are brief, broadband, atonal transients (American National Standards Institute 1986, Harris 1998) and occur either as isolated events or repeated in some succession (Southall *et al.* 2007). Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a decay period that may include a period of diminishing, oscillating maximal and minimal pressures (Southall *et al.* 2007). Pulsed sounds generally have an increased capacity to induce physical injury as compared with sounds that lack these features (Southall *et al.* 2007).

Non-pulse (intermittent or continuous sounds) can be tonal, broadband, or both (Southall *et al.* 2007). Some of these non-pulse sounds can be transient signals of short duration but without the essential properties of pulses (e.g., rapid rise time) (Southall *et al.* 2007). Examples of non-pulse sounds include vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (Southall *et al.* 2007). The duration of such sounds, as received at a distance, can be greatly extended in highly reverberant environments (Southall *et al.* 2007).

In the project area, extensive measurements were made of underwater noise levels during April-June of 2012 and (Figure 3.4-4 and Appendix E.5). Median values were predominantly in the range of 120-130 dB re 1µPa, with substantially higher maximum rms and peak SPL readings (in excess of 150 dB re 1µPa) due to passing ships. From Section 3.2.2.3, given there are about 225 commercial ship transits per day, most during daylight hours, plus an unknown but potentially equal number of recreational vessels moving in and out of San Diego Bay, underwater noise from passing ships is expected every few minutes in the North Bay. This pattern is expected to continue through the period of demolition and construction activities. The data indicate slightly ambient lower sound levels at the proposed bait barge relocation sites than at their existing location (refer to Appendix E.5).

The ambient sound data for the project area suggest that with increasing distance from the project site, particularly for vibratory pile driving, as received sound levels drop below approximately 140 dB re 1µPa rms, project sound would become undetectable with regard to potential monitoring and verification of sound levels, and that it would not be perceived by marine mammals as louder or significantly different than regularly occurring background noise due to vessels. As such, it would be unlikely to elicit biologically significant behavioral reactions.

Underwater Sound Propagation Formula

Pile driving and vibratory pile extraction would generate underwater noise that potentially could result in disturbance to marine mammals swimming by the Project Area. TL underwater is the decrease in sound intensity due to sound spreading and chemistry- and viscosity-based absorption as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for transmission loss is:

$$TL = B * \log_{10}(R) + C * R, \text{ where}$$

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R = ratio of receiver distance to source reference distance (usually 1m or 10m)



Figure 3.4-4
Ambient Underwater Sound Locations

The C term is strongly dependent on frequency, temperature, and depth, but is conservatively assumed to equal zero for pile driving. The B term has a value of 10 for cylindrical spreading and 20 for spherical spreading. A practical spreading value of 15 is often used in shallow water conditions where spreading may start out spherically but then end up cylindrically as the sound is constrained by the surface and the bottom. For this application, however, a site-specific model was developed for TL from pile driving at a central point at the project site (Appendix E.4). The model is based on historical temperature-salinity data and location-dependent bathymetry. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. For pile driving at the Navy MMP relocation site (NMAWC), no site-specific modeling was conducted, and practical spreading loss is assumed.

Airborne Sound Propagation Formula

Pile driving can generate airborne noise that could potentially result in disturbance to marine mammals (pinnipeds hauled out or at the water surface. The Navy therefore analyzed the potential for pinnipeds hauled out or swimming at the surface near the project site to be exposed to airborne SPLs that could result in Level B behavioral harassment. The appropriate airborne noise thresholds for behavioral disturbance for all pinnipeds, except harbor seals is 100 dB re 20 µPa rms (unweighted) and for harbor seals is 90 dB re 20 µPa rms (unweighted) (see Table 3.4-3). A spherical spreading loss model, assuming average atmospheric conditions, was used to estimate the distance to the 100 dB and 90 dB re 20 µPa rms (unweighted) airborne thresholds. The formula for calculating spherical spreading loss is:

$$TL = 20\log r$$

where:

TL = Transmission loss

r = ratio of receiver distance to reference distance (equates to straight line distance from source when reference is at 1 m)

*Spherical spreading results in a 6 dB decrease in SPL per doubling of distance.

Basis for Estimating Take by Harassment

The U.S. Navy is seeking authorization for the potential taking of small numbers of California sea lions, harbor seals, gray whales, and coastal bottlenose dolphins in northern San Diego Bay as a result of pile removal and pile driving during demolition and construction activities associated with the Fuel Pier Replacement Project. The takes requested are expected to have no more than a minor effect on individual animals and no effect on the populations of these species. Any effects experienced by individual marine mammals are anticipated to be limited to short-term disturbance of normal behavior or temporary displacement of animals near source of the noise.

Spatial Distribution

Density assumes that marine mammals are uniformly distributed within a given area, although this is rarely the case. Marine mammals are usually clumped in areas of greater importance, for example, areas of high productivity, lower predation, safe calving, breeding,

etc. The site-specific surveys of northern San Diego Bay provide high resolution of the distribution of marine mammals within the affected area. The distribution of sightings (see Figure 3.4-2) indicates that the assumption of uniform or random distribution throughout the affected area is reasonable, with two qualifiers: (1) sea lions are strongly concentrated on the bait barges; and (2) the area adjacent to and inshore of the fuel pier is not used to an appreciable extent.

Submergence

Cetaceans spend their entire lives in the water and spend most of their time (>90 percent for most species) entirely submerged below the surface. When at the surface, cetacean bodies are almost entirely below the water's surface, with only the blowhole exposed to allow breathing. This makes cetaceans difficult to locate visually and also exposes them to underwater noise, both natural and anthropogenic, essentially 100 percent of the time because their ears are nearly always below the water's surface.

Seals and sea lions (pinnipeds) spend significant amounts of time out of the water during breeding, molting, and "hauling out" (resting out of the water on land or structures) periods. Sea lions in San Diego Bay are most commonly observed out of water, especially on bait barges, navigation aids, and other structures. Within the bay, harbor seals would be most likely to occur in the water. When not actively diving, pinnipeds at the surface often orient their bodies vertically in the water column and often hold their heads above the water surface. Consequently, pinnipeds would not be exposed to underwater sounds to the same extent as cetaceans occurring in the same location, but would be subject to airborne noise to a greater degree.

For the purpose of assessing impacts from underwater sound at NBPL, the Navy assumed that that both cetaceans and pinnipeds that occur in the vicinity would be submerged and at the same water depth as the source, and would thereby experience the maximum received SPLs predicted to occur at a given distance from the acoustic source on the basis of acoustic modeling. However, pinnipeds are also conservatively assumed to be out of the water for sufficient periods to be exposed to whatever airborne noise is generated by construction activities as well.

California Sea Lion

California sea lions are present in northern San Diego Bay year-round and are by far the dominant marine mammal in the bay. The local population comprises adult females and sub-adult males and females, with adult males being uncommon (Merkel & Associates, Inc. 2008; Navy 2010; TDI 2012). The Navy conducted surveys by boat for marine mammals in northern San Diego Bay and adjacent waters on 16 separate occasions between 2007 and the end of March 2012. These surveys were conducted at slow speed (approximately 3-5 knots) along the same general routes (Figure 3.4-1) during calm weather and excellent viewing conditions. Observers were able to closely investigate and confirm sightings. Individuals that conducted the surveys (D. Lerma, C. Johnson, K. Merkel) are of the opinion that the detectability of animals within the study area at the time of the survey approached 100 percent. However, to account for the possibility that some parts of the study area may not have been covered due to access

limitations, and to allow for variation in the accuracy of counts of large numbers of animals, a 95 percent detection rate is assumed.

During the surveys, the maximum number of sea lions observed within the study area, defined as the 120 dB ZOI for potential behavioral disturbance by vibratory pile driving, was 114, with an average abundance of 63.00 individuals per survey day; this translates to an average density of 5.48/km^2. Adjusting based on 95 percent detection results in an average abundance of 66.32, and density of 5.77/km^2. This estimate is remarkably close to that of the Navy Marine Species Density Database (NMSDD) (Hanser *et al.* 2012) for North and Central San Diego Bay, which is 5.75/km^2 for the summer and fall periods. Although the NMSDD estimate for winter and spring is lower (2.51/km^2), this difference appears largely due to the inclusion of more recent (2012) surveys in the Navy's IHA (Navy's IHA application) submitted to NMFS as part of the NEPA process for the proposed project (U.S. Pacific Fleet 2012, TDI 2012), which found higher numbers during winter and spring 2012 than were seen in previous surveys.

In the surveys analyzed for the Navy's IHA application, an average of 50.33 animals was observed on or swimming next to the bait barges. Assuming the same proportion of the population continues to spend most of their time at the bait barges when they are moved out of the ZOI, there would be an average of 12.67 individuals within the ZOI (1.11/km^2). Assuming 95 percent detection results in an estimated average abundance of 13.36 and density of 1.16/km^2 in the ZOI without the bait barges' influence.

Potential takes would likely involve sea lions that are loafing on or in the vicinity of structures or moving through the area en route to breeding areas or structures where they haul out. California sea lions that are taken could exhibit behavioral changes such as increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, California sea lions may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any major rookeries and only a few isolated haulout areas near or adjacent to the project site, potential takes by disturbance will have a negligible short-term effect on individual California sea lions and would not result in population-level impacts.

Harbor Seal

Harbor seal occurrence within potential ZOIs for project activities is expected to consist of up to three individuals for approximately 1 month in the vicinity of Pier 122, roughly 250 m south of the fuel pier. The take estimate for harbor seals is based on these individuals experiencing both airborne and underwater sound from the project when they are present.

Potential takes would likely involve harbor seals that are on the shoreline or structures at the identified location, or swimming in the vicinity. The most likely movements of harbor seals would be to and from breeding areas in the kelp beds south of Ballast Point. Harbor seals that are taken could exhibit behavioral changes such as entering the water in response to airborne noise, increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, harbor seals may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any major rookeries and only a few isolated haulout areas near or adjacent to the project site, potential takes by disturbance will have a

negligible short-term effect on individual harbor seals and would not result in population-level impacts.

Gray Whale

Gray whale occurrence within northern San Diego Bay is sporadic and would likely consist of one to a few individuals that venture close to, or enter the bay for a brief period, then continue northward. The take estimate for gray whales assumes the presence of one individual for 15 days near the mouth of the bay during the month of March. Note that this could represent the same individual for 15 days, 15 individuals that pass through the area, or intermediate numbers for varying periods.

Coastal Bottlenose Dolphin

Coastal bottlenose dolphins can occur at any time of year in northern San Diego Bay. Numbers sighted have been highly variable, ranging from zero (5 out of 12 surveys) to more than 30 individuals. The Navy has conducted surveys by boat for marine mammals in northern San Diego Bay and adjacent waters on 16 separate occasions between 2007 and the end of March 2012. These surveys were conducted at slow speed (approximately 3.5 knots) along the same general routes (Figure 3.4-1) during calm weather and excellent viewing conditions. Observers were able to closely investigate and confirm sightings. Individuals that conducted the surveys (D. Lerma, C. Johnson, K. Merkel) were of the opinion that the detectability of animals within the study area at the time of the survey approached 100 percent. However, to account for the possibility that some parts of the study area may not have been covered due to access limitations, and to allow for variation in the accuracy of counts of large numbers of animals, a 95 percent detection rate is assumed. Unidentified dolphins recorded in the surveys are assumed to have been coastal bottlenose dolphins, which is the only dolphin that regularly occurs in San Diego Bay and adjacent waters (Navy 2011, NAVFAC Southwest and Port of San Diego 2011).

During the surveys, the maximum number of bottlenose dolphins observed within the study area, defined as the 120 dB ZOI for potential behavioral disturbance by vibratory pile driving, was 40, with an average abundance of 8.83 individuals per survey day; this translates to an average density of 0.77/km^2. Adjusting based on 95 percent detection results in an average abundance of 9.29 and density of 0.81/km^2. This estimate is higher than that of the NMSDD, which is 0.36/km^2 (Hanser *et al.* 2012) estimate for all of California coastal waters south of San Francisco within 1 km of the coast. The higher density used in this application is consistent with the regular occurrence of bottlenose dolphins in all four surveys conducted in San Diego Bay during the month of March 2012.

Potential takes could occur if bottlenose dolphins move through the area on breeding trips when pile driving would occur. Bottlenose dolphins that are taken could exhibit behavioral changes such as increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, bottlenose dolphins may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any regular occurrence adjacent to

the project site, potential takes by disturbance will have a negligible short-term effect on individual bottlenose dolphins and would not result in population-level impacts.

3.4.3.2 Avoidance and Minimization Measures

The following avoidance and minimization measures are divided into four sections: (1) Avoidance and Minimization Measures for Pile Driving Activities; (2) Avoidance and Minimization Measure Effectiveness; (3) Monitoring Plan; and (4) Reporting.

Avoidance and Minimization Measures for Pile Driving Activities

Proposed Measures

The modeling results for ZOIs were used to develop avoidance and minimization measures for pile driving activities at NBPL. The ZOIs effectively represent the avoidance and minimization zone that would be established to prevent Level A harassment to marine mammals.

1. Shutdown and Buffer Zone During Pile Driving and Removal

- During pile driving and removal, the shutdown zone shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level A (injury) harassment criteria for marine mammals (180 dB rms isopleth for cetaceans; 190 dB rms isopleth for pinnipeds). During all pile driving and removal activities, regardless of predicted SPLs, a conservative 10 m (33 ft) shutdown zone shall be established and monitored to prevent injury to marine mammal species from their physical interaction with construction equipment during in-water activities.
- During pile driving and removal, the buffer zone shall include areas where the underwater and airborne SPLs are anticipated to equal or exceed the Level B (disturbance) harassment criteria for marine mammals (underwater: 160 dB rms isopleths for impact pile driving, 120 dB rms isopleth for vibratory pile driving; airborne: 90 dB rms isopleth for harbor seals, 100 dB isopleth for sea lions). The distance encompassing these zones will be adjusted to accommodate any difference between predicted and measured sound levels.
- The shutdown and buffer zones will be monitored throughout the time required to drive or extract a pile. If a marine mammal is observed entering the buffer zone, an exposure would be recorded and behaviors documented. However, that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point pile driving or extraction will be halted.
- All buffer and shutdown zones will initially be based on the distances from the source that were predicted for each threshold level. However, in-situ acoustic monitoring will be utilized to determine the actual distances to these threshold zones, and the size of the shutdown and buffer zones will be adjusted accordingly (increased or decrease) based on received SPLs.

2. Shutdown Zone During Other In-water Construction or Demolition Activities

   - During all in-water construction or demolition activities having the potential to affect marine mammals, in order to prevent injury from physical interaction with construction equipment, a shutdown zone of 10 m (33 ft) will be monitored to ensure marine mammals are not present within this zone. These activities could include, but are not limited to: (1) the movement of a barge to the pile location, or (2) the removal of a pile from the water column/substrate via a crane (i.e., "dead pull").

3. Visual Monitoring

   a. Impact Installation: Monitoring will be conducted within the Level A harassment shutdown zone and Level B harassment buffer zone during impact pile driving before, during, and after pile driving activities. Monitoring will take place from 15 minutes prior to initiation through 15 minutes post-completion of pile driving activities.

      Vibratory Installation and Removal: Monitoring will be conducted for a 10 m (33 ft) shutdown zone. Given ambient underwater sound of approximately 124 dB re 1 µPa (rms), punctuated by louder sound from passing ships, as well as the difficulty of effectively monitoring the full extent of the predicted 120 dB re 1 µPa (rms) Level B behavioral disturbance ZOI for vibratory pile driving/extraction, the Navy intends initially to monitor a buffer zone equivalent to the full extent of the predicted Level B disturbance ZOI, but to adjust the extent of the monitored buffer zone based on acoustic monitoring (see below). The outer limits of the buffer zone would be defined by the point at which the measured SPL (maximum rms) produced by the equipment either declines to 120 dB re 1 µPa or falls below the median ambient SPL (rms) and hence becomes indistinguishable from background. Monitoring will take place from 15 minutes prior to initiation through 15 minutes post-completion of vibratory installation/removal activities.

      Other In-Water Activities: Monitoring will take place from 15 minutes prior to initiation until the action is complete.

   b. Monitoring will be conducted by qualified observers. All observers would be trained in marine mammal identification and behaviors, have experience conducting marine mammal monitoring or surveys, and would have no other construction-related tasks while monitoring. A trained observer will be placed from the best vantage point(s) practicable (e.g., from a small boat, the pile driving barge, on shore, or any other suitable location) to monitor for marine mammals and implement shut-down/delay procedures when applicable by calling for the shut-down to the hammer operator.

   c. Prior to the start of pile driving activity, the shutdown and safety zones will be monitored for 15 minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the buffer zone and their behavior will be monitored and documented.

d. If a marine mammal approaches/enters the shutdown zone during the course of pile driving operations, pile driving will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal.

e. In the unlikely event of conditions that prevent the visual detection of marine mammals, such as heavy fog, activities with the potential to result in Level A or Level B harassment will not be conducted.

4. Acoustic Measurements – Acoustic measurements will be used to empirically verify the proposed shutdown and buffer zones. For further detail regarding our acoustic monitoring plan, see the "Monitoring Plan" subsection below.

5. Timing Restrictions – The Navy has set timing restrictions to avoid noise and turbidity generating in-water construction and demolition activities in designated breeding habitat of the ESA-listed California least tern, from 1 April through 15 September. Underwater noise-generating activities would only occur from 16 September through 31 March.

6. Soft Start – The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows:

   "The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."

   The 30-second waiting period is proposed based on the Navy's recent experience and consultation with NMFS on a similar project at Naval Base Kitsap at Bangor.

7. Daylight Construction – Pile driving will only be conducted during daylight hours.

Measures Considered but not Proposed

The use of bubble curtains to reduce underwater sound from impact pile driving was considered but is not proposed because strong tidal currents at the project site would disperse the bubbles and compromise the effectiveness of sound attenuation. Other considerations were that the potential for Level A exposures and the number and relative intensity of Level B exposures has already been reduced by (1) relocation of the bait barges; (2) primary reliance on vibratory installation of steel piles – in itself an accepted avoidance and minimization measure to reduce the intensity of underwater sound from pile driving (Caltrans 2009) - except for final testing of load bearing capacity and structural integrity as needed with an impact hammer; and (3) relatively small ZOIs associated with impact pile driving of concrete piles.

The use of a coffer dam surrounding each pile to absorb sound was also considered. The installation and take-down of the coffer dam around each pile would substantially increase the

time required to drive each pile. With the construction schedule already maximizing the amount of work that can be done during daylight hours and outside of the least tern nesting season, this would translate into several additional years of construction. Reasons 1 through 3 above also indicated this measure would not be cost effective.

Silt curtains were considered but rejected as an avoidance and minimization measure for turbidity because (1) the sediments of the project site are sandy and will settle out rapidly when disturbed; (2) fines that do remain suspended would be rapidly dispersed by tidal currents; and (3) tidal currents would tend to collapse the silt curtains and make them ineffective.

Avoidance and Minimization Measure Effectiveness

It should be recognized that although marine mammals will be protected from Level A harassment by marine mammal observers (MMOs) monitoring the near-field injury zones, avoidance and minimization may not be 100 percent effective at all times in locating marine mammals in the buffer zone. The efficacy of visual detection depends on several factors including the observer's ability to detect the animal, the environmental conditions (visibility and sea state), and monitoring platforms.

All observers utilized for avoidance and minimization activities will be experienced biologists with training in marine mammal detection and behavior. Due to their specialized training, the Navy expects that visual avoidance and minimization measures will be highly effective. Trained observers have specific knowledge of marine mammal physiology, behavior, and life history that may improve their ability to detect individuals or help determine if observed animals are exhibiting behavioral reactions to construction activities.

Visual detection conditions in northern San Diego Bay are generally excellent. By its orientation, the bay is sheltered from large swells and infrequently experiences strong winds; winds are less than 17 knots 98 percent of the time between November and April (San Diego Bay Harbor Safety Committee 2009). Fog is anticipated on 10-20 percent of the days, typically in late night and early morning hours (San Diego Bay Harbor Safety Committee 2009) and could occasionally limit visibility for marine mammal monitoring. However, observers will be positioned in locations which provide the best vantage point(s) for monitoring, such as on nearby piers or on a small boat, and the shutdown and buffer zones cover relatively small and accessible areas of the bay. As such, proposed avoidance and minimization measures are likely to be very effective.

Monitoring Plan

The following monitoring measures would be implemented along with the avoidance and minimization measures for pile driving activities in order to reduce impacts to marine mammals to the lowest extent practicable. A marine mammal monitoring plan will be developed further and submitted to NMFS for approval prior to the start of construction. The monitoring plan includes the following components: acoustic measurements and visual observations.

The Navy intends to continue its marine mammal and acoustic surveys of the project area up until the in-water activities begin, at which time the monitoring described below would be implemented. The Navy would conduct post-project surveys as well on a quarterly basis to document any changes in the San Diego Bay populations of marine mammals.

Acoustic Measurements

The Navy will conduct acoustic monitoring for impact driving of steel piles in order to determine the actual distances to the 190 dB re 1µPa rms/180 dB re 1µPa rms and the 160 dB re 1µPa rms isopleths; for impact driving of other piles to determine the actual distance to the 160 dB re 1µPa rms isopleth; and for vibratory pile driving and extraction, including use of the pneumatic chipper, to determine the actual distance to either the 120 dB re 1µPa rms isopleth or the point at which the SPL (maximum rms) from the equipment diminishes to the median ambient SPL (rms) and hence becomes indistinguishable. The monitoring plan addresses both underwater and airborne sounds.

At a minimum, the methodology includes:

- Acoustic monitoring will be conducted for a minimum of five piles for each different type of pile and each different method of installation and removal.
- For underwater recordings, a stationary hydrophone system with the ability to measure SPLs will be placed in accordance with NMFS most recent guidance for the collection of source levels.
- For airborne recordings, reference recordings will be attempted at approximately 50 ft from the source via a stationary microphone. However, other distances may be utilized to obtain better data if the signal cannot be isolated clearly due to other sound sources (i.e., barges or generators).
- Hydrophones will be placed various distances and depths from piles using a static line or buoy. A weighted tape measure will be used to determine the depth of the water. The hydrophone will be attached to a nylon cord or steel chain if current is swift enough, to maintain a constant distance from the pile. The nylon cord or chain will be attached to a float or tied to a static line.
- Each hydrophone (underwater) and microphone (airborne) will be calibrated at the start of the action and will be checked at the beginning of each day of monitoring activity.
- For each monitored location, a two-hydrophone set-up will be used, with the first hydrophone at mid-depth and the second hydrophone at approximately 1 m from the bottom in order to evaluate site specific attenuation and propagation characteristics that may be present throughout the water column.
- In addition to determining the area encompassed by the 190, 180, 160, and 120 dB rms isopleths for marine mammals, hydrophones would also be placed at other distances as appropriate to accurately capture source levels and spreading loss.
- Ambient conditions, both airborne and underwater, would be measured at the project site in the absence of construction activities to determine background sound levels.

Ambient levels are intended to be recorded over the frequency range from 10 Hz to 20 kHz. Ambient conditions will be recorded for 1 minute every hour of the work day, for one week of each month of the period of the Navy's IHA.

- Sound levels associated with soft-start techniques will also be measured.
- Underwater SPLs would be continuously monitored during the entire duration of each pile being driven. Sound pressure levels will be monitored in real time. Sound levels will be measured in Pascals, which are easily converted to dB units.
- Airborne levels would be recorded as unweighted, as well as in dBA and the distance to marine mammal and/or avian thresholds (respectively) would be measured.
- Environmental data would be collected including, but not limited to, wind speed and direction; air temperature; humidity, surface water temperature; water depth; wave height; weather conditions and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats, etc.).
- The chief inspector would supply the acoustics specialist with the substrate composition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored, depth of the pile being driven, and blows per foot for the piles monitored.
- For acoustically monitored piles, post-analysis of the sound level signals will include frequency spectra between 10 Hz and 20 kHz; determination of absolute peak overpressure and under pressure levels recorded for each pile; average, minimum, and maximum rms values; for each absolute peak pile strike, the rise time, average duration of each pile strike, number of strikes per pile, SEL of the absolute peak pile strike, mean SEL, and cumulative SEL (Accumulated SEL = single strike SEL + 10*log (# hammer strikes) and a frequency spectrum for up to eight successive strikes with similar sound levels.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of construction. All observers will be trained in marine mammal identification and behaviors. NMFS requires that the observers have no other construction related tasks while conducting monitoring.

Methods of Monitoring

The Navy will monitor the shutdown zone and safety zone before, during, and after pile driving and removal. Based on NMFS requirements, the Marine Mammal Monitoring Plan would include the following procedures:

- MMOs would be located at the best vantage point(s) in order to properly see the entire shut down zone and safety zone. This may require the use of a small boat to monitor certain areas while also monitoring from one or more land based vantage points.
- During all observation periods, observers would use binoculars and the naked eye to search continuously for marine mammals.

- Monitoring distances will be measured with range finders.
- In-water activities would be curtailed under conditions of fog or poor visibility that would obscure the presence of a marine mammal within the shutdown zone.
- The shutdown and safety zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.
- Pre-Activity Monitoring: The shutdown and buffer zones will be monitored for 15 minutes prior to in-water construction/demolition activities. If a marine mammal is present within the shutdown zone, the activity would be delayed until the animal(s) leave the shutdown zone. Activity would resume only after the MMO has determined, through sighting or by waiting approximately 15 minutes, that the animal(s) has moved outside the shutdown zone.
- During Activity Monitoring: The shutdown and buffer zones will also be monitored throughout the time required to drive and remove piles. If a marine mammal is observed entering the buffer zone, a "take" would be recorded and behaviors documented. However, that pile segment would be completed without cessation, unless the animal enters or approaches the shutdown zone, at which point all pile driving activities will be halted. Pile driving can only resume once the animal has left the shutdown zone of its own volition or has not been re-sighted for a period of 15 minutes.
- Post-Activity Monitoring: Monitoring of the shutdown and buffer zones would continue for 15 minutes following the completion of the activity.

Data Collection

NMFS requires that the MMOs use NMFS-approved sighting forms. NMFS requires that a minimum, the following information be collected on the sighting forms:

- Date and time that pile driving or removal begins or ends.
- Construction activities occurring during each observation period.
- Weather parameters identified in the acoustic monitoring (e.g., wind, humidity, temperature).
- Tide state and water currents.
- Visibility.
- Species, numbers, and if possible sex and age class of marine mammals.
- Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs.
- Distance from pile driving activities to marine mammals and distance from the marine mammal to the observation point.
- Locations of all marine mammal observations.
- Other human activity in the area.

To the extent practicable, the Navy will record behavioral observations that may make it possible to determine if the same or different individuals are being "taken" as a result of project activities over the course of a day.

Reporting

A draft report would be submitted to NMFS within 45 days of the completion of acoustic measurements and marine mammal monitoring. The results would be summarized in graphical form and include summary statistics and time histories of sound values for each pile. A final report would be prepared and submitted to the NMFS within 30 days following receipt of comments on the draft report from the NMFS. At a minimum, the report shall include:

- General data:
  - Date and time of activities.
  - Water conditions (e.g., sea-state, tidal state).
  - Weather conditions (e.g., percent cover, visibility).
- Specific pile data for acoustically monitored piles:
  - Description of the activities being conducted.
    - Size and type of piles.
    - The machinery used for installation or removal.
  - The power settings of the machinery used for installation or removal
- Specific acoustic monitoring information:
  - A description of the monitoring equipment.
  - The distance between hydrophone(s) and pile.
  - The depth of the hydrophone(s).
  - The physical characteristics of the bottom substrate where the piles were driven or extracted (if possible).
  - Acoustic data (per the "Acoustic Measurements" subsection above) for each monitored pile and activity.
- Pre-activity observational survey-specific data:
  - Dates and time survey is initiated and terminated.
  - Description of any observable marine mammal behavior in the immediate area during monitoring.
  - If possible, the correlation to underwater sound levels occurring at the time of the observable behavior.
  - Actions performed to minimize impacts to marine mammals.
- During-activity observational survey-specific data:
  - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding monitoring zones.

- If possible, the correlation to underwater or airborne sound levels occurring at the time of this observable behavior.
- Actions performed to minimize impacts to marine mammals.
- Times when pile extraction is stopped due to presence of marine mammals within the shutdown zones and time when pile driving resumes.

- Post-activity observational survey-specific data:
  - Results, which include the detections of marine mammals, species and numbers observed, sighting rates and distances, behavioral reactions within and outside of safety zones.
  - A refined take estimate based on the number of marine mammals observed during the course of construction.

3.4.3.3 Alternative 1 Pier Replacement and Associated Dredging

Potential Effects of Underwater Noise

The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex which leads to rapid sound attenuation. In addition, substrates which are soft (i.e., mud) will absorb or attenuate the sound more readily than hard substrates (rock) which may reflect the acoustic wave. Soft porous substrates would also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source.

Impacts to marine species are expected to be the result of physiological responses to both the type and strength of the acoustic signature (Viada *et al.* 2008). Behavioral impacts are also expected, though the type and severity of these effects are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range from brief acoustic effects such as behavioral disturbance, tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton *et al.* 1973, O'Keeffe and Young 1984, Navy 2001).

Physiological Responses

Direct tissue responses to impact/impulsive sound stimulation may range from mechanical vibration or compression with no resulting injury, to tissue trauma (injury). Because the ears are the most sensitive organ to pressure, they are the organs most sensitive to injury (Ketten

2000). Sound related trauma can be lethal or sub-lethal. Lethal impacts are those that result in immediate death or serious debilitation in or near an intense source (Ketten 1995). Sub-lethal impacts include hearing loss, which is caused by exposure to perceptible sounds. Severe damage, from a pressure wave, to the ear can include rupture of the tympanum, fracture of the ossicles, damage to the cochlea, hemorrhage, and cerebrospinal fluid leakage into the middle ear (NMFS 2008). Moderate injury implies partial hearing loss. Permanent hearing loss can occur when the hair cells are damaged by one very loud event, as well as prolonged exposure to noise. Instances of TTS and/or auditory fatigue are well documented in marine mammal literature as being one of the primary avenues of acoustic impact. Temporary loss of hearing sensitivity (TTS) has been documented in controlled settings using captive marine mammals exposed to strong SELs at various frequencies (Ridgway *et al.* 1997, Kastak *et al.* 1999, Finneran *et al.* 2005), but it has not been documented in wild marine mammals exposed to pile driving. While injuries to other sensitive organs are possible, they are less likely since pile driving impacts are almost entirely acoustically mediated, versus explosive sounds that also include a shock wave, which can result in damage.

No physiological responses are expected from pile driving operations occurring during the Fuel Pier Replacement Project for several reasons. Firstly, vibratory pile driving which is being utilized as the primary installation method, does not generate high enough peak SPLs that are commonly associated with physiological damage. Any use of impulsive pile driving will only occur from a short period of time (approximately 30 to 120 minutes per steel pile). Additionally, the avoidance and minimization measures that the Navy will be employing (see Section 3.4.3.2) will greatly reduce the chance that a marine mammal may be exposed to SPLs that could cause physical harm. The Navy will have trained biologists monitoring a shutdown zone equivalent to the Level A Harassment zone (inclusive of the 180 dB re 1 µPa (cetaceans) and 190 dB re 1 µPa (pinnipeds) isopleths to ensure no marine mammals are injured.

Behavioral Responses

Behavioral responses to sound are highly variable and context specific. For each potential behavioral change, the magnitude of the change ultimately determines the severity of the response. A number of factors may influence an animal's response to noise, including its previous experience, its auditory sensitivity, its biological and social status (including age and sex), and its behavioral state and activity at the time of exposure.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing noise levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.* 1995, National Research Council 2003, Wartzok *et al.* 2003).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.* 1997, Finneran *et al.* 2003).

Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, and also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; Caltrans 2001, 2006; also see reviews in Gordon *et al.* 2004; Wartzok *et al.* 2003; and Nowacek *et al.* 2007). Responses to continuous noise, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds.

With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in the animal's typical behavior and/or avoidance of the affected area. A marine mammal may show signs that it is startled by the noise and/or may swim away from the sound source and avoid the area. Other potential behavioral changes could include increased swimming speed, increased surfacing time, and decreased breeding in the affected area. Pinnipeds may increase their haulout time, possibly to avoid in-water disturbance (Caltrans 2001, 2006). Since pile driving will likely only occur for a few hours a day, over a short period of time, it is unlikely to result in permanent displacement. Any potential impacts from pile driving activities could be experienced by individual marine mammals, but would not cause population level impacts, or affect the long-term fitness of the species.

Potential Effects of Airborne Noise

Marine mammals that occur in the project area could be exposed to airborne sounds associated with pile driving that have the potential to cause harassment, depending on their distance from pile driving activities. Airborne pile driving noise would have less impact on cetaceans than pinnipeds because noise from atmospheric sources does not transmit well underwater (Richardson *et al.* 1995); thus airborne noise would only be an issue for hauled-out pinnipeds in the Project Area. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater noise. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their habitat and move further from the source. Studies by Blackwell *et al.* (2004) and Moulton *et al.* (2005) indicate a tolerance or lack of response to unweighted airborne sounds as high as 112 dB peak and 96 dB rms. Based on these observations marine mammals could exhibit temporary behavioral reactions to airborne noise, however, exposure is not likely to result in population level impacts.

Underwater Sound from Pile Driving and Extraction

The intensity of pile driving or sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the proposed action were evaluated. Piles to be installed include 36- and 48-in steel pipes, 24- and 18-in concrete piles, and 16-in fiberglass-concrete piles. In addition, a vibratory pile driver could be used in the extraction of 16-in steel, 14- 16- and 24-in concrete, 13-in plastic, and 12-in timber piles.

Table 3.4-5 details representative pile driving activities that have occurred in recent years. Due to the similarity of these actions and the Navy's proposed action in terms of pile size and type, installation method, and water depth, as well as substrate and expected sound speed, they represent reasonable SPLs, which could be anticipated.

Table 3.4-5. Underwater Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities

Project and Location	*Pile Size and Type*	*Installation Method*	*Water Depth*	*Measured Sound Pressure Levels*
Mukilteo Test Piles, WA[1]	36-in Steel Pipe	Impact	7.3 m (24 ft)	195 dB re 1 µPa (rms) at 10 m
Richmond-San Rafael Bridge, CA[2]	66-in CISS Pile	Impact	4.0 m (13.1 ft)	195 dB re 1 µPa (rms) at 10 m
Unknown Location, CA[2]	72-in Steel Pipe Pile	Vibratory	approximately 5 m (16.4 ft)	180 dB re 1 µPa (rms) at 10 m
San Francisco Bay, CA[2]	24-in Concrete	Impact	10-15 m (33-50 ft)	176 dB re 1 µPa (rms) at 10 m
San Francisco Bay, CA[2]	16-in Concrete	Impact	10 m (33 ft)	173 dB re 1 µPa (rms) at 10 m
Columbia River Crossing, WA[3]	24- and 48-in Steel Pipe Piles	Vibratory extraction	10 m (33 ft)	172 dB re 1 µPa (rms) at 10 m

Sources: [1]WSDOT 2007, [2]Caltrans 2009, [3]WSDOT 2012.

Underwater sound levels from pile driving for this project are assumed to be as follows:

- For 36- and 48-in steel pipes, 195 dB re 1 µPa (rms) at 10 m when driven by impact hammer, 180 dB re 1 µPa (rms) at 10 m when driven by vibratory hammer;
- For 24-in concrete piles driven by impact hammer, 176 dB re 1 µPa (rms) at 10 m; and
- For 16- and 18-in concrete piles driven by impact hammer, 173 dB re 1 µPa (rms) at 10 m.

As noted by NMFS (2010), there is a paucity of data on airborne and underwater noise levels associated with vibratory hammer extraction. However, it can reasonably be assumed that vibratory extraction emits SPLs that are no higher than SPLs caused by vibratory hammering of the same materials, and results in lower SPLs than caused by impact hammering comparable piles (NMFS 2010). The only available data regarding underwater sound from vibratory pile extraction are from the Columbia River Crossing Test Pile Project in Washington state (WSDOT 2012). In that project, underwater sound from vibratory extraction of several 24- and 48-in diameter steel pipes was found to range from 167 to 176 dB, averaging 172 dB re 1 µPa (rms) at 10 m. Because pile driving and extraction are less noisy for concrete than steel piles (Caltrans 2009), this is almost certainly greater than what would occur at the project site during removal of the existing pier structure, except possibly for the 16-in concrete-filled steel pipes. For vibratory extraction of concrete piles up to 24-in diameter, as well as the 12-in timber piles, a reduction of 10-20 dB from the sound produced by an impact driver can reasonably be assumed (Caltrans 2009). Accordingly, for the Navy's IHA application it is assumed that vibratory extraction of concrete, wood, or plastic piles would generate sound levels of up to 160 dB re 1

µPa (rms) at 10 m. This approach is consistent with NMFS' recent evaluation of a pier demolition project (NMFS 2010) and is likely to overestimate the potential for MMPA harassment during pier demolition.

There is scant information on underwater sound produced by pneumatic chippers or underwater cutting tools. The only data cited in recent IHA and Letter of Authorization applications (http://www.nmfs.noaa.gov/pr/permits/incidental.htm) were combined from a variety of diver tools, including jackhammers, drills, grinders, bolt guns, and hydraulic wrenches, showing peak source levels of up to 200 dB re 1µPa at 1 m and averaged levels of up to 161 dB re 1µPa at 1 m (Nedwell and Howell 2004). The averaged source levels would equate to approximately 141 dB re 1µPa at 10 m (assuming spherical spreading loss), but given the variability and uncertain applicability of these measurements to the proposed NBPL fuel pier replacement project, it is conservatively assumed that the pneumatic chipper could have up to the same sound source levels as vibratory extraction, i.e. 160 dB re 1µPa at 10 m, which equates to approximately 180 dB re 1µPa at 1 m.

Table 3.4-6 provides the calculated areas of ZOIs associated with different types of pile driving and extraction. It should be noted that the ZOIs for level A harassment would be closely monitored and subject to shutdowns if a marine mammal approaches the area. These calculations are based on the site-specific modeling of transmission loss at the project site, and practical spreading loss at the MMP relocation site. Predicted sound "contours" emanating from different sources are shown in Figures 3.2-1 through 3.2-7. The figures reflect the conventional assumption that the natural or man-made shoreline acts as a barrier to underwater sound. Although it is known that there can be leakage or diffraction around such barriers, the prediction of resulting sound levels remains in the research modeling world, and it is generally accepted practice to model underwater sound propagation from pile driving as continuing in a straight line past a shoreline projection such as Ballast Point (Dahl 2012). Although the influence of Zuniga Jetty was not modeled, it is reasonable to assume that project sound would not propagate east of the jetty (Dahl 2012). Hence the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and narrower in reality than shown. The proposed bait barge relocation sites are outside of the predicted ZOIs associated with pile driving and extraction.

Table 3.4-6. Calculated Areas of ZOIs Corresponding to MMPA Thresholds

Description	*Figure*		*Area of ZOI (km²)*				
		Source Level, dB @ 10m	*Pinniped Level A – 190 dB[1]*	*Dolphin Level A – 180 dB[1]*	*Impact Level B – 160 dB[1]*	*Vibratory Level A – 180 dB[1,2]*	*Vibratory Level B – 120 dB[1]*
Impact driving steel piles	3.2-1	195	0.0034	0.1477	8.5069	N/A	N/A
Vibratory driving steel piles	3.2-2	180	N/A	N/A	N/A	0.0004	11.4895
Impact driving 24-in concrete piles	3.2-3	176	N/A	N/A	0.1914	N/A	N/A
Impact driving 16-in concrete-fiberglass piles	3.2-4	173	N/A	N/A	0.0834	N/A	N/A
Impact driving 18-in concrete piles	3.2-5	173	N/A	N/A	0.0620	N/A	N/A
Vibratory extraction – steel piles	3.2-6	172	N/A	N/A	N/A	0	11.4895
Vibratory extraction – non-steel piles[3]	3.2-7	160	N/A	N/A	N/A	0	11.4890

Notes: [1]All sound levels expressed in dB re 1 µPa rms; N/A = not applicable.

[2]The vibratory driving steel pile Level A ZOI for pinnipeds (190 dB) is less than 3 m from the source (<0.0001 km²).

[3]Including use of a pneumatic chipper.

Airborne Sound from Pile Driving

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the proposed action were evaluated. Studies that met the following parameters were considered: 1) Pile materials - steel pipe piles (36-48-in diameter); 2) Hammer machinery - vibratory and impact; and 3) Physical environment - shallow depth (<100 foot). Table 3.4-7 details representative pile driving activities that have occurred in recent years. Due to the similarity of these actions and the Navy's proposed action, they represent reasonable SPLs that could be anticipated.

Table 3.4-7. Airborne Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities

Project and Location	*Pile Size and Type*	*Installation Method*	*Water Depth*	*Measured Sound Pressure Levels*
Northstar Island, AK[1]	42-in Steel Pipe Pile	Impact	approximately 12 m (40 ft)	97 dB re 20 µPa (rms) at 525 ft
Keystone Ferry Terminal, WA[2]	30-in Steel Pipe Pile	Vibratory	approximately 9 m (30 ft)	98 dB re 20 µPa (rms) at 36 ft

Sources: [1]Blackwell *et al.* 2004; [2]WSDOT 2010.

Based on in-situ recordings from similar construction activities, the maximum airborne noise levels that would result from impact and vibratory pile driving are estimated to be 97 dB re 20 µPa (rms) at 525 ft and 98 dB re 20 µPa (rms) at 36 ft, respectively (Blackwell *et al.* 2004, WSDOT 2010). The distances to the airborne thresholds were calculated with the airborne transmission loss formula presented in Section 3.4.3.1. All calculated distances to and the total area encompassed by the airborne marine mammal noise thresholds are provided in Tables 3.4-8 and 3.4-9, respectively.

Table 3.4-8. Calculated Distances to the Marine Mammal Noise Thresholds in Air from Pile Driving

Species	*Threshold*	*Airborne Behavioral Disturbance*	
		Distance to Threshold Impact Pile Driving	*Distance to Threshold Vibratory Pile Driving*
Pinnipeds (seals, sea lions, walrus, except harbor seal)	100 dB re 20 µPa rms (unweighted)	113 m (371 ft)	9 m (30 ft)
Harbor seal	90 dB re 20 µPa rms (unweighted)	358 m (1175 ft)	28 m (92 ft)

Table 3.4-9. Calculated Area Encompassed (Per Pile) by the Marine Mammal Noise Thresholds In-air from Pile Driving

Species	*Threshold*	*Airborne Behavioral Disturbance*	
		Area Encompassed by the Threshold for Impact Pile Driving	*Area Encompassed by the Threshold for Vibratory Pile Driving*
Pinnipeds (except harbor seal)	100 dB re 20 µPa rms (unweighted)	0.040 km^2	0.000 km^2
Harbor seal	90 dB re 20 µPa rms (unweighted)	0.403 km^2	0.002 km^2

The distance to the sea lion airborne threshold would be 113 m (371 ft) for impact pile driving, and 9 m (30 ft) for vibratory pile driving. The distance to the harbor seal airborne threshold would be 358 m (1,175 ft) for impact pile driving, and 28 m (92 ft) for vibratory pile driving. The nearest location for harbor seals is approximately 250 m away and hence would be subject to airborne behavioral disturbance. These distances are all less than the corresponding distances calculated for underwater sound thresholds. Other types of pile driving and extraction would

generate far lower airborne sound pressures, with much smaller distances and areas of potential disturbance and for that reason are not considered further in this application.

Since protective measures are in place out to the distances calculated for the underwater Level A threshold for sea lions, the distances for the airborne thresholds will be covered fully by monitoring.

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. If the second sound is man-made and disrupts hearing-related behavior such as communications or echolocation (Wartzok *et al.* 2003), it could be considered harassment under the MMPA. Noise can only mask a signal if it is within a certain "critical band" around the signal's frequency and its energy level is similar or higher (Holt 2008). Noise within the critical band of a marine mammal signal will show increased interference with detection of the signal as the level of the noise increases (Wartzok *et al.* 2003). In delphinid subjects, for example, relevant signals needed to be 17 to 20 dB louder than masking noise at frequencies below 1 kHz in order to be detected and 40 dB greater at approximately 100 kHz (Richardson *et al.* 1995). It is important to distinguish TTS and permanent threshold shift, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without a resulting in a threshold shift) is not associated with abnormal physiological function, it is not considered a physiological effect in the Navy's IHA application, but rather a potential behavioral effect.

The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources would likely be within the audible range of California sea lions, harbor seals, gray whales, and bottlenose dolphins. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately 15 minutes per pile. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately 1.5 hours per pile. It is possible that impact and vibratory pile driving resulting from this proposed action may mask some acoustic signals that are relevant to the daily behavior of marine mammal species, but the short-term duration and limited areas affected make it very unlikely that survival would be affected. Masking effects are, therefore, treated as negligible. Any masking event that could possibly rise to Level B harassment under the MMPA would occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in San Diego Bay. The population data used for each species' take calculation is provided in Section 3.4.3.1. The formula was developed for calculating take due to pile driving and extraction as applicable and applied to the species-specific noise impact threshold. The formula is founded on the following assumptions:

- Each species' density is based on the average number seen (per day), adjusted upward assuming 95 percent detection, in Navy Marine Mammal surveys within the largest project ZOI - which is the 120 dB threshold for vibratory pile driving.
- ZOIs for underwater sound generating activities at the fuel pier location are based on sound emanating from a central point in the water column slightly offshore of the existing pier, at the source levels specified in Table 3.4-6, and rates of transmission loss derived from the site-specific model in Appendix E.4. Graphical representations of each ZOI were provided in Figures 3.2-1 through 3.2-7.
- Pile driving or vibratory extraction is conservatively estimated to occur on every day within the scheduled window for that component of project construction, as defined in Section 3.2.3.1.
- An individual can only be taken once due to underwater or airborne sound from pile driving, whether from impact or vibratory pile driving, or vibratory extraction, during each 24 hour period of that activity.
- Although sea lions and harbor seals in the project area spend a considerable amount of time above water, when they would not be subject to underwater sound, the conservative assumption is made that all sea lions within the ZOI are underwater during at least a portion of the noise generating activity, and hence exposed to sound at the predicted levels. However, all sea lions within each airborne sound ZOI are also assumed to be exposed to the airborne sound of each activity.

The calculation for marine mammal takes is estimated by:

$$\text{Take estimate} = (n * ZOI) * \text{days of activity}$$

where:

n = density estimate used for each species

ZOI[1] = noise threshold zone of influence (ZOI) impact area

n * ZOI produces an estimate of the abundance of animals that could be present in the area for exposure, this must be a whole number, therefore, this value was rounded (down if <0.5, up if >0.5).

[1] Zone of Influence (ZOI) is the area encompassed by all locations where the SPLs equal or exceed the threshold being evaluated.

The exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of pile driving and extraction activities exceeding NMFS established thresholds. Of significant note in these exposure estimates, additional mitigation methods (i.e., visual monitoring and the use of shutdown zones to ensure there are no Level A takes) were not quantified within the assessment and successful implementation of this mitigation is not reflected in exposure estimates. Results from acoustic impact exposure assessments should be regarded as conservative estimates that are strongly influenced by limited biological data. While the numbers generated from the pile driving exposure calculations provide conservative overestimates of marine mammal exposures for consultation with NMFS, the intermittent duration and limited geographic extent of in-water construction and demolition activities would further limit actual exposures and their potential biological effects.

California Sea Lion

As described in Section 3.4.3.1, the density of California sea lions observed within the maximum project area ZOI, subtracting out individuals that have been on or next to the bait barges, and which are assumed to move out of the ZOI with the bait barges when they are moved during the tern season, is 1.16/km^2. Table 3.4-10 provides the number of potential exposures constituting takes under the MMPA that would be caused by each project component during the first year of in-water activities.

Since steel pile installation involves a combination of vibratory and impact hammering, both are assumed to occur on the same day, and the number of animals taken is given by the maximum of either type of exposure. Given that the vibratory (120 dB) ZOI is larger, all animals considered behaviorally harassed by impact pile driving are also considered to be harassed by vibratory pile driving, whereas animals outside of the ZOI for impact hammering but within the ZOI for vibratory hammering would only be harassed by the latter. The total estimate for pile driving is thus 650 sea lion harassments by continuous sound from vibratory hammering, of which 500 would also constitute harassment by impulsive sound from impact hammering. This represents a daily take of 13 individuals, which may or may not be the same individuals from day to day. No harassments are anticipated from airborne sound of any type. Vibratory removal of concrete, plastic, and wood piles as part of demolition of the existing pier would result in 273 harassments, also representing a daily take of 13 individuals which may or may not be the same individuals from day to day (Table 3.4-10). To provide a more conservative estimate of total harassments, demolition use of vibratory extraction is assumed not to overlap the driving of steel piles for the new pier. Overall, a total of 923 California sea lion takes are predicted during the first 12-month period.

Table 3.4-10. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During First 12-Month Period

Activity	*# Days*	*Underwater*				*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Injury Threshold (190 dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact and Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	50	0	500	N/A	N/A	0
Vibratory driving steel piles	50	N/A	N/A	0	650	0
Impact driving 24-in concrete piles	16	0	0	N/A	N/A	0
Vibratory removal non-steel piles	21	N/A	N/A	0	273	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Take estimates for the second and third years of in-water activities, based on the same assumptions and methods applied to planned activities are provided in Tables 3.4-11 and 3.4-12, respectively.

Table 3.4-11. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Second 12-Month Period

Activity	*# Days*	*Underwater*			*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact and Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	102	0	1,020	N/A	0
Vibratory driving steel piles	102	N/A	N/A	1,326	0
Impact driving 24-in concrete piles	15	0	0	N/A	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Table 3.4-12. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Third 12-Month Period

Activity	*# Days*	*Underwater*			*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact amd Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	12	0	120	N/A	0
Vibratory driving steel piles	12	N/A	N/A	156	0
Impact driving 24-in concrete piles	15	0	0	N/A	0
Impact driving 16-in fiberglass-concrete piles	12	0	0	N/A	0
Vibratory extraction non-steel piles	33	N/A	N/A	429	0
Vibratory extraction steel/concrete piles	6	0	0	78	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Harbor Seal

The take estimate for harbor seals is based on the presence of 3 animals during 30 days within both airborne and underwater ZOIs for Level B harassment by pile driving and extraction. Therefore, the worst-case total number of takes equals 90, the same 3 animals being taken repeatedly during the first year of in-water construction and demolition. During the second year, the 102 days of planned steel pile installation is assumed to overlap the period when harbor seals are present, again resulting in 3 individuals x 30 days of underwater and airborne noise exposure equals 90 takes. In the third year, the only potential harassments due to airborne noise would occur during 12 days of steel pile installation. Other activities causing harassment by underwater noise are assumed to occur on the remaining 18 days when harbor seals are present, resulting again in a total of 90 takes.

Gray Whale

The take estimate for gray whales is based on the presence of an individual animal during 15 days within the underwater ZOIs for pile driving and extraction near the mouth of the bay. Therefore, the worst-case take estimate for gray whales during each of the 3 years is 15, representing up to 15 different individuals taken.

Coastal Bottlenose Dolphin

As described in Section 3.4.3.1, the estimated density of coastal bottlenose dolphins observed within the maximum project area ZOI is 0.81/km2. Table 3.4-13 provides the number of potential exposures constituting takes under the MMPA that would be caused by each project component during the first year.

Table 3.4-13. Number of Potential Exposures Constituting Takes of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During First 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Injury Threshold (180 dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	50	0	350	N/A	N/A
Vibratory driving steel piles	50	N/A	N/A	0	450
Impact driving 24-in concrete piles	16	0	0	N/A	N/A
Vibratory removal non-steel piles	21	N/A	N/A	0	189

Since steel pile installation involves a combination of vibratory and impact hammering, both are assumed to occur on the same day, and the number of animals taken is given by the maximum of either type of exposure. Given that the vibratory (120 dB) ZOI is larger, all animals considered behaviorally harassed by impact pile driving are also considered to be harassed by vibratory pile driving, whereas animals outside of the ZOI for impact hammering but within the ZOI for vibratory hammering would only be harassed by the latter. The total estimate for pile driving is thus 450 bottlenose dolphin harassments by continuous sound from vibratory hammering, of which 350 would also constitute harassment by impulsive sound from impact hammering. Vibratory removal of concrete, plastic, and wood piles as part of demolition of the existing pier would result in 189 harassments (Table 3.4-13). To provide a more conservative estimate of total harassments, demolition use of vibratory extraction is assumed not to overlap with the driving of steel piles for the new pier. Overall, a total of 639 coastal bottlenose dolphin takes are predicted during the first 12-month period. The total number of individuals taken is estimated as 9 per day, which may or may not be the same individuals on different days, during 71 days of vibratory/impact hammering and vibratory extraction.

Take estimates for the second and third years of in-water activities, based on the same assumptions and methods applied to planned activities, are provided in Tables 3.4-14 and 3.4-15, respectively.

Table 3.4-14. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Second 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	102	0	714	N/A
Vibratory driving steel piles	102	N/A	N/A	918
Impact driving 24-in concrete piles	15	0	0	N/A

Table 3.4-15. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Third 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	12	0	84	N/A
Vibratory driving steel piles	12	N/A	N/A	108
Impact driving 24-in concrete piles	15	0	0	N/A
Impact driving 16-in fiberglass-concrete piles	12	0	0	0
Vibratory extraction non-steel piles	33	N/A	N/A	297
Vibratory extraction steel/concrete piles	6	N/A	N/A	54

Summary

Based on the modeling results presented above, the total number of expected takes under MMPA is provided in Table 3.4-16. The Navy will submit sequential IHA applications for each year of in-water activities. All takes are anticipated to occur during fall through spring, 16 September through 31 March. All takes are anticipated to be Level B, disturbance. The totals for each species are as follows: California sea lions (2,405), harbor seals (270), gray whales (45), and coastal bottlenose dolphins (2,016).

Table 3.4-16. Summary of Potential Exposures Constituting Takes for All Species, All Years

Species	*Underwater*				*Airborne*	*Totals*
	Impact Injury Threshold (190 dB)	*Impact Injury Threshold (180 dB)*	*Both Impact Disturbance Threshold (160 dB) and Vibratory Disturbance Threshold (120 dB)*	*Vibratory Disturbance Threshold Only (120 dB)*	*Impact and Vibratory Disturbance Threshold (100 dB)**	
Year 1, 30 September 2013 through 29 September 2014						
California sea lion	0	N/A	500	423	0	923
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	350	289	N/A	639
Year 1 Total	**0**	**0**	**955**	**712**	**90**	**1,667***
Year 2, 30 September 2014 through 29 September 2015						
California sea lion	0	N/A	1,020	306	0	1,326
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	714	204	N/A	918
Year 2 Total	**0**	**0**	**1,839**	**510**	**90**	**2,349***
Year 3, 30 September 2015 through 29 September 2016						
California sea lion	0	N/A	120	543	0	663
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	84	375	N/A	459
Year 3 Total	**0**	**0**	**309**	**918**	**90**	**1,227***
Total, All Years						
California sea lion	0	N/A	1,640	765	0	2,405
Harbor seal	0	N/A	270	0	270	270*
Gray whale	0	0	45	0	N/A	45
Coastal bottlenose dolphin	0	0	1,148	868	N/A	2,016
Total All Years	**0**	**0**	**3,103**	**1,633**	**270**	**4,736***

Note: *In each year, the same three individual harbor seals would be subject to harassment by both underwater and airborne sound.

Conclusions Regarding Impacts to Species or Stocks

Individual marine mammals may be exposed to SPLs during pile driving and extraction operations at NBPL may result in Level B Behavioral harassment. Any marine mammals that are taken (harassed), may change their normal behavior patterns (i.e., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. The sound generated from vibratory pile driving is non-pulsed (e.g., continuous) which is not known to cause injury to marine mammals. Mitigation is likely to avoid most potential adverse underwater impacts to marine mammals from impact pile driving. Nevertheless, some level of impact is unavoidable. The expected level of unavoidable impact (defined as an acoustic or harassment "take") is described in sections above. This level of effect is not anticipated to have any detectable adverse impact on population recruitment, survival or recovery (i.e., no more than a negligible adverse effect).

Impacts to Marine Mammal Habitat

The proposed activities at NBPL will include the temporary relocation of bait barges used as haulouts by California sea lions, which is expected to result in a temporary redistribution of sea lions within northern San Diego Bay. The factors that currently attract sea lions to the barges are expected to operate equally in their new locations. There are no known breeding hotspots, or other ocean bottom structure of significant biological importance to marine mammals, that may be present in the marine waters in the vicinity of the Project Area. Therefore, the main impact issue associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals, as discussed above. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (i.e., fish) nearby NBPL and minor impacts to the immediate substrate during installation and removal of piles.

Pile Driving Effects on Potential Prey (Fish)

Construction activities will produce both pulsed (i.e., impact pile driving) and continuous sounds (i.e., vibratory pile driving). Fish react to sounds that are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005, Popper and Hastings 2009) identified several studies that suggest fish may relocate to avoid certain areas of noise energy. Additional studies have documented effects of pile driving (or other types of continuous sounds) on file, although several are based on studies in support of large, multiyear bridge construction projects (Scholik and Yan 2001, 2002; Govoni *et al.* 2003; Hawkins 2005; Hastings 1990, 2007; Popper *et al.* 2006; Popper and Hastings 2009). Sound pulses at received levels of 160 dB re 1 µPa may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Chapman and Hawkins 1969, Pearson *et al.* 1992, Skalski *et al.* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality (Caltrans 2001, Longmuir and Lively 2001). The most likely impact to fish from pile driving activities at the Project Area would be temporary behavioral avoidance of the immediate area. The duration of fish avoidance of this area after pile driving stops is

unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary.

Pile Driving Effects on Potential Breeding Habitat

The area likely impacted by the Fuel Pier Replacement Project is relatively small compared to the available habitat in northern San Diego Bay. Given that the Navy's marine mammal surveys have documented no marine mammal occurrences in the immediate vicinity of the fuel pier (see Figure 3-2), the affected area is used little, if at all, as breeding habitat. As a result, the removal and replacement of pilings, substrate disturbance, and high levels of activity at the project site would be inconsequential in terms of effects on marine mammal breeding.

The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal breeding habitat in northern San Diego Bay.

The project design has minimized effects on eelgrass beds and would mitigate any unavoidable losses by replacement. Hence the project would not negatively impact eelgrass beds and the important nursery and breeding habitat functions they provide for fish, which in turn serve as prey for marine mammals.

Summary of Impacts to Marine Mammal Habitat

Given the short daily duration of noise associated with individual pile driving\removal, seasonal limitations on the in-water activities that have the greatest potential to disturb marine mammals and their prey, and the relatively small areas being affected, pile driving and extraction activities associated with the proposed action are not likely to have a permanent, adverse effect on any EFH, or population of fish species. Therefore, pile driving\removal is not likely to have a permanent, adverse effect on marine mammal breeding habitat at the Project Area.

Conclusion

The Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). NMFS accepted the Navy's IHA application and associated monitoring plan, and published the proposed rule to issue the IHA on 23 May 2013. Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals.

3.4.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, the implementation of Alternative 2 would not result in any significant impacts to marine mammals.

3.4.3.5 Mitigation Measures

Because potential impacts to marine mammals would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.4.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to marine mammals.

3.5 THREATENED AND ENDANGERED SPECIES

3.5.1 Definition of Resource

This section describes species protected by the ESA that may occur within areas directly or indirectly affected by the proposed project.

3.5.2 Affected Environment

The three federally threatened or endangered species that occur or have the potential to occur in or adjacent to the proposed project area are provided in Table 3.5-1 and are discussed in detail below. Of these species, only the California least tern regularly occurs within the vicinity of the proposed project area. There is no designated critical habitat for these species in the proposed project area.

3.5.2.1 California Least Tern

The California least tern was listed as endangered in 1970; there is currently no designated critical habitat for this species (USFWS 2006). It is the smallest North American tern and is found along seacoasts, beaches, bays, estuaries, lagoons, lakes, and banks of rivers and lakes.

Least terns are inshore foragers and surface-feeding fish eaters who are opportunistic in their search for prey, eating fish that are small enough to catch including anchovies and smelt (NAVFAC Southwest and Port of San Diego 2011). Studies conflict as to whether piers, docks, sea walls, and other artificial structures along the shoreline may attract least terns; these structures typically act as artificial reefs for juvenile schooling fish, which terns feed upon, whereas human activity may be a deterrent (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). Terns will also frequently forage in the open waters of the ocean and bays, and although eelgrass is an important habitat for several prey species, terns do not demonstrate any preference for feeding in eelgrass (NAVFAC Southwest and Port of San Diego 2011).

Table 3.5-1. Federally Threatened and Endangered Species Occurring or Having the Potential to Occur in the Vicinity of the Proposed Project Area

Species	*Status*	*Habitat*	*Occurrence*
California least tern (*Sterna antillarum browni*)	Endangered	Bays, estuaries, lagoons, shoreline, river mouths, sandy unvegetated strips. Spring-summer breeding resident.	Locally common spring-summer resident, feeding in bay and ocean waters. Nesting colonies outside of the project area around San Diego Bay. Breeding habitat is present within the San Diego Bay project area, off shore west of Naval Base San Diego (NBSD).
Green sea turtle (*Chelonia mydas*)	Endangered	Warm oceans, eelgrass beds. Non-breeding migrant.	Occurs in south bay, Coronado Bridge, South Bay Power Plant's warm water discharge channel. Feeds on marine algae and sea grasses, such as eelgrass. No breeding sites occur in San Diego Bay. Possible rare transient in the project area.
Western snowy plover (*Charadrius alexandrinus nivosus*)	Threatened	Intertidal mudflats, beaches, dunes, salt flats and dikes.	Local spring-summer breeding resident, migrant and wintering individuals at other times; inhabits sandy beaches. Breeding and wintering sites are known at SSTC, Naval Amphibious Base (NAB), and NAS North Island. Feeds on terrestrial and aquatic invertebrates such as amphipods, sand hoppers, and flies. Not known or likely in the San Diego Bay project area.

Note: Endangered = Listed as endangered under the federal ESA. Threatened = Listed as threatened under the federal ESA.

California least terns are residents in San Diego Bay from late spring to early fall, with the breeding season beginning 1 April and ending 15 September. In the spring of 2012, the first least tern nest was discovered on 28 April at Silver Strand Beach (Naval Base Coronado 2012). There are six recognized least tern nesting colonies in the bay, spanning from an area near the San Diego International Airport at the northern portion of the bay to the Sweetwater Marsh National Wildlife Refuge in the southern portion of the bay (Figure 3.5-1; NAVFAC Southwest 2004). Central portions of the bay house the largest nesting populations in the bay (NAVFAC Southwest 2004). The nesting population closest in proximity to the project area is located approximately 0.6 mi to the east of the proposed dredging area.

Five key breeding areas exist in the San Diego Bay region. Two are located outside of the Bay in the shallow ocean waters off of Coronado and Silver Strand Beach; a third is at the mouth of the bay; the fourth is inside the bay along the silver strand; and the fifth is in southern San Diego Bay, within the Sweetwater Marsh National Wildlife Refuge. The proposed project area is located almost entirely within the breeding area at the mouth of the bay (Figure 3.5-1).

California least terns nest in open expanses of sand or light-colored dirt on or near beaches and the shores of coastal bays. The nest is a small depression that may be natural, man-made, or excavated by the birds. One to four eggs are laid, although most nests have two or three. This species forages over shallow waters within 2 to 3 mi of the nest, feeding primarily on small fish, including silversides (*Atherinidae* spp.) and northern anchovy (Massey and Atwood 1985).



Figure 3.5-1
California Least Tern Nesting Sites and Foraging Areas Identified in the Tern MOU Within the Vicinity of the Proposed Project

Source: NAVFAC Southwest 2010a, 2010b

Least tern nesting populations for the bay have increased dramatically, from 187 in 1993 to 1,606 in 2006 (Navy 2006). In 2010, the estimated number of breeding pairs throughout San Diego Bay ranged from 1,418 to 1,478 (CDFW 2011). Tern populations have increased in the bay due to coordinated management strategies with the USFWS and the Navy on Navy lands. These strategies include predator management, tern monitoring, site preparation of tern nesting colonies, and biological information gathering (NAVFAC Southwest 2004).

The closest least tern nesting colonies to the project area are located at NAS North Island; specifically, the Runway 1-1 and the Ammo Dump alternative sites, all of which are on Navy land, approximately 2,800 ft (850 m) to the east of the proposed project area. All nesting sites at NAS North Island have close proximity to breeding areas. The only other nesting colony within the north bay is found at Lindberg Field. Other nesting colonies within central and south bay are found at North Delta Beach, South Delta Beach, NAB Ocean Beach, "D" Street, Chula Vista Wildlife Reserve, and South Bay Refuge (NAVFAC Southwest 2004). All of these nesting areas, with the exception of the airport location, have been used annually since 1994.

The Navy implements an extensive program of research, monitoring, protection, nest site enhancement, and avoidance measures to minimize the take of California least tern from Navy activities. An MOU between the USFWS Ecological Services and Refuges and NAVFAC Southwest and NRSW (USFWS and Navy 2004, NRSW 2008) summarizes efforts and commitments by the U.S. Navy and USFWS to California least tern conservation and enhancement in San Diego Bay. The MOU is included in this EA as Appendix E.2.

3.5.2.2 Green Sea Turtle

The green sea turtle is federally threatened throughout its eastern North-Pacific range. A small population primarily resides in southern San Diego Bay's warmer waters, which are heated by cooling water discharge from the South Bay Power Plant. It is also believed that other green sea turtles migrate from nesting sites in Mexico to San Diego Bay to forage on red algae, sea lettuce, and eelgrass. The number of turtles using the Bay varies but is estimated to range from 30 to 60 animals, increasing to nearly 100 during peak migratory time periods (NAVFAC Southwest and Port of San Diego 2011). As such, transient green sea turtles may occur in the proposed project area, although they have not been detected in the North Bay in recent years (Richter 2012).

3.5.2.3 Western Snowy Plover

The western snowy plover is a federally threatened bird species that nests in colonies on sandy beaches along the west coast of the United States and into southern Baja California. They occur on the beaches in the San Diego Bay area and on the salt work levees in the south Bay. The majority (78 percent) of the coastal breeding colonies in California occur on eight sites from San Francisco Bay to Oxnard and the Channel Islands (NAVFAC Southwest and Port of San Diego 2011). There were an estimated 248 snowy plovers in San Diego County in 2010 and 277 in 2011 during the breeding season (USFWS 2011). Of the 126 nests in the county in 2006, approximately 54 percent were at Camp Pendleton, 6 percent at Batiquitos lagoon, and 34 percent were in the San Diego Bay area at several sites (in decreasing order of importance—NAB Coronado [Ocean], NAS North Island, Silver Strand State Beach [Ocean], SSTC, Saltworks, and NAB

Coronado [Bay]) (NAVFAC Southwest and Port of San Diego 2011). Navy 2012 surveys to date show that there are 22 active nests on the beach southeast of the North Island airfield and that three of the five nests located on the airfield have been collected to protect the snowy plovers (NAB Coronado 2012).

An estimated 70 percent of the snowy plover population migrates in the winter; the remainder are present year-round. The San Diego Bay area also serves as the over-wintering grounds for plovers from Monterey Bay and Oregon and now holds much of the remaining nesting grounds for snowy plovers in Southern California. As its natural nesting areas have come under development or heavy human usage, the undeveloped Naval training beaches have become increasingly important for this species locally (NAVFAC Southwest and Port of San Diego 2011). There is no designated critical habitat within or adjacent to the project area; the closest designated critical habitat is on the southeast side of North Island at Coronado Beach, 2.5 mi to the southeast (USFWS 2012). Snowy plovers are not known or likely to use the small areas of beach near the proposed project.

3.5.3 Environmental Consequences

3.5.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to threatened and endangered species based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

3.5.3.2 Avoidance and Minimization Measures

The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species:

1) Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September).
2) The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2).
3) In conjunction with marine mammal monitoring (Section 3.4.3.2) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the limit of potential Level B behavioral harassment, specifically to the underwater 160 dB re 1 μPa (rms) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 μPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound SPL (rms) ≤ median ambient rms), whichever is less. A 10-m buffer zone will also be monitored

during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities.

4) If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting.

5) Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.

3.5.3.3 Alternative 1 Pier Replacement and Associated Dredging

California Least Tern

Most of the proposed project (i.e., the existing fuel pier, the proposed fuel pier, the proposed dredging area, and the proposed temporary Navy MMP relocation site) is located within a breeding area identified in the existing Tern MOU between the USFWS and U.S. Navy (Figure 3.5-1, Appendix E.2). Various studies have confirmed that terns forage in both shallow and deep water habitats, although studies conflict as to whether artificial structures attract or deter tern breeding (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). The nearest nesting habitat areas are across the bay, on the western edge of North Island, approximately 700 m east of the dredging footprint.

Conservation measures established in the MOU Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (refer to Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No persistent effects on breeding conditions are expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at North Island. Based on this analysis, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the California least tern. The Navy made a no effect determination on the California least tern as full compliance with the MOU would occur. There would be no significant impact on the California least tern.

The proposed relocation of the bait barges as well as sediment disposal at the SSTC reuse site would occur outside of the least tern nesting season and would thus have no effect on the species.

Green Sea Turtle

Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area

(NAVFAC Southwest and Port of San Diego 2011). In any case, proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities.

No sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures described in Section 3.5.3.2 would be implemented to avoid potential impacts to green sea turtles from pile driving activities. Although there are no empirical data on the effects of pile driving on sea turtles, NMFS has identified impact pile driving underwater sound criteria for sea turtles as 190 dB re 1 µPa (rms) for Level A physiological effects, and 160 dB re 1 µPa (rms) for Level B behavioral effects. For vibratory pile driving, NMFS criteria are 190 dB rms for Level A and 120 dB re 1 µPa (rms) for Level B. However, sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Furthermore, any sea turtles present in the general vicinity would be able to detect the noise and associated in-water activities and may avoid the project area during project activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Therefore, the Navy has concluded that Alternative 1 may effect, but is not likely to adversely effect, the green sea turtle. The Navy consulted informally with NMFS to request concurrence with this conclusion and NMFS concurred (refer to Appendix A). There would be no significant impact on the green sea turtle.

Western Snowy Plover

Since the western snowy plover is not known or expected to occur in the San Diego Bay project area, and since the nearby sandy beach would not be used for any project-related purpose, there would be no effect on individuals or potential habitat for this species in San Diego Bay. Nearshore sediment disposal at the SSTC reuse site would occur 1,000-2,000 ft offshore, and thus have no effect on snowy plovers that may be present on the beach. Therefore, the Navy made a no effect determination on western snowy plovers and no consultation is required. There would be no significant impact to western snowy plovers.

Other Special Status Species

The project sites are not in proximity to important breeding, resting, or nesting areas for bird species, and similar habitats are abundant throughout San Diego Bay. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. No impacts are anticipated from the temporary relocation of the bait barges within the same deep subtidal habitat. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, there would be no adverse effect on these species' populations or habitats as a result of Alternative 1.

3.5.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on threatened and endangered species as a result of Alternative 2.

3.5.3.5 Mitigation Measures

Because potential impacts to threatened and endangered species would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.5.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zones, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to threatened and endangered species.

3.6 WATER RESOURCES

3.6.1 Definition of Resource

Water quality describes the chemical and physical composition of water as affected by natural conditions and human activities. Water resource regulations focus on the right to use water and protection of water quality. The principal federal laws enforced by the U.S. Environmental Protection Agency (USEPA) to protect water quality are the CWA, as amended (33 USC § 1251 *et seq.*), and the Safe Drinking Water Act (42 USC § 300f *et seq.*). The CWA provides protection of surface water quality and preservation of wetlands. Section 404 of the CWA regulates discharge of dredged or fill material in waters of the U.S. (USEPA 2005). The Marine Protection, Research, and Sanctuaries Act (also known as the Ocean Dumping Act) governs transportation of materials for the purpose of disposal into ocean waters (USEPA 2005). The Safe Drinking Water Act is directed at protection of drinking water supplies. At the state level, the Porter-Cologne Water Quality Control Act (California Water Code §§ 13000-13999.10) gives the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) responsibilities for protection of the waters within their regions. The regional boards are also responsible for implementing provisions of the CWA delegated to states, such as the National Pollutant Discharge Elimination System (NPDES), which regulates point (industrial) and non-point (stormwater) sources of pollutants, and Section 401, which requires certification that discharges to water bodies comply with state water quality standards.

In the Water Quality Control Plan for the San Diego Basin (Basin Plan), the California RWQCB, San Diego Region, designated beneficial uses for the surface and ground waters in the San Diego Region, including San Diego Bay (RWQCB 1994). Beneficial uses are defined as the uses

of water necessary for the survival or well-being of man, plants, and wildlife, and are protected against degradation of their quality under the state Porter-Cologne Act (RWQCB 1994). Examples include drinking, swimming, industrial, and agricultural water supplies, and the support of fresh and saline aquatic habitats. Specific beneficial uses established for San Diego Bay include the following (RWQCB 1994): Industrial Service Supply; Navigation; Contact Water Recreation; Non-contact Water Recreation; Commercial and Sport Fishing; Preservation of Biological Habitats of Special Significance; Estuarine Habitat; Wildlife Habitat; Rare, Threatened, or Endangered Species; Marine Habitat; Migration of Aquatic Organisms; and Shellfish Harvesting. The Basin Plan sets objectives for water quality that must be maintained to protect the designated beneficial uses of water resources in the San Diego region and conform to the state's antidegradation policy. The California Ocean Plan establishes limits or levels of water quality characteristics for ocean waters to ensure the reasonable protection of beneficial uses and the prevention of nuisance (SWRCB 2005).

3.6.2 Affected Environment

The following section describes existing conditions for water resources at the proposed project site located in San Diego Bay. The region of influence (ROI) for water resources for the proposed project is San Diego Bay.

3.6.2.1 Existing Conditions

San Diego Bay is a narrow, crescent-shaped natural embayment oriented northwest to southeast with an approximate length of 15 mi (Port of San Diego 2007). The width of the bay ranges from 0.2 to 3.6 mi, and depths range from -74 ft MLLW near the tip of Ballast Point (see Figure 1-1) to less than four ft at the southern end (Merkel & Associates, Inc. 2009). About half of the bay is less than 15 ft deep and most of it is less than 50 ft deep (Merkel & Associates, Inc. 2009).

On average, the San Diego region receives 10 inches of rainfall per year, occurring mostly between November and March (Port of San Diego 2007). Seasonal inputs of freshwater from the land to the east are conveyed to the bay through the three sub-watersheds of the San Diego Bay watershed (Port of San Diego 2007). The Pueblo San Diego sub-watershed encompasses the northern portion of the bay including the project area. This sub-watershed has the smallest drainage area, but is the most densely developed and populated because it includes the City of San Diego (Port of San Diego 2007). Freshwater contribution to the Bay comes primarily from the Otay and Sweetwater Rivers in the south portion of the Bay, and secondarily from Chollas and Paleta Creeks in the central portion (USACE 2009). For approximately 9 months of the year, the Bay receives no significant amount of fresh water input. The fresh water that does flow into the bay is limited to surface runoff from urban areas (e.g., the over 200 storm drains and intermittent flows from the rivers and creeks after storms) (USACE 2009). Surface water on the Point Loma peninsula comprises ephemeral drainages that convey water to the bay or ocean directly after rain events. In the northern, developed urban portion of the peninsula, seasonal runoff flows to the ocean via gutters and storm drains. Some of the natural drainage pattern remains in the undeveloped western and southern portions (Figure 1-2). West (upslope) of the project site, runoff is diverted to containment basins and concrete channels to prevent contact

with potential contaminants at the NBPL DFSP fuel storage facilities before outflow to the bay (Navy 2007).

Bathymetry and Circulation

The northern and central portions of the bay have been shaped by historic dredging to support large ship navigation, and filling (Merkel & Associates, Inc. 2009). Only the far southern portion retains its natural shallow bathymetry (Merkel & Associates, Inc. 2009). The bathymetry and bedform of the bay are defined by a main navigation channel that steps up to shallower dredged depths toward the sides and bottom of the bay (Merkel & Associates 2009). USACE dredges the navigation channel to maintain it a depth of -47 ft MLLW (NOAA 2012). Outside the navigation channel, the bay floor consists of platforms at depths that vary slightly (Merkel & Associates 2009). Within the north bay, typical depths range from -36 to -38 ft MLLW to support large ship turning and anchorage (Merkel & Associates, Inc. 2009). Small vessel marinas are typically dredged to depths of -15 ft MLLW (Merkel & Associates, Inc. 2009).

Bathymetry at the proposed project site has been altered by filling and dredging as well. The quay wall at the fuel pier has been artificially filled to its elevation of approximately +12 ft MLLW (Terra Costa Consulting Group, Inc. 2010). The bay bottom on the south side of the fuel pier approach segment has been dredged to a depth of about -20 ft MLLW, while the bathymetry of the north side retains a more gradual downward slope to the east. Beneath the fuel pier itself, the bottom was protected from historical dredging by the pier pilings and thus stands several feet higher than immediately adjacent depths (Terra Costa Consulting Group, Inc. 2010, NAVFAC 2009a). Beyond the fuel pier headline, the bottom drops sharply to -30 ft and then -40 ft, the result of dredging. Bayward (east) of the headline, most of the bathymetry out to the navigation channel is at least -41 ft MLLW. However, there is one wedge-shaped high spot along the western edge of the navigation channel where bottom depths rise from -40 to -36 ft MLLW (see Figure 2-6).

Circulation within San Diego Bay is affected by the bay's crescent shape and narrow bay mouth, tides, and seasonal salinity and temperature variations (Port of San Diego 2007). San Diego Bay can be divided into four regions based upon circulation characteristics. The North Bay – Marine Region extends from the bay mouth to the area offshore from downtown San Diego. Tidal action has the greatest influence on circulation in this area where bay water is exchanged with sea water over a period of two to three days (Port of San Diego 2007). The North-Central Bay – Thermal Region runs from the north bay to Glorietta Bay (south of Coronado Island). In the Thermal Region, currents are mainly driven by surface heating (Port of San Diego 2007). The incoming tide brings cold ocean water from deeper areas, which is then replaced with warm bay surface water when the tide recedes. These tidal processes lead to strong vertical mixing (Port of San Diego 2007). The region between Glorietta Bay and Sweetwater Marsh is characterized as the South-Central Seasonally Hypersaline (i.e., higher salt content than seawater) Region. Here, variations in salinity due to warm-weather evaporation at the surface separate the water into upper and lower zones driven by density differences (Port of San Diego 2007). The South Bay estuarine region south of Sweetwater marsh receives occasional freshwater inflows from the Otay and Sweetwater Rivers (Port of San Diego 2007). Residence

time of bay water in the estuarine region may be greater than 1 month (Port of San Diego 2007). Common salinity values for the bay range from 33.3 to 35.5 practical salinity units for the bay mouth and the south bay, respectively (Chadwick *et al.* 1999).

San Diego Bay has mixed diurnal/semi-diurnal tides, with the semi-diurnal component being dominant (Largier 1995). The interaction between these two types of tides is such that the higher high tide occurs before the lower low tide, creating the strongest currents on the larger ebb tide (Largier 1995). The tidal range (difference between MLLW and mean highest high water) is about 5.5 ft (Largier 1995). In general, tidal currents are strongest near the bay mouth, with maximum velocities of 1.6 to 3.3 ft per second (Largier 1995). Tidal current direction generally follows the center of the bay channel (Chadwick *et al.* 1999). Residence time for water in the bay increases from approximately five to 20 days in mid-bay to over 40 days in south bay (Chadwick *et al.* 1999). During an average tidal cycle, about 13 percent of the water in the bay mixes with ocean water and then moves back into the bay (Port of San Diego 2007). The complete exchange of all the water in the bay can take 10 to 100 days, depending on the amplitude of the tidal cycle (Port of San Diego 2007). Tidal flushing and mixing are important in maintaining water quality within the bay. The tidally-induced currents regulate salinity, moderate water temperature, and disperse pollutants (Port of San Diego 2007).

Marine Water Quality

San Diego Bay

Before the 1960s, San Diego Bay was one of the most polluted harbors in the world. This was due to over 70 years of discharge of raw sewage and industrial waste as the population of the City of San Diego increased and became a major harbor for the U.S. Navy and civilian commerce (Chadwick *et al.* 1999). In 1963, the City of San Diego constructed its Wastewater Treatment Plant on the west side of the Point Loma peninsula to properly treat sanitary sewage before ocean discharge via an offshore pipeline. Use of the treatment plant and elimination of industrial discharges in the 1970s resulted in rapid water quality improvements in the bay (Port of San Diego 2007).

Water quality is commonly assessed by measuring dissolved nutrients, dissolved oxygen, pH, turbidity, chlorophyll *a,* and coliform bacteria (Chadwick *et al.* 1999). Measured values for dissolved nutrients in San Diego bay such as phosphate and silicates range from 0.9 to 4 parts per million (ppm) for silicon and 0.02 to 0.3 ppm phosphorus in the winter, to 0.3 to 1.3 ppm for silicates and 0.2 ppm phosphorus in the summer (Chadwick *et al.* 1999). This variation is the result of inflow of these nutrients with winter runoff, and uptake by phytoplankton growth in the summer (Chadwick *et al.* 1999). Dissolved oxygen levels range from about 4 (summer) to 8 milliliters (ml) per liter (winter) (Chadwick *et al.* 1999). These oxygen levels are typically at or near atmospheric equilibrium levels. The pH of seawater in San Diego Bay is relatively uniform, ranging from about 7.9 to 8.1 throughout the bay and the year (Chadwick *et al.* 1999).

Turbidity is a measure of water clarity or murkiness, and can be caused by suspended sediments transported in runoff or increased algal/bacterial growth (TDI 2010). Turbidity can also be created by natural and man-made resuspension of bottom sediments. Bottom sediments

are resuspended by the action of tides, winds, and movements of ships with drafts deeper than 22 ft in the shallow waters of the south bay around Naval Base San Diego (NBSD) (Chadwick *et al.* 1999). Increased turbidity reduces the amount of light available for plant growth underwater, so it can affect the entire ability of the Bay to support living organisms (TDI 2010). Turbidity in San Diego Bay varies, depending on the tides, seasons, and location within the Bay (TDI 2010). The monthly average for the northern portion of the bay varies from approximately 1.0 to 3.7 nephelometric turbidity units (NTU) (TDI 2012). The Basin Plan sets limits for allowable increases in turbidity over existing conditions (RWQCB 1994).

Chlorophyll *a* (a measure of the amount of phytoplankton present in the bay) ranges from 0.2 to 25 micrograms per liter (Chadwick *et al.* 1999). The highest values were measured in the south bay in winter, when runoff carries high levels of nutrients into the south bay. In summer, chlorophyll *a l*evels return to background levels of 1 to 2 micrograms per liter. These chlorophyll *a l*evels are generally much higher than those found in the adjacent open ocean. Before 1964, when untreated sewage was still being discharged into San Diego Bay, bacterial counts (fecal coliform) were as high as 82 per milliliter in the south bay (Chadwick *et al.* 1999). Since these discharges ended, bacterial counts typically remain below 10 per milliliter except during some winter storms. These levels are below federal limits for water contact, implying that the bay is generally safe for recreational use (Chadwick *et al.* 1999).

Current sources of pollution to the bay include underground dewatering, industries on the bay and upstream, marinas and anchorages, DoD and Department of Homeland Security (DHS) activities, materials used for underwater hull cleaning and vessel antifouling paints, and urban runoff (Chadwick *et al.* 1999). Additional pollution sources include creosote-treated wood pier pilings, which are a source of polycyclic aromatic hydrocarbons (PAHs), stormwater runoff from land used for industrial, commercial, and transportation purposes, bilge water discharge, and oil spills (Chadwick *et al.* 1999). Recent changes in Navy procedures have included replacing approximately half of the pier pilings with plastic, concrete, or untreated wood, and eliminating bilge water inputs (Chadwick *et al.* 1999). Overall, the levels of contamination in the water and sediment in San Diego Bay appear to be lower now than in decades past, including levels of some metals and PAHs (Port of San Diego 2007). However, copper concentrations remain routinely higher than federal and state limits for dissolved copper (Port of San Diego 2007).

Silver Strand Training Complex Sediment Beneficial Reuse Site

The beneficial reuse site is located offshore of SSTC beach, approximately 3 miles southeast of Zuniga Jetty along the Pacific Coast. The dredged sediment would be discharged in water of depths between -25 and -35 ft MLLW, within areas of approximate dimensions 2,800 ft long by 1,000 ft wide, approximately 64 acres (Figure 2-10).

The nearshore receiver site is within the Silver Strand Littoral Cell (Navy 2011). The Tijuana River historically delivered a steady supply of sand from the from the south, which was moved northward to the Silver Strand beaches by longshore currents (Navy 2011). Silver Strand Peninsula, a sand spit deposited by a northward-bound eddy of the coastal current on the west, separates San Diego Bay from the Pacific Ocean. Since the Tijuana River was dammed in 1937

the supply of sediment to the coastline has diminished by 70 percent (Navy 2011). Beaches south of Coronado (i.e., SSTC Beach) have become severely eroded by waves and wave-driven currents (Navy 2011, USACE 2012). The P-151 sediment reuse site is approximately 1,000 ft south of a site where the USACE proposed to discharge clean sediment from their San Diego Harbor Maintenance Dredging Project for beneficial reuse for beach replenishment (Figure 2-10) (USACE 2009, 2012).

Ocean water quality monitoring conducted by the City of San Diego indicates that water quality offshore of Silver Strand is generally good. Occasional water poor quality/elevated bacteria levels associated with heavy storm runoff and sewage spills caused multiple closures of neighboring Breakers Beach at NAS North Island and Silver Strand State Beach from 2004 through 2006 (Navy 2011). Natural conditions such as thermal stratification, upwelling, tides and currents; surface runoff and river discharges; as well as wastewater discharges affect ocean water quality offshore of the Silver Strand peninsula (Navy 2011). Dissolved oxygen ranges from 5.0 to 11.6 milligrams per liter (mg/L) throughout waters offshore of southern California. Ocean surface water dissolved oxygen was measured at 7.8 mg/L and 8.3 mg/L; dissolved oxygen measured at the bottom was 8.6 mg/L. The concentration of dissolved oxygen is generally higher in surface and nearshore waters as a result of continuous wave action and atmospheric mixing. Salinity has been fairly constant in Southern California waters, in the range of 32 to 34 parts per trillion, and tends to be homogeneous throughout the water column (Navy 2011). Pacific Ocean waters offshore of Silver Strand tend to have higher-than-average levels of total suspended solids (TSS, a measure of turbidity). In 2002, TSS offshore of Silver Strand was measured in the range of 11.5 to 23.2 mg/L in 2002 (Navy 2011). Silver Strand offshore waters typically have low levels of oil and grease. Above-average concentrations of semi-volatile organic compounds (i.e., PAHs) and some metals (aluminum, arsenic, chromium, copper, iron, manganese, and zinc) have been detected in sample from sediments collected offshore from the SSTC–North beach (Navy 2011). However, the detected contaminants are not at concentrations that pose a risk to public health or the environment (Navy 2011).

Surface Water Quality

Fuel Pier

Stormwater runoff from the fuel pier is regulated as an industrial discharge under NBPL's NPDES Permit (Permit No. CA 0109363 Order No. R9-2002-0002) (RWQCB 2002a). This permit prohibits the discharge of wastes including water contaminated with oils, fuels, lubricants, solvents, and oily bilge water (RWQCB 2002a). The NPDES permit states that the discharger (i.e., NBPL and the fuel pier) shall not cause pollution, contamination, or nuisance, and the discharge of wastes shall not cause or contribute to an exceedance of any applicable State or San Diego regional water quality objective or standard (RWQCB 2002a). The NPDES permit also regulates discharges from miscellaneous point source associated with the fuel pier: miscellaneous (potable water and fire system maintenance) (RWQCB 2002b).

To fulfill the requirements of the NBPL NPDES permit, NBPL has implemented a Stormwater Discharge Management Plan (NAVFAC Southwest 2009). This Plan includes Basewide and facility-specific Best Management Practices (BMPs) for preventing and minimizing contact of

stormwater with potential pollutants that are present at the fuel pier. The Basewide BMPs include restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system (NAVFAC Southwest 2009). The BMPs specific to operations at the fuel pier include: the pier perimeter where fueling operations take place has an 8-in high concrete containment berm; drainage ports in the pier deck are covered during fueling operations to prevent pollutants, in the event of a spill, from entering San Diego Bay; drip pans are used to contain leaking fluids from valves and piping until leaks are repaired; fill pipes are protected by berms from potential vehicle damage; spill kits are provided to mitigate liquid spills; and an oil containment boom surrounds the entire fuel pier (NAVFAC Southwest 2009). The floating boom is extended to surround vessels while they are berthed at the pier as well (Navy 2010a). To further minimize impacts of potential spills, additional absorbent booms, three boats to deploy them, and an oil skimmer boat are kept on the quay wall south of the fuel pier at all times (Navy 2010a). A vacuum truck is generally staged at the foot of the fuel pier as well (NAVFAC 2009). Implementation of the Basewide and site specific BMPs, and compliance with the NPDES permit ensure that ongoing fuel pier operations do not result in significant impacts to surface water. No NPDES permit violations were issued to NBPL DFSP at the fuel pier in the period from January 2004 through November 2010 (RWQCB 2011).

NMAWC Site

NMAWC is covered under NBPL's NPDES Permit but does not have any permitted industrial related discharges (NAVFAC Southwest 2012).

3.6.3 Environmental Consequences

3.6.3.1 Approach to Analysis

Water quality impacts are evaluated based on the potential for a substantial increase in turbidity, discharge of suspended sediments, or discharge of contaminants that exceeds federal or state water quality standards or objectives. Impacts to water resources would occur if implementation of the Proposed Action would cause major changes to bathymetry; alter or obstruct patterns of circulation in San Diego Bay; substantially degrade surface water, groundwater, or marine water quality or cause impairment to beneficial use.

3.6.3.2 Alternative 1 Pier Replacement and Associated Dredging

Bathymetry and Circulation

Pier Demolition

No dredging is needed near the fuel pier itself (only in the high spot in the turning basin) so there would be no changes to bathymetry at the existing pier site. A remnant soil mound (created by historical dredging of the bay floor adjacent to the fuel pier) lies beneath the existing fuel pier (Terra Costa Consulting Group, Inc. 2010). The height of the soil mound varies from approximately elevation -1 ft (MLLW) under the approach segment at the shoreline, to approximately elevation -8 ft (MLLW) near the in the center of the main pier, and -10 ft below the south segment and -20 ft beneath the north (Terra Costa Consulting Group, Inc. 2010). Sheet

pile bulkheads that protrude 10 ft above the mudline would be left in place beneath the north and approach segments, which would preserve the soil mound beneath. Vessels berthing at the new fuel pier would be operating approximately 300 ft east of the old pier berthings, so the old sheet piles, pile stubs, and remnant bathymetry would not affect navigation uses.

Demolition of the existing fuel pier would the use of a vibratory hammer and/or jetting outside the least tern breeding season (1 April through 15 September). The pier piles would be pulled with a crane or clam shell dredge bucket used as a crane. Barges, tugs, and other vessels would move about the work area. All these operations would increase water movement in the area where the removal occurs, but the effect would be strictly limited to the duration of the demolition period and work area. As stated in Section 3.6.2.1, the primary mechanisms controlling circulation in San Diego bay are tidal currents and seasonal variations in temperature and salinity. Small-scale, localized increases in water movements would not be expected to have a significant effect on bay circulation. The sheet pile bulkheads would remain in place so the absence of the individual piles would represent a negligible change from existing conditions. Because water already circulates freely around the bulkheads and the individual pilings, this change would not have a significant impact to circulation in the Bay overall. Therefore, impacts to bathymetry and circulation associated with demolishing the existing fuel pier would not be significant.

Pier Construction

There would be no dredging or other changes to bathymetry at the proposed new pier construction site. Construction of the new fuel pier would require installation of approximately 554 structural and fender piles. The first 400 ft of the new pier approach segment would be constructed within 5 ft of the existing fuel pier approach. As such, this segment of the new pier would not represent a change from existing conditions with regard to circulation. The new pier approach segment would extend about 250 ft bayward (east) beyond the old pier, where the 1,100 ft-long berthing segment would be located. Throughout the new pier structure, pier pilings would be spaced 10 ft apart. This spacing would be wide enough so that the new pier would not form a barrier to local circulation. Construction of the new fuel pier would involve the use of barges, tugs, other vessels that would move about the work area, and jetting, a vibratory hammer and a diesel hammer to install the piles. These operations would increase water movement in the area where the construction occurs, but the effect would be strictly limited to the duration of the construction period and work area. Therefore, impacts to the bathymetry and circulation of the bay overall associated with pier construction would not be significant and existing patterns of circulation would continue.

Turning Basin

The sediments in the dredge footprint generally consist of a 0.5 to 1 ft layer of fine sand and silty sand (bay/beach deposits) overlying medium and coarse grained sand with shell fragments (Bay Point Formation) (Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging [Navy Military Construction Project P-151] in Appendix D). The Bay Point Formation is native material that was deposited in the San Diego

area near the end of the last ice age (more than 10,000 years ago) (USACE 2009). The bay/beach deposits are sediments transported by current movements in the Bay (USACE 2009).

The wedge-shaped high spot in the turning basin adjacent to the west of the navigation channel would be dredged to a depth of -40 ft MLLW, removing the bay/beach deposits and several feet of Bay Point Formation. Most of the area surrounding the dredge footprint is already deeper than -40 ft MLLW (see Figure 2-6) due to historical dredging. Reducing the high spot in the turning basin to a depth similar to existing surrounding depths would not be a major change to bathymetry. The dredging operations would temporarily increase water movement in the area where dredging is taking place, but the effect would be strictly limited to the duration of the dredging period and work area. The minor changes to bathymetry would not be sufficient to affect circulation patterns in the Bay. Therefore, dredging associated with Alternative 1 would not have a significant impact to bathymetry and circulation.

Silver Strand Training Complex Sediment Beneficial Reuse Site

Changes to the existing bathymetry of the beneficial reuse site should be expected as a result of the Proposed Action. Sediment deposited in the nearshore zone at the replenishment site would be gradually reworked by the forces of wave action, longshore currents, and seasonal storms into offshore sandbars and the natural beach profile. Placement of the dredged sediment at the receiver site would help remedy erosion at the SSTC beach. Therefore, it is anticipated that use of the dredge sediments for nearshore replenishment would be a beneficial impact.

Temporary Relocation of the Navy MMP

Temporary relocation of the Navy MMP would not involve dredging, filling, or other alteration of the bay bottom so there would be no changes to bathymetry at either the existing Navy MMP or proposed temporary relocation site. The Navy MMP marine mammal enclosures consist of floating walkways and enclosures (wide-mesh nets) anchored to concrete guide piles (Moffatt & Nichol-Blaylock [MNB] 2011). The guide pile spacing and floating walkways, and enclosures at the existing location permit free movement of water through this area. Removal of the floating walkways and enclosures would not affect circulation at the existing site; the guide piles would be left in place to re-anchor the floating facilities after the temporary relocation period.

Some guide piles and walkways are already in place at the NMAWC site. However, 32 of the existing guide piles would be removed and relocated, and 46 new guide piles and additional floating walkways would be installed. Guide piles are assumed to be required at a minimum of approximately 30 ft on centers along the floats; certain configurations could require additional guide piles between enclosures (MNB 2011). The Navy MMP activities while at the temporary NMAWC site would include housing and training the animals, and cleaning the animals' enclosures and Navy MMP vessels with potable water. Such activities would not involve alteration of the bay bottom, so there would be no effect on bathymetry. At the end of the 4-year temporary relocation period, the temporary guide piles would be removed. The piles would be extracted entirely or cut at the mudline, with no change to the bay bottom surface (i.e., no high spots that would pose a navigation hazard).

With respect to circulation, there would be minor, localized increases to circulation caused by vessel movement and in-water construction and demolition; these increases would cease when each particular activity ends. The temporary in-water facilities to be installed at NMAWC site - guide piles, floating walkways, and enclosures – would be similar to those already in place at the site. The only change from the existing condition would be the addition of the animal enclosures (wide-mesh floating nets). By their nature these in-water structures – guide piles spaced 30 ft apart, floating walkways and wide-mesh nets, would not create a barrier or diversion to water circulation. The Navy MMP in-water activities while at the temporary relocation site, as described in the preceding paragraph, would involve the use of high-pressure hoses for cleaning, and small boats for animal training. This equipment would not generate wakes or turbulence sufficient to affect the natural tidal-controlled flow of water in San Diego Bay. As described in the preceding paragraph, the Navy MMP marine mammal facilities would be removed from the NMAWC site after the 4-year temporary relocation period and the site would return to its existing condition i.e., the marina facilities consisting of guide piles and floating walkways. The physical changes to the NMAWC site and the activities that would occur there during the temporary relocation of the Navy MMP would not obstruct the flow of water or create artificial currents, so there would be no significant impact to circulation.

Therefore, as detailed in the preceding paragraphs, the proposed temporary relocation of the Navy MMP to the NMAWC site as described above would not have a significant impact to bathymetry and circulation.

Proposed Temporary Relocation of Everingham Brothers Bait Company Bait Barges

Temporary relocation of the bait barges does not involve dredging or other alteration of the bay bottom so there would be no changes to bathymetry at either the existing or the temporary relocation site. The bait fish are held in enclosures that have 1-in wide slots on the sides allowing sea water to flow through freely. Thus, temporary relocation of the bait barges to the would not have a significant impact to bathymetry and circulation.

In summary, limited dredging would occur in a portion of the existing turning basin, and pier piles would be installed in areas where piles already exist. Temporary relocation of the Everingham Brothers Bait Company Bait Barges would not involve alternation of the bay bottom or obstruct the free flow of water. For the reasons stated above (the dredging would level a high spot in the turning basin), piles would be spaced at a sufficient distance to allow free movement of water) implementation of Alternative 1 would not have a significant impact to bathymetry and circulation.

Marine Water Quality

Pier Demolition

The Navy would require the contractor to prepare and implement a comprehensive debris management plan that would address the types of construction and demolition debris, expected separation and retrieval methods, and disposal methods. The contractor would be required to use catch devices and sheeting to capture and contain debris and materials that may be produced by project activities. The selected contractor would be required to implement BMPs to

meet USACE and RWQCB permit conditions. Accidental releases of debris to San Diego Bay would be prevented by placing floating booms around the site to provide a complete barrier to floating debris. Debris from work on demolition and construction barges would also be captured on-board the barges. All captured material would be swept and disposed of in accordance with the debris management plan.

Before demolition begins, the contents of each fuel pier pipeline would be pumped out and each pipeline would be disconnected from the fuel supply. All fuel dispensing ports would be sealed, and each pipeline would be flushed with high-pressure water. The water from flushing the pipelines would be treated at the NBPL DFSP Fuel Oil Reclamation (FOR) system. Sanitary sewage pipelines would also be flushed with high pressure water, which would be pumped to the NBPL sanitary sewer system for discharges. Flushing the pipelines would minimize accidental release of pipeline residue during demolition activities.

The contractor would coordinate their activities with Navy FLC DFSP Fuel Pier personnel to avoid potential accidents. The Navy maintains detailed plans to prevent fuel spills at DFSP Point Loma and to respond in the event spills do occur. State regulations mandate that the operator of a bulk fuel facility such as NBPL must prepare an Integrated Contingency Plan (ICP) in accordance with the guidelines of 40 CFR 112.7. The Navy has prepared an ICP for the fuel facility at Point Loma, which was last updated in 2009. The ICP is DFSP Point Loma's in-depth response plan that addresses all aspects of an oil spill response, including organization, assessment, recommended cleanup methods, environmental considerations, establishment of priorities, training, preventive maintenance, and other required items. The current ICP complies with the requirements of federal and state regulatory agencies overseeing DFSP Point Loma, including the USEPA, USCG, CSLC, and California Office of Spill Prevention and Response. The NBPL Emergency Response Action Plan and the "Red Plan" form the first 26 pages of the ICP and are followed for immediate action in the event of an oil or hazardous substance release.

Per the NBPL Emergency Response Action Plan (a subsection of the ICP), any petroleum release or petroleum sheen observed on the water surface would be reported to National Response Center and other agencies as required. Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup measures appropriate to the nature and extent of the spill would be implemented (Red Plan-pages 1-3.). These procedures would minimize the potential for contaminants related to project activities to enter or spread in marine waters.

Vessel movement associated with demolition activities, jetting, and extraction of the existing piers would cause disturbance of bottom sediments and increased turbidity as a result of sediment resuspension. To limit sediment disturbance and turbidity, the sheet pile bulkheads would be left in place beneath the north and approach segments. Increased turbidity due to demolition would be localized to the fuel pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC Earth & Environmental, Inc. [AMEC] 2008).

Sediment Quality

Testing at the P-151 fuel pier project area and the proposed NMAWC temporary Space and Naval Warfare Systems Center (SSC) MMP relocation footprint was conducted by the Navy in January 2013 to investigate sediment quality, and evaluate the potential impacts from disturbance and suspension (NAVFAC Southwest 2013a). The sampling methodology and complete analytical results are presented in the Final Report *Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Sediment Quality Investigation San Diego Bay, San Diego, California Prepared for Naval Facilities Engineering Command Southwest by Tierra Data, Inc., March 2013* ([NAVFAC Southwest 2013a] available upon request from the NBPL Public Affairs Officer). Information within this subsection is summarized from this document.

Within each project footprints, sediment samples were collected from three separate locations. For analytical purposes, the three samples from the fuel pier area were combined into one composite and the three samples from the proposed NMAWC footprint were combined into a second composite.

The two lines of evidence necessary to assess the potential for impact to marine organisms are: (1) the physical properties of the sediment, and (2) the concentrations of contaminants in the sediment. The ability for the sediment to bind to contaminants is a function of size, with smaller particle sized diameters (less than 62.5 microns [µm]) (e.g., silts and clays) having a greater capacity to bind organic contaminants for transport. Increased concentrations of contaminants in sediment similarly increase the likelihood of binding, mobilization, and transport.

The sediments within the P-151 fuel pier project footprint and the NMAWC project footprint can be characterized as fine grain sand for both sites, with more than 60 percent of the size classes greater than 62.5 µm. As previously mentioned, larger particles sizes (greater than 62.5 µm) indicates a reduced potential for binding to contaminants. Further, under similar hydrographic conditions, larger grained particles mobilized generally fall out of suspension earlier, thereby limiting the spatial re-distribution of suspended material.

Results of the chemical analyses of sediments collected from the project areas were compared to NOAA effects range-low (ERL) and effects range-median (ERM) values. For the purposes of this EA, the NOAA effects-range values represent an established method for assessing the potential significance of elevated contaminants of concern, and therefore the potential to have adverse toxicological effects (NAVFAC Southwest 2013a). However, these NOAA guidelines should not be inferred as a compliance criterion (NAVFAC Southwest 2013a).

Analytical results from the composite of NMAWC sediments sample locations were below the corresponding ERL for all chemicals tested, including PAHs Metals, polychlorinated biphenyl (PCB) Aroclors, Organotins, Pesticides, and Petroleum Hydrocarbons (C6-C44). At the proposed NMAWC project footprint, only total PCB congeners (29 micrograms per kilogram [µg/kg]) was greater than ERL screening concentration (22.7 µg/kg), and significantly less than the established ERM of 180 µg/kg.

Analytical results from the composite of three samples from the fuel pier project footprint indicate that mercury, zinc, and total PAHs were above the ERL screening level. The

concentration of Mercury was 0.429 µg/kg, above than the ERL of 0.15 µg/kg but well below the mercury ERM screening value of 0.71 µg/kg. The concentration of Zinc in the fuel pier area sample was 180 mg/kg compared to the ERL screening level of 150 mg/kg. Zinc is often found in sediments near areas of heavy vessel use, and the level detected in the fuel pier sediment sample is well below the ERM value of 410 mg/kg.

The concentration of total PAHs in the fuel pier project area composite sample was above the ERL screening level (4022 µg/kg) at 7500 µg/kg, but significantly less than the ERM of 44,792 µg/kg. PAHs are hydrophobic (partition poorly into water) and have the capacity to bioaccumulate in the fatty tissues in marine organisms. Ubiquitous near urban centers, elevated PAHs in and of themselves do not indicate a potential for impact. Many individual congeners and PCB aroclors were reported in the composite sediment sample from the fuel pier area at concentrations below the level of analytical detection, i.e., not detected. Similarly, while sediment in the fuel pier area may have concentrations of total PCBs above the ERL, the presence of these chemicals alone does not imply potential impairment, given that the majority of individual PCB congeners and aroclors were at or below analytical detection.

Two lines of evidence suggest that impacts to marine water quality and adjacent marine habitats during disturbance activities from the removal of the existing fuel pier, construction of the new fuel pier, and in-water construction to support the temporary relocation of the Navy MMP would not be significant. The physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size and low concentrations of contaminants. With the exception of slightly elevated Total PAHs, Mercury, and Zinc at the fuel pier site, and elevated Total PCBs at the NMAWC footprint, chemical concentrations were below ERL screening criteria and in many cases below the analytical limit of detection for organic and inorganic contaminants of concern. The results of the sediment study indicate that contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts would not be significant.

Pier Construction

Construction of the new fuel pier would require installation of approximately 554 new pier pilings using jetting, a vibratory hammer, and a pile driver with a diesel hammer. Pre-cast concrete and cast-in-place concrete deck slabs would be assembled and multiple pipelines and their fittings would be installed, as well as utilities. Increased turbidity due to pile installation would be localized to the fuel pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC 2008). The potential for construction-related materials and hazardous materials to enter San Diego Bay would be minimized through the use of catch devices and sheeting as described above, and the NBPL Emergency Response Action Plan. Therefore, impacts from pier construction would be not significant.

Turning Basin

Potential sources of impacts to marine water quality associated with dredging activities would include potential release of vessel and equipment fuels and hydraulic fluids, and increased

turbidity as bottom sediments become resuspended in the water column during the dredging process.

A barge-mounted clamshell bucket dredge (or a hopper [hydraulic] dredge if available) would be used during dredging activities (MNB 2012a, 2012b). Dredging projects using any type of excavating equipment (clamshell, hopper dredge, or pipeline) generate short term turbidity. This type of dredging is common within San Diego Bay. For example, a hopper dredge project with equivalent characteristics occurred in November through December 2012 (see Section 4.1.1.6) in the entrance to the federal navigation channel, near the proposed fuel pier project dredge footprint.

Typical industry practices in dredging can be used to reduce turbidity, ranging from the type of clamshell dredge bucket used (open or closed), removing material by scooping it horizontally or vertically relative to the seabed, the speed of the bucket's ascent, and the amount of dredge material in each load. If there is a need for special measures, any of these variables can be modified. If there are no restrictions, the typical bucket for new (hard bottom) dredging would be a heavier bucket that takes vertical scoops out of the bottom and would be as full as the dredge operator could make it, which depends in part on the amount of cut.

Closed clamshell buckets (also known as environmental buckets) minimize impacts to water quality by preventing water and sediment from leaking out of the bottom of the bucket as it is raised to the surface; water can only escape through the top of the bucket. Normal clamshell buckets with teeth are usually needed for new (hard bottom) dredging; the closed buckets, however, have no teeth and are not effective for hard bottom dredging. Environmental buckets work best in maintenance dredging projects to dredge soft material. The proposed dredge footprint has not been previously dredged, so hard bottom conditions are likely to be encountered there.

Increased turbidity would cause impacts to water quality that would include temporary decreases in light penetration and levels of dissolved oxygen. Analysis of core samples taken from the proposed dredge footprint in the turning basin in November 2010 indicated that the dredge sediments are composed of approximately 14 percent fine-grained material (i.e., silt and clay) and 86 percent coarser material (sand), and low or no concentrations of contaminants detected for the suite of analyses tested (*Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging* [Navy Military Construction Project P-151] in Appendix D). Sands tend to settle out quickly, and contaminants do not typically adhere to larger-grained material such as sand, so contaminants would not be anticipated in the dredged material (USACE 2008, 2009). The vast majority of sediments resuspended by dredging settle out of the water column near the dredge within one hour, and only a small fraction takes longer to resettle (USACE 2008).

Increases in turbidity would be minimal due to the physical characteristics (mainly sand) of the dredge sediments, and limited to the immediate vicinity of the operation. Decreases in levels of light penetration and dissolved oxygen would occur only within a few hundred feet of the dredging site, and end several hours from the cessation of dredging activities, making a permanent decline in aquatic primary productivity unlikely. Because the material to be dredged

is mostly sand in which analytical testing did not indicate elevated levels of contaminants, it is unlikely that temporary turbidity associated with dredging would mobilize significant levels of dissolved-phase contaminants into the water column. Impacts to water quality due to increased turbidity, therefore, would not be significant.

As stated in Section 2.2.1.2 under Alternative 1, dredging could take place before, during, or shortly after pier demolition and construction. It is possible that some of the pile removal/installation activities could happen at the same time as dredging, although all dredging would occur outside the least tern breeding season (1 April through 15 September). At its closest point, the dredge footprint is about 1,200 ft from the existing fuel pier and 700 ft from the new fuel pier. The dredging schedule and plan would be designed to keep the dredge work as far as possible from the pier work to avoid concentrating the effects of increased turbidity in one area.

A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all in-water components of the project (NAVFAC Southwest 2011).

Silver Strand Training Complex Sediment Beneficial Reuse Site

The SSTC sediment receiver site is illustrated on Figure 2-10. Sediment disposal impacts may include temporary increases in turbidity and TSS levels, as well as associated decreases in dissolved oxygen in the immediate vicinity of the disposal operation (USACE 2012). The proposed project's dredged sediments would constitute a small fraction of the amounts to be deposited by other previously approved users (USACE 2012), and would be similar to the existing nearshore sands at the site (see Table 2-10 in Section 2.2.1.5). Turbidity associated with disposal would be brief because the sediments consist mainly of sand, would rapidly settle and the relatively small percentage of fines (silt and clay) would be rapidly dispersed by waves and currents. Increases in turbidity would be minimal and restricted to the immediate vicinity of the disposal operation.

Sediment samples from the proposed dredge footprint were collected in November 2010 and tested in accordance with regulations contained in Title 40 CFR Parts 220-228. The sediment characterization report is included as Appendix D of this EA. The sediment characterization report was provided to USEPA and USACE for review and comment on potential sediment disposal options. Based upon the analytical results, the agencies determined that the sediments from the proposed dredge footprint are suitable for unconfined aquatic disposal for nearshore replenishment (refer to Appendix A) (USEPA 2011). As such, the dredged sediments would not present a risk of toxicity or bioaccumulation to marine organisms. Because increased turbidity would be minimal, and the dredge material would not present a risk of toxicity to the marine environment, impacts to marine water quality would not be significant. In addition, the detailed protocol used in the previous USACE channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with training operations at SSTC.

Temporary Relocation of the Navy MMP

The in-water construction activities associated with temporary relocation of the marine mammals would be the same as those for the replacement fuel pier; therefore, the potential temporary impacts would be the same, i.e., a short-term increase in turbidity, potential for dust and debris to fall into the Bay, potential releases of construction and vessel-related fuel and hazardous materials. However, the construction and demolition period associated with temporary relocation of the marine mammals is much shorter than that of the replacement fuel pier: approximately 90 days. The demolition period is similarly brief: 90 days to remove/rebuild the enclosures and transfer the animals to their current location; one week to remove the guide piles. Thus, the duration of the temporary impacts would be considerably shorter for this component of Alternative 1 than for the pier replacement effort. The potential for construction and demolition related materials and hazardous materials to enter San Diego Bay would be minimized through use of catch devices and sheeting as described above, and the NBPL Emergency Response Action Plan. Therefore, impacts from construction and demolition associated with temporary relocation of the Navy MMP would not be significant.

As noted above, sediment samples at the proposed NMAWC temporary Navy marine mammal relocation site were collected and analyzed in January 2013. The analytical results did not indicate elevated levels of contaminants, so it is unlikely that temporary turbidity associated with demolition/pile removal would mobilize significant levels of dissolved-phase contaminants into the water column. Impacts to water quality due to increased turbidity, therefore, would not be significant.

The San Diego Bay shoreline at Harbor Island (west basin), listed as an impaired water body on the CWA Section 303(d) list due to copper from an unknown source is about 600 ft east of the proposed temporary Navy MMP relocation site at NMAWC (SWRCB 2012). No additional input of pollutants at the Harbor Island shoreline is anticipated due to construction of the temporary MMP facilities. Navy MMP equipment and activities at NMAWC would not involve the use of copper-containing materials (SSC Pacific 2012a). Because the construction and operation of the temporary Navy marine mammal relocation facilities at NMAWC would not result in an increase in copper concentration in San Diego Bay waters, no significant impact to water quality relative to levels of copper at Harbor Island shoreline west basin would occur.

Water and Sediment Quality Investigation

During the MILCON P-151 draft EA comment period, public commenters raised concerns regarding sediment quality and regarding hydrodynamics at the proposed temporary Navy MMP relocation area at NMAWC (RA). In response, the Navy further studied these issues. A Water and Sediment Quality Investigation was conducted in support of the temporary relocation of the MMP to NMAWC. The findings and analytical results of this investigation are presented in *Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation San Diego Bay, San Diego, California Prepared for Naval Facilities Engineering Command Southwest by Tierra Data, Inc., April 2013* (NAVFAC Southwest 2013b). This report is included in this EA as Appendix I.

To evaluate potential bacterial impacts to water quality associated with the temporary relocation of the Navy MMP to NMAWC, available water quality data was reviewed, additional field surveys were performed, and hydrodynamic modeling was conducted. The findings of the investigation concluded that once the marine mammals are moved to the proposed RA site indicator bacteria, fecal and total coliform, concentration values contributed by the marine mammals are not expected to result in increased frequency of exceedances of regulatory water quality objectives for indicator bacteria in waters designated for contact recreation (REC-1) beneficial uses. The frequency of exceedances is expected to primarily be dependent on external sources related to stormwater runoff and not the marine mammal inputs. In addition, the relocation of the marine mammals is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

Existing water quality data were reviewed and compared to the REC-1 fecal and total coliform bacteria water quality objectives provided in the San Diego RWQCB, San Diego Region Basin Plan (herein Basin Plan). The Basin Plan objectives for fecal coliform are: 1) shall not exceed 200 most probable number (MPN) per 100 ml for any 30 day logarithmic average (at least 5 samples), and 2) shall not exceed 400 MPN per 100 ml for more than 10 percent of samples during any 30 day period. The Basin Plan objectives for total coliform are: 1) no more than 20 percent samples at any sampling station, in a 30 day period, may exceed 1,000 organisms per 100 ml, and 2) no single sample, when verified by a repeat sample taken within 48 hours, shall exceed 10,000 organisms per 100 ml. Indicator bacteria data sets were obtained from the City of San Diego for outfalls discharging to the Naval Training Center (NTC) Channel and from the County of San Diego Environmental Health Department (SDCDEH) for receiving water data during dry season months near Spanish Landing. Data from the City (2008 to 2012) displayed elevated fecal and total coliform levels, whereas data from SDCDEH (2009 to 2012) rarely exceeded the REC-1 objectives, only one fecal and one total coliform sample during the period, and the logarithmic averages for fecal coliform were all below the 200 MPN/100ml objective. The City of San Diego data do not represent existing receiving water conditions, but rather provide information on a potential source of bacteria loading, urban runoff. SDCDEH data represent the existing receiving water conditions at Spanish Landing during dry season months.

In addition to the City of San Diego and SDCDEH data, bacteria sampling data from the Navy's MMP for the SSC Pacific marine mammals' existing location and the proposed temporary RA was reviewed. Water samples were collected monthly from January 2010 through November 2012 adjacent to the mammals' existing enclosures and the proposed NMAWC RA. With a few exceptions bacterial levels in the samples were below the San Diego Bay REC-1 water quality objectives for fecal coliform. The exceptions included four exceedances of the 400 MPN/100 ml objective at the proposed RA in 2010. However, there have been no exceedances at the RA since November 2010 (a period longer than 2 years) and no exceedances of the fecal coliform objectives have been recorded at the location of the existing enclosures. The monthly historical sampling data were also compared to the total coliform REC-1 water quality objectives for the existing enclosures and RA. With one exception in December 2010, all sample results were below total coliform objectives at the existing

enclosures location. At the proposed temporary RA, there were seven exceedances of the total coliform objective from 2010 through 2012. Six of the seven exceedances occurred during the wet season and were likely associated with stormwater runoff.

In January 2013, receiving water samples were collected at the existing enclosures and at the proposed RA to establish existing water quality conditions and to evaluate the effects of dispersion and natural degradation of the bacteria from factors such as sunlight, salinity, and water temperature. Twelve water samples were collected in January 2013 100 ft away from the existing marine mammal enclosure locations, six during flood tide conditions and six during ebb tide conditions. The 100 ft distance represents the 100 ft security zone that is in place at the existing enclosures and would be established for the proposed temporary RA, thus, only San Diego Bay water outside the 100-ft zone would be accessible to the public for recreation. All sample results were below laboratory detection limits for both fecal and total coliform (less than 18 MPN/100 ml). These results indicate that with the effects of dispersion and natural degradation at the existing enclosure locations maintained bacteria levels below REC-1 water quality objectives. Natural degradation can substantially lower bacteria concentrations in the bay water and must be considered when evaluating impacts to water quality. Six water samples were also collected in January 2013 in the approximate locations where the SSC Pacific marine mammal enclosures would be placed at the proposed RA. The RA samples were collected during the same flood and ebb tide conditions on the same dates as the samples collected from the existing enclosures. A fecal coliform concentration of 68 MPN/100 ml and a total coliform concentration of 140 MPN/100 ml were detected in one of the proposed RA location ebb tide samples. Total and fecal coliform bacteria concentrations were reported as below laboratory detection limits (less than 18 MPN/100 ml) for all the other RA samples.

Hydrodynamic modeling of the existing SSC Pacific marine mammal enclosures and the proposed temporary RA was conducted using a Curvilinear Hydrodynamics in three dimensions (CH3D) model that was developed for San Diego Bay. The CH3D model results were used to identify comparative tidal flushing values between the existing enclosures and proposed RA, and to provide average fecal coliform and nutrient concentrations throughout the RA site based on projected loading from the proposed number of marine mammals (70 dolphins and 30 sea lions) that will be relocated. Model results indicate that although tidal flushing values averaged 3.38 times higher at the existing enclosure locations compared to the proposed RA, the indicator bacteria concentrations contributed by the marine mammals will not significantly increase exceedances of water quality objectives for indicator bacteria in REC-1 beneficial uses. Modeling was performed based on expected fecal coliform loading from dolphins and sea lions without accounting for natural bacteria degradation factors such as ultraviolet radiation from sunlight, salinity, and water temperature. Using the loading data from the Swimmer Interdiction Security System (SISS) Final EIS Naval Base Kitsap-Bangor (Navy 2009), the modeling results are based on the mean of the four modeled cells within the RA and are a best estimate of fecal coliform concentrations contributed by the marine mammals. Based on the hydrodynamic modeling, the relocation of the marine mammals to the RA would contribute on average 90 MPN/100 ml of fecal coliform to the existing conditions. Considering natural degradation factors were excluded from the modeling the predictions are

likely a high estimate. To evaluate the accuracy of the model the model was run concurrently for the existing enclosures site. The modeling results predicted an average concentration of 5 MPN/100 ml at the existing enclosures, which compares favorably to concentrations recorded during the January 2013 sampling events.

Nutrient source loading examined by the hydrodynamic modeling using individual marine mammal species contributions and proposed animal relocation numbers reported that concentrations of both nitrogen and phosphorus would not cause exceedances to regulatory standards. Constraints on the results from physical and biological processes not accounted for during the modeling effort (plant uptake and nutrient recycling) place the reported values in the conservative context and are not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

In summary, review of the existing available data for indicator bacteria indicate temporal variability of the fecal and total coliform concentrations at the existing enclosures and the RA. The results place into context the relatively low frequency in which REC-1 standards were exceeded at the RA location over a 34-month period. City of San Diego outfall data and the higher frequency of exceedances recorded during wet season months suggests that potential bacteria sources from storm events intermittently contribute to overall bacteria loading and may elevate the likelihood of exceedances. In addition, dry season data from the SDCDEH covering 2009 through 2012 only had one instance when REC-1 standards for indicator bacteria were exceeded further suggesting that stormwater runoff may be a primary driver for exceedances recorded at the RA.

Sampling conducted 100 ft from the existing enclosures for fecal and total coliform indicate that dispersion and natural degradation are significant factors in lowering bacteria concentrations and can be expected to reduce concentrations at the RA. These results compared favorably to predicted values from the hydrodynamic modeling that was used to predict average concentrations at the RA resulting from marine mammal contributions. The predicted average value (90 MPN/100ml) provides a relevant value to estimate fecal coliform concentrations at the RA. Based on a cumulative sum of the fecal coliform load contributed by the proposed marine mammal relocation and fecal coliform concentration existing conditions at the RA from the MMP data, no additional exceedances of the REC-1 standards would have occurred over the nearly 3 years of measures at the RA site between 2009 and 2012. Though the hydrodynamic modeling did not specifically address predicted total coliform concentration levels it is appropriate to assume the fecal coliform concentration estimates are an accurate surrogate for total coliform concentrations based on specific marine mammals as the source.

In summary, relocation of the Navy marine mammals to the proposed RA is not expected to result in additional exceedances of REC-1 standards for indicator bacteria, fecal and total coliform, and is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. These conclusions are based on the conservative hydrodynamic modeling that does not consider natural degradation of the bacteria and physical and biological processes that would be expected to lower nutrient concentrations. For the bacteria concentrations natural degradation, along with dispersion, likely were significant factors in the

non-detect values measured 100 ft from the existing enclosures. Similar affects can be expected at the 100 foot security zone that would be implemented at the RA. For this reason using the predicted values from the hydrodynamic model is conservative and further reinforces the conclusion that additional exceedances of the REC-1 standards are not expected. Therefore, based on this combined modeling and sampling data, and taking into account historical conditions, it is not anticipated that moving the marine mammals to the proposed RA will have significant water quality impacts at the 100 foot security barrier or beyond.

In the interest of validating the results of the Navy's investigation, monitoring would be conducted while the mammals are at the RA, and results would be submitted to the CCC Staff. If monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy will employ adaptive management measures in consultation with CCC staff. Potential adaptive management measures include:

- 27 of the 30 sea lions would be housed in the enclosures furthest to the south, which receives higher tidal flushing, increasing natural degradation.
- Solid portions of sea lion scat would be scooped up and disposed of as solid waste prior to high pressure washing of the enclosures.
- Moving some of the mammals back to the existing enclosure locations during non-pile driving operations.
- Install ultraviolet treatment systems for the enclosure area to reduce bacteria loading.
- Install flushing system (diffusers/air bubblers) to increase tidal flushing/aeration action.
- Install Oloid ® floating aerators for mixing and increasing natural degradation.

Proposed Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The bait fish are held in enclosures that have 1-in wide slots on the sides allowing sea water to flow through freely (Everingham Brothers Bait Company 2012). It is important to the health of the bait fish that they always stay in the water they live in normally (fresh sea water with the correct temperature, salinity, oxygen, etc.). Waste water from bathrooms on the barges goes into holding tanks that are pumped out once per week by a contractor (Everingham Brothers Bait Company 2012). The same practices would be followed at the temporary relocation site. As shown on Figure 2-2, both site options under consideration for temporary relocation of the bait barges are in open waters in San Diego Bay, outside the federal navigation channel. Like the fuel pier and the current bait barge location, both proposed temporary bait barge relocation option sites are located within the North Bay – Marine region, where tidal action has the greatest influence on circulation and bay water is exchanged with sea water over a period of 2 to 3 days (Port of San Diego 2007). Because the Everingham Brothers Bait Company operations are centered on maintaining the ambient water quality for the health of the bait fish, and do not involve waste water discharges, and due to natural tidal circulation through the North Bay-Marine Region, there would not be a significant impact to marine water quality associated with temporary relocation of the bait barges southeast of Harbor Island.

In summary, during demolition, construction, and dredging, protective measures would be implemented to minimize impacts to marine water quality. Protective measures for demolition and construction would include the NBPL Emergency Response Action Plan and the use of catch devices and sheeting. As a protective measure to minimize turbidity retention of the sheet pile beneath the existing fuel pier would be left in place. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the RWQCB and a Section 404/Section 10 permit from the USACE. It is not anticipated that bacteria loading from the marine mammals alone would exceed San Diego Basin Plan REC-1 water quality limits at the proposed RA 100 ft-security barrier; therefore, significant impacts to water quality would not occur. However, the REC-1 objective levels could be exceeded near NMAWC if external sources (i.e., bacteria from sources other than the Navy MMP) elevate background bacteria concentrations close enough to the threshold for the addition of the MMP concentration to exceed it. The greatest probability of additional exceedances would likely occur during the wet season and would likely be dependent on the frequency and magnitude of rainfall events and resulting stormwater input. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the temporary relocation site or discharge waste water. The changes to water quality associated with demolition, construction, dredging, and temporary relocation of the Navy MMP and the Everingham Brothers Bait Company bait barges would be localized and short-term. For the reasons summarized in this paragraph and described in detail above in the preceding paragraphs, with implementation of Alternative 1 a significant impact to marine water quality would not occur. The use of dredge sediments for nearshore replenishment would help to restore natural bathymetry; therefore, this component of Alternative 1 would be a beneficial impact.

Surface Water Quality

The ROI for surface water quality is the fuel pier, the current location of the Navy marine mammal enclosures, and NMAWC. Potential surface water quality impacts associated with Alternative 1 include spills and releases of construction-related hazardous and non-hazardous materials, construction materials such as dry and liquid concrete, and turbidity caused by runoff carrying soil and dust from shoreside construction/staging areas.

Pier Demolition and Pier Construction

A stormwater management system would be required for the new pier (Navy 2010b). All stormwater runoff would be managed in accordance with current NBPL NPDES Permit requirements (NAVFAC Southwest 2011). The proposed new pier deck design is such that all rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be collected on the pier and sent to the FOR receipt tank for treatment (Burns and McDonnell 2012). The upper deck would be equipped with underflow scuppers that would permit a portion of the runoff from large storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay and also capture the "first flush" of runoff from a storm to be sent to the FOR Receipt Tank. All runoff from the fuel containment areas and the lower deck would be piped to the FOR system for processing (Burns and McDonnell 2012).

Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system (NAVFAC Southwest 2009b). All BMPs specific to the fuel pier would also be followed. Implementation of the BMPs and compliance with NPDES permit requirements would ensure that no significant water quality impacts would occur as a result of operations at the new fuel pier.

A 12-in diameter stormwater outfall is located immediately north of the existing pier abutment. This outfall discharges stormwater runoff from the paved area directly west of the existing pier (Burns and McDonnell 2012). The existing discharge point penetrates the vertical wall portion of the existing pier abutment and discharges on to the riprap located along the shoreline north of the existing fuel pier. The existing stormwater outfall would be removed (Burns and McDonnell 2012). A new storm sewer system consisting of four grated area inlets, 12-in reinforced concrete pipe, and a single outfall point would replace the existing system (Burns and McDonnell 2012). The existing outfall would be relocated from the north side of the existing pier to the north side of the new pier (Burns and McDonnell 2012). No changes in impervious areas contributing to the storm sewer system are anticipated. Replacement and re-routing of the existing stormwater outfall would continue to provide drainage for the paved area west of the existing pier, thus, the proposed pier replacement would not have a significant impact to the existing surface water drainage pattern in the area immediately adjacent to the pier.

Temporary Relocation of the Navy MMP

The existing NBPL NPDES permit addresses the following discharges associated with the Navy MMP in its current location: potable and seawater discharges from cleaning the mammal enclosures (the floating enclosures and the nets suspended in the water below), potable water from rinsing small boat interiors and engines, and seawater discharges from above ground shipboard pool simulators. The same permit conditions would apply to the Navy MMP at the proposed temporary relocation site at NMAWC (SSC Pacific 2012b).

In summary, standard operating procedures and BMPs would be followed to reduce impacts to surface water to a less than significant level. The new fuel pier would have stormwater management capabilities that would comply with current NPDES Permit requirements. Basewide and site-specific BMPs to prevent impacts to surface water would be followed at the new fuel pier. Therefore, implementation of Alternative 1 would not have a significant impact to surface water quality and beneficial water uses within the bay. Improved stormwater management capabilities for the fuel pier would be a beneficial impact to surface water quality.

3.6.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would be implemented as described under Alternative 1. Under this Alternative, dredging would be done years after the pier replacement effort is completed. Thus under Alternative 2, there would be no potential intermittent overlap of increased turbidity associated with demolition and construction due to dredging activities.

Under Alternative 2, during demolition, construction, and dredging, the same protective measures would be implemented to minimize impacts to marine water quality that would be used for Alternative 1: retention of the existing sheet pile, the use of catch devices and sheeting, and the NBPL Emergency Response Action Plan. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the RWQCB and a Section 404/Section 10 permit from the USACE. Changes to bacteria and nutrient levels in the bay waters near NMAWC associated with proposed temporary relocation of the Navy MMP would be the same as under Alternative 1. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the selected temporary relocation site or discharge waste water. As with Alternative 1, demolition, construction, and dredging would not have significant impacts to bathymetry and circulation. Therefore, implementation of Alternative 2 would not have a significant impact to marine water quality, surface water quality, and beneficial water uses within the bay. As with Alternative 1, improved stormwater management capabilities for the proposed new fuel pier, and the reuse of dredge sediments for nearshore replenishment are anticipated to be beneficial impacts.

3.6.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not result in significant impacts to water resources; therefore, no mitigation measures are proposed.

3.6.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Brothers Bait Company bait barges, demolition and replacement of the existing fuel pier, dredging of the turning basin and beneficial re-use of dredge sediments for nearshore replenishment would not occur. No changes to existing water resources would occur. Therefore, implementation of the No-Action Alternative would not have a significant impact to water resources.

3.7 HAZARDOUS MATERIALS AND WASTES

3.7.1 Definition of Resource

The terms *"hazardous materials"* and *"hazardous waste"* are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA [42 19 USC § 6901 *et seq.*]). In general, hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released into the environment. Hazardous wastes are regulated under RCRA and defined as any solid, liquid, contained gaseous, or

semisolid waste, or any combination of wastes that either exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste under 40 CFR Part 261. Petroleum products include petroleum-based fuels, oils, and their wastes.

Hazardous waste issues may also include the presence of asbestos and lead-based paint (LBP) in structures and exposure to contaminated sites. Asbestos was once widely used in building construction as a fire retardant and noise barrier, but was linked to several diseases. Since the 1970s its use has been restricted by federal regulation under the Clean Air Act (CAA) (e.g., Asbestos National Emission Standards for Hazardous Air Pollutants) rules, and the Toxic Substances Control Act (e.g., Asbestos Ban and Phaseout) asbestos rules. Friable (brittle) asbestos becomes hazardous when fibers become airborne and are inhaled. Lead, which was used as an additive and pigment in paints for many years before 1978, has been associated with central nervous system disorders, particularly among children and other sensitive populations. Exposure to lead is usually through inhalation during renovation and demolition activities or through ingestion of paint chips or lead-contaminated drinking water. Contaminated sites are locations that have been rendered unsafe due to the presence of hazardous wastes. To facilitate the investigation and cleanup of contaminated sites at military installations, the DoD has developed the Installation Restoration (IR) Program. The IR Program is the process by which contaminated sites and facilities are identified and characterized, and existing contamination is contained, removed, and disposed of to allow for the future beneficial use of the property.

Hazardous materials and wastes are also controlled under the California Code of Regulations (CCR) and these regulations are implemented by the California Department of Toxic Substances Control and the local Certified Unified Program Agency. San Diego County, Department of Environmental Health (DEH) acts as the Certified Unified Program Agent under authorization from the California Environmental Protection Agency to implement state environmental requirements. The U.S. Navy is required to comply with these acts and all DoD requirements, as well as management plans specific to NBPL.

Emergency Planning Community Right-to-Know Act (EPCRA)

The EPCRA (42 USC § 11001 *et seq.*) includes four major provisions:

1) Emergency planning (Section 301-303)
2) Emergency release notification (Section 304)
3) Hazardous chemical storage reporting requirements (Sections 311-312)
4) Toxic chemical release inventory (Section 313)

Section 311 requires facilities that have Material Safety Data Sheets (MSDS) for chemicals held above certain quantities to submit either copies of their MSDS or a list of MSDS chemicals to the Local Emergency Planning Committee and local fire department. Facilities that need to report under EPCRA Section 311 must also submit an annual inventory report (Tier I or Tier II form) for the same chemicals. This inventory report must be submitted to the State Emergency Response Commission and local fire department by 1 March each year. The information

submitted under Sections 311 and 312 are available to the public from Local Emergency Planning Committees and State Emergency Response Commissions. In California, the chemical storage reporting thresholds under the California Health and Safety Code Chapter 6.95 are 55 gallons, 500 pounds, and 200 cubic ft of a compressed gas. Otherwise, the federal threshold limits are 500 pounds for extremely hazardous substances and 10,000 pounds for all other hazardous substances. Any hazardous materials and wastes generated during construction and operation would be subject to installation-wide EPCRA reporting.

3.7.2 Affected Environment

The ROI of potential effects associated with hazardous materials and hazardous wastes for the Proposed Action is NBPL and San Diego Bay. This section describes the presence of hazardous materials and wastes within the proposed project locations.

3.7.2.1 MWR Marina at NMAWC (Site Proposed for Temporary Navy MMP Relocation)

Small volumes of lubricating oil, gasoline, and various marina boat maintenance materials are currently stored and used at the MWR marina piers at NMAWC. Hazardous wastes at the marinas comprise small volumes of oily rags and marina boat maintenance wastes (NAVFAC Southwest 2011a). These wastes are properly managed in accordance with the Waste Management Plan (WMP) for the San Diego Metro Area (an environmental reference document to support overall hazardous waste management by NRSW military and civilian personnel that also establishes an effective management program for hazardous waste compliance according to federal, state, and local regulations [NRSW 2007]) and disposed of via a licensed contractor.

3.7.2.2 Everingham Brothers Bait Company Bait Barges

The bait barges have a total of three diesel storage tanks: one 1,500-gallon tank and two 240 gallon (Everingham Brothers Bait Company 2012). The storage tanks contain fuel for a generator that powers pumps, lights, and other equipment. The barges have rooms that are specially built as containment structures for the tanks and are capable of capturing the tank contents in the event of a leak. The Everingham Brothers' own vessels refill the barge fuel tanks (Everingham Brothers Bait Company 2012). The connections for the fuel transfer hose are inside the delivering vessel and the bait barges' storage tank rooms, to prevent spills during refueling. Personnel from Navy Environmental inspect the barges from time to time. The company is working to reduce the hours of generator operation on the barges by using light-emitting diode lights, a rechargeable diesel-powered battery, and planned installation of a vertical access wind turbine with a power storage battery (Everingham Brothers Bait Company 2012).

Hazardous materials such as fresh oil, waste oil, and paint on the bait barges are handled and stored according to the Navy's requirements, applicable state, and county regulations (Everingham Brothers Bait Company 2012). Evergreen Environmental Services (Evergreen Oil, Inc.) removes hazardous waste from the barges (Everingham Brothers Bait Company 2012). All the company's barges and vessels have onboard and follow a policy book for hazardous materials training that was developed by a hazardous materials consultant according to applicable state and county regulations (Everingham Brothers Bait Company 2012). All

Everingham Brothers barge and boat personnel are trained according to this policy book. All the barges and skiffs have spill kits on board (Everingham Brothers Bait Company 2012).

Although the majority of the paints and other materials used for repairing the bait receivers are kept on the repair vessel, the barges have a dedicated paint locker room designed and constructed for containment purposes. Wastes from the maintenance operations are properly stored on the barges until they are removed by Evergreen Environmental Services for proper disposal.

3.7.2.3 Proposed Temporary Bait Barge Relocation Sites Options 4A and 6A

As shown on Figure 2-2, both proposed temporary relocation Options (4A and 6A) for the bait barges are in open waters in San Diego Bay, outside the federal navigation channel where no vessels are currently anchored. Aside from fuel in vessels that pass through these two areas, there are no hazardous materials, hazardous wastes, or petroleum products at either of proposed temporary relocation sites.

3.7.2.4 NBPL Fuel Pier Bulk Fuel Pipelines

The pipelines on the existing fuel pier contain a total static volume of approximately 26,040 gallons of fluids comprising fuels, lubricating oil, and contaminated petroleum product (CPP, a mixture of fuel and water) (MNB 2010). The bulk fuel pipelines and fuel transfer operations at the existing fuel pier are regulated by multiple federal and state agencies. Some of these include the following (agency name is in bold, legislative title is in italics):

- **USEPA:** 40 CFR Part 112, *Oil Pollution Prevention and Response; Non-Transportation-Related Facilities*
- **USEPA**: 40 CFR Part 300, *The National Oil and Hazardous Substances Pollution Contingency Plan,* (National Contingency Plan)
- **USEPA**: 40 CFR Part 302, *CERCLA*
- **USEPA**: 40 CFR Part 355, *EPCRA*
- **USEPA**:, 40 CFR Part 264, Subpart D, *RCRA*
- **USEPA**: 40 CFR Part 68, *Chemical Accident Prevention Provisions*
- **USEPA:** Public Law 101-380 (33 USC 2701 et seq.;104 Stat. 484) Oil Pollution Act
- **Occupational Safety and Health Administration**, 29 CFR 1910.38(a), *Employee Emergency Plans and Fire Prevention Plans*, 1910.120, *Hazardous Waste Operations and Emergency Response,* and 1910.165, *Employee Alarm*
- **The Pipeline and Hazardous Material Safety Administration (U.S. Department of Transportation [USDOT]):** Direct Final Rule as Amended, 49 CFR Part 194, *Response Plans for On Shore Oil Pipelines*
- **The Pipeline and Hazardous Material Safety Administration (USDOT):** 49 CFR, Part 195 Transportation of Hazardous Liquids by Pipeline
- **State of California, Office of Oil Spill Prevention and Response** Title 14 CCR Sections 815-820, *Oil Spill Contingency Plans*

- **USCG:** 33 CFR Part 154, *Facilities Transferring Oil or Hazardous Material in Bulk*
- **CSLC** CCR: Title 2, Division 3, Chapter 1 *Marine Terminal Oil Pipelines*
- **CSLC** CCR: Title 24, Part 2, Vol.1, *Chapter 31F MOTEMS*

The fuel pier pipelines were constructed and are maintained in compliance with the applicable federal and state regulations, which specify measures for preventing and containing leaks and spills. Secondary containment structures have been installed where required or appropriate on the fuel pier (NAVFAC 2009). In addition to the 8-in curbing around the pier deck, concrete curbing is installed around the valves and risers and at the loading stations. Spill kits and absorbent materials are located on the pier for response to a spill (NAVFAC 2009). Pipelines, manifolds, valves, loading arms, hoses, containment pits, and other safety equipment such as fire protection or control equipment, lighting, emergency shutdown switches, and the communication systems are inspected weekly and before and after any vessel transfer operation (NAVFAC 2009). The fuel loading arms and supporting piping systems are routinely inspected along with other equipment on the fuel pier (NAVFAC 2009). The pipelines are pressure-tested in accordance with CSLC requirements (Shaw Environmental, Inc. 2007).

The safety and health of all fuel pier personnel, customers, and protection of the environment are of primary importance to the Navy Regional Fuel Officer and Fuel Director. NBPL DFSP has a safety and health program that conforms to the best practices in industry. The program embodies fostering proper attitudes within the workforce and is focused on safety practices, accident prevention, and insuring that mechanical and physical equipment required for personal safety and health are maintained to the highest possible standards. NBPL DFSP subscribes to and emphasizes risk management as the cornerstone of its safety program (Navy 2012a). As such NBPL DFSP utilizes a documented process by which the steps/procedures required to accomplish a work activity are outlined; the actual or potential hazards of each step are identified and measured; and its workforce are charged with eliminating or controlling those hazards (Navy 2012a).

Regarding fuel pier operations, standard operating procedures for Barge Operations, for Lube Oil Operations, for Pipeline Operations, for Ship Operations, for Small Craft Operations, and for Truck Loading Operations are in place and periodically updated (Navy 2012a). NBPL DFSP's preventative maintenance work plans also include safety plans that discuss the principal steps, potential safety and health hazards, and recommended controls. In the event of an accident or spill, NBPL implements the NBPL Emergency Response Action Plan. The Fuels Department holds daily, weekly and quarterly safety stand downs using the following guiding safety principles (Navy 2012a):

- **General Safety Requirements:** Present an overview of the safety and health program, risk management, hazard analysis, hazard assessment, general safety practices, housekeeping and hygiene rules, and first aid.
- **Emergency Safety Requirements:** Outline emergency response training requirements and safe practices applicable to all emergencies. Describes the type of communications devices available and outlines practices for effective emergency communication.

- **Training:** Detail training programs are required for operating personnel working at NBPL DFSP as well as guidelines for maintaining public awareness regarding the facility.

Operations at the fuel pier meet all USCG requirements in 33 CFR Part 154 (NAVFAC 2009). Fuel transfer equipment meets or exceeds industry and regulatory standards (NAVFAC 2009). Loading arms and transfer hoses are marked and pressure tested as required. The communications equipment is maintained on the pier and between persons-in-charge by two-way radios during any fuel transfer operation (NAVFAC 2009). Fire suppression equipment (extinguishers, hydrants, monitors) and personnel safety equipment (first-aid kit, emergency eye wash/shower, life ring, etc.) is available on the pier. Control systems and alarms are located at each loading station (NAVFAC 2009). The piping is controlled with an automated fuel handling supervisory control and data acquisition system that provides alarms as well as graphically depicts pressures, flows, and quantities to and from the tanks. During each fueling evolution on the fuel pier, a safety supervisor and an observer known as a "hose watch" monitor product flow and can manually shut down the systems in an emergency (NAVFAC Southwest 2010a).

The CSLC provides regulatory oversight for the fueling operations and is notified of each fueling evolution for a ship capable of storing 90,000 gallons or more fuel (Navy 2010a). Inspectors from CSLC are present at fueling evolutions on the fuel pier 50 times per year on average (Navy 2010a). U.S. Customs inspections occur on average 2-4 times per year.

The volume of CPP off-loaded can vary from around 50,000 gallons to 150,000 gallons depending on the vessel (Navy 2010a). The USCG conducts inspections to insure that NBPL DFSP is in compliance with its USCG Certificate of Adequacy to receive CPP from ships, which documents the type of waste the facility may receive, the waste transfer rate, and the storage capacity of the facility. CPP is pumped from vessels berthed at the fuel pier into a 4,000 gallon aboveground storage tank onshore and then to the NBPL DFSP FOR system where petroleum products are separated from the water (Navy 2011). Oil recovered at the FOR system is recycled via a hazardous waste contractor, and water is discharged to the sanitary sewer system (NAVFAC Southwest 2009).

Because DFSP Point Loma is a bulk fuel storage and transfer facility, Defense Energy Support Center, U.S. Navy policy, and government regulations require that a contingency plan is in place to respond to oil and hazardous substance spills (NAVFAC 2009). The ICP for Oil and Hazardous Substance Spill Prevention and Response NBPL serves as the single operational document used for responding to any spill occurring at NBPL (NAVFAC 2009). In the event of a spill or release of oil or hazardous material at the fuel pier, the procedures discussed in the Emergency Response Action Plan, and particularly the Red Plan sections of the ICP are followed to contain the release and properly dispose of any spilled materials in compliance with CCR Title 14 (NAVFAC 2009). The Emergency Response Action Plan and the Red Plan include specific measures such as securing pumps and closing valves, blocking drains, and deploying booms (NAVFAC 2009). Additional booms are deployed as quickly as possible to prevent the spill from moving into the bay or affecting sensitive areas (NAVFAC 2009). Additional military

and civilian contractor personnel and equipment are mobilized as needed to expedite cleanup operations, and procedures are reviewed to address the cause of the spill and prevent its recurrence (NAVFAC 2009).

3.7.2.5 NBPL Fuel Pier other Hazardous Materials/Waste

Hazardous Materials

No hazardous materials other than fuel are present on the fuel pier. Routine maintenance of the metal bollards and pipe risers involves the use of limited quantities of paint that are stored shoreside in the Fleet Logistics Center (FLC) hazardous materials locker (NAVFAC Southwest 2010b). Paint is brought out to the pier for use, then returned to the locker when painting is completed (NAVFAC Southwest 2010b).

Hazardous Wastes

Hazardous wastes aboard NBPL are managed according to Chief of Naval Operations Instructions (OPNAVINST) 5090.1C *Environmental and Natural Resources Program Manual* and the WMP for the San Diego Metro Area (NRSW 2007). The guidance in the WMP ensures that Navy commands and contractors manage hazardous waste in accordance with requirements specified in federal, state and local laws and regulations including Title 40, CFR, Title 22, CCR, California Health and Safety Code, and San Diego County Code of Regulatory Ordinances. The WMP contains instructions for hazardous waste minimization, waste characterization, use of proper containers and storage practices, inspection, and disposal via a licensed hazardous waste contractor (NRSW 2007).

The Defense Reutilization and Marketing Office (DRMO) through its contractors manages, stores, ships, and disposes of hazardous materials associated with all DoD installations and operations. DRMO maintains all hazardous materials documentation. DRMO also contracts with licensed firms for proper disposal of these materials at permitted facilities.

Hazardous wastes generated at the fuel pier comprise oiled boom, rags, and absorbent materials (NAVFAC Southwest 2010a). These wastes are taken to the 90-day storage facility behind located behind Building 75 (about 400 ft northwest of the fuel pier access gate), and are properly managed in accordance with the WMP. Hazardous wastes at the fuel pier are covered under County of San Diego DEH Unified Program Facility Permit #HK 57-180134 USN-Fleet and Industrial Supply Center Point Loma Bayside (i.e., FLC Fuel Facility NBPL) and under NBPL's USEPA large quantity hazardous waste generator permit (County of San Diego 2002, NAVFAC Southwest 2010b). A facility is classified a "large quantity" generator of hazardous waste if it produces one kilogram [2.2 pounds] or more per month of acutely hazardous waste). The DEH conducts annual inspections of the fuel pier hazardous waste management operations and facilities (County of San Diego 2008, Navy 2010a).

3.7.2.6 IR Program and RCRA Facility Assessment Program Sites

The DoD established the IR Program to identify and clean up areas at military facilities that have been affected by past use of hazardous materials and disposal of hazardous waste (NRSW 2005). Cleanup of the IR Program sites is legislated through CERCLA (commonly known as

"Superfund") that primarily addresses contamination resulting from past disposal practices (NRSW 2005). Thirty-nine sites at NBPL Point Loma Complex are being investigated/cleaned up under the IR and Munitions Response Programs. Active remediation is ongoing at Fleet and Industrial Supply Center IR Site 4 near the proposed project site (about 700 ft west of the existing fuel pier shoreline abutment). Soil within Site 4 was contaminated with hydrocarbons from oily sludge cleaned from the bottoms of the tanks that was placed over the site throughout the years to minimize erosion and control dust. Onsite soil remediation with low temperature thermal desorption was completed in December 2011, and cleanup of a contaminated groundwater plume is underway (NAVFAC Southwest 2012). Cleanup has been completed and regulatory closure has been issued for 21 of the 39 NBPL IR and Munitions Response sites (NAVFAC Southwest 2012). Two closed shoreside IR sites (Sites 3 and 22) are within 500 ft of the proposed fuel pier replacement site (CH2MHill Kleinfelder 2012). Two closed shoreside IR sites (Sites 2 and 5) are within 500 ft of the proposed Navy MMP relocation facilities at NMAWC (CH2MHill Kleinfelder 2012).

Twenty-seven aboveground and underground storage tank (UST) sites have been identified at NBPL. Regulatory closure has been issued for 23 of the tank sites and cleanup activities are ongoing at four sites (CH2MHill Kleinfelder 2012). RCRA establishes requirements for current hazardous waste handling practices, as well as for investigation and cleanup of existing hazardous waste handling facilities (CH2MHill Kleinfelder 2012). Fifty-four sites were evaluated under the RCRA programs, and investigation/cleanup activities are ongoing at 12 of those sites. Regulatory closure has been issued for 42 RCRA sites (CH2MHill Kleinfelder 2012). The proposed project sites at NMAWC and the fuel pier are not identified as IR or RCRA program sites.

3.7.2.7 County of San Diego Unauthorized Release Sites and SWRCB Underground Storage Tank Sites

The County of San Diego and the SWRCB oversee investigation and cleanup of sites where releases of petroleum products and/or hazardous wastes from storage tanks have taken place. There are no such sites at the onshore areas immediately adjacent to the existing fuel pier and the location proposed for the replacement pier (County of San Diego 2011, SWRCB 2011a). There are three release sites onshore in the vicinity of the fuel pier where cleanup has been completed. Overfills resulted in the releases of CPP from two USTs shoreside on the south side of the existing fuel pier (Tanks 115A and 115B) (Navy 2012b). The release was cleaned up and there was no soil contamination (Navy 2011). The two tanks were taken out of service, filled in place with concrete slurry under SWRCB oversight in 1997 and the case is closed (Navy 2012b, RWQCB 2005, SWRCB 2011a). Cleanup is also completed, and the case is closed for SWRCB Tank Site Building 113 located approximately 75 ft south of the existing fuel pier (SWRCB 2011a). At NMAWC, cleanup is completed, and the case was closed in 2000, for a release that occurred in 1996 at Pier 619 (SRWCB 2011b).

3.7.2.8 California SWRCB Sediment Toxic Hotspots

The SWRCB has identified toxic hotspots as locations in enclosed bays, estuaries, or the ocean where pollutants have accumulated in the water or sediment to levels that: (1) may pose a

hazard to aquatic life, wildlife, fisheries, or human health; (2) may impact beneficial uses; or (3) exceed SWRCB or RWQCB-adopted water quality or sediment quality objectives (SWRCB 2003). Under the Bay Protection program, all designated hotspots require corrective action, management action, or delisting (SWRCB 2008). The proposed P-151 project locations (comprising the temporary Navy marine mammal relocation site at NMAWC, the fuel pier, the dredge footprint, and bait barge relocation sites [4A and 6A]) are neither sediment cleanup sites nor an SWRCB-identified toxic hotspot (SWRCB 2008). Neither of the proposed bait barge relocation sites is identified as a CERCLA or RCRA cleanup site (SWRCB 2012).

3.7.2.9 Public Health and Safety

Explosives Safety Quantity Distances (ESQD) Arcs

ESQD arcs are calculated for all locations where explosives are handled and stored to minimize the risk of serious personal injury, loss of life, and property damage associated with the presence of military explosives (DoD 2004). The safety distance from the explosives storage area (size of the arc) depends on the quantities and types of explosives present at that location (DoD 2004). No habitable development may occur within an ESQD arc (NAVFAC 2001). The piers at NMAWC are not approved for explosives storage and handling so there are no ESQD arcs at or near the proposed Navy MMP temporary relocation site (NBSD 2012). There are no ESQD arcs associated with the existing fuel pier or for piers and facilities in the area (NAVFAC Southwest 2010c).

Discarded Military Munitions (DMM)

DMM are unfired military munitions that have been abandoned, discarded, or improperly disposed of and are still capable of functioning (e.g., items found with their cartridges). The Navy is evaluating portions of San Diego Bay under its Munitions Response Program Site 100 – San Diego Bay Primary Ship Channels (also known as UX100, Munitions San Diego Bay Channel) (NAVFAC Southwest 2010d). Four Areas of Concern surrounding the existing fuel where historical records or other evidence suggested the potential presence of DMM were investigated using a remotely-operated underwater camera, sonar, and a magnetometer. The magnetometer data showed the presence of unknown metallic items within portions of the footprint of the proposed new fuel pier (NAVFAC Southwest 2013a).

3.7.2.10 Solid Waste

The ROI for solid waste is San Diego County. In general terms, solid waste refers to garbage, refuse, sludge, and other discarded solid materials resulting from residential activities, and industrial and commercial operations, including construction and demolition (C & D) debris. The City of San Diego uses innovative engineering, waste reduction, and recycling programs to help extend the working life of the only active, City-run landfill, Miramar Landfill, which was originally scheduled to close as early as 1995 (City of San Diego 2011). Almost 910,000 tons of waste are disposed annually at the Miramar Landfill (City of San Diego 2011). At this rate, the Miramar Landfill will likely be filled to capacity and closed by 2019 (City of San Diego 2011).

To support the City of San Diego in reaching its solid waste diversion goals (i.e., 50 percent of 1990 baseline as required by the California Integrated Waste Management Act Division 30), the

U.S. Navy and U.S. Marine Corps (USMC) agreed to limit the amount of waste sent annually to Miramar Landfill from U.S. Navy and USMC installations in San Diego County to 10.8 percent of the City's annual baseline disposal figure (NRSW 2000). To that end, NRSW has established an extensive recycling program. The NRSW Sustainable Solid Waste Program diverts cans, bottles, plastics, cardboard, and C & D waste from landfilling to the maximum extent possible (Navy Compass 2010).

Solid waste generated at the NMAWC marinas consists of a small volume of domestic trash from marina staff and boat owners (NAVFAC Southwest 2011a). Non-hazardous solid waste associated with the existing fuel pier operations consists of paper and other domestic-type trash from the Control House Building 110. These materials are included with solid waste collected and recycled from NBPL as part of the NRSW Sustainable Solid Waste Program (Navy 2011).

NRSW Instruction 11350.1A (Regional C & D Debris Landfill Diversion) requires that all construction projects submit a solid waste management plan during the project planning phase that must include the types and quantities of waste expected to be generated, actions that would be taken to divert at least 54 percent (in 2012, increasing by 2 percent each year until 60 percent is reached in 2015) of the C & D waste stream from landfilling, a list of the specific waste materials that would be salvaged for resale, reuse, or recycling, and identification and justification for materials that cannot be reused/recycled. While the project is ongoing, the contractor must submit monthly solid waste reports that include the waste tonnages recycled and landfilled (NRSW 2006). The Sustainable Solid Waste program uses a database to track reuse opportunities for recycling materials resulting from construction projects, and to track solid waste diversion for every project. As of 2011, Navy construction projects in the San Diego area are required to divert a minimum of 52 percent of C & D waste from landfill disposal (NAVFAC Southwest 2011b). In the period from 2009 through 2010, 80 percent of the C & D waste resulting from NRSW construction projects was diverted from landfill disposal (NRSW 2010).

Solid waste aboard the Everingham Brothers Bait Company bait barges comprises domestic trash, and dry paint cans and wood waste from repairing the bait receivers (Everingham Brothers Bait Company 2012). All solid waste aboard the barges is contained in commercial-size dumpsters (Everingham Brothers Bait Company 2012). When the dumpsters are full, the Everingham Brothers Bait Company vessels offload the dumpsters from the barges and transport them to the company's onshore property to be taken to Miramar Landfill by a licensed solid waste hauler (Everingham Brothers Bait Company 2012).

3.7.3 Environmental Consequences

3.7.3.1 Approach to Analysis

Federal, DoD, and U.S. Navy regulations govern the storage, disposal, and transportation of hazardous materials, hazardous wastes, and non-hazardous solid wastes. These laws and specifications were established to protect human health and the environment from potential impacts. The significance of impacts associated with hazardous materials and wastes is based on the toxicity of the substance, the quantity of the substance involved, the risk of exposure, and

the method of disposal. Impacts are considered significant if the storage, use, transportation, or disposal of these substances increase human health risks or environmental exposure. The ROI for hazardous materials and wastes is NBPL, the City of San Diego, and San Diego Bay.

3.7.3.2 Alternative 1 Pier Replacement and Associated Dredging

Temporary Navy MMP Relocation Site at NMAWC

Under Alternative 1, before construction begins to modify the NMAWC site for temporary use by the Navy MMP, all hazardous materials and wastes associated with marina activities would be removed and properly recycled or disposed per the WMP. Navy MMP activities at the NMAWC site would not involve the use of hazardous materials, or generate hazardous waste (NAVFAC Southwest 2011a). As stated above in Section 3.7.2.9, the piers at NMAWC are not approved for explosives storage and handling (NBSD 2012). The temporary relocation of marine mammals maintained by the Navy's EOD Mobile Unit 1 would not result in explosives handling at NMAWC.

Temporary Relocation of Everingham Brothers Bait Company Bait Barges

Under Alternative 1, the two bait barges would temporarily relocate to either proposed relocation site Options 4A or 6A (see Figure 2-2). As stated in Section 3.7.2.2, the barges have diesel storage tanks and hazardous materials/waste storage on board. Everingham Brothers' personnel are trained in proper management procedures and the fuels and hazardous materials/wastes are stored and handled according to applicable state and county regulations (Everingham Brothers Bait Company 2012). Under Alternative 1, Everingham Brothers Bait Company would continue to manage fuel, hazardous materials, and hazardous waste according to applicable state and county regulations while at the temporary relocation site (Everingham Brothers Bait Company 2012). There are no CERCLA or RCRA sites identified at the proposed temporary relocation sites. Therefore, temporary relocation of the bait barges would not have a significant impact with respect to hazardous materials or wastes at either of the proposed temporary relocation sites Option (4A or 6A).

Fuel Pier Demolition and Construction

Hazardous materials associated with proposed demolition and construction activities would include universal wastes, LBP on bollards and striping on the pier deck, coal-tar coating on the steel superstructure of the original pier segment, oily waste water from cleaning pipelines, treated wood waste, fuel and hydraulic fluid contained in heavy equipment, vehicles and vessels performing the overall demolition and construction tasks, and paints to be used on deck infrastructure and deck striping. Potential asbestos-containing material (ACM) could be revealed when demolition exposes previously hidden structural components. Any hazardous materials and wastes generated during construction would be subject to installation-wide EPCRA 312 and 313 reporting requirements.

Impacts of accidental spills from demolition and construction debris would be minimized. The Navy would require demolition and construction contractors to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. Catch devices and sheeting would be used to capture and contain debris, and

floating booms would be placed around the work site to confine any potential release to a minimal area. Contractors would be required to have booms and other spill containment equipment on their work vessels and work site(s) at the fuel pier, additional to the spill containment equipment that is always present at the fuel pier.

Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the WMP (NRSW 2007). Section 5 of the WMP includes emergency procedures to be followed upon discovery of any spill or release either in or outside the work area that meets or exceeds these criteria:

- Any spilled substance that is greater than five gallons in total volume.
- Spilled substance(s) that enters a storm drain, sewer system, or body of water (bay).
- The spill is not easily contained or controlled.
- Spills that threaten human health, safety or the environment.

The emergency procedures include:

- Notify the federal fire department, and the Installation Environmental Office and Safety Office;
- Limit access of personnel to where the spill or release occurred;
- Identify the substance released;
- If safe, prevent the spill from spreading, cover or dike any nearby floor, storm, or sewer drains (NRSW 2007).

Building Materials Falling Under the Universal Waste Rule (UWR). Building materials falling under the UWR visually identified at the fuel pier include high-intensity mercury vapor lights, mercury vapor light ballasts, and the fuel pipes. Before pier demolition, the building materials falling under the UWR would be properly characterized, containerized removed and properly recycled or disposed of by a licensed contractor, as per the requirements of the NRSW Waste Management Plan San Diego Metro Area (Hazardous Waste Guidance for Mercury-Containing Waste) (NRSW 2007).

Coal Tar. Elevated concentrations of PAHs were detected in samples of coal tar coating on portions of the original (i.e., 1908) fuel pier steel superstructure. After the steel superstructure is disassembled and taken onshore, the Navy would characterize the coating and determine proper management and disposal for the superstructure according to all applicable federal and state regulations (NRSW 2007).

LBP Removal. LBP abatement would be performed by trained, state- certified and licensed lead paint removal contractors. The licensed contractors would be required to prepare and implement a site-specific health and safety plan that complies with California Occupational Safety and Health Administration regulations for air monitoring, engineering and work practices controls of lead emissions, signage, and personal protective equipment (PPE) such as face masks, respirators, and protective clothing. During the removal of LBP, work containment would be erected to capture and filter all contaminated air during lead removal and cleanup.

All removed LBP materials/residue would be captured and properly containerized. The contractor would be required to use catch devices and sheeting in the work area to ensure that LBP paint chips, flakes, or dust would not enter San Diego Bay. All waste would be properly stored while waiting for proper disposal per federal and state requirements. After testing is completed, the waste stream would be properly characterized for disposal as hazardous waste, excluded recycled waste, or landfill waste, as per the requirements of the NRSW Waste Management Plan San Diego Metro Area (Hazardous Waste Guidance for Construction Debris Containing Lead-based Paint) (NRSW 2007). After all bulk waste has been removed from the containment, all surfaces would be wiped down with a damp rag to remove dust. No compressed air blowing would be allowed, only vacuuming and wiping would be allowed for final cleanup.

ACM Removal. Based on the analytical results of the bulk samples collected during the 2009 survey by Ninyo and Moore, ACMs are not believed to be present at the fuel pier. Because limited-destructive sampling techniques were used in the 2009 Ninyo and Moore survey, it is possible that suspect ACMs may be found during demolition of the fuel pier. In the event that suspect ACMs are encountered, samples of suspect materials would be collected for laboratory analysis, and all activities that may disturb the materials would cease until laboratory analytical results are reviewed. Any work involving the disturbance of materials containing asbestos would be performed using appropriate work practices, and be conducted by, and under the supervision of, properly trained, experienced, and certified personnel.

If determined to be present, asbestos abatement would be performed by properly trained and licensed abatement contractors. All ACM and debris would be removed using wet methods. Asbestos barrier tape would be place around the individual sites of removal. Wearing appropriate personal protective equipment, the contractor personnel would thoroughly wet the area, and then prepare for abatement by setting up containment bags along the perimeter of the ACM area. The ACM would be cut to sections of a manageable size, and the sections would be placed in double-polyethylene-lined, closed container. The San Diego County Air Pollution Control District (SDCAPCD) would be notified in writing of the planned removal of friable (brittle) ACM per regulations. If more than 260 linear feet (lf) of asbestos were found, an asbestos abatement permit would be filed with SDAPCD in coordination with the NBPL Asbestos Program Manager. The latest applicable requirements of federal, state, and local regulations governing removal and disposal of ACM would be complied with.

Treated wood waste. The demolition phase would potentially generate treated wood waste in the form of potentially creosote-treated timber pilings supporting the caissons of the approach and north segments of the pier. Navy representatives have met with Miramar Landfill environmental personnel, provided waste determinations and a policy statement specifying how NRSW will manage various types of treated woods as either non-hazardous special waste or hazardous waste (NRSW 2007). Timber pier piling have been analyzed and classified as non-hazardous and may be transported to a municipal landfill as special waste using the criteria specified in the WMP (NRSW 2007). The Navy would submit the appropriate disposal request,

manifest, or other pertinent documentation for proper waste determination to the appropriate municipal landfill authority for review (NRSW 2007).

DMM. The Proposed Action includes replacing the existing fuel pier with a double-deck pier in a similar location, but slightly different project footprint. The Proposed Action also includes a dredging component to ensure safe navigation of vessels to the new fuel pier. From 1919 to 1974, the NBPL fuel pier was used for ammunitions transfer as well as fueling (Navy 2012c). While no handling of ammunition currently occurs at the fuel pier, historical loading and unloading of ammunition from ships pierside may have contributed to the potential for DMM within the fuel pier construction footprint (NAVFAC Southwest 2013b). Magnetometer scans of portions of the project footprint identified magnetic anomalies in the marine sediment (NAVFAC Southwest 2013b). It has not been determined what the magnetic anomalies are at this time, thus from a conservative safety stance, DMM should not be ruled out (NAVFAC Southwest 2013b). Many metallic objects other than DMM (such as anchor chain, ship parts, metal pipes, cables, tools, rebar, debris etc.) impart magnetic signals (NAVFAC Southwest 2013b). Further, underwater conditions interfere with the magnetic and acoustic sensors used to detect and characterize metal objects underwater or buried in sediment.

Construction of the new fuel pier requires pile driving for the installation of approximately 300 36-in to 48-in diameter steel piles needed to meet the seismic and structural requirements of the new pier plus approximately 255 – 16- and 24-in piles for the fendering system. Ground disturbing operations, including dredging, that have the potential for physical contact in areas known or suspected to contain potential discarded military munitions require development of an Explosive Safety Submission Determination Request (ESS DR) for review by the Navy's explosive safety division. An ESS DR is a document that details how explosives safety is evaluated to ensure protection of personnel and Navy assets in the event of unintentional detonation from potential discarded military munitions. The construction contractor would draft an ESS DR to support construction and pile driving for the new Fuel Pier footprint. The ESS DR document is required to be reviewed and coordinated with the Navy Project Manager and the Explosives Safety Officer before submittal to Naval Ordnance Safety and Security Activity (NOSSA) for their approval prior to the start of fieldwork. It should be noted that the approximate water depth (40 to 50 ft) where pile driving would take place would act as a safety shield from fragmentation or blast overpressure and therefore exclusion zones and engineering controls to protect the pile driving rig operators would not be necessary(NAVFAC Southwest 2013b). However, as stated previously, a vibratory hammer and/or jetting may be used to loosen existing piles before extraction with a crane (Section 2.2.1.2) and steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile drive (Section 2.2.1.3).

NBPL has consulted with NOSSA regarding the dredging component of the Proposed Action (NAVFAC Southwest 2013b) and has received their concurrence on the ESS DR submitted for pre-construction activities. Historical records and instrument survey data associate the potential presence of DMM with the fuel pier footprint, not the dredge footprint (NAVFAC Southwest 2013b). Therefore, the potential presence of DMM in the dredge footprint is considered to be

low, and it was determined that an ESS is not necessary for the dredging component of the Proposed Action (NAVFAC Southwest 2013b). However, in accordance with Navy policy, the dredged sediments from the proposed project would be screened with a 12-in square grid to remove potential DMM and debris (NAVFAC Southwest 2013b). If DMM were encountered during project activities, the Navy would evacuate the area, and conduct an emergency response by NRSW EOD Mobile Unit 3 Detachment as needed. EOD Mobile Unit 3 Detachment is dispatched from the Southwest Regional Operations Center in coordination with the cognizant Explosive Safety Officer when response is required or requested (NAVFAC Southwest 2013b).

In summary, the proposed project would be required to prepare and follow a Navy-approved ESS DR that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential DMM, and NRSW EOD Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths and use of the above-referenced safety plans and procedures there would be no significant impact from DMM.

ESQD Arcs. There are no ESQD arcs associated with the NMAWC temporary Navy marine mammal relocation site, the existing fuel pier, or for piers and facilities in the area (NAVFAC Southwest 2010c). Extending the fuel pier about 200 ft to the east would not interfere with ESQD arcs at other surrounding piers or onshore, or increase explosive hazards for surrounding facilities. No inhabited buildings would be constructed as part of Alternative 1 (Navy 2010b), so there would be no significant impact with respect to ESQD.

IR Program and RCRA Facility Assessment Sites

No IRP or RCRA facility assessment sites would be disturbed by project activities at the proposed Navy marine mammal temporary relocation site or the fuel pier project site, nor would investigation/cleanup of such sites be affected. Closed IR Site 22 is located near the base of the existing fuel pier. This IR site consists of an abandoned diesel pipeline that was partially removed and partially abandoned in place. The site was issued regulatory closure in 2007. There is no known impact from closed IR Site 22 to the proposed fuel pier demolition and construction site (NAVFAC Southwest 2011c). Contaminated soil or groundwater associated with open IR Site 4 is not anticipated to be encountered in the fuel pier project (NAVFAC Southwest 2012). Therefore, with implementation of Alternative 1 there would be no significant impacts relative to IR Program and RCRA sites.

County of San Diego Unauthorized Release Sites and SWRCB Underground Storage Tank Sites

There are no unauthorized release sites at the fuel pier project site or the marine mammal temporary relocation site at NMAWC. Cleanup has been completed, and No Further Action Status assigned, for several sites near the fuel pier (RWQCB 2005, SWRCB 2011a). Cleanup has also been completed, and the case is closed, for a release at Pier 619 (Navy marine mammal

temporary relocation site) (SWRCB 2011b). Implementation of Alternative 1 would not have a significant impact with respect to these closed sites. In the event that suspect contaminated soil and/or groundwater is encountered, it would be analyzed and the Navy would consult with regulatory agencies to develop an appropriate course of action regarding further evaluation and potential remediation.

Bulk Fuel Pipelines

The Navy would work with contractors to establish a safety buffer zone between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint, and would ensure that all contractors' equipment and vessels remain outside the buffer zone during demolition, construction, and dredging. The contractor would coordinate their activities with Navy FLC DFSP Fuel Pier personnel to avoid potential accidents.

Before the fuel pier is demolished, all fuel, lubricating oil, and CPP inside the pipelines on the fuel pier would be pumped out. The fuel and lubricating oil lines would then be disconnected from the fuel supply system. All the lines, including the CPP line, would be flushed with high-pressure water from the fuel pier's existing water supply lines. The cleaning water would be pumped through the CPP pipeline for treatment at the NBPL DFSP FOR system. After the cleaning water was pumped out of the CPP pipeline, the fuel pier segment of the fuel CPP piping system would be cut and capped.

In the event of an accidental spill of oil or hazardous substance at Naval Base Point Loma, the Emergency Response Action Plan, and in particular the Red Plan (these two plans comprise the first 26 pages of the ICP) would be followed for immediate action:

1) Stop the product flow – Stop transfers, secure pumps, and close valves
2) Warn personnel – Sound alarms, enforce safety and security actions
3) Shut off ignition sources – Motors, electric circuits, and open flames
4) Contain the spill – Secure valves, block drains, and deploy boom
5) Notify authorities – Ensure the Command Duty Officer is called and the (federal) fire department is advised if the situation warrants

The NBPL Emergency Response Action Plan specifically calls out two external agencies that must be notified of reportable spills: the National Response Center and California Emergency Management Agency. The emergency response procedures would minimize potential effects of accidental spills. Reportable spills are publicly available on the California Emergency Management Agency website at http://w3.calema1212.ca.gov/operational/malhaz.nsf/$defaultview.

The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. These regulations include specifications for pipeline design, construction, pressure testing, corrosion control, operation and maintenance, and qualifications of operator personnel (49 CFR Subtitle Part 195 Subparts A-H; CCR California Government Codes Section 51010-51019.1). The USCG and CSLC would

continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines when they are complete (NAVFAC Southwest 2011d). Under Alternative 1, the pipelines on the new fuel pier would hold a total of 49,000 gallons, an increase of 22,960 gallons (approximately 88 percent) from the existing pipeline capacity of 26,040 gallons (Burns and McDonnell 2012). However, compliance with applicable regulations and regular inspections from DFSP personnel, USCG, and CSLC would minimize potential risk of releases of fuel or CPP from the new pipelines.

The oily water pipeline for the new fuel pier would be designed and tested in accordance with the requirements of CCR Title 22, Chapter 15- *Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems* and the applicable guideline standards in the American Petroleum Institute *Standard 650 Welded Tanks for Oil Storage* (NAVFAC Southwest 2011d). Compliance with these regulations and standards would ensure that the oily water pipeline is compatible with the materials it contains, is structurally sound, and is pressure-tested and certified by an independent professional engineer before use (CCR Chapter 15, Article 10, and Section 66265.192). NBPL would also be required to submit to DEH certification from a professional engineer before the line could be used (NAVFAC Southwest 2011d). The new oily water pipeline would be designed and constructed in compliance with all applicable federal, state, and county regulations, including applicable MOTEMS and USCG requirements (NAVFAC Southwest 2011d). The new fuel pier oily water pipeline would be operated in accordance with USCG and SCLC requirements, and inspections by these agencies would continue. CPP (i.e., oily water) would be piped to the onshore DFSP FOR system for processing.

Other Hazardous Materials and Hazardous Wastes

As stated in Section 3.7.2.5, hazardous waste generated by fuel pier operations (used absorbents and oily rags) is taken to the 90-day storage facility behind Building 75, i.e., outside the fuel pier demolition and construction area, and the contractors' laydown area. Because the hazardous waste storage facility is outside the areas involved with the construction project, project activities would not affect hazardous waste management with respect to fuel pier operations. No hazardous materials would be present on the new fuel pier (other than the bulk fuels, lubricating oils, and CPP in the pipelines, described above). Hazardous waste generated at the new fuel pier would be stored at the facility behind Building 75, managed according to federal, state and county regulations, and be recycled/disposed of appropriately per the Waste Management Plan, by licensed contractors through the DRMO. Any hazardous wastes generated during operation of the new fuel pier would be subject to installation-wide EPCRA 312 and 313 reporting requirements. The SDCDEH would continue their regulatory oversight of hazardous waste activities at the new fuel pier.

Through the use of the preventive measures described above (proper management of hazardous materials and waste during construction and operation of the new fuel pier; compliance with regulations for pipeline construction and operational safety; use of the spill control and minimization procedures described in the Emergency Response Action Plan in the event of an accidental release), no increase in human health risk or environmental exposure to

hazardous materials or hazardous wastes would result from implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes.

Solid Waste

The ROI for solid waste includes NBPL, NRSW, and regional landfills including Miramar, Otay, and Sycamore Canyon Landfills. Implementation of Alternative 1 would have a significant impact with respect to solid waste if disproportionate volume of available regional landfill capacity were consumed by C & D waste resulting from the project.

As part of the project design, the contractor would be required to perform an Opportunity Assessment to verify the types and quantities of materials on the project that can be reused/recycled, identify procedures intended for a recycling, reuse, or salvage program, and prepare a solid waste management plan (NRSW 2006). A minimum of 52 percent of project waste would be required to be diverted from landfill disposal, and all concrete demolition debris would be crushed for reuse on site or hauled to local recycling facilities (NAVFAC Southwest 2011b).

Before construction would begin to prepare the NMAWC site for relocation of the Navy marine mammals, any domestic trash remaining at Building 606 and Piers 607, 548, and 619 would be removed and properly recycled/disposed per the NRSW Sustainable Solid Waste Program. The floating enclosures and walkways from the existing Navy marine mammal location would be transferred to the temporary location, and then transferred back when the construction/demolition component of Alternative 1 is complete. The guide piles would be sold to other marinas for reuse after removal from the NMAWC site. Thus, the temporary marine mammal relocation component of Alternative 1 is not anticipated to generate C & D waste.

There would be no change to the types and volume of solid waste associated with the Everingham Brothers Bait Company bait barges during the temporary relocation periods (Everingham Brothers Bait Company 2012). While at the temporary relocation site, the Everingham Brothers Bait Company would continue to contain all solid waste aboard the barges in dumpsters, and transport the waste onshore for landfill disposal. Because temporary relocation of the bait barges would represent no change from existing conditions with respect to solid waste types, volumes, or management, this component of Alternative 1 would not have a significant solid waste impact.

During demolition activities, the contractor would be required to submit monthly diversion summary reports and weight tickets from recyclers to the NAVFAC Construction and Demolition Debris Manager to prove that materials are being diverted according to the project solid waste management plan. The contractor would only be allowed to dispose of the volume of non-recyclable C & D waste as designated in the project solid waste management plan at Miramar Landfill. This would ensure that solid waste associated with the proposed project is reused/recycled to the maximum extent possible, minimizing use of regional landfill capacity for the C & D waste resulting from the proposed project (NRSW 2006).

In summary, through adherence to NRSW recycling and waste minimization requirements, reuse of the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would have not have a significant impact to solid waste and regional landfill capacity.

3.7.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would occur as for Alternative 1. As with Alternative 1, the guide piles from the temporary Navy marine mammal relocation site would be sold for reuse at another marina. While at the selected temporary relocation site (Option 4A or 6A), the Everingham Brothers Bait Company would continue to manage fuels, hazardous materials, and hazardous waste according to applicable Federal, state and county regulations and to contain all solid waste for onshore landfill disposal. Proposed demolition of the existing fuel pier and construction of the replacement fuel pier would involve the same types and volumes of hazardous and non-hazardous materials and wastes as under Alternative 1. The same protective plans and procedures would be used for Alternative 1 to minimize impacts from hazardous materials, hazardous wastes, DMM, and C & D waste would be used for Alternative 2. Therefore, implementation of Alternative 2 would not have a significant impact with respect to hazardous materials and wastes and solid waste.

3.7.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant hazardous materials or waste impacts; therefore, no mitigation measures are proposed.

3.7.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Fueling operations would continue at the existing fuel pier. There would be no change from the existing conditions. Therefore, implementation of the No-Action Alternative would not have a significant impact with respect to hazardous materials and wastes.

3.8 AIRBORNE NOISE

This section provides information on airborne noise, including characterization of existing noise conditions and sensitive receptors in the general vicinity of the proposed project. Underwater noise is discussed in Section 3.2, *Fisheries,* Section 3.3, *Birds,* and Section 3.4, *Marine Mammals.* No site-specific noise data are available for this project, but information is available for the general San Diego Bay area.

3.8.1 Definition of Resource

Noise is defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive, stationary or transient. There is wide diversity in responses to noise that vary not only according to the type of noise and the characteristics of the sound source, but also

according to the sensitivity and expectations of the receptor, time of day, and distance between the noise source (e.g., a bulldozer) and the receptor (e.g., a person or animal).

Noise levels are measured in dB, and represented on a logarithmic scale of about 20 to 120 dB. On this scale, everyday noises range from 30 dB for a quiet room to 100 dB for a loud power lawn mower at close range. At a constant level of 70 dB, noise can be irritating and disruptive to speech; at louder levels, hearing losses can occur. A difference of 3 dB represents a doubling of sound levels in terms of energy. However, because of how we hear, it is necessary to have a 10-dB increase to be perceived as a doubling in sound. Noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to identify that the measurement has been made with this filtering process (A-weighted decibel measurement, or dBA).

Because noise levels vary widely during the day, it is customary to record multiple noise levels over a stated period, such as 24 hours, and then calculate the average noise level. Time-averaged noise levels form the basis for land use compatibility guidelines. For instance, the term Day-Night Average Sound Level (Ldn) is used to describe the average noise level during a 24-hour day with a penalty of 10 dBA added to nighttime sound levels (10 P.M. to 7 A.M.). Community Noise Equivalent Levels (CNEL) add a 5 dBA penalty for noise events that occur in the evening (7:00 P.M. to 10:00 P.M.), as well as a 10 dBA penalty for noise events at night (10:00 P.M. to 7:00 A.M.). Shorter measurement durations (typically 1 hour) are described as Energy Equivalent Levels (Leq) indicating the total energy contained by the sound over a given sample period. The Leq for 1 hour is the energy average noise level during the hour; specifically, the average noise based on the energy content (acoustic energy) of the sound. It can be thought of as the level of a continuous noise that has the same energy content as the fluctuating noise level. The Leq for a 24-hour period (Leq24) is the Ldn/CNEL without the penalties.

Airborne sound can be transmitted into the water. However, the amount of acoustic energy directly transmitted from a source is limited due to reflection (sound wave bouncing back) and refraction (sound wave bending away from the original path). Sound transmission in shallow water is also influenced by reflection losses from the bottom and the surface, refraction from sound speed gradients, reflection, and refraction from shallow bottom layers, and scattering from rough surfaces. Underwater noise is discussed in Section 3.2, *Fisheries,* Section 3.3, *Birds,* and Section 3.4, *Marine Mammals*.

3.8.2 Affected Environment

Land use compatibility with differing noise levels is regulated at the local level, although the federal government has established suggested land use compatibility criteria for different noise zones (Federal Interagency Committee on Urban Noise [FICUN] 1980). Based on the 1980 FICUN Land Use Guidelines (Table 2), residential areas and schools are considered compatible where the Ldn is up to 65 dBA; outdoor recreational activities such as fishing and golfing are compatible with noise levels up to 70 dBA; and parks are compatible with noise levels up to 75 dBA (FICUN 1980).

The City of San Diego has an exterior noise level standard of 65 dBA CNEL for noise-sensitive land uses (e.g., residential areas, hospitals, childcare facilities, schools). This standard protects sensitive land uses such as these from high noise levels and guides the City's future planning decisions (City of San Diego 2007). The City of San Diego construction noise ordinance places a restriction of an average sound level (Leq) of 75 dBA or less during the 12-hour period from 7 A.M. to 7 P.M. (City of San Diego 2010). The ordinance also limits construction activity outside of these hours and during certain days (i.e., Sundays and major holidays) where it may create an excessive impact on neighboring sites (City of San Diego 2010).

For listeners with normal hearing and fluency in the language, complete sentence intelligibility can be achieved when the signal-to-noise ratio (i.e., the difference between the speech level and the level of the interfering noise) is in the range of 15 to 18 dBA (Lazarus 1990). The American National Standard Institute (ANSI) recommends at least a 15-dBA signal-to-noise ratio in classrooms, to ensure that children with hearing impairments and language disabilities are able to enjoy high speech intelligibility (ANSI 2002). As such, provided that the average adult male or female voice registers a minimum of 50 dBA in the rear of the classroom, the ANSI standard requires that the continuous background noise level indoors must not exceed a Leq of 35 dBA (assumed to apply for the duration of school hours).

The City of San Diego noise ordinances specify separate noise limits for ambient noise and construction noise levels (City of San Diego 2010). Therefore, in this EA the proposed project construction noise is analyzed independently of ambient noise levels at the project site and the surrounding area.

3.8.2.1 NMAWC

The NMAWC lies outside of the 65-dBA noise contours generated by aircraft activity at San Diego International Airport and NAS North Island (City of San Diego 2007). The primary noise sources at the project site include vessel traffic in the channel, vehicular traffic on North Harbor Drive, and air traffic associated with NAS North Island, the USCG Air Station, and San Diego International Airport.

Sensitive receptors near the proposed Navy MMP relocation site include two preschools, a Navy Child Development Center, and a high school. The nearest residential area is Navy family housing located 0.25 mi away on Tattnal Way and the Harbor Island Marina is located across the channel from NMAWC.

3.8.2.2 NBPL Fuel Pier

The proposed project site lies outside the 65-dBA noise contours generated by aircraft activity at San Diego International Airport and NAS North Island (City of San Diego 2007). Nearby ambient sources include vessel traffic in the channel, vehicular traffic, and air traffic associated with NAS North Island, the USCG Air Station, and San Diego International Airport.

The NBPL waterfront area where the project site is located is an industrial area, where ambient (i.e., background) noise levels are typically higher than in residential areas. Common daytime outdoor ambient sound levels for industrial areas range up to 67 dBA (Engineering Toolbox.com 2010). Although the project site is on Navy property and not subject to municipal

requirements, for comparison, the City of San Diego allows ambient noise levels up to 75 dBA in industrial areas (City of San Diego 2007).

Sensitive receptors within NBPL boundaries include the NBPL Child Development Center (CDC), located at Building 377 on Myers Road about 0.7 mi west of the fuel pier, and a cluster of dormitories for NBPL submarine base personnel on Kerrick Road near Ballast Point about 1 mi to the south of the fuel pier.

The nearest sensitive receptor outside the NBPL boundary is the suburban residential neighborhood (La Playa) that borders NBPL to the north. Typical ambient noise levels range from 50 to 65 dBA CNEL in suburban to urban areas, and 65 to 75 dBA CNEL in downtown urban areas (USEPA 1974). Vehicle traffic on the roadways that provide the main access to the Point Loma peninsula (Rosecrans Street and Catalina Boulevard) is the main source of ambient noise in the residential neighborhood (Navy 2007). When there is no major construction activity occurring at NBPL DFSP Point Loma, noise is not intrusive or loud (Navy 2007). Also audible are periodic aircraft from San Diego International Airport, and military aircraft on NAS North Island. Noise from trucks, along with periodic construction in the area, also contributes to the ambient sound levels. Noise from these sources and NBPL DFSP operational activities are typical and not significant (Navy 2007). The City of San Diego exterior and construction noise ordinances apply at the NBPL property boundary, which is approximately 0.5 mi north of the fuel pier.

3.8.3 Environmental Consequences

3.8.3.1 Approach to Analysis

The primary factor considered in determining the significance of noise effects includes the extent or degree to which implementation of Alternative 1 or Alternative 2 would affect baseline noise environments. The primary issue of concern with regard to noise is the potential for impacts to humans and wildlife. Significant noise impacts would occur if implementation of Alternative 1 or Alternative 2 would directly or indirectly do one or both of the following:

- Increase ambient outdoor CNEL levels at noise-sensitive land uses beyond the 65-dBA CNEL land use compatibility standard for residential, education, and health care land uses.
- Establish noise-sensitive land use (residential, educational, and health care uses) in areas exposed to outdoor ambient noise levels that are higher than the 65-dBA land use compatibility standard.

Both of these criteria represent effects from long-term noise exposure once construction is complete. For this EA, less stringent guidelines are applied to temporary noise sources that are restricted to daytime hours (such as most construction and demolition activities) unless they affect noise-sensitive land uses and result in CNEL levels more than 10 dBA above the respective land use compatibility criteria. Noise levels exceeding the City of San Diego's construction noise limit of 75 dBA Leq between the hours of 7 A.M. and 7 P.M. would be considered significant.

The significance of noise impacts on marine biological resources is considered in Section 3.4 and depends on the sensitivity of the resource and magnitude of impact, considering any applicable thresholds for injury or disturbance. Consultation with the NMFS would ensure that appropriate measures are implemented to reduce impacts below a level of significance.

3.8.3.2 Alternative 1 Pier Replacement and Associated Dredging

Alternative 1 would consist of two overall phases with several components within each phase. Noise generating activities during Phase 1 include the relocation of the Navy MMP to NMAWC, Project Indicator Pile and Temporary Mooring Dolphin, Approach Pier construction, and North Pier construction. Construction of the new south pier and demolition of the existing approach pier comprise Phase 2. Temporary relocation of the bait barges and amendments to the Regulated Navigation Zones would not involve noise-generating activities, so these two project components are not addressed in detail for noise impacts. Project activities that involve demolition and construction would occur during the daylight hours on weekdays using standard equipment ranging from trucks and cranes to pile drivers, all of which would create noise. To assess potential impacts of this noise, estimated on-site equipment usage was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM) (USDOT 2008) (Appendix F). Since the City of San Diego noise ordinances contain specific stipulations for construction noise, the project-related noise assessment focuses on the output of the RCNM model. The results calculated by the model are conservative. Noise levels in the model originated from data developed by the USEPA, and were refined using an "acoustical usage factor" to estimate the fraction of time each piece of construction equipment would be operating at full power (i.e., its loudest condition) during the project (USDOT 2008).

The RCNM calculates acoustic sound levels at identified receptor points, and reports maximum sound level (Lmax) and Leq at those points. Under the Proposed Action, noise-generating activities at the NMAWC site would potentially affect receptors near the NMAWC site and pier construction would affect receptors near the fuel pier. For each portion of the project, noise levels at the sensitive receptors are relative to the noise generated at the center of the construction activities and scheduled timeframe for that particular episode of construction.

NMAWC Site

Temporary Relocation of the Navy MMP

Before the pier replacement activities begin, the Navy MMP would be temporarily relocated to the NMAWC. Pile driving would be the dominant noise producer for the MMP portion of the project. Activities associated with the Navy MMP construction would involve a pile driver, crane, and a workboat. Other light construction equipment usage and pile-driving activities would occur during the 90-day NMAWC construction period. Only 32 repositioned and 46 new piles would be required for the proposed temporary Navy MMP facilities at NMAWC under Alternative 1 (Section 2.2.1.1). Although the piles would be small concrete piles and use smaller pile-driving equipment than used for the larger steel piles planned for the fuel pier, the calculation for this analysis used the default pile-driver noise levels in RCNM, resulting in a higher estimated noise level than would likely be produced for driving the concrete piles. The

timeframe window for this portion would be between September 2013 and February 2014. Table 3.8-1 shows calculated noise levels at various representative receptors near the proposed temporary Navy MMP relocation site. All of the residential receptors would be below the 75-dBA San Diego weekday construction ordinance limit.

Table 3.8-1. Proposed Navy Temporary MMP Relocation NMAWC Site Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Outdoor Construction-Related Noise (dBA Leq)*
Harbor Island West Marina	0.1 (0.17)	73.2
Fun House Preschool	0.45 (0.73)	60.8
Patrick Wade CDC (Navy family housing area north of Rosecrans Street)	0.42 (0.67)	61.5
Baypoint Preschool	0.40 (0.65)	61.9
High Tech High School	0.5 (0.8)	60.1
Tattnal Way (residential)	0.25 (0.4)	66.0

Notes: The City of San Diego Daytime Weekday Construction Ordinance Limit is 75 dBA (Leq).
CDC = Child Development Center.
Source: City of San Diego 2010.

At the Patrick Wade CDC, outdoor noise levels would be 61.4 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. With windows closed, there would be a 25-dBA reduction in noise levels, so noise levels inside the preschools, high school, and Patrick Wade CDC would be very close to the indoor classroom criteria level of 35 dBA for effective hearing. These levels likely would be further attenuated because there are a number of two-story buildings between the schools and the proposed temporary Navy MMP relocation site, and all of the schools are located upwind from the MMP location. For these reasons, including that a more conservative noise level was used in the calculations, and that pile driving would be intermittent during the school day (the classroom criteria is for continuous noise levels), these construction noise levels would be considered acceptable. Considering that the noise impacts would be very short term lasting only a few days, the noise impacts associated with construction of the proposed temporary Navy MMP relocation site would not be considered significant.

NBPL Fuel Pier Location

Construction of the proposed replacement fuel pier would involve the demolition of the existing pier and installation of indicator and temporary mooring dolphin piles; approach pier construction; north pier construction; and south pier construction. Demolition and construction of the fuel pier would involve typical construction equipment including: impact pile driver; vibratory pile driver; tug boats; work boats; hydraulic rams; fork lift; ,excavators;, front end loaders; concrete crushing equipment; delivery trucks; and other miscellaneous equipment.

The impact pile driver is the dominant noise producer of all of the construction equipment that would be used at the NBPL site. Steel wall, concrete, and fiberglass piles would be used in this component of the project. The impact pile driver would be needed for all three types of piles (MNB 2011). The vibratory hammer would drive the steel wall piles to the majority of the required depth, and the embedment would be completed with the impact hammer. The concrete piles would be first jetted, then driven the last few feet with the impact hammer. The fiberglass fender piles would not be embedded as deeply as the other two pile types, so they would be driven for the entire length with the impact hammer (MNB 2012).

The second loudest piece of equipment that would be used for the proposed construction at the NBPL site is the vibratory pile driver; however, it would not operate at the same time as the impact pile driver. The project construction schedule calls for four pile driving episodes: Indicator Pile Driving; Approach Pier Construction; North Pier Construction; and South Pier Construction. Each episode would be separated by 6.5 months of work with no pile driving (i.e., the least tern breeding season). This would help to minimize acute noise impacts. Demolition work would not involve impact pile driving but would take place at the same time as the earlier portions of the construction. The noise associated with pile driving would be temporary and would only occur during daylight hours (a normal workday is 9.5 hours) (MNB 2011).

Fuel Pier Demolition, Indicator Piles and Temporary Mooring Dolphin Installation

Multiple pieces of construction equipment would be used to demolish the existing pier and install indicator piles and temporary mooring dolphin including cranes, wheel loaders, tugboats, and work boats. By far, the impact pile driver is the loudest piece of equipment planned for the project. At the source, i.e., within 50 ft, of pile driving equipment RCNM uses an Lmax of 101.3 dBA and the noise level diminishes as the distance from the noise source increases. Two types of piles would be used for indicator piles, 36- or 48-in diameter steel piles (MNB 2011).

During this portion of the project, the datum for noise calculations was assumed to be in the area of the new pier alignment. The proposed schedule for the pile driving is in March of 2014. Two sensitive receptors landside of the site have been identified: the residential neighborhood of La Playa north of NBPL and the CDC at Building 377 inside NBPL. Both are approximately 0.5 mi away from the proposed project site. These points are areas with land uses that could be sensitive to elevated noise levels.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptor areas are listed in Table 3.8-2. Model results indicate that noise levels at the La Playa neighborhood would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the NBPL CDC, outdoor noise levels would be 60.6 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (60.6 dBA - 25 dBA = 35.6 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise

throughout the school day but impact pile driving would occur intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-2. Indicator Piles and Mooring Dolphin Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*
La Playa	0.48 (0.78)	61.0
CDC NBPL (Building 377)	0.45 (0.50)	60.6

Noise from demolition activities without pile driving for the North Pier was calculated to be 58.1 dBA measured from the center of the pier to the base boundary at La Playa at 0.47 mi (0.76 km). The CDC is approximately the same distance of 0.47 mi (0.76 km).

Approach Pier Construction

Pile-driving and multiple pieces of other construction equipment would be used to construct the approach pier including cranes, wheel loaders, tug boats, and work boats. The impact pile driver is the loudest piece of equipment planned for the project. At the source, i.e., within 50 ft of pile driving equipment, RCNM uses an Lmax of 101.3 dBA and the noise level diminishes as the distance from the noise source increases. Two sizes of piles would be used for abutment (24 piles) and structural piles (105 piles): 36- or 48-in diameter steel piles (MNB 2011). Fiberglass piles (21 piles) would be used for fender piles.

During this portion of the project, the datum for noise calculations was assumed to be in the center of the new approach pier alignment. The proposed schedule for this portion of the project would start after the 2014 least tern breeding season in mid-September and continue until mid-November. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the NBPL CDC (Building 377). Both are approximately a half mile away from the project site, but La Playa is just off-base to the north and the CDC is on-base to the west. These points represent areas with land uses that could be sensitive to elevated noise levels.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptors are listed in Table 3.8-3. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (63.2 dBA - 25 dBA = 38.2 dBA) for

effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would occur intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may reduce interior noise levels to below 35 dB. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-3. Approach Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*	
		With Pile Driving	*Without Pile Driving*
La Playa neighborhood	0.47 (0.73)	62.3	57.7
CDC NBPL (Building 377)	0.42 (0.68)	63.2	58.6

North Pier Construction

Pile-driving and multiple pieces of other construction equipment would be used to construct the north pier including cranes, wheel loaders, tug boats, and work boats. By far, the impact pile driver is the loudest piece of equipment planned for the project. Two sizes of steel piles would be used for structural piles (93 piles) and mooring dolphin piles (16 piles): 36- or 48-in diameter steel piles (MNB 2011). Concrete primary fender piles (88 piles) and fiberglass secondary fender piles (25 piles) would be used also be driven.

During this portion of the project, the datum for noise calculations was assumed to be in the center of the new approach pier alignment. The proposed schedule for pile driving the steel structural and mooring dolphin piles portion of the project would start after the pile driving of the piles for the approach pier in mid-November 2014 and continue through mid-January 2015. Construction without pile driving would continue through the least tern breeding season and pile driving the concrete and fiberglass fender piles would start in mid-September 2015. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the CDC.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptors are listed in Table 3.8-4. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (61.4 dBA - 25 dBA = 36.4 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would occur intermittently throughout the

school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-4. North Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*	
		With Pile Driving	*Without Pile Driving*
La Playa	0.47 (0.73)	61.7	56.7
CDC NBPL (Building 377)	0.42 (0.68)	61.4	56.4

South Pier Construction/Existing Pier Demolition

During this phase of the project, piles for south berthing pier and mooring dolphins would be driven and demolition of the existing pier would be completed. Once the mooring dolphin piles are driven, the pile driver would be moved shore-side to drive abutment piles where the existing pier meets the shore. The impact pile driver is the loudest piece of equipment planned for the project. Two sizes of steel piles would be used for the berthing/mooring dolphin piles (17 piles) and for the abutment piles (13 piles): 36- or 48-in diameter steel piles (MNB 2011).

The primary datum for noise calculations for this portion of the project was assumed to be in the center of the dolphin piles, with a secondary location at the shoreline for the abutment piles. The proposed schedule for pile driving the mooring dolphin piles and abutment piles portion of the project would start in mid-September 2016 and continue until completion around the end of September 2016. Demolition without pile driving would start in June 2016 and continue through November 2016. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the NBPL CDC.

Potential noise levels from construction activities during the mooring dolphin construction at the two sensitive receptors are listed in Table 3.8-5. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (for dolphin installation: 61.8 dBA - 25 dBA = 36.8 dBA and for abutment piles: 63.0 dBA – 25 dBA = 38 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building

itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-5. South Pier Dolphin Installation and Existing Pier Demolition Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Dolphin Installation		
Receptor Point	***Distance Miles (km)***	***Construction-Related Noise (dBA Leq)***
La Playa	0.60 (0.97)	59.1
CDC NBPL (Building 377)	0.42 (0.68)	61.8
Abutment Piles		
Receptor Point	***Distance Miles (km)***	***Construction-Related Noise (dBA Leq)***
La Playa	0.46 (0.74)	61.4
CDC NBPL (Building 377)	0.38 (0.62)	63.0

Demolition of the existing approach pier and south pier would occur during this phase of the project and the approximate centroid of the pier area was used for the distance datum for these noise calculations. Noise levels for demolition activities at La Playa and the NBPL CDC are shown in Table 3.8-6.

Table 3.8-6. Existing Pier Airborne Outdoor Demolition Noise Levels at Representative Receptor Points

Receptor Point	***Distance Miles (km)***	***Construction-Related Noise (dBA Leq)***
La Playa	0.52 (0.83)	56.8
CDC NBPL (Building 377)	0.40 (0.64)	59.0

Dredging

Mechanical dredging of the high spot in the turning basin would produce noise from the dredging equipment, tugboats, and barges, and associated human activity. No blasting would take place. The portions of the turning basin that would be dredged are adjacent to the federal channel. Noise levels associated with dredging the turning basin would therefore be comparable to those that occur during the periodic maintenance dredging of the channel by USACE. Dredging operations would take place on weekdays during daylight hours for approximately 3 months. Noise levels from dredging would be 87 dBA at 50 ft (15 m) dropping to 61 dBA at 1,000 ft (305 m) and to 55 dBA at 2,000 ft (610 m) from the source (USDOT 2008). At its closest, the proposed dredge footprint is about 0.5 mile away (approximately 2,600 ft) away from shore (see Figure1-2). The outdoor airborne noise levels associated with dredging operations that could be heard ashore in the La Playa neighborhood would be less than the City of San Diego construction noise limit of 75 dBA for residential areas. Therefore, there would be no significant noise impact associated with the dredging component of Alternative 1.

Barges transporting the dredged material to a nearshore replenishment site would also be a source of noise associated with the dredging operations. The sediment transport barges would join with existing vessel traffic in the federal channel and noise levels would be comparable to ambient levels. Any additional noise resulting from the sediment transport barges would be short-term (up to 3 months), so impacts from transporting the dredge material to a nearshore replenishment site would not be significant.

In summary, noise modeling indicates that the noise associated with the proposed demolition, construction and dredging activities would not exceed City of San Diego construction airborne outdoor noise limits for residential areas (75 dB A-weighted) which apply at the boundaries of NBPL and NMAWC. Modeling also indicates that the indoor airborne noise levels at educational facilities in the areas surrounding the proposed NBPL and NMAWC project components would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dB A-weighted). However, because the pile driving would be intermittent rather than continual, the noise levels would be considered acceptable. The following BMPs could be used to attenuate noise further levels if a greater reduction in noise levels is desired: noise monitoring for classroom criteria; acoustic blankets around the pile driver; or use of pile cushions could be used to reduce noise levels.

The demolition, construction, and dredging noise generated under Alternative 1 would be generally consistent with the industrial waterfront nature of NBPL and would not permanently alter the overall noise environment. Therefore, with implementation of Alternative 1 there would not be a significant noise impact.

3.8.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components and activities would occur as under Alternative 1. The noise impacts associated with demolition, construction, and dredging activities would be the same as those discussed under Alternative 1, i.e., the City of San Diego construction noise ordinance limits would not be exceeded and classroom criteria for effective hearing would be slightly exceeded, but the classroom noise levels would be considered acceptable because the noise would be intermittent throughout the school day. Under Alternative 2, dredging would take place years after construction is completed, so noise from dredging would occur in the absence of other project-related noise. However, the demolition, construction, and dredging noise generated under this Alternative would be generally consistent with the industrial waterfront nature of NBPL and would not permanently alter the overall noise environment. Therefore, implementation of Alternative 2 would not have a significant noise impact.

3.8.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not result in significant airborne noise impacts; therefore, no mitigation measures are proposed.

3.8.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement

of the existing fuel pier, and associated dredging of high spots in the turning basin would not occur. Industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant noise impact.

3.9 AIR QUALITY

3.9.1 Definition of Resource

Air quality is defined by ambient air concentrations of specific pollutants that have been determined to be of concern with respect to the health and welfare of the general public by the USEPA. The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. The seven major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). Primary NAAQS are established to protect public health. Secondary NAAQS may also be established to avoid other adverse impacts to the public welfare such as odors or visibility effects. Areas that violate a federal air quality standard are designated as nonattainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, fine particulate matter (PM_{10} and $PM_{2.5}$) can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as Reactive Organic Gases [ROG] and oxides of nitrogen [NO_x], which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

The State of California has identified four additional pollutants for ambient air quality standards: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Air Resources Board (CARB) has also established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state and/or federal standard are considered to be nonattainment for that pollutant. Table 3.9-1 details both the federal and state ambient air quality standards.

Table 3.9-1. Ambient Air Quality Standards

Pollutant	*Averaging Time*	*NAAQS1*		*CAAQS*
		Primary	*Secondary*	*Concentration*
Ozone (O_3)	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m3)
	8-Hour	0.075 (147 µg/m3) ppm		0.070 ppm (137 µg/m3)
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m3)	None	9.0 ppm (10 mg/m3)
	1-Hour	35 ppm (40 mg/m3)		20 ppm (23 mg/m3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m3)	Same as Primary Standard	0.030 ppm (56 µg/m3)
	1-Hour	0.100 ppm (188 µg/m3)		0.18 ppm (338 µg/m3)
Sulfur Dioxide (SO_2)	24-Hour	-	-	0.04 ppm (105 µg/m3)
	3-Hour	-	0.5 ppm (1300 µg/m3)	-
	1-Hour	75 ppb (196 µg/m3)	-	0.25 ppm (655 µg/m3)
Respirable Particulate Matter (PM_{10})	24-Hour	150 µg/m3	Same as Primary Standard	50 µg/m3
	Annual Arithmetic Mean	-		20 µg/m3
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 µg/m3	Same as Primary Standard	-
	Annual Arithmetic Mean	12 µg/m3		12 µg/m3
Lead (Pb)	30-Day Average	-	-	1.5 µg/m3
	Calendar Quarter	1.5 µg/m3	Same as Primary Standard	-
3-Month Rolling Average	Rolling 3-month Average	0.15 µg/m3		
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m3)
Sulfates (SO_4)	24-Hour			25 µg/m3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific			In sufficient amount to produce an extinction coefficient of 0.23 per

Pollutant	*Averaging Time*	*NAAQS1*		*CAAQS*
		Primary	*Secondary*	*Concentration*
	Standard Time)			kilometer due to particles when the relative humidity is less than 70 percent.
Vinyl chloride2	24 Hour			0.01 ppm (26 µg/m3)

Notes: 1 NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For NO_2, to attain the national standard, the 3-year average of the 98th percentile of the 1-hour maximum daily concentration must not exceed 100 ppb.

2 The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

$\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter.

Source: CARB 2012, USEPA 2012.

Toxic air pollutants, also called hazardous air pollutants (HAPs), are a class of pollutants that do not have ambient air quality standards but are examined on an individual basis when there is a source of these pollutants. The State of California has identified particulate emissions from diesel engines as a toxic air pollutant.

3.9.2 Affected Environment

NBPL is located within San Diego County and are under the jurisdiction of the SDCAPCD. The SDCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in the San Diego Air Basin (SDAB), which is contiguous with San Diego County.

On 15 April 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O_3, and on 15 July 2005, the 1-hour NAAQS for O_3 was rescinded. The USEPA was challenged on their justification for "basic" nonattainment designations and published proposed for all "basic" nonattainment areas for the 8-hour NAAQS for O_3. The SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS (volatile organic compounds [VOCs] and NO_x are precursors to the formation of O_3). In 1994, the SDAB attained the standard for CO; the air basin is considered a maintenance area for CO and has been subject to a maintenance plan. The SDAB is currently in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for O_3, PM_{10}, and $PM_{2.5}$.

The SDCAPCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the project site is located in downtown San Diego, California.

3.9.2.1 Region of Influence

Specifically identifying the ROI for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. The ROI for the NBPL Fuel Pier is defined by the SDAB. For inert pollutants (all pollutants other than O_3 and its precursors), the ROI is generally limited to a few miles downwind from the source. However, for a photochemical pollutant such as O_3, the ROI may extend much farther downwind. O_3 is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (ROG and NO_x). The maximum effect on O_3 levels from precursors tends to occur several hours after the time of emission during periods of high solar load and may occur many miles from the source. O_3 and O_3 precursors transported from other regions can also combine with local emissions to produce high local O_3 concentrations

3.9.2.2 Federal Requirements

Under NEPA, air quality impacts must be evaluated and assessed with regard to the significance of their impacts. NEPA is applicable to areas that are within the United States Territory, typically defined as within 12 nautical miles of shore and on land. In addition to NEPA, the CAA, General Conformity, and New Source Review (NSR) are applicable to analyses of impacts to air quality. These federal requirements are discussed in the following sections.

3.9.2.3 Clean Air Act

The USEPA is the agency responsible for enforcing the CAA of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish NAAQS, which classify areas as to their attainment status relative to NAAQS; develop schedules and strategies to meet the NAAQS; and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The CAA Amendments established new deadlines for achievement of NAAQS, dependent upon the severity of nonattainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. In California, the SIP consists of separate elements for each air basin, depending upon the attainment status of the particular air basin.

The CAA Amendments also require that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce criteria pollutant emissions and control emissions of HAPs by establishing control technology guidelines for various classes of emission sources. Under the CAA, state and/or local agencies may be delegated authority to administer the requirements of the CAA, including requirements to obtain permits to operate stationary sources on Navy installations. Section

3.9.2.7 discusses the local permitting requirements for equipment that is subject to these requirements.

3.9.2.4 General Conformity

Under 40 CFR Part 93 and the provisions of Part 51, Subchapter C, Chapter I, Title 40, Appendix W of the CFR, of the CAA as amended, federal agencies are required to demonstrate that federal actions conform with the applicable SIP. In order to ensure that federal activities do not hamper local efforts to control air pollution, Section 176(c) of the CAA, 42 USC 7506(c) prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved SIP or federal implementation plan.

The USEPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels. Table 3.9-2 identifies the federal nonattainment pollutants and the relevant *de minimis* emission thresholds.

In order to demonstrate conformity with the CAA, a project must clearly demonstrate that it does not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard, any required interim emission reductions, or other milestones in any area. A conformity applicability analysis is required for each of the nonattainment pollutants or its precursor emissions.

Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. The Proposed Action must also demonstrate that its net emission increase is not regionally significant, where regionally significant is defined as 10 percent of basin-wide emissions. If net emissions exceed the relevant *de minimis* value, or if a project is regionally significant, a formal conformity determination process must be followed.

3.9.2.5 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most significant of the human activities emitting GHGs is the burning of fossil fuels. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century correlating with an increase in GHG emissions from human activities.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential that is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential scale is standardized to CO_2, which has a value of one. For example, CH_4 has a global

warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. CO_2 is the dominant gas in terms of quantities of total GHG emissions, although other GHGs have a higher global warming potential than CO_2. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emission rate representing all GHGs.

Federal agencies are addressing emissions of GHGs by mandating GHG reductions in federal laws and EOs, most recently EO 13423, *Strengthening Federal Environment, Energy, and Transportation Management* and EO 13514, *Energy Efficient Standby Power Devices*. Several states have passed GHG related laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 (Assembly Bill 32) directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with goals set by EO 13423 and the Energy Policy Act of 2005, the "*Navy or Marine Corps*" has implemented a number of renewable energy projects. The types of projects currently in operation within military installations include thermal and photovoltaic solar energy systems, geothermal power plants, and wind energy generators.

The potential effects of GHG emissions are by nature global and cumulative, and it is impractical to attribute climate change to individual projects. Therefore, the impact of GHG emissions associated with this project is discussed in the context of cumulative impacts in Section 4.3.9.2 of this EA.

3.9.2.6 New Source Review

A NSR is required when a source has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specified major source thresholds (100 or 250 tons per year), predicated on the source's industrial category. A major modification to the source also triggers a NSR. Any new or modified stationary emission source requires construction and operating permits from the SDCAPCD. Through the SDCAPCD's permitting process, all stationary sources are reviewed and are subject to a NSR process. The NSR process ensures that factors such as the availability of emission offsets and their ability to reduce emissions are addressed and conform with the SIP.

3.9.2.7 Local Requirements

In San Diego County, the SDCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. Included in the SDCAPCD's tasks are monitoring of air pollution, preparation of the SIP for the SDAB, and the promulgation of rules and regulations. The SIP includes strategies and tactics to be used to attain the federal O_3 standard within San Diego County. The SIP elements are taken from the Regional Air Quality Strategy and the SDCAPCD plan for attaining the state O_3 standard, which is more stringent than the federal standard. The SDCAPCD's rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

These regulations require that facilities constructing, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, SDCAPCD regulations require stationary sources of air pollutants to obtain and maintain Permits to Operate for all stationary sources subject to the requirements of Regulation II. The Navy must submit applications to the SDCAPCD for their review and approval. The SDCAPCD is responsible for the review of applications and for the approval and issuance of these permits. Once a permit is issued, the Navy is responsible for compliance with the conditions specified in the permit, and is responsible for quantification of emissions associated with the permitted unit. The SDCAPCD does not have quantitative emissions limits for construction activities, nor for long-term emissions that may result from increased vehicle use or other mobile sources.

3.9.2.8 Current Best Management Practices

The Navy currently has a comprehensive air quality management program to comply with all federal, state, and local requirements. BMPs that are part of the Navy's air quality program are implemented at NBPL. Equipment is maintained and meets applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. The Navy would require equipment such as dredging equipment to obtain the necessary air permits to operate within the SDAB.

3.9.3 Environmental Consequences

This resource section focuses on activities that have the potential to result in an impact to the ambient air quality. Emissions from construction activities associated with the NBPL Pier 180 replacement project could affect air quality. Air quality impacts from proposed construction activities would occur from (1) combustion emissions due to the use of fossil fuel-powered equipment, and (2) fugitive dust emissions (PM_{10}) during construction activities including demolition. Due to the nature of the project, earthmoving and grading would not be required; dredging activities would not generate fugitive dust, as the marine sediments that would be dredged are wet.

3.9.3.1 Approach to Analysis

The air quality analysis is based on estimates of emissions from combustion of fossil fuels in heavy construction equipment and vehicles. A list of estimated equipment required for construction activities, including support boats and tugboats, heavy construction equipment, truck trips, and workforce estimates, are provided in Appendix H, along with the emission calculations for all activities. It is assumed that all construction activities would be completed over the course of a 4-year period starting in August 2013 and ending in January 2017.

Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the project is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, the Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, this analysis focuses on construction activities required to replace the pier.

Emissions Evaluation Methodology

The methodology for estimating construction emissions involves quantifying the number and type of heavy construction equipment, truck trips, worker trips, and marine vessels that would be used for the NBPL Pier 180 replacement.

Emissions from heavy construction equipment were estimated based on emission factors for specific equipment from the CARB's OFFROAD emission model, which provides emission factors for offroad equipment. Emission factors developed by the South Coast Air Quality Management District (2007) were used. Emissions were estimated by multiplying the number of each type of equipment by the hours per day, days per year, and emission factor in pounds per day. Emissions from the pile driving hammer were calculated based on the Delmag D12 hammer, assuming the hammer would use 0.95 gallons of diesel fuel per hour (Delmag 2012).

Emissions from the dredge involved in the construction project were calculated based on the engine specification for the dredge. It was assumed that the main dredge engine would be 2,935 horsepower (hp), with the auxiliary engine rated at 550 hp and the spud winch at 250 hp. It was assumed the engines would meet Tier 2 emission standards. Emissions were calculated by multiplying the emission factor for the dredge times the amount of time the dredge would be used.

Emissions from ground vehicles (worker vehicles and truck trips) involved in construction of the NBPL Fuel Pier include combustion emissions from delivery vehicles such as trucks, and emissions from the construction workforce traveling to and from the site. Emissions associated with ground vehicles were estimated based on emission factors for specific equipment, or for ground vehicles, from the CARB's Emission Factors 2011 model (CARB 2011), which provides emission factors for on-road vehicles. Emissions were estimated by multiplying the number of each type of vehicle times the estimated mileage traveled per day, and the number of days for each phase of construction.

Marine vessels would be involved in the construction of the NBPL Pier during demolition of the existing pier and construction of the new pier. The methodology for estimating marine vessel emissions involves evaluating the type of activity, the number of hours of activity, the type of propulsion engine, and the type of generator used onboard for each type of vessel. Emission factors were obtained from the USEPA (USEPA 2000).

Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, the Proposed Action is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, this analysis focuses on construction activities required to replace the pier.

Baseline Emissions

The emissions baseline levels provide a basis for evaluating potential emission increases associated with the Proposed Action and alternatives. For the purpose of evaluating operational emissions associated with the Proposed Action and alternatives, it was assumed that the operation of the Fuel Pier would not be altered with replacement of the pier. Accordingly, there would be no net change in operational emissions.

3.9.3.2 Alternative 1 Pier Replacement and Associated Dredging

As discussed in Chapter 2, construction of the new fuel pier would take place concurrently with demolition of the old pier. The project would be constructed in two main phases. Implementation of Alternative 1 would include the following activities:

Phase 1 – Fuel Pier Construction:

- Temporary Relocation of the Navy MMP to NMAWC
- Project Indicator Pile Program
- Temporary Mooring Dolphin
- North Segment Demolition
- Access Pier Construction
- North Pier Construction
- Mooring Dolphins

Phase 2 – South Pier Construction:

- South Pier Construction
- South Pier and Access Pier Demolition

In addition to construction of the new fuel pier, dredging for the high spot in the turning basin would be conducted under Alternative 1. Dredging could occur any time before, during, or after the construction process. There would be no dredging during the least tern breeding season, 1 April to 15 September. For the purpose of calculating emissions associated with dredging, it was assumed that dredging would be concurrent with fuel pier construction, and could occur during the maximum activity years of 2014 and 2015.

Table 3.9-2 presents a summary of the emissions associated with construction activities under Alternative 1. Emission calculations are provided in Appendix G.

Table 3.9-2. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity –Alternative 1

Construction Year	*Emissions (tons/year)*					
	CO[1]	*VOCs*[2]	*NOx*[2,3]	*SOx*[3]	*PM_{10}*[3]	*$PM_{2.5}$*[3]
2013	2.69	0.24	1.50	0.00	0.07	0.05
2014	15.63	3.04	39.70	0.05	1.17	1.03
2015	22.84	14.27	44.89	0.07	1.90	1.63
2016	14.24	9.75	35.52	0.05	1.26	1.10
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.
(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.
(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.
(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDCAPCD major source thresholds.
Sources: USEPA 2012, SDCAPCD 2012.

As shown in Table 3.9-2, emissions would be below *de minimis* thresholds. Therefore, implementation of Alternative 1 would not have a significant impact to air quality.

General Conformity Applicability Analysis

The estimated construction emissions associated with Alternative 1 would be below the *de minimis* threshold levels for CAA conformity. Therefore, Alternative 1 would conform to the SDAB SIP and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Refer to Appendix G).

Hazardous Air Pollutants

As discussed above, the USEPA has listed 188 substances that are regulated under Section 112 of the CAA, and the State of California has identified additional substances that are regulated under state and local air toxics rule. Minor amounts of HAPs are emitted from the combustion of fossil fuels in construction equipment and vehicles. The amounts that would be emitted are small in comparison with the emissions of criteria pollutants; emission factors for most HAPs from combustion sources are roughly three or more orders of magnitude lower than emission factors for criteria pollutants.

Because the majority of activities occur in restricted areas where no sensitive receptors (i.e., residents, schools, hospitals, etc.) are located, no health effects would be anticipated from emissions of HAPs. Therefore, implementation of Alternative 1 would not have a significant impact to air quality.

3.9.3.3 Alternative 2 Delayed Dredging Alternative

As discussed in Chapter 2, implementation of Alternative 2 would involve the same construction activities described under Alternative 1, except that dredging would take place years after construction of the fuel pier and demolition of the existing pier are completed. Under this alternative, emissions associated with dredging would not occur during construction of the pier.

Table 3.9-3 presents a summary of the emissions associated with construction activities under Alternative 2. Emission calculations are provided in Appendix G.

Table 3.9-3. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity – Alternative 2

	Emissions (tons/year)					
Construction Year	*CO*[1]	*VOCs*[2]	*NOx*[2,3]	*SOx*[3]	*PM_{10}*[3]	*$PM_{2.5}$*[3]
2013	2.69	0.24	1.50	0.00	0.07	0.05
2014	14.32	2.67	34.78	0.05	1.02	0.88
2015	21.53	13.89	39.97	0.07	1.75	1.50
2016	12.94	9.38	30.60	0.05	1.11	0.97
Dredging	1.31	0.37	4.92	0.00	0.15	0.13
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.

(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.

(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.

(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDCAPCD major source thresholds.

Sources: USEPA 2012, SDCAPCD 2012.

As shown in Table 3.9-3, emissions would be below *de minimis* thresholds. Therefore, implementation of Alternative 2 would not have a significant impact to air quality.

3.9.3.4 Proposed Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant air quality impacts; therefore, no mitigation measures are proposed. However, current BMPs, implemented as part of the Navy's air quality management program and practices, would continue to be implemented for operations of the NPBL Fuel Pier. All necessary construction or operationally-related permits would be authorized by the SDCAPCD before project implementation occurs.

3.9.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. As a result, no construction emissions would result from implementation of the No-Action

Alternative. With no construction emissions, the No-Action Alternative is exempt from the General Conformity Rule. Therefore, implementation of the No-Action Alternative would not have a significant impact to air quality.

3.10 TRANSPORTATION AND CIRCULATION

3.10.1 Definition of Resource

Transportation and circulation refer to the operational characteristics of a transportation network, including the network's capacity to accommodate the additional demand resulting from a proposed project. Networks may encompass many different types of facilities that serve a variety of transportation modes, such as vehicular traffic, public transit, and non-motorized travel. Because the primary effect of the Proposed Action on transportation and circulation would involve vehicular traffic, this analysis focuses on the street network that provides access to and from NBPL.

Roadway operating conditions and the adequacy of existing roadway systems to accommodate vehicle use are described in terms of average daily traffic (ADT) volumes and level of service (LOS) ratings. LOS is a method used to rate the performance of streets, intersections, and other highway facilities. Developed by the Transportation Research Board, and documented in various editions of the Highway Capacity Manual (Transportation Research Board 2010) since 1950, LOS rates performance on a scale of A to F, with LOS A reflecting free flowing conditions and LOS F representing heavily congested conditions. Table 3.10-1 summarizes the general traffic conditions associated with each LOS rating.

Table 3.10-1. Traffic Conditions Associated with LOS Ratings

LOS Rating	*Description of Traffic Conditions*
A	Traffic flows freely, with little or no restrictions to vehicle maneuvers within the traffic stream.
B	Reasonably free-flowing conditions, with slight restrictions to vehicle maneuvers within the traffic stream.
C	Traffic speed approaches free-flowing conditions, but freedom to maneuver within the traffic stream noticeably restricted.
D	Traffic speed begins to be reduced, and freedom to maneuver is seriously limited due to a high concentration of traffic.
E	Unpredictable traffic flow, with virtually no usable gaps in the traffic stream to accommodate vehicle maneuvers.
F	Unstable flow resulting in delays and the formation of queues in locations where traffic demand exceeds roadway capacity.

Source: Transportation Research Board 2010, Chapters 11 and 14.

Traffic analysis is guided by procedures and standards established by the federal, state, regional or local agency having jurisdiction over the transportation facilities that comprise the ROI. The Proposed Action and the surrounding street network are located within the City of San Diego; therefore, City of San Diego procedures are incorporated into this analysis.

The City of San Diego Traffic Impact Study Manual (City of San Diego 1998) establishes LOS criteria for roadway segments based on their physical characteristics (e.g., the number of lanes,

the presence of a median, adjacent land uses, etc.) and ADT thresholds assigned to each LOS grade (City of San Diego 1998). For example, a four-lane major arterial roadway would have LOS A with an ADT of 15,000 vehicles, and LOS D at 35,000 vehicles per day. The City of San Diego considers LOS D to be the minimum acceptable LOS; LOS E and F are considered unacceptable.

3.10.2 Affected Environment

The ROI for this analysis includes the roadways in the NBPL and NMAWC areas. Roadway access to the Point Loma peninsula and NBPL is limited. There is no immediate freeway access. Two City of San Diego streets, Rosecrans Street and Catalina Boulevard/Cabrillo Memorial Drive, are the main routes leading to the Point Loma peninsula and NBPL. NBPL has access gates on both Rosecrans Street (Rosecrans Gate) and Cabrillo Memorial Drive (McClelland Gate). Due to the volume of traffic on Rosecrans Street, many NBPL workers enter via the McClelland Gate (NAVFAC Southwest 2011).

NMAWC is also accessed by way of city streets. The routes directly leading to NMAWC are North Harbor Drive and Nimitz Boulevard; Rosecrans Street via Nimitz Boulevard is also an option. The NMAWC main gate is on North Harbor Drive, at the intersection with Laning Road (see Figure 2-1).

3.10.2.1 Existing Conditions

Rosecrans Street is the major arterial roadway that connects Point Loma to the Mission Valley community, and regional transportation facilities, including Interstate (I)-5, I-8, the Old Town Transit Center, and other land uses. Rosecrans Street is approximately 5 mi long, extending from Taylor Street near I-5 southwest down the peninsula past the proposed project area, where it transitions into Fort Rosecrans Boulevard. The morning traffic peak on Rosecrans Street typically occurs between 4:00 and 6:30 A.M. This peak period is substantially earlier than traditional peak commuting periods, which typically begin after 7:00 A.M. (City of San Diego 2010). Afternoon commute volumes begin to peak at 3:00 P.M. and can continue well into the typical evening commute period after 6:00 P.M. The posted 30 to 35 mi per hour speed limits are often exceeded during off-peak hours (City of San Diego 2010).

The capacities of Rosecrans Street are defined as 40,000 vehicles per day for the four lane sections; 45,000 vehicles per day for the five lane sections; and 50,000 vehicles per day for the six lane sections. In addition, the southernmost segment of Rosecrans Street, from Talbot Street to NBPL, is defined as a two-lane major arterial, which has a capacity of 27,000 vehicles per day (City of San Diego 2010). Existing ADT volumes were obtained from the Rosecrans Corridor Mobility Study (City of San Diego 2010), supplemented where appropriate by more updated traffic data obtained from the SANDAG website (SANDAG 2012), and with 24-hour traffic counts conducted in May 2012 (see Appendix H). Table 3.10-2 presents existing LOS within the ROI. As shown in this table, all segments within the ROI are characterized by acceptable LOS D or better conditions.

Table 3.10-2. Level of Service for ROI Roadway Segments, Existing Conditions

Roadway Segment	*Street Classification* [(a)]	*LOS E Capacity* [(b)]	*Existing*		
			ADT [(c)]	*V/C* [(d)]	*LOS* [(e)]
Rosecrans Street					
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	33,300	0.83	D
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	34,400	0.86	D
From Canon St. to Talbot St. [(f)]	2 Lane Major Arterial	27,000	15,200	0.56	C
From Talbot St. to Kellogg St. [(f)]	2 Lane Major Arterial	27,000	10,500	0.39	A
Nimitz Boulevard					
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	12,020	0.30	A
Canon Street					
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	12,870	0.86	D
Laning Road					
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,532	0.44	B
Catalina Boulevard					
From Canon St. to Mills St.	4 Lane Collector	30,000	15,100	0.50	C
Cabrillo Memorial Drive					
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,303	0.55	C

Notes:

Bold values segments operating at LOS E or F.

LOS = Level of Service; ADT = Average Daily Traffic volume; V/C = volume divided by capacity; Bl. = Boulevard; N. = North; Dr. = Drive; St. = Street

(a) Street classifications and LOS E Capacities for 2-lane Major Arterials were taken from the Rosecrans Corridor Mobility Study (City of San Diego 2010)

(b) LOS E Capacity obtained from City of San Diego Traffic Impact Study Manual (City of San Diego 1998)

(c) Average Daily Traffic (ADT) volumes obtained from San Diego Association of Governments Average Weekday Traffic Volumes (SANDAG 2012), from the Rosecrans Corridor Mobility Study (City of San Diego 2010), and from 24-hour counts conducted in May 2012 (Appendix I)

(d) ADT divided by LOS E Capacity

(e) City of San Diego Traffic Impact Study Manual, Table 2 (City of San Diego 1998)

(f) LOS E Capacity obtained from Rosecrans Corridor Mobility Study (City of San Diego 2010)

3.10.3 Environmental Consequences

3.10.3.1 Approach to Analysis

For the purpose of this analysis, the proposed project would result in significant impacts to transportation and circulation if it would:

- Exceed City of San Diego significance criteria on segments characterized by LOS E or LOS F conditions.

The following evaluation is based on past traffic analyses and available traffic data. Limited traffic data collection was conducted in instances where no recent traffic data was available (i.e., Laning Road north of North Harbor Drive, and Cabrillo Memorial Drive north of McClelland Road).

3.10.3.2 Alternative 1 Pier Replacement and Associated Dredging

NMAWC Site

Complete relocation of the Navy MMP would take place before any demolition or construction begins for the fuel pier replacement, so there would be no potential overlap of construction traffic for the two project components. Nearly all the construction materials involved in the Navy MMP component would arrive via water (pilings would be delivered via barge; floating enclosures and walkways would be towed by small boats), so negligible construction traffic on roadways in the ROI is anticipated. The number of construction workers needed during the NMAWC pile installation period is expected to be minimal and not anticipated to result in a significant increase in traffic.

Approximately 204 Navy MMP personnel would be stationed at the NMAWC site along with the animals during temporary relocation period. Many of these workers likely already commute into NBPL via North Harbor Drive, Nimitz Boulevard, and/or Rosecrans Street. Temporarily transferring the MMP personnel to NMAWC would redistribute existing traffic volumes, resulting in a reduction in traffic on Rosecrans Street and other roadways within the ROI. For example, inbound trips approaching from the east via North Harbor Drive would make a left turn at the Laning Road intersection in order to access NMAWC. Diversion of trips traveling along this route would reduce traffic on North Harbor Drive and Rosecrans Street. Traffic approaching from the east on Rosecrans Street would turn left onto Laning Road and continue southward on Laning Road, past North Harbor Drive, into the NMAWC site. Although traffic would be added to a segment of Laning Road, the diversion of trips would reduce traffic volumes further to the west and south, in the vicinity of NBPL.

At the end of the temporary relocation period, the enclosures and walkways would be towed back to their original locations, and the Navy MMP workers would resume their former commuting pattern. The guide piles would be transported from the NMAWC site by barge, so there would be no demolition truck traffic. As with construction, the time period to remove the guide piles would be short, and a minimal number of workers would be needed.

Fuel Pier Replacement

Under Alternative 1, demolition of the existing fuel pier would begin in 2014. It is anticipated that the proposed fuel pier replacement effort would require approximately 100 workers per day making one trip each to the site and home, i.e., 200 vehicle trips added daily to Rosecrans Street. It is estimated that overland transport of construction materials and demolition debris would add, on-average, approximately 96 trucks per day, for a daily total of about 296 vehicle trips associated with the P-151 project. In addition, for the duration of the construction/demolition period, approximately 204 Navy MMP personnel (or 408 trips) would be transferred to NMAWC. Accordingly, there would be a net reduction in traffic volumes on Rosecrans Street near NBPL.

When the construction period ends in 2017, traffic levels would return to baseline conditions. There would be no change to the number of workers employed at the new fuel pier (Navy 2012). These workers could be directed to travel to the fuel pier via Catalina Boulevard/Cabrillo

Monument Drive and the McClelland Gate to remove trips from Rosecrans Street. Operations at the new fuel pier would not result in any additional vehicle traffic to the pier (Navy 2010).

Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The bait barges would be towed from their current location to the selected temporary relocation site (4A or 6A, Figure 2-2). The Navy would coordinate with the USCG to issue a Notice to Mariners for moving the bait barges to and from the temporary relocation site. Therefore, temporary relocation of the bait barges would not have a significant impact on marine traffic and circulation.

Demolition and Construction Potential Impacts to Vessel Traffic

Proposed demolition and construction activities would take place inside an existing restricted navigation zone (Security Zone) that is off-limits to civilian vessels (see Figure 2-5). Therefore, significant impacts to civilian vessel traffic would not occur.

Sediment Dredging and Disposal

This project component would occur entirely in-water. Dredged material would be transported to the beneficial reuse site periodically via barge or the hopper dredge vessel. Dredging would take place outside the federal channel. The number of vessels needed would be as follows:

- Hopper dredge - two (one dredge vessel and one assisting tug). The dredge vessel itself would transport the sediment to the reuse site.
- Clamshell dredge – six (one dredge vessel, two sediment barges, and three assisting tugs. However, there would likely be only the dredge vessel, one barge and two tugs in the project area at any given time because the second barge and its tug would be traveling to or from the SSTC beneficial reuse site.

All vessels involved with the project would follow all applicable navigation regulations and procedures. An increase of two or six vessels west of the navigation channel near the fuel pier for a period of less than 90 days would not obstruct large/commercial vessel traffic in the navigation channel. There would still be open water east of the channel for small vessel navigation. The periodic round trip movement of two vessels (the hopper or sediment barge and its assisting tug) from the proposed dredge site to the SSTC beneficial reuse site would be a minimal addition to vessel traffic in the channel and along the coast south of Point Loma. The Navy would coordinate the USCG to issue a Notice to Mariners to advise civilian vessels of the presence of the dredging vessels. Therefore, there would be no significant impacts to vehicular or vessel traffic associated with this component of Alternative 1.

Amendments to Existing Navigation Zones

The Navy has coordinated with the USCG to amend the existing Security Zone to the east of the fuel pier. Appropriate amendments of this designated zone would establish new boundaries for Navy operational areas associated with the proposed new fuel pier that would be approximately 250 ft east of the existing Security Zone boundary. There would be approximately 700 ft of open water between the amended Security Zone Boundary and the federal channel, so the impact to civilian vessel traffic would not be significant.

Baseline and Baseline Plus Project Traffic Conditions

The Baseline condition represents the estimated future traffic conditions that would exist when project construction begins (i.e., 2013). Baseline ADT volumes were estimated assuming an annual growth rate of two percent per year. This factor is consistent with the approach taken in the P-401 Traffic Impact Study (Shaw Environmental & Infrastructure 2007)[2]. It should be noted that this is a conservative approach, as the P-401 traffic report was prepared before the national economic downturn that began in 2008, and assumed future traffic growth based on pre-recession development trends[3]. Table 3.10-3 presents volumes and LOS for ROI street segments under Baseline conditions. As shown in this table, estimated future traffic growth would cause two segments of Rosecrans Street and one segment of Canon Street to deteriorate from LOS D to LOS E.

Table 3.10-4 summarizes the assignment of traffic volumes to the ROI for the following categories of project-related traffic during construction:

1) Construction employees: 100 workers, one inbound and one outbound trip = 200 trips
2) Construction trucks: 48 trucks, one trip inbound and one outbound trip = 96 trips
3) Relocated Navy MMP personnel: 204 employees, one inbound and one outbound trip = 408 trips (relocated)

The additional and relocated trips associated with Alternative 1 were assigned in accordance with the P-401 Traffic Impact Study (for construction employees and trucks), and likely travel routes (for relocated trips). As shown in Table 3.10-4, Alternative 1 would result in relatively minor traffic increases on Nimitz Boulevard (96 daily trips) and Laning Road (204 daily trips). Alternative 1 would not increase traffic volumes on Canon Street, Catalina Boulevard, or Cabrillo Memorial Drive. During project construction, there would be a net reduction in traffic on Rosecrans Street due to the temporary relocation of MMP personnel. The construction-related impacts under Alternative 1 are presented in Table 3.10-3. As shown in this table, Alternative 1 would not have any substantial effect, i.e., the LOS on roadways in the project area does not decrease with the addition of project construction traffic.

If it is desired to further reduce traffic volumes on Rosecrans Street during construction, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. For informational purposes, the volumes, LOS, and significance of impact associated with this optional minimization measure are also presented in Table 3.10-3. As shown in this table, the redistribution of truck traffic resulting from the optional minimization measure would not cause any significant traffic impact.

[2] Because of the general similarity of the P-401 project to the proposed project (i.e., construction activities at NBPL), assumptions regarding background traffic growth and truck traffic distribution contained in this EA were developed based upon the P-401 Traffic Impact Study.

[3] For example, instead of increasing, the ADT volume on Rosecrans Street from Nimitz Boulevard to North Harbor Drive *decreased* by 8.7 percent from 2008 to 2010 (SANDAG 2012).

Table 3.10-3. Level of Service for ROI Roadway Segments, Baseline and Baseline Plus Project Conditions (Construction)

Roadway Segment	*Street Classification* [a]	*LOS E Capacity* [b]	*Baseline*			*Baseline Plus Project*			*Effect*	
			ADT [c]	*V/C* [d]	*LOS* [e]	*ADT* [c]	*V/C* [d]	*LOS* [e]	*Δ in V/C* [g]	*Substantial?* [h]
Alternative 1										
Rosecrans Street										
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	35,338	0.88	**E**	35,190	0.88	**E**	(0.004)	NO
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	36,506	0.91	**E**	36,394	0.91	**E**	(0.003)	NO
From Canon St. to Talbot St. [f]	2 Lane Major Arterial	27,000	16,130	0.60	C	16,018	0.59	C	(0.004)	NO
From Talbot St. to Kellogg St. [f]	2 Lane Major Arterial	27,000	11,143	0.41	A	11,031	0.41	A	(0.004)	NO
Nimitz Boulevard										
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	13,011	0.33	A	13,107	0.33	A	0.002	NO
Canon Street										
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	13,931	0.93	**E**	13,931	0.93	**E**	-	NO
Laning Road										
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,663	0.44	B	6,867	0.46	B	0.014	NO
Catalina Boulevard										
From Canon St. to Mills St.	4 Lane Collector	30,000	16,345	0.54	C	16,345	0.54	C	-	NO
Cabrillo Memorial Drive										
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,469	0.56	C	8,469	0.56	C	-	NO
Alternative 1, with Optional Minimization Measure [i]										
Rosecrans Street										
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	35,338	0.88	**E**	35,190	0.88	**E**	(0.004)	NO
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	36,506	0.91	**E**	36,394	0.91	**E**	(0.003)	NO
From Canon St. to Talbot St. [f]	2 Lane Major Arterial	27,000	16,130	0.60	C	15,922	0.59	C	(0.008)	NO
From Talbot St. to Kellogg St. [f]	2 Lane Major Arterial	27,000	11,143	0.41	A	10,935	0.40	A	(0.008)	NO
Nimitz Boulevard										
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	13,011	0.33	A	13,107	0.33	A	0.002	NO
Canon Street										
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	13,931	0.93	**E**	14,027	0.94	**E**	0.006	NO
Laning Road										
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,663	0.44	B	6,867	0.46	B	0.014	NO
Catalina Boulevard										
From Canon St. to Mills St.	4 Lane Collector	30,000	16,345	0.54	C	16,441	0.55	C	0.003	NO
Cabrillo Memorial Drive										
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,469	0.56	C	8,565	0.57	C	0.006	NO

Notes:

Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate substantial project effect.

(a) Street classifications and LOS E Capacities for 2-lane Major Arterials were taken from the Rosecrans Corridor Mobility Study (City of San Diego 2010)

(b) LOS E Capacity obtained from City of San Diego Traffic Impact Study Manual (City of San Diego 1998)

(c) Baseline volumes factored by two percent per year to reflect future growth

(d) ADT divided by LOS E Capacity

(e) City of San Diego Traffic Impact Study Manual, Table 2 (City of San Diego 1998)

(f) LOS E Capacity obtained from Rosecrans Corridor Mobility Study (City of San Diego 2010)

(g) Baseline Plus Project V/C minus Baseline V/C

(h) City of San Diego Traffic Impact Study Manual, Table 5 (City of San Diego 1998)

(i) Staging and queuing of truck traffic at Navy's truck inspection site on Cabrillo Memorial Drive. Trip assignment is based on conservative assumption that all trucks would use this facility.

Table 3.10-4. Assignment of Project Traffic, Construction

Roadway Segment	*Construction Workers* [a]		*Construction Trucks* [d]		*MMP Personnel Relocation* [e]		*Net Traffic Assignment* [g]
	Distribution [b]	*Assignment* [c]	*Distribution* [b]	*Assignment* [c]	*Distribution* [b]	*Assignment* [f]	
Rosecrans Street							
From Nimitz Bl. To N. Harbor Dr.	82%	164	100%	96	-100%	-408	-148
From N. Harbor Dr. to Canon St.	100%	200	100%	96	-100%	-408	-112
From Canon St. to Talbot St. (f)	100%	200	100%	96	-100%	-408	-112
From Talbot St. to Kellogg St. (f)	100%	200	100%	96	-100%	-408	-112
Nimitz Boulevard							
From N. Harbor Dr. to Rosecrans St.	0%	0	100%	96	0%	0	96
Canon Street							
From Rosecrans St. to Locust St.	0%	0	0%	0	0%	0	0
Laning Road							
From N. Harbor Dr. to Decatur Rd.	0%	0	0%	0	50%	204	204
Catalina Boulevard							
From Canon St. to Mills St.	0%	0	0%	0	0%	0	0
Cabrillo Memorial Drive							
From Mills St. to McClelland Rd.	0%	0	0%	0	0%	0	0

Notes:

Bl. = Boulevard; N. = North; Dr. = Drive; St. = Street

(a) 100 workers, with one trip in and one trip out = 200 daily construction worker trips

(b) Percent of traffic on roadway segment, from P-401 Traffic Impact Study (Shaw Environmental & Infrastructure 2007)

(c) Number of trips for each category times distribution percentage

(d) 48 trucks, with one trip in and one trip out = 96 daily truck trips. A portion of construction truck traffic would be staged on Cabrillo Monument Dr. before entering NBPL via McClelland Gate. To provide a conservative analysis, 100 percent of construction truck traffic is assumed to enter the installation via this route.

(e) Temporary relocation from NBPL to NMAWC. 204 relocated MMP personnel, with one trip in and one trip out = 408 daily MMP personnel relocation trips. 50 percent of diversion trips assumed to divert to Laning Rd. from Rosecrans St. en route to NMAWC.

(f) Relocation would remove MMP personnel trips from Rosecrans Street, and add some traffic to Laning Road

(g) Combined traffic assignment for construction workers, construction trucks, NBPL diversion, and MMP personnel relocation.

In summary, implementation of Alternative 1 would not result in any change to baseline LOS on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, implementation of Alternative 1 would not have a significant impact to transportation and circulation.

3.10.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would occur as for Alternative 1, except that with Alternative 2, dredging would occur years after the pier replacement effort is complete. Transportation and circulation impacts would be the same as described under Alternative 1. Therefore, implementation of Alternative 2 would not have a significant impact to transportation and circulation.

3.10.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant to transportation and circulation impacts; therefore, no mitigation measures are proposed.

3.10.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the high spot in the turning basin would not occur. Roadway and vessel traffic conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to transportation and circulation.

3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.11.1 Definition of Resource

Socioeconomics is a social science discipline that focuses on the attributes of human social and economic interactions within an area. Socioeconomic analyses typically address issues such as population demographics, business activity, employment and income, and environmental justice. Impacts to these fundamental socioeconomic components can also influence other systemic issues such as the availability and affordability of housing, the provision of public services (e.g., emergency services, education, health services, etc.), and the general quality of life in a community.

The primary focus of the socioeconomic analysis in this EA is on the net economic effect on employment, income, and business activity (measured by economic output) in San Diego County, related to the construction of the fuel pier and the relocation of the bait barges. The Proposed Action would involve no change in housing supply and only potentially small changes in population, demand for housing, and public services; therefore, these issues are not addressed.

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities. In addition, EO 12898

aims to ensure that the environmental effects of federal actions do not fall disproportionately on low-income and minority populations. To support an evaluation of environmental justice issues, this section includes GIS maps identifying the presence of minority and low-income populations in the vicinity of the Proposed Action that could potentially be disproportionately affected.

3.11.2 Affected Environment

The ROI for socioeconomic impacts is defined as San Diego County. Socioeconomic data are provided in this section to establish baseline conditions. Data consist primarily of publicly-available information about San Diego County and, to provide perspective, the State of California and the United States.

3.11.2.1 Existing Conditions

Population Trends

Table 3.11-1 shows population in San Diego County, the State of California, and the United States from 1990 to 2010. In 2010 San Diego County had a population of 3,095,313, making it the second most populous county in California (behind Los Angeles County). Similar to the national and statewide trend, population growth in San Diego County has slowed since 1990, as population growth from 1990 to 2000 exceeded population growth from 2000 to 2010. Over the 20-year period from 1990 to 2010, San Diego County grew at a slower rate than California and the nation overall; however, in the more recent period, 2000 to 2010, population growth in San Diego County did exceed population growth in the nation overall.

Table 3.11-1. Population, 1990-2010

Location	*1990*	*2000*	*2010*	*Percent (%) Change 1990 - 2000*	*Percent (%) Change 2000 - 2010*	*Percent (%) Change 1990 - 2010*
San Diego County	2,498,016	2,813,833	3,095,313	12.6%	10.0%	23.9%
California	29,760,021	33,871,648	37,253,956	13.8%	10.0%	25.2%
USA	248,709,873	281,421,906	308,745,538	13.2%	9.7%	24.1%

Sources: United States Census Bureau (Census) 1990, 2000, 2010a.

Table 3.11-2 displays population projections, for 2020 and 2030, for San Diego County, the State of California, and the United States. From 2010 to 2020, population in San Diego County is expected to increase by 11.8 percent, exceeding population growth experienced from 2000 to 2010 (see Table 3.11-1). Population growth from 2020 to 2030 is expected to be greater in San Diego County and California than the nation overall (11.3 percent and 11 percent for San Diego and California respectively, compared to 7.3 percent for the nation). For the 20-year period from 2010 to 2030 population in San Diego County is expected to increase by 24.5 percent, slightly less than growth expected in California (25.6 percent) but greater than expected growth in the nation overall (16.1 percent). Projections suggest that by 2030 there will be 3.85 million residents of San Diego County (24.5 percent more than measured in the 2010 Census).

Table 3.11-2. Population, 2010 and Population Projections, 2020-2030

Location	*2010*	*2020*	*2030*	*Percent (%) Change 2010 - 2020*	*Percent (%) Change 2020 - 2030*	*Percent (%) Change 2010 - 2030*
San Diego County	3,095,313	3,461,629	3,853,209	11.8%	11.3%	24.5%
California	37,253,956	42,140,000	46,780,000	13.1%	11.0%	25.6%
USA	308,745,538	334,123,000	358,407,000	8.2%	7.3%	16.1%

Sources: Caltrans 2011; Census 2009, 2010a.

Demographics

As shown in Table 3.11-3, in 2010, the population of San Diego County was 68.3 percent White, 14.8 percent Hispanic or Latino, 13.2 percent Asian, 6.3 percent Black or African American, 1.7 percent American Indian or Native Alaskan, and 1 percent Native Hawaiian or Other Pacific Islander. Compared to the population of the state of California, the population of San Diego County was more White, less Hispanic or Latino, and had a similar proportion of Black or African Americans, American Indian or Native Alaskans, and Native Hawaiian or Other Pacific Islanders. In comparison to the population of the nation overall, San Diego County was less White, more Hispanic or Latino, less Black or African American, more Native Hawaiian or Other Pacific Islander, and had a similar proportion of American Indian or Alaska Natives.

Table 3.11-3. Race, Alone or in Combination[1], 2010

Location	*White (percent)*	*Hispanic or Latino (percent)*	*Asian (percent)*	*Black or African American (percent)*	*American Indian or Alaska Native (percent)*	*Native Hawaiian or Other Pacific Islander (percent)*
San Diego County	68.3%	14.8%	13.2%	6.3%	1.7%	1.0%
California	61.6%	18.4%	14.9%	7.2%	1.9%	0.8%
USA	74.8%	6.7%	5.6%	13.6%	1.7%	0.4%

Note: [1] Respondents were able to identify themselves as one or more races so percentage totals may exceed 100 percent.
Source: Census 2010a.

Table 3.11-4 presents data on educational attainment for San Diego County, the state of California, and the nation overall, as of 2010. Of the population aged 25 or older, 15 percent of San Diego residents had not completed high school, 20 percent had completed high school but not attended college, 31 percent had attended some college or received an Associate degree, and 34 percent had earned a Bachelor's degree or advanced degree. In general, San Diego County had a higher level of educational attainment in comparison to California and the nation overall. As of 2010, a higher percentage of the population of San Diego County had completed some college or received an Associate degree than the populations of California and the nation overall; also, a greater proportion of San Diego County residents had earned a Bachelors or advanced degree. San Diego County had a lower proportion of its population that had either

not completed high school or had completed high school but not attended college than California and the nation overall.

Table 3.11-4. Educational Attainment[1], 2010

Education Attainment	*San Diego County (percent)*	*California (percent)*	*U.S. (percent)*
Did not complete high school	15%	19%	15%
High school or equivalent, no college	20%	21%	29%
Some college or Associate degree	31%	29%	28%
Bachelor's degree or advanced degree	34%	30%	28%

Note: [1] Educational attainment for individuals aged 25 or older.
Source: Census 2010b.

Table 3.11-5 provides household characteristics data for San Diego County, the state of California, and the nation overall. As of 2010, San Diego County had a household population of 2,918,121 (94 percent of total population) and 1,061,789 total households. The average household size was 2.75 persons per household, fewer than California but greater than the nation overall. San Diego County had a higher median household income and a higher income per household member than California and the nation overall. The number of San Diego County households with incomes below the poverty line totaled 113,963, or 10.7 percent of county households, a rate lower than California and the nation overall.

Table 3.11-5. Household Characteristics

Location	*Population in HH's[1]*	*Total Households*	*Avg. HH Size*	*Percent of Family HH's*	*Median HH Income*	*Income Per HH Member*	*HH's Below Poverty Level*	*Percent HH's Below Poverty Level*
San Diego County	2,918,121	1,061,789	2.75	66.3%	$63,069	$22,934	113,963	10.7%
California	35,810,593	12,392,852	2.89	68.6%	$60,883	$21,067	1,493,426	12.1%
USA	295,968,252	114,235,996	2.59	66.8%	$51,914	$20,044	14,865,322	13.0%

Note: [1] By definition, population in households consists of the resident population excluding people living in group quarters (i.e., 9 or more people living together who are unrelated to the householder).
HH = households
Source: Census 2010b.

Employment and Income

Table 3.11-6 provides labor force statistics for San Diego County, the state of California, and the nation overall. In 2010, the labor force of San Diego County was 1,558,186. Of the total labor force, 1,393,866 individuals were employed and 164,320 were unemployed implying an unemployment rate of 10.5 percent. The unemployment rate in San Diego County in 2010 was lower than California's (12.4 percent) but higher than the nation overall (9.6 percent). From 1990 to 2010, the labor force, the number of employed, and the number of unemployed in San Diego expanded at a greater rate than California and the nation overall; the number of individuals

who were employed in San Diego County increased by 20 percent while the number of unemployed nearly tripled (increasing by 191 percent).

Table 3.11-6. Labor Force, Employment, and Unemployment, 1990, 2000, and 2010

Location	*Years*	*Labor Force*	*Employed*	*Unemployed*	*Unemployment Rate[1] (percent)*
San Diego County	1990	1,215,650	1,159,268	56,382	4.6%
	2000	1,376,008	1,322,244	53,764	3.9%
	2010	1,558,186	1,393,866	164,320	10.5%
	Percent Change 1990 to 2010	28%	20%	191%	5.9
California	1990	15,168,531	14,294,115	874,416	5.8%
	2000	16,857,578	16,024,341	833,237	4.9%
	2010	18,316,411	16,051,513	2,264,898	12.4%
	Percent Change 1990 to 2010	21%	12%	159%	6.6
USA	1990	125,840,000	118,793,000	7,047,000	5.6%
	2000	142,583,000	136,891,000	5,692,000	4.0%
	2010	153,889,000	139,064,000	14,825,000	9.6%
	Percent Change 1990 to 2010	22%	17%	110%	4.0

Note: [1] Changes in the unemployment rate, from 1990 to 2010, are expressed in terms of percentage points.
Source: U.S. Bureau of Labor Statistics (BLS) 2012a.

Table 3.11-7 shows data on employment by industry in San Diego County for the years 2000 and 2010. In terms of employment, the largest industry in San Diego County in 2010 was the Educational, Health, and Social Services industry, which employed 175,905 people (21.4 percent of industry employment). Other large industries in 2010, in terms of employment, included the Retail Trade industry (12.7 percent of employment) and the Manufacturing industry (10.4 percent of industry employment). The fastest growing industries in San Diego County from 2000 to 2010, in terms of employment, include the Construction industry (43 percent increase in employment from 2000 to 2010), the Arts, Entertainment, Recreation, Accommodation, and Food Services industry (37 percent increase), and the Transportation, Warehousing, and Utilities industry (35 percent increase). From 2000 to 2010, overall industry employment in San Diego County increased by 25 percent.

Table 3.11-7. Employment by Industry in San Diego County 2000 and 2010

Industry	*2000 Employment*	*Share of Total 2000 Employment (percent)*	*2010 Employment*	*Share of Total 2010 Employment (percent)*	*Growth Rate 2000 to 2010 (percent)*
Agriculture, forestry, fishing, hunting, and mining	5,934	0.9%	6,256	0.8%	5%
Construction	49,517	7.5%	70,951	8.6%	43%
Manufacturing	84,166	12.7%	85,943	10.4%	2%
Wholesale trade	27,174	4.1%	33,179	4.0%	22%
Retail trade	84,460	12.8%	104,614	12.7%	24%
Transportation, warehousing, and utilities	46,776	7.1%	63,024	7.6%	35%
Information	14,961	2.3%	14,762	1.8%	-1%
Finance, insurance, real estate, rental, and leasing	36,860	5.6%	46,496	5.6%	26%
Professional, scientific, management, administrative, and waste management services	50,726	7.7%	68,024	8.3%	34%
Educational, health, and social services	140,063	21.2%	175,905	21.4%	26%
Arts, entertainment, recreation, accommodation, and food services	49,494	7.5%	67,563	8.2%	37%
Other services (except public administration)	34,428	5.2%	40,190	4.9%	17%
Public administration	36,713	5.6%	47,003	5.7%	28%
Total Industry Employment	**661,272**		**823,910**		**25%**

Sources: Census 2000, 2010b.

Table 3.11-8 provides data on average annual salary for San Diego County, the state of California, and the nation overall for 2001 and 2010. Average annual pay in San Diego County in 2010, was $50,746. Average annual pay in San Diego County was lower than the California average ($53,285) but greater than the national average ($46,751). From 2001 to 2010, average annual pay in San Diego County increased at a faster pace than California and the nation overall, increasing 32 percent compared to 29 percent increases for California and the nation overall.

Table 3.11-8. Average Annual Pay[1], 2001-2010

Location	*2001*	*2010*	*Percent (%) Change*
San Diego County	$38,418	$50,746	32%
California	$41,327	$53,285	29%
USA	$36,219	$46,751	29%

Note: [1] Average annual pay for all employees covered by unemployment insurance.
Source: BLS 2012b.

Industries Related to Recreational Fishing

Table 3.11-9 provides information on number of establishments and revenue for industries in San Diego County that receive revenue in association with recreational fishing expenditures.

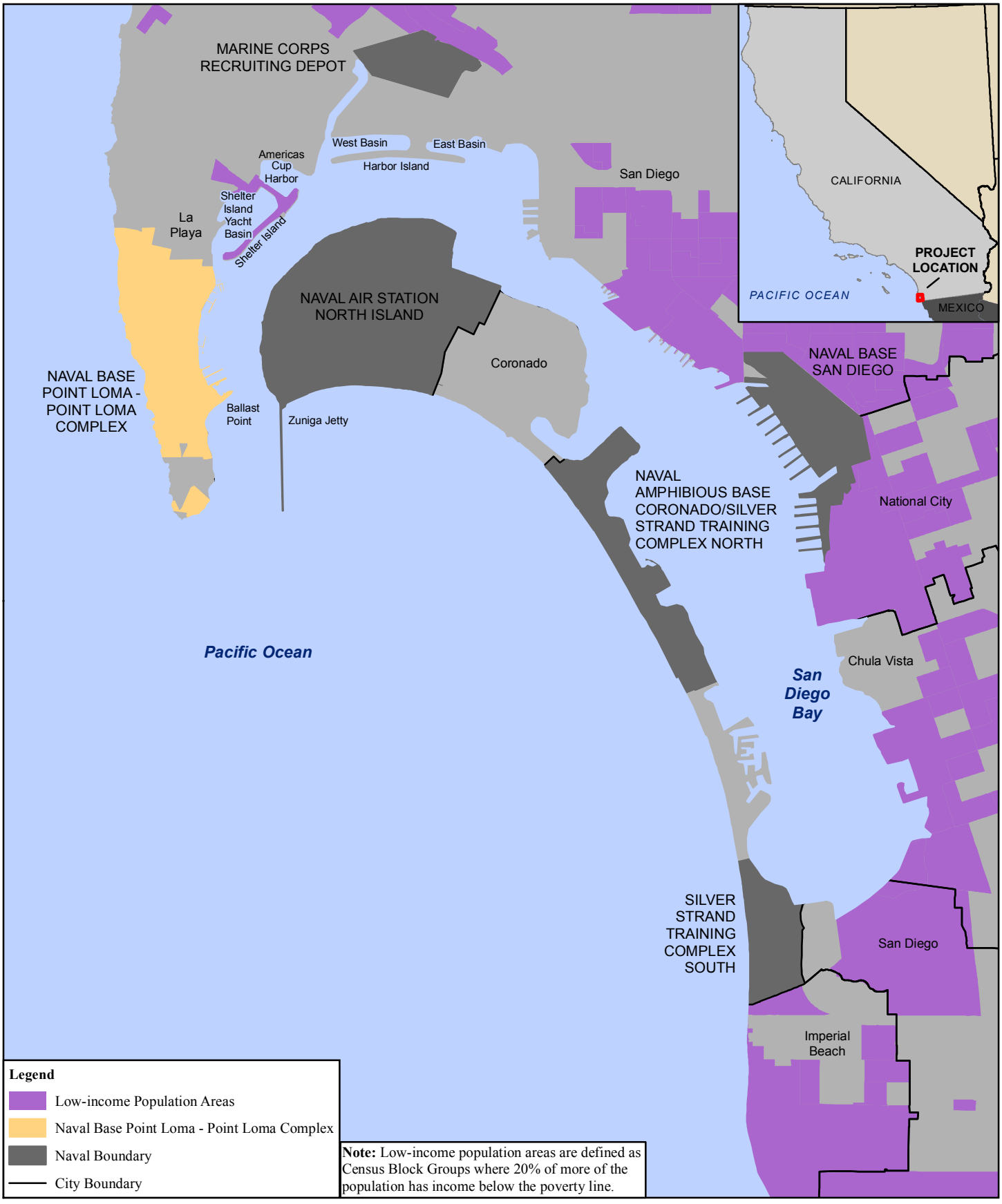
Table 3.11-9. San Diego County[1] Industries Related to Recreational Fishing, 2007

Industry	*Establishments*	*Revenue ($1,000)*
Scenic and sightseeing transportation, water[1,2]	50	$70,305
All other miscellaneous amusement and recreation services	36	$15,481
Marinas	32	$51,925
Boat dealers	139	$187,772
Boat repair	40	$38,283
Recreational goods rental	25	$16,146
Sporting goods stores	463	$449,417
Gasoline stations	666	$3,039,365
Accommodation and food services	9,258	$9,551,513
Food and beverage stores	2,254	$6,188,523
Totals	**12,963**	**$19,608,730**

Notes: [1] Data for Scenic and Sightseeing Transportation was not available for San Diego County. Data provided are for the San Diego-Carlsbad-San Marco Metro Area.
[2] Industry includes charter fishing establishments.
Sources: Census 2007a, 2007b.

Environmental Justice

Figure 3.11-1 shows environmental justice low-income population areas around San Diego Bay. The nearest low income population is located at Shelter Island. Figure 3.11-2 shows environmental justice minority population areas around San Diego Bay. There are no environmental justice low-income areas within 4 mi of the project location.



Source: Census 2010b

Figure 3.11-1
Environmental Justice Low-Income Population Areas



Source: Census 2010a

Figure 3.11-2
Environmental Justice Minority Population Areas

3.11.3 Environmental Consequences

3.11.3.1 Approach to Analysis

As part of the Proposed Action, the U.S. Navy would engage in a construction project to replace an existing fuel pier. As a result of expected noise from the construction, the bait barges located in San Diego Bay, near the existing fuel pier, would be required to relocate to another location in San Diego Bay. The construction project may bring new economic activity in the local construction sector; however, the relocation of the bait barges may lead to a reduction in economic activity in local industries that are supported by recreational fishing. The socioeconomic analysis measures the economic impact of this scenario, on the economy of San Diego County, by modeling the combined effect of a potential increase in expenditures in the construction sector and a potential reduction in expenditures in industries that are supported by recreational fishing. The Impact Analysis for Planning (IMPLAN) economic software model with 2010 data for San Diego County was used to estimate direct, indirect, and induced impacts.

Site activity associated with the proposed project would be expected to last for 4 years, 2013 to 2017 (construction work is estimated to be completed in late 2016; however, contractors' demobilization from the job site could run through the first weeks of 2017). Since the bait barges' relocation is contingent upon construction, the relocation would be expected to take place over the same timeframe. While multiple years are considered in the analysis, results of economic modeling are presented in constant 2011 dollars.

The following sections of the Approach to Analysis outline how inputs to the economic model (changes in expenditures related to construction and the bait barges' relocation) were estimated. In the case of the construction portion of the analysis, expected construction expenditures had been previously estimated by NAVFAC Southwest; this estimate was reviewed and then prepared for socioeconomic analysis by removing portions of expenditures that would not be expected to be spent within the economy of San Diego County and portions related to construction cost inflation. The detailed construction estimates were compared to the construction schedule so that analysis could be completed for each year of the project's life.

Inputs for the bait barges' portion of the analysis were developed by incorporating information from multiple sources including project information provided by the U.S. Navy, bait barge specific information provided by the Everingham Brothers Bait Company, publicly available recreational fishing survey data gathered by the CDFW, and recreational fishing expenditures data gathered by NOAA. Changes in expenditures related to the relocation of the bait barges are estimated for 1 year but since angler effort (annual number of trips) is considered to be stable over time and since the analysis is conducted in constant dollars, the single estimate of expenditures is utilized for each year or the project's life.

Fuel Pier Construction

The construction of the fuel pier would be expected to occur over a 3.5-year period; it would consist of six major tasks, which are listed in Table 3.11-10. For each major task of construction, Table 3.11-10 provides detail on anticipated direct construction expenditures that would be

expected to take place in the San Diego County, by year, from 2013 to 2016. The single largest task of construction would be the new double deck pier, which would be expected to directly contribute over $23 million to the San Diego County economy over the 3.5-year time period. The years 2014 and 2016 would be expected to be the most active years for construction; over $13.5 million in direct expenditures within the San Diego County economy would be expected to result from the construction project in each of those years.

Table 3.11-10. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, 2013-2016

Type of Expenditure	*2013*	*2014*	*2015*	*2016*	*Total*
New Double Deck Pier	$0	$7,704,526	$7,704,526	$7,704,526	**$23,113,579**
Marine Loading Arm manifolds	$0	$0	$0	$1,685,216	**$1,685,216**
Navigation Dredging and Reclamation	$1,550,400	$1,550,400	$0	$0	**$3,100,800**
Waterfront Utilities	$0	$2,078,664	$2,771,552	$1,385,776	**$6,235,991**
Waterfront Demolition	$0	$2,624,575	$0	$2,624,575	**$5,249,149**
Building Site work	$48,290	$193,159	$193,159	$193,159	**$627,767**
Totals	**$1,598,690,**	**$14,151,324**	**$10,669,237**	**$13,593,252**	**$40,012,502**

Source: NAVFAC Southwest 2011.

Data in Table 3.11-11 detail construction expenditures for material, labor, equipment, and unit costs. The Revised 35 Percent Submittal (NAVFAC 2011), which was used as the source for estimating direct construction expenditures in San Diego County, also include estimates related to escalation costs (cost inflation) and construction contractor markups; however, escalation costs and contractor markups are not included in the socioeconomic analysis. While contractor markups might serve to maintain some employment at local construction firms (administrative and marketing jobs for instance), those jobs would not be entirely attributable to the Proposed Action and so they are excluded from the economic impact analysis altogether.

Table 3.11-11. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, by Type of Expenditure

Type of Expenditure	*Materials*	*Labor*	*Equipment*	*Unit Cost*	*Total*
New Double Deck Pier	$14,826,242	$5,379,027	$2,308,310	$600,000	**$23,113,579**
Marine Loading Arm manifolds	$1,452,776	$172,990	$0	$59,450	**$1,685,216**
Navigation Dredging and Reclamation	$0	$0	$0	$3,100,800	**$3,100,800**
Waterfront Utilities	$4,187,652	$1,567,120	$0	$481,219	**$6,235,991**
Waterfront Demolition	$6,525	$4,223,354	$1,019,270	$0	**$5,249,149**
Building Site work	$292,602	$249,558	$11,507	$74,100	**$627,767**
Totals	**$20,765,797**	**$11,592,049**	**$3,339,087**	**$4,315,569**	**$40,012,502**

Source: NAVFAC Southwest 2011.

The direct construction expenditures identified in Tables 3.11-10 and 3.11-11 would contribute to the number of jobs, the amount of income earned by San Diego County residents, and the overall level economic activity in the county. To determine how much of an impact that would

occur, the expenditures were input into the IMPLAN model, which uses direct expenditures to estimate changes in employment, labor income, and economic output.

Bait Barge Relocation

The Everingham Brothers Bait Company bait barges provide a service demanded by the recreational fishing industry. Many party/charter fishing and private/rental fishing trips, heading out from the bay to ocean fishing areas, stop by the bait barges to purchase live bait. At its current location, the Everingham Brothers Bait Company operation is well positioned for this role – from almost every harbor or launch ramp in San Diego Bay, the bait barges are "on the way" to the ocean. During certain periods of construction; however, the bait barges would be required to relocate further into San Diego Bay, which would place them "out of the way" for most ocean fishing trips. These fishing trips would, as a result of the Proposed Action, then need to travel extra distance and spend valuable time to patronize the bait barges.

As measured in economic impacts, the relocation of the bait barges would add cost to those fishing trips that are reliant upon the bait barges. Additional cost associated with recreational fishing trips could discourage recreational fishing and potentially reduce the number of people who partake in ocean fishing trips in San Diego County. Since there are associated expenditures every time an individual takes a fishing trip (NOAA 2001), a reduction in the number of fishing trips, caused by the relocation of the bait barges, would lead to a reduction in expenditures and constitute a negative economic impact to the San Diego County economy. Any negative impacts would be expected to occur only during the years 2014 through 2016 as relocation would likely not be required in 2013 or 2017. The equation below illustrates how the direct expenditures impact of the bait barges' relocation was determined:

Number of Fishing Trips That Would Not Occur Due to the Bait Barges' Relocation (Reduction in Fishing Trips)

X

Average Expenditures per Fishing Trip

=

Total Reduction in Expenditures Due to the Bait Barges' Relocation

Reduction in Fishing Trips

For purposes of analysis, impacts related to the bait barges' relocation would occur only during periods of time when the bait barges would be relocated. Table 3.11-12 presents the anticipated location of the bait barges during each year of the 4-year construction period. There are two potential relocation sites (Options 4A and 6A) identified in Chapter 2; however, the two potential sites are near enough to each other that economic impacts would be expected to be the same for either option, thus separate economic impact analyses are not conducted for each potential relocation site.

Table 3.11-12. Anticipated Bait Barges' Location, by Month

Month	*Bait Barges' Location*
January	Relocation Site
February	Relocation Site
March	Relocation Site
April	Current Location
May	Current Location
June	Current Location
July	Current Location
August	Current Location
1-15 September	Current Location
16-30 September	Relocation Site
October	Relocation Site
November	Relocation Site
December	Relocation Site

Information on usage of the bait barges was provided by Everingham Brothers Bait Company. In 2011, the bait barges sold bait to 3,303 boats carrying 112,350 individuals; the seemingly large number of individuals per boat is a function of party/charter fishing boats, which obtain bait exclusively from the bait barges and can carry as many as 150 individuals (Everingham Brothers Bait Company 2012). The Everingham Brothers Bait Company estimated that 75 percent of their business came from party/charter boats and 25 percent came from private/rental boats. Table 3.11-13 presents information either provided by the Everingham Brothers Bait Company or estimated using data and estimation factors provided by the Everingham Brothers Bait Company.

Table 3.11-13. Bait Barge Utilization, 2011

Number of Boats Served	3,303
Total Bait Barge Customers	112,350
Total Party/Charter Customers	84,262
Total Private/Rental Customers	28,087

Source: Everingham Brothers Bait Company 2012.

Table 3.11-14 provides an estimated breakdown of the number of private/rental and party/charter fishing trips by month. The breakdown was estimated based on sample data from the California Recreational Fishing Survey (CRFS). Since the bait barges would be relocated only during certain times of the year, use of the bait barges, on a monthly basis, was estimated in order to delineate what percentage of trips would be affected by the relocation, over the course of each year. The sample data that was used for estimates in Table 3.11-14 are from 2010 and relate to all ocean fishing trips embarking from San Diego Bay, not just fishing trips that use the bait barges. However, the analysis assumes that percentages in Table 3.11-14 are representative of bait barges' utilization.

Table 3.11-14. Monthly Breakdown of Individual Fishing Trips

Month	*Party/Charter Monthly Percent (%)*	*Private/Rental Monthly Percent (%)*
January	7.1%	6.2%
February	7.5%	2.6%
March	8.2%	9.8%
April	6.7%	9.7%
May	11.4%	6.4%
June	8.5%	14.4%
July	10.3%	11.6%
August	11.1%	9.2%
September	8.2%	16.8%
October	6.4%	4.8%
November	7.8%	5.3%
December	6.9%	3.2%

Source: CDFW 2010.

Table 3.11-15 presents the percentage of party/charter and private/rental fishing trips that are estimated to occur while the bait barges would be relocated (between the middle of September and the end of March). During the portion of the year that the bait barges would be expected to be relocated, 47.9 percent of total annual party/charter fishing trips, and 40.4 percent of private/rental fishing trips are estimated to occur.

Table 3.11-15. Percentage of Individual Fishing Trips Occurring While Bait Barges are Relocated

Party/Charter	*Private/Rental*
47.9 percent	40.38 percent

Note: Sum of percentages in Table 3.11-14 for the months of January, February, March, October, November, December, and half of September.
Source: CDFW 2010.

The Everingham Brothers Bait Company indicated that they expected a reduction in private/rental business of 10 percent to 15 percent during times that the bait barges would be relocated. While the Everingham Brothers bait barge operation may lose 10 percent to 15 percent of its business in the San Diego Bay, not all of this business would be lost to the San Diego County economy. Some fishing trips that choose not to use the bait barges, because of their relocation, would proceed with their trips using bait from another source; some anglers may switch to artificial lures or they may catch their own live bait. In cases such as these, where fishing trips do not utilize the bait barges but proceed with their fishing trips, there is assumed to be no change in recreational fishing related expenditures.

However, since it is unknown how many private/rental fishing trips would be completely discouraged, the analysis applies the range provided by the Everingham Brothers Bait Company. The analysis assumes that the bait barges' private/rental business would be reduced by 15 percent. More importantly in terms of relevance to estimates of reduced recreational

fishing expenditures – the assumption is made that 10 percent of the bait barges' private/rental business would be discouraged from fishing altogether.

Table 3.11-16 outlines the estimate for the number of private/rental fishing trips that would be discouraged altogether, and thus potentially lead to reductions in recreational fishing related expenditures. Annually, it is estimated that there would be a reduction of 1,134 private/rental fishing trips in San Diego County as a result of the relocation of the bait barges.

Table 3.11-16. Estimated Reduction in Private/Rental Fishing Trips, Annual

Private/Rental Bait Barge Customers	28,087
Percentage (%) of Private/Rental Customers while relocated	40.38%
Number Private/Rental Customers while relocated	11,340
Percentage (%) of Private/Rental trips that would be discouraged	10%
Estimated Reduction in Annual Private/Rental Fishing Trips	**1,134**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010.

An estimate for the potential reduction in party/charter business for the bait barges was not provided by the Everingham Brothers Bait Company; the Company expects that all party/charter fishing trips would continue to use the bait barges during times when they are relocated. The Everingham Brothers Bait Company, however, did indicate that some party/charter business may be lost, indirectly, due to potentially lower quality bait (resulting from warmer water temperatures at the relocation site) and an increased potential for charter companies to raise fuel surcharges (as a result of needing to travel further to get live bait). The potential for lower quality bait and an increased fuel surcharge may lead to higher prices for party/charter customers and this may be discouraging to some potential party/charter anglers. Considering these factors, it was assumed that there was potential for a reduction in individuals who would engage in party/charter fishing trips of up to 2 percent, during times when the bait barges are relocated.

Table 3.11-17 shows the estimated reduction in the number of party/charter fishing trips; it is estimated that, annually, 807 people who would have taken a party/charter fishing trip, would not take that trip because of costs indirectly associated with the relocation of the bait barge operation.

Table 3.11-17. Estimated Reduction in Party/Charter Fishing Trips, Annual

Annual Party/Charter Bait Barge Customers	84,262
Percentage (%) Occurring While Bait Barge would be Relocated	47.9%
Percentage (%) reduction in Fishing Trips	2%
Estimated Reduction in Annual Party/Charter Fishing Trips	**807**

Source: Everingham Brothers Bait Company 2012, CDFW 2010.

Average Expenditures per Fishing Trip

In 2000, NOAA conducted a recreational fishing expenditures survey for the Pacific Coast Region and, in 2001, published a report summarizing the results (NOAA 2001). Angler trip expenditures were reported for southern California by fishing mode (private/rental and party charter), and by resident type (state resident or non-resident). Table 3.11-18 provides relevant expenditures data from that report.

Table 3.11-18. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2000

Fishing Mode	*Residents*	*Non-residents*
Party/Charter	$83	$495
Private/Rental	$37	$220

Source: NOAA 2001.

Since the expenditures survey was conducted in 2000, and impacts are presented in 2011 dollars, the expenditures presented in Table 3.11-18 were inflated to 2011 dollars. Table 3.11-19 presents results from the NOAA expenditures survey, inflated to 2011 dollars using the Consumer Price Index, which increased by 30.6 percent from 2000 to 2011.

Table 3.11-19. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2011

Fishing Mode	*Residents*	*Non-residents*
Party/Charter	$107.8	$646.2
Private/Rental	$48.8	$287.7

Sources: NOAA 2001, BLS 2012c.

CRFS sample data, from 2010, attributable to ocean fishing trips embarking from San Diego Bay, was used to establish residency, by fishing mode (party/charter or private/rental). Residency data from the NOAA survey could not be applied in this analysis as it classified residents as residents of the state of California, as opposed to residents of San Diego County, which is the region subject to analysis. CRFS data identified the county of residence of surveyed anglers, so the percentages of anglers who are residents of San Diego County were estimated using that source. Table 3.11-20 presents estimated residency status, by fishing mode (party/charter or private/rental), based on CRFS sample data from 2010.

Table 3.11-20. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2010

Fishing Mode	*Percentage (%) San Diego County Residents*	*Percentage (%) Non-residents*
Party/Charter	71.6%	28.4%
Private/Rental	91.6%	8.4%

Source: CDFW 2010.

Annual Reduction in Fishing Trip Expenditures Due to the Bait Barge Relocation

Table 3.11-21 details the estimated annual reduction in private/rental fishing trip expenditures that would be expected in San Diego County, as a result of the relocation of the bait barge

operation, in 2011 dollars. An estimated total reduction in expenditures of $77,876 per year would be expected as a result of the relocation of the bait barges, $50,408 per year would be as a result of reduced expenditures by residents of San Diego County, and $27,468 per year would be expected as a result of reduced expenditures by non-residents.

Table 3.11-21. Estimated Annual Reduction in Private/Rental Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars

Annual Reduction in Private/Rental Fishing Trips	1,134
Percentage (%) of Reduction from San Diego County Residents	91.6%
Reduction in Trips - San Diego County Residents	1,038
Per Trip Expenditures - San Diego County Residents	$48.5
Reduced Expenditures - San Diego County Residents	$50,408
Percentage (%) of Reduction from Non-residents	8.4%
Reduction in Trips - Non-residents	95
Per Trip Expenditures - Non-residents	$287.7
Reduced Expenditures - Non-residents	$27,468
Total Reduction in Expenditures - Private/Rental	**$77,876**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

Table 3.11-22 details the estimated annual reduction in party/charter fishing trip expenditures that would be expected in San Diego County, as a result of the relocation of the bait barge operation, in 2011 dollars. An estimated total of $210,357 per year in reduced expenditures would be expected as a result of the relocation of the bait barges, $62,389 per year would be as a result of reduced expenditures by residents of San Diego County, and $147,968 per year would be expected as a result of reduced expenditures by non-residents.

Table 3.11-22. Estimated Annual Reduction in Party/Charter Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars

Annual Reduction in Private/Rental Fishing Trips	807
Percentage (%) of Reduction from San Diego County Residents	71.6%
Reduction in Trips - San Diego County Residents	579
Per Trip Expenditures - San Diego County Residents	$107.8
Reduced Expenditures - San Diego County Residents	$62,389
Percentage (%) of Reduction from Non-residents	28.4%
Reduction in Trips - Non-residents	229
Per Trip Expenditures - Non-residents	$646.2
Reduced Expenditures - Non-residents	$147,968
Total Reduction in Expenditures - Private/Rental	**$210,357**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

Table 3.11-23 displays total estimated annual expenditure reductions that would be expected as the result of the relocation of the bait barges. Annually, a total reduction in recreational fishing related expenditures of $288,233 would be expected as a result of the relocation of the bait barges; most of the reduction in expenditures would extend, indirectly, from a reduction in

party/charter fishing trips ($210,357), and the remainder ($77,876) would extend from a reduction in private/rental trip expenditures.

Table 3.11-23. Total Estimated Annual Reduction in Recreational Fishing Trip Expenditures Due to Potential Bait Barge Relocation

Reduced Expenditures - Private/Rental Fishing Trips	$77,876
Reduced Expenditures - Party/Charter Fishing Trips	$210,357
Annual Reduction in Expenditures	**$288,233**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

The total reduction in fishing trip expenditures that would be expected as a result of the potential relocation of the bait barges were weighted by industry according to how they were delineated in the NOAA expenditures survey. Industry weights and total value of reduced expenditures are presented in Table 3.11-24.

Table 3.11-24. Annual Reduction in Recreational Fishing Expenditures by Industry, 2011 Dollars

Expenditure Category	*Percentage (%) Weight*	*Reduced Expenditures*
Private Transportation	14%	($41,563)
Grocery Stores	10%	($28,977)
Restaurants	5%	($13,636)
Lodging	4%	($11,008)
Public Transportation	12%	($33,432)
Boat Fuel	9%	($25,374)
Party/Charter Fees	37%	($105,693)
Access/Boat Launching	2%	($5,134)
Equipment Rental	3%	($9,132)
Bait and Ice	5%	($14,286)
Total	**100%**	**($288,233)**

Source: NOAA 2001 (percentage weights).

There is the potential that some marine mammals may be drawn to areas around the bait barges near the relocation site. If this does occur, there would be the potential that these marine mammals would occupy privately owned areas that, previous to the relocation, had lesser or no marine mammal presence. If marine mammals do increase occupancy of privately owned areas, private owners may find this to be a nuisance. In the event of a nuisance, caused by marine mammals, it would be within the property owner's rights and it would be their responsibility to deter the marine mammals from causing them nuisance.

There are a variety of methods that can be legally applied to deter nuisance caused by the presence of marine mammals. Broadly, these methods include: Barriers and Exclusion Devices (such as fencing), Visual Repellents (such as flashing lights), Noise Makers (such as horns and whistles), and Physical Contact (such as water from hoses and projectiles from sling shots). Engaging in any of these methods of deterrence imposes a cost on the owner – whether it would

be the cost of purchasing and installing fencing or simply the cost of time it takes to blow a whistle in the direction of a marine mammal.

Since marine mammals could be attracted to the bait barges, any new or additional presence of the marine mammals on private property would likely be associated with the relocation of the bait barges and thus the cost of deterrence would be attributable to the proposed action. If there are additional costs associated with deterrence of marine mammal nuisance on private property, brought about by the Proposed Action, it would be considered an indirect impact of the proposed action. However, since these costs would be very small relative to the regional economy, the impact would be less than significant.

Summary of Input Data

Table 3.11-25 identifies annual expenditures, as they were input into the IMPLAN model, related to construction expenditures, and reduced recreational fishing related expenditures. Construction expenditures were input into the IMPLAN sector "construction of other new nonresidential structures" and reduced recreational fishing related expenditures were input into various industries corresponding to the industries and weights identified in Table 3.11-24.

Table 3.11-25. Direct Expenditures Input into IMPLAN Model, Constant 2011 Dollars

Annual Expenditures	*2013*	*2014*	*2015*	*2016*
Construction Expenditures	$1,598,690	$14,151,324	$10,669,237	$13,593,252
Reduction in Recreational Fishing Related Expenditures	$0	($288,233)	($288,233)	($288,233)

3.11.3.2 Alternative 1 Pier Replacement and Associated Dredging

Table 3.11-26 shows the estimated number of direct, indirect, induced, and total jobs, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on jobs would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, increases of over 145 jobs would be generated within the San Diego County economy. During the least active year of construction, 2013, an estimated 18 jobs would be generated by Alternative 1. Figure 3.11-3 illustrates potential changes in jobs over the course of the proposed construction period. Overall, more jobs would be created than are lost, resulting in beneficial impacts. Therefore, there would be no significant impact to jobs from implementation of Alternative 1.

Table 3.11-26. Jobs[1] Impact, 2013-2016

Jobs Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	9	77	57	74
Indirect Effect	3	28	21	27
Induced Effect	5	46	34	44
Total Effect	**18**	**151**	**113**	**145**

Note: [1] Jobs are not Full Time Equivalent; some part-time jobs may be included in results.

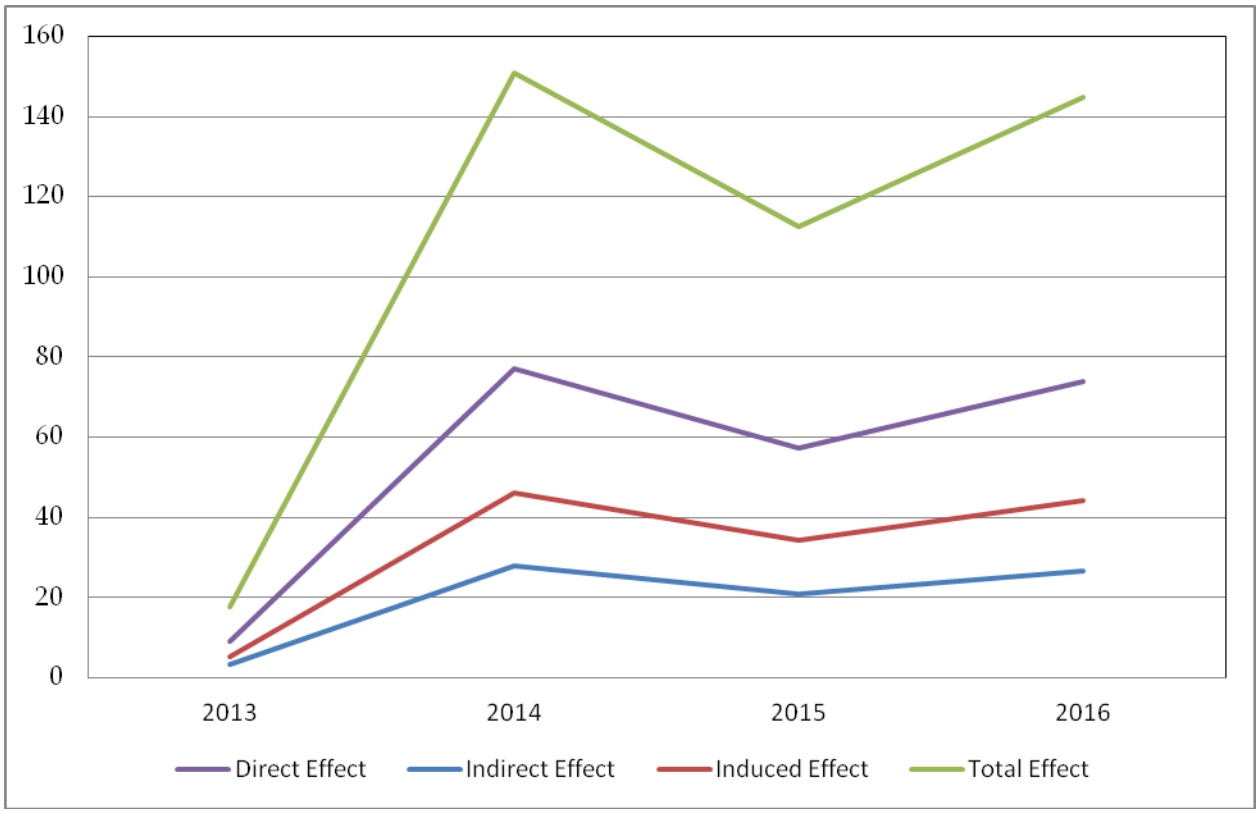


Figure 3.11-3. Jobs Impact, 2013-2016

Table 3.11-27 shows the estimated direct, indirect, induced, and total labor income, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on labor income would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, an increase of about $9 million in labor income would be generated within the San Diego County economy. During the least active year of construction (2013) $1 million in labor income would be generated by Alternative 1. Figure 3.11-4 illustrates potential changes in labor income over the course of the proposed construction period. Overall, labor income impacts from Alternative 1 would be beneficial, but less than significant.

Table 3.11-27. Labor Income Impact, 2013-2016, Constant 2011 Dollars

Labor Income Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	$646,550	$5,575,866	$4,167,624	$5,350,167
Indirect Effect	$198,427	$1,726,669	$1,294,478	$1,657,402
Induced Effect	$237,930	$2,056,256	$1,538,022	$1,973,199
Total Effect	**$1,082,907**	**$9,358,790**	**$7,000,124**	**$8,980,768**

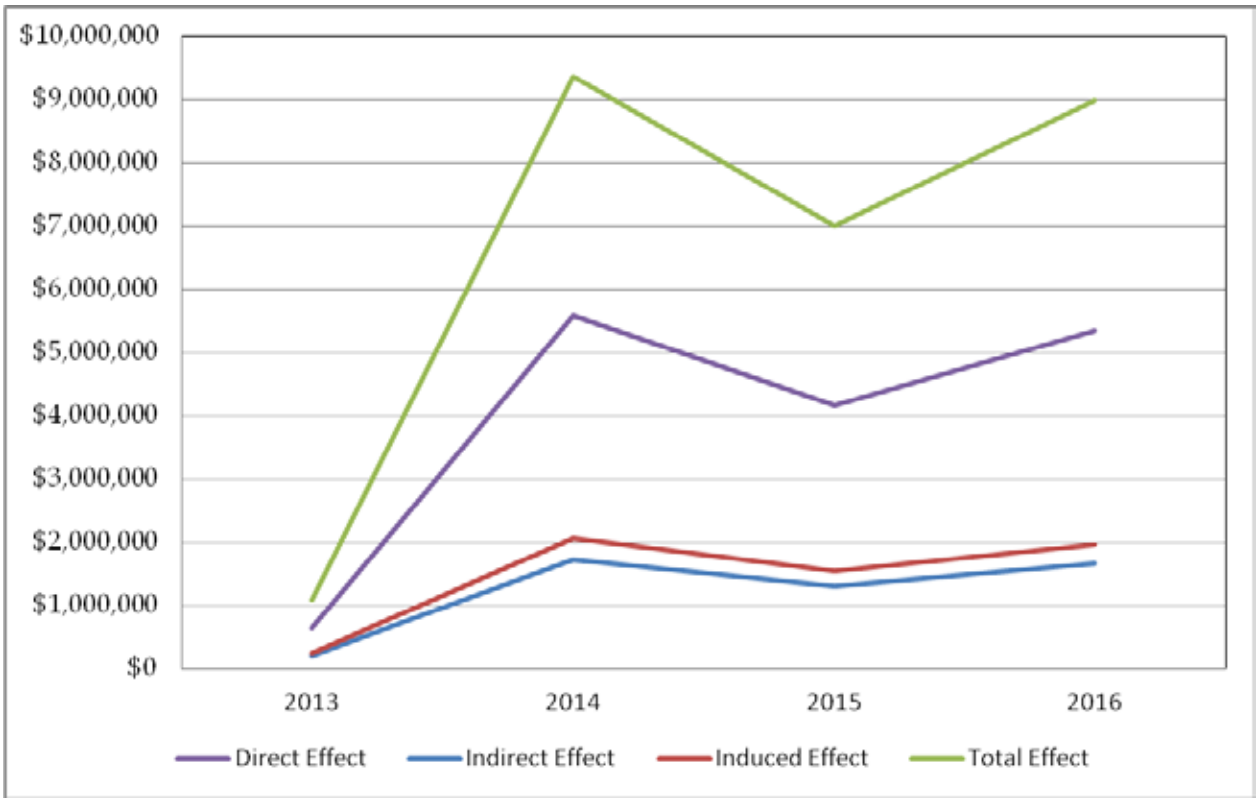


Figure 3.11-4. Labor Income Impact, 2013-2016

Table 3.11-28 shows the estimated direct, indirect, induced, and total economic output, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on economic output would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, an increase of over $23 million in economic output would be generated within the San Diego County economy. During the least active years of construction, 2013 and 2017 (years when construction activity would be building-up and winding-down, respectively), about $3 million in economic output would be generated with implementation of Alternative 1. Figure 3.11-5 illustrates potential changes in economic output over the course of the proposed construction period. Overall, labor income impacts would be beneficial. Therefore, there would be no significant impact to labor income from implementation of Alternative 1.

Table 3.11-28. Economic Output Impact, 2013-2016, Constant 2011 Dollars

Economic Output Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	$1,598,690	$13,863,089	$10,381,002	$13,305,017
Indirect Effect	$485,936	$4,227,772	$3,169,360	$4,058,141
Induced Effect	$705,278	$6,095,189	$4,559,032	$5,848,990
Total Effect	$2,798,904	$24,186,050	$18,109,394	$23,212,148

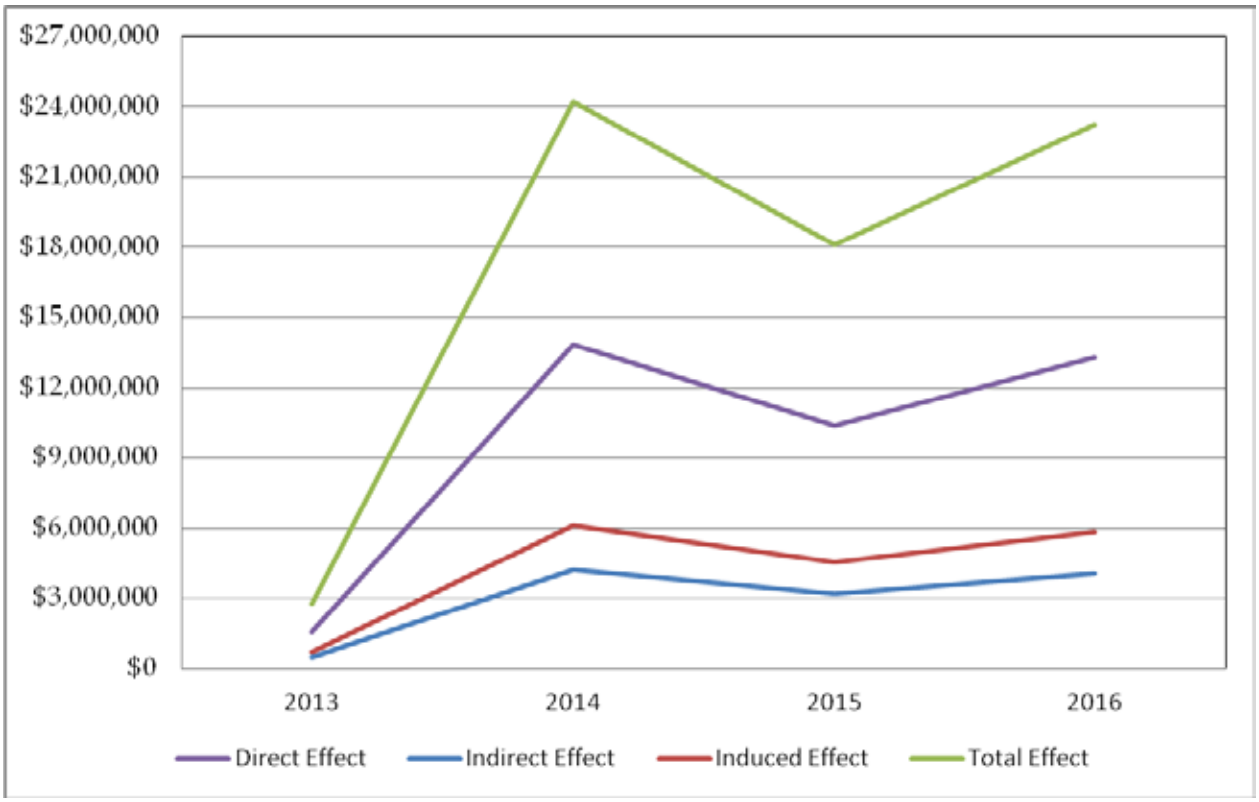


Figure 3.11-5. Economic Output Impact, 2013-2016

Overall, Alternative 1 would have a beneficial impact on the San Diego County economy; however, some industries might be negatively impacted. Charter fishing companies, for instance, may lose some business during the course of the project. This impact would be less than significant relative to the industries' overall size. In addition, the impact would be indirect, potentially stemming from increased gasoline costs and a choice by the industry as to whether it would increase gasoline surcharges (which would be a choice not entirely dependent on the location of the bait barge operation, but on broader economic conditions).

Individuals interviewed in the process of conducting this socioeconomic analysis discussed their concerns that the charter fishing industry was performing below its potential; that it was suffering from image problems and had failed to counteract those image problems by effectively promoting itself. Interviewees noted that the charter fishing is a healthy, environmentally sustainable, recreation activity. If the charter fishing industry improves its marketing profile and overall popular presence, any potential impacts from the bait barges' relocation could be more than offset. Therefore, implementation of Alternative 1 would not have a significant impact to socioeconomics.

Environmental Justice

No residential areas would be affected by Alternative 1, so no environmental justice impacts would be expected. There was some potential for the low-income population residing at Shelter Island to be impacted by construction noise, but analysis shows that construction noise would not be audible from that distance. There would be no disproportionately high environmental or

health impacts on low-income or minority populations Therefore, implementation of Alternative 1 would not have a significant impact with respect to environmental justice.

3.11.3.3 Alternative 2 Delayed Dredging Alternative

Socioeconomic and environmental justice impacts would be the same under Alternative 2 as described under Alternative 1. Therefore, implementation of Alternative 2 would not have a significant impact with respect to socioeconomics and environmental justice.

3.11.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant socioeconomics and environmental justice impacts; therefore, no mitigation measures are proposed.

3.11.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the high spot in the turning basin would not occur. Socioeconomic and environmental justice conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact with respect to socioeconomics and environmental justice.

[This Page Intentionally Left Blank]

CHAPTER 4
CUMULATIVE IMPACT ANALYSIS

Federal regulations implementing National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq.*) and California regulations for Implementing NEPA (32 Code of California Regulations [CFR] 775), as described in Chief of Naval Operations Instruction (OPNAVINST) 5090.1C, require that the cumulative impacts of a Proposed Action be assessed. Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA define cumulative impacts as:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1507).

To analyze cumulative impacts, the following must be considered:

1) The area in which the effects of the proposed project will be felt;
2) The impacts that are expected in the area from the proposed project;
3) Other actions past, present, and reasonably foreseeable that have had or are expected to have impacts in the same area;
4) The impacts or expected impacts from these other actions; and
5) The overall impact that can be expected if the individual impacts are allowed to accumulate.

Consequently, the region where cumulative impacts may occur includes Naval Base Point Loma (NBPL) in the San Diego Bay, and the surrounding area (e.g., Naval Base San Diego [NBSD]) as illustrated in Figure 4.1-1. The cumulative projects described in Section 4.1 focus on other military projects and a civilian project adjacent to NBPL planned within San Diego Bay. The analysis presented in Section 4.2 considers additional impacts arising from the impacts of implementing Alternative 1 or Alternative 2 combined with the impacts of the other known past, present, and reasonably foreseeable future actions within this region. Figure 4.1-2 shows the estimated construction period timeframe for present and reasonably foreseeable projects and the Proposed Action and illustrates the temporal overlap of the cumulative projects and the Proposed Action.

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

4.1.1 Past Projects

4.1.1.1 Upgrades to Magnetic Silencing Facility for Advanced Degaussing Systems Military Construction (MILCON) P-135 (NBPL)

MILCON Project P-135 upgraded the Magnetic Silencing Facility at NBPL so that it could support newer class Pacific Fleet surface ships. Upgrades occurred at pre-existing piers and associated underwater grids, vessel mooring system, Anti-terrorism/Force Protection floating barriers, and power supply systems (which required the installation of a new onshore electrical cable distribution system and onshore building demolition, repair, and construction).

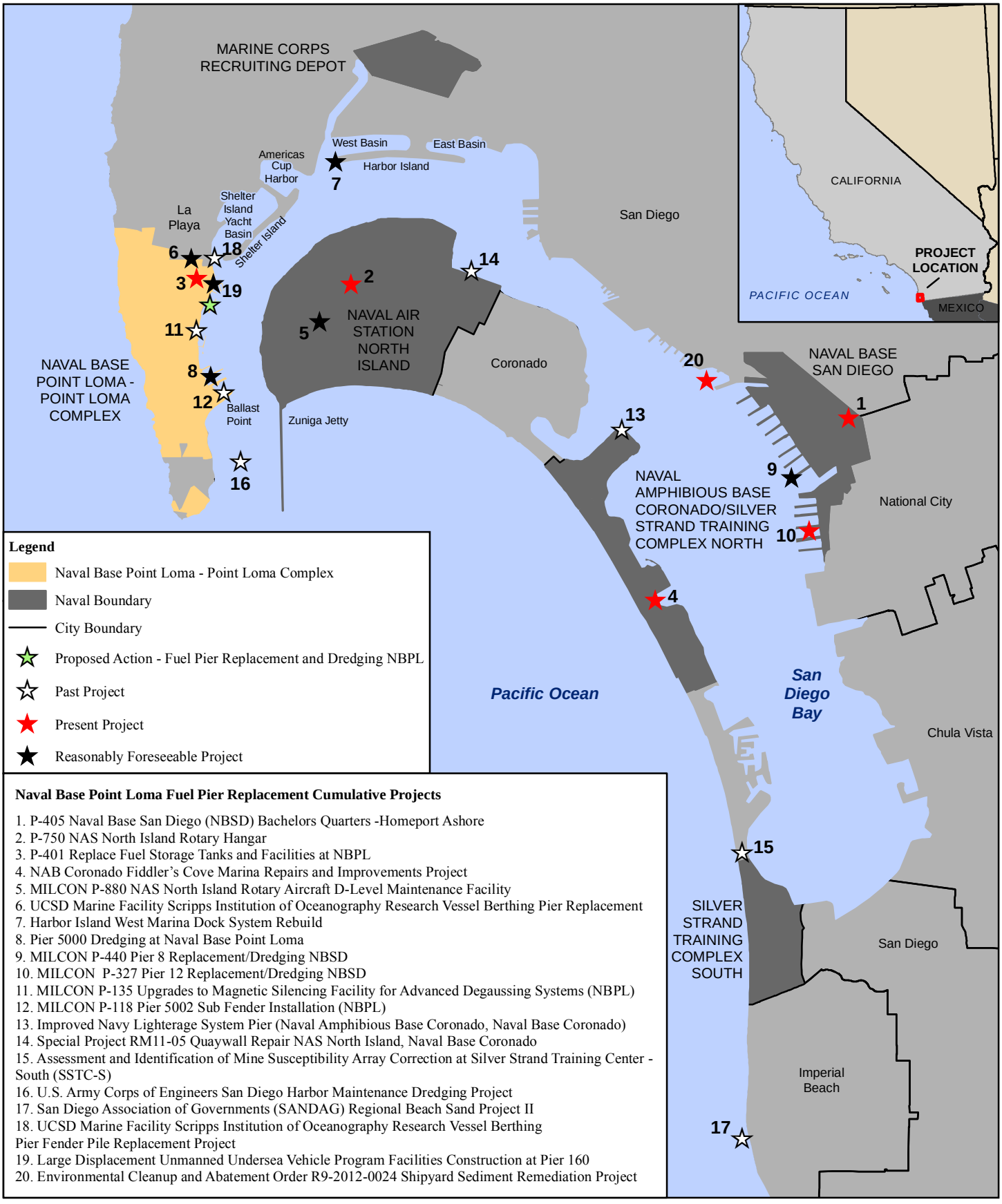
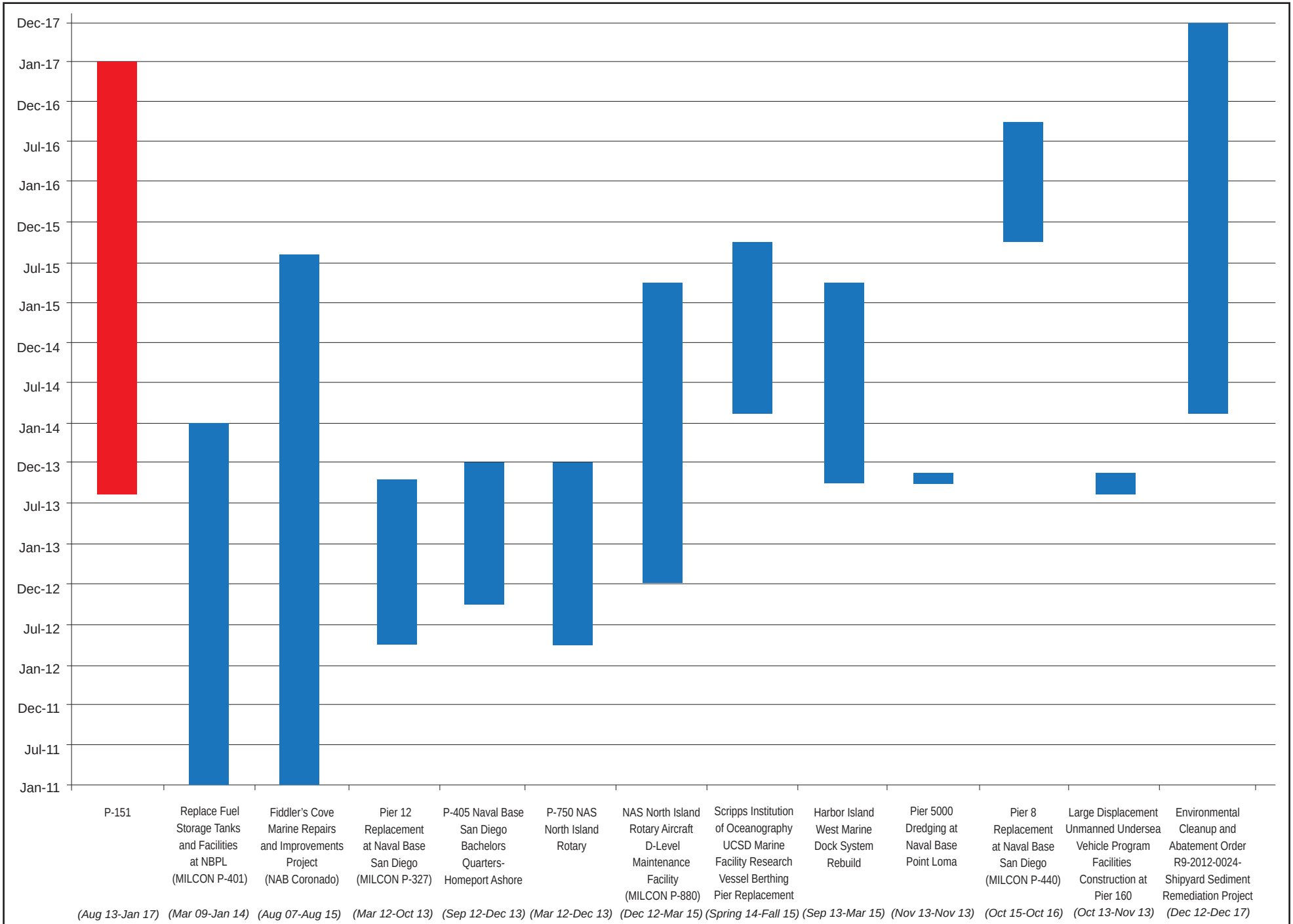


Figure 4.1-1
Locations of Present and Reasonably Foreseeable Cumulative Projects

Source: Navy, NAVFAC Southwest, and Port of San Diego 2010



Note: Construction start and end dates are estimated.

Figure 4.1-2
Comparison (overlap) of Estimated Construction Time Periods for Present and Reasonably Foreseeable Cumulative Projects to the Construction Time Period of the Proposed Action

As part of the project, the Navy marine mammals maintained by Explosive Ordnance Disposal (EOD) Mobile Unit 1 and their floating enclosures would be moved to Pier F122, where they could be located with other Navy marine mammals maintained by Space and Naval Warfare Systems Center (SSC) Pacific. A new access pier was constructed at Pier F122 for the co-located Navy marine mammal facilities. A Finding of No Significant Impact (FONSI) was signed for this project. Project activities were completed in 2010.

4.1.1.2 Pier 5002 Sub Fender Installation MILCON P-118 (NBPL)

MILCON Project P-118 modified Submarine Pier 5002, south of the P-135 project area, at NBPL. It allowed mooring of submarines next to the maintenance building. The principal modification was removal of deteriorating timber piles and replacement with composite piles with an expected life of 50 years. Supplemental foam-filled fenders were interspersed between the submarine fenders to accommodate surface ships. There was no increase in the pier footprint and no dredging was done. New power supply booms routing shore power to moored submarines and extra communications lines were installed. A Categorical Exclusion (CATEX) was signed for the project. The project occurred in 2008.

4.1.1.3 Improved Navy Lighterage System Pier (Naval Amphibious Base [NAB] Coronado, Naval Base Coronado [NBC])

The Improved Navy Lighterage System project involved construction of waterfront command and control facilities for amphibious operations and training at NAB Coronado. The project consisted of an Improved Navy Lighterage System lift/launch pier facility, including new pier construction and upgrades to pre-existing Piers 16, 18, and 19; road upgrades; increased storage yard space in conjunction with adequate maintenance and operational storage facilities; and quay wall repairs. A FONSI was signed for the project. Construction was completed in 2008.

4.1.1.4 Quay Wall Repair (Special Project RM11-05) Naval Air Station (NAS) North Island, NBC

Special Project RM11-05 involved both in-water and land based construction to repair the deteriorated portions of the quay wall along Berths "L" through "P" at NAS North Island. The quay wall became distressed because of scouring at the base, which compromised its structural integrity. Repairs were needed to prevent structural failure of the quay wall and to provide for its continued functionality in support of the Navy's operational and support mission. Project components included: (1) dredging and disposal of 49,000 cubic yards (cy) of bay sediment; (2) placement of rock armoring layers on the base of the sheet piling along the entire length of the quay wall (3,200 feet [ft]); (3) demolition and replacement of a portion (150 linear ft [lf]) of the damaged quay wall cap; (4) replacement of 150 lf of damaged steam line; (5) filling voids behind the quay wall; and (6) installation of new fendering at the location of the quay wall repairs. A FONSI was signed for the project. Construction was completed in 2008.

4.1.1.5 Assessment and Identification of Mine Susceptibility Array Correction at Silver Strand Training Complex - South (SSTC-S)

This project consists of the placement of a stone-filled concrete caisson structure around the existing eight piles of the Assessment and Identification of Mine Susceptibility Array at SSTC-S.

The existing facility is 1 mile (mi) offshore in 50 ft of water. The concrete caisson "stiffened" the structure, limiting its wave force deflection, and improving its performance. The project included the creation of fish habitat through the placement of A-jacks structures. A CATEX was signed for this project in December 2010. Construction began in March 2011 and was completed in November 2011.

4.1.1.6 U.S. Army Corps of Engineers (USACE) San Diego Harbor Maintenance Dredging Project

This project includes the removal of up to 550,000 cy of beach compatible material from the entrance to the federal channel, and discharge of dredged material for beneficial reuse in the nearshore zone at Imperial Beach and Coronado Beach. The project is required to maintain Federally authorized channel configurations, and to restore and ensure safe navigation within the harbor. The Final Supplemental Environmental Assessment (EA) (USACE 2012) prepared for this project concluded that there would be no significant impact to any resource area, and a FONSI was signed on 12 June 2012 (USACE 2012). Maintenance dredging began in November 2012 and was completed in December 2012.

4.1.1.7 San Diego Association of Governments (SANDAG) Regional Beach Sand Project II

The project restored beaches in the San Diego region, because water supply and flood control projects reduce the natural flow of water and sand to the coast (SANDAG 2012). The project replenished 1.4 million cy of clean beach-quality sand at up to 11 receiver sites in the San Diego region, including Imperial Beach (SANDAG 2012). Sand was dredged from up to three offshore borrow sites and placed on shore. An Environmental Impact Report was certified for this project in May 2011. Work took place from August through October 2012 (SANDAG 2012). Equipment set-up for this project included assembling and anchoring 3,000 ft sections of 30-inch (in) diameter dredge pipe in the waters south of Harbor Island for approximately 1 week in August 2012. Work at Imperial Beach included dredging sand from a borrow site offshore, transporting the dredge sediment to a pump-out location located approximately 6,000 ft from shore, and pumping the sand to the onshore placement site via an underwater pipeline. This work began in September 2012 and was completed in December 2012.

4.1.1.8 Scripps Institution of Oceanography (SIO)/ University of California San Diego (UCSD) Pier Fender Pile Replacement Project

This project replaced 12 concrete and wood fender piles at the existing SIO UCSD Nimitz Marine Facility Research Vessel Berthing Pier and associated wharf on NBPL and UCSD lands adjacent to the north of NBPL (Figure 2-5). The 12 fender piles identified for replacement have failed or are missing completely, thus the work was urgently needed, i.e., ahead of the replacement of the entire pier and wharf facility as described below in Section 4.1.3.1. At seven designated locations on the pier (Navy lands) and five locations on the wharf (UCSD lands), broken piles or visible pile stubs were removed or cut at the mudline. The fender piles were replaced in-kind with 14-in square concrete fender piles installed using jetting and an impact hammer. The proposed fender pile replacement did expand the existing pier footprint or change its use. Construction for this project began on 5 November 2012 and ended on 13

November 2012. The total construction time was less than 2 weeks. UCSD-SIO coordinated all pile-driving activities with SSC Pacific such that the Navy's marine mammals could be observed during construction. If any unexpected adverse effects were observed, SSC Pacific was prepared to take preventive actions such as moving disturbed individuals.

4.1.2 Present Projects

4.1.2.1 P-405 NBSD Bachelors Quarters - Homeport Ashore

This project would construct a 162,040 square ft (sf) bachelor enlisted quarters to house 772 E1-E4 personnel. Additionally, a seven level parking structure of 284,167 sf will be constructed. The project location is dry side NBSD (next to the bowling alley). A CATEX has been completed for the project. Construction began in September 2012 and is estimated to be completed in December 2013.

4.1.2.2 P-750 NAS North Island Rotary Hangar

The project will provide a helicopter maintenance facility and an aircraft parking apron to bed-down three helicopter squadrons being assigned to NAS North Island. The project will consist of a multi-story, steel framed, three-bay maintenance hangar at the current site of Building 802. The hangar will have a concrete foundation, concrete first and second floors, interior partitions, steel roof deck, masonry walls, and a pile foundation. The project includes electrical and mechanical utilities, power check pad, engine wash pad, compressed air, secure communications connections, aircraft parking apron, and roadway. Built-in equipment would include an elevator, back-up generators, and a closed-loop wash rack system. Special construction features would include sound attenuation for administration and shop space and an aqueous film-forming foam fire protection system. The project will also upgrade electrical power for the new MH-60S/R helicopters by installing a 1,500 kilovolt-ampere transformer and secondary switchboard and construct a 12 kilovolt duct bank with conductors, manholes, and switch. A 5-ton crane will be provided from other appropriations. The project will conform to anti-terrorism/force protection standards and follow sustainable development criteria for design, development, and construction of the project. P-750's NEPA is included in the MH60 Homebasing EA, which was completed in 2011. Construction began in March 2012 and is estimated to be completed in December 2013.

4.1.2.3 Replace Fuel Storage Tanks and Facilities at NBPL (MILCON P-401)

This project consists of modernizing the existing Defense Fuel Support Point (DFSP) Point Loma fuel storage and distribution facility. All existing bulk fuel storage tanks, both above and underground (and their associated pipelines and pumping facilities) are being demolished or closed in place. Eight new multi-product, aboveground bulk fuel storage tanks are being constructed to provide a total fuel storage capacity of 42 million gallons. New pumping facilities and transfer pipelines are also being constructed, as well as new access roads within DFSP Point Loma and new sedimentation basins for stormwater management. The construction plan is divided into two phases: construction activities followed by the in-place closure of underground storage tanks (USTs). While construction is ongoing, fueling operations will continue from USTs that will be decommissioned when the new tanks are functional. No

significant impacts to any resource area were identified in the EA prepared for this project. Work on the P-401 project began in March 2009 and is expected to be completed in January 2014.

4.1.2.4 Fiddler's Cove Marina Repairs and Improvements Project (NAB Coronado, NBC)

The purpose of the Fiddler's Cove Marina Repairs and Improvements Project is to provide a functional multi-use, year-round recreational facility in San Diego County to support the military's regional recreational needs. The project is restoring serviceability of deteriorated marina facilities at the existing Fiddler's Cove Marina, NAB Coronado, NBC. This project includes restoration of deteriorated marina facilities including slips and docks at Fiddler's Cove, replacement of the floating wave attenuation system, erosion control and shoreline stabilization, and enhancement/expansion of existing recreational functions of the marina. A FONSI was signed for the project. The Fiddler's Cove Marina Repairs and Improvements Project began construction in August 2007 and is expected to be completed in August 2015.

4.1.2.5 NAS North Island Rotary Aircraft D-Level Maintenance Facility MILCON P-880

This project would construct a depot-level rotary aircraft maintenance facility at NAS North Island. A new high-bay facility is required to support the current depot-level H-60 helicopter maintenance, repair, and overhaul program workload and to accommodate scheduled workload increases due to the arrival of three additional H-60 squadrons. The facility would house maintenance shops, administration offices, parts storage spaces, break room/lunch room, restrooms, showers, and locker rooms. The building space would consist of aircraft rework shop space (high bay), plant services for aircraft overhaul (administration and production control), and maintenance aircraft storage space. The project would also demolish 10 existing facilities. Sustainable design principles would be included in the design and construction of the projects in accordance with Executive Order (EO) 13123 and other laws and EOs. Facilities would meet Leadership in Energy and Environmental Design green building certification ratings and comply with the Energy Policy Act of 2005. Low Impact Development would be included in the design and construction of this project. A CATEX was signed for this project; construction began in December 2012 and is estimated to be completed in March 2015.

4.1.2.6 Pier 12 Replacement and Dredging NBSD MILCON P-327

This project would involve demolition of an inadequate existing pier (Pier 12) at NBSD, dredging in berthing and approach areas for the new single-deck pier, dredged material disposal at an approved ocean disposal site and permitted landfill, construction of a new general purpose berthing pier and associated pier utilities, including upgrades to the electrical utilities at adjacent Pier 13, and construction of fish enhancement structures (artificial habitat for fish) using concrete debris from pier demolition. An EA has been completed for this project and a FONSI was signed. Demolition and dredging for this project began in March 2012. Construction is estimated to be completed October 2013.

4.1.2.7 Environmental Cleanup and Abatement Order R9-2012-0024-Shipyard Sediment Remediation Project

The environmental cleanup and abatement order R9-2012-0024 was issued by the San Diego RWQCB. The shipyard sediment remediation project involves the dredging of the sediment adjacent to shipyards in San Diego Bay, the dewatering and solidification of the dredged material (onshore or on a barge), the potential treatment of decanted water (anticipated disposal to the sanitary sewer), and the transport of the removed material to an appropriate landfill for disposal. A total volume of 52,600 cy of sediments would be dredged, dewatered, and land disposed. The sediment remediation project is centered on an area adjacent to the NASSCO and BAE shipyards located along the eastern shore of San Diego Bay, extending approximately from the Sampson Street Extension on the northwest to Chollas Creek on the southeast, and from the shoreline out the San Diego Bay shipping channel to the west. An Environmental Impact Report was prepared for this project. The project commenced in December 2012 and is expected to take 5 years to complete.

4.1.3 Reasonably Foreseeable Projects

4.1.3.1 SIO UCSD Marine Facility Research Vessel Berthing Pier Replacement

This project would replace the existing SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier and associated wharf on NBPL and UCSD lands adjacent to the north of NBPL (Figure 2-5). The existing pier and wharf that were originally constructed in 1965 replaced and expanded in 1973, would be demolished. A new, modern replacement pier and wharf of the same size and configuration would be constructed with upgrades including: cold-iron berthing for ships in port; improved lighting for nighttime operations; fiber optic lines for telecommunications and data transfer; and modern systems for potable water, management of oily water, waste oil, sanitary sewage, and stormwater. The Scripps Pier project would install 137 24-in diameter concrete piles over the course of a 20-month construction period. In-water work for this proposed project would also be scheduled to coincide with the temporary relocation of the Navy's Marine Mammal Program (MMP) that is planned for the proposed P-151 fuel pier replacement project. Dredging would not be required for the Scripps Pier project but design would allow for future dredging and expansion. The slope under the Scripps Pier wharf and landward would be stabilized with cement deep soil mixing. All concrete and steel debris would be recycled; treated wood waste wood be disposed at an appropriately permitted facility. An EA for the project is in process. Construction for this project is estimated to begin in the spring of 2014, and be completed in the fall/winter of 2015.

4.1.3.2 Harbor Island West Marina Dock System Rebuild

Harbor Island West Marina is a privately owned facility located across San Diego Bay to the east of the Naval Mine and Anti-Submarine Warfare Command (NMAWC) that accommodates recreational vessels ranging from 25 to over 55 ft long. This project would rebuild the existing docks at Harbor Island Marina and is anticipated take approximately 3 to 4 years to complete. The estimated project start date is approximately October 2013, so that in-water construction may take place outside the least tern breeding season. The project would likely occur in phases

that would occur over 18 months. As of the period of this EA, project environmental and permitting work was not initiated. Harbor Island West Marina is in contact with the Unified Port of San Diego (San Diego Port Authority), which will be the California Environmental Quality Act (CEQA) lead agency, to determine what CEQA and permitting requirements apply. An engineering firm is under contract to develop the early design and cost estimate. The numbers and sizes of structural piles that would be required at Harbor Island West Marina are unknown within the timeframe of this EA. However, it is anticipated that jetting would be used to install the new piles, which could potentially be of concern to the Navy MMP. Construction for this project is estimated to begin in September 2013 and end in March 2015.

4.1.3.3 Pier 5000 Dredging at Naval Base Point Loma

This project involves dredging sediment at NBPL Pier 5000 (located at Submarine Base NBPL about 0.4 mile south of the fuel pier) and offsite sediment disposal. The proposed dredge footprint is adjacent to the north side of Pier 5000, starting approximately 800 ft from the shoreline and extending to the end of the pier. Dredging would most likely involve a barge-mounted clamshell or backhoe dredge. The NBPL Pier 5000 Dredging project is for approximately 6,380 cy of sediment. The proposed Pier 5000 Dredging project is small when taken in comparison with other typical area dredging projects. Depending upon the dredging method used the dredging operation may be complete in a few as three days. Therefore, while any dredging at the NBPL Pier 5000 site can be considered relatively intense when considered in combination with P151, its very short duration and very small size makes it relatively insignificant. There is also consideration of rescheduling the project to Fiscal Year (FY) 16. The project includes two options for sediment disposal: nearshore replenishment (beneficial reuse) or ocean disposal. Sediment disposal for this project would adhere to the Marine Protection, Research, and Sanctuaries Act of 1972; the Clean Water Act (CWA) Sections 404 and 401; and Rivers and Harbors Act (RHA) Section 10 Regulatory Programs. A Draft EA for this project was completed in October 2012. Construction for this project is estimated to begin and be completed in November 2013.

4.1.3.4 Pier 8 Replacement MILCON P-440 (NBSD)

MILCON P-440 would demolish the inadequate existing Pier 8 at NBSD and construct a replacement general purpose berthing pier. The new, single deck pier would fulfill berthing needs for modern ships in the U.S. Pacific Fleet. Pier design would include pre-stressed concrete piles supporting a concrete deck and support a future upgrade of shore-to-ship power to meet power intensive ship requirements. A stormwater collection system with an oil/water separator would be included. No dredging would be required because Pier 8 is already a deep draft pier. The EA for this project is ongoing. Construction for this project is estimated to begin in October 2015 and be completed in October 2016.

4.1.3.5 Large Displacement Unmanned Undersea Vehicle (LDUUV) Program Facilities Construction at Pier 160

SSC Pacific proposes to make improvements in the Bayside area to accommodate the LDUUV Program. Primary improvements are to construct up to five boat lifts at Pier 160, construct two

concrete tracks for a launch and recovery area, and install a compressed gas recharging station on Pier 160. In addition, Building 9 would be repaired and modified and the flume bridge located on Front Street would be modified. All work would be conducted within the bayside area of NBPL. Facility improvements are required to enable launch, recovery, and recharging of the LDUUV at the pier, out-of-water mooring for the LDUUV and accompanying small boats, and maintenance of the LDUUV inside a building. The level of NEPA documentation to be prepared for this action is anticipated to be an EA but has not been finalized at this time. The 1-month construction period for this project is estimated to begin in October 2013.

4.2 APPROACH TO CUMULATIVE IMPACTS ANALYSIS

4.2.1 Context and Intensity

Analysis of cumulative impacts is an important aspect of the impacts analysis undertaken by an EA. Per the CEQ regulations: 40 CFR 1508.7 Cumulative impact. "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

The goal of the cumulative impacts section is the same as the goal of analysis for individual direct and indirect impacts. It is to furnish the decision makers with sufficient information to judge whether the proposed action "significantly affects the human environment" within the meaning of NEPA and the authorities that interpret it. Therefore, the term "significantly" referenced herein is as defined by the CEQ regulations (40 CFR 1508.27)

Per the CEQ regulations, "significantly" for an impact is a matter of "context" and "intensity" of that impact. Context varies with the scale and nature of the action. In our case, San Diego Bay represents a major aspect of context. The Bay is the discrete, coherent ecosystem where the project occurs. The bay has its own unique habitats and species, and a shared history of similar types of man-made impacts. It is also somewhat isolated and set apart as an area of recreational and industrial use, surrounded by residential and urban uses. Some particular impacts such as impacts to traffic, or air, have much smaller, or much wider contexts of potential impact. Traffic impacts occur only on the impacted roadways. At the same time, air quality is a matter of air basins and regional concerns.

"Intensity" is a matter of the amount: level, magnitude, volume, or quantity of impact. Generally the question is whether the intensity rises to a significant level with regard to the partial list of environmental considerations listed 40 CFR 1508.27(b) or to other relevant considerations or aspects of the "human environment."

4.2.2 Acute Impacts and Lingering Impacts

The first distinction to make with regard to a particular impact is the question of whether it is transitory or "acute" or it is a lingering effect. Because an acute impact is temporary, it goes away. Therefore for its impacts to be additive, they must go on at the same time in whole or part. This is defined as temporal overlap. In addition, the impacts have to take place in

sufficient geographic proximity that one can potentially add to another. The less intense an impact is, the closer it has to be to the proposed project to be close enough in proximity to contribute to a cumulative impact. Or viewed another way, unless a cumulative impact is close enough and intense enough to reasonably have the potential to significantly align with, magnify, or exacerbate environmental impacts of a Proposed Action (P-151 in this case), it is irrelevant. It is often relevant to use quantitative and/or modeling analysis to analyze acute effects. It is important where and when each cumulative action takes place. The environmental resources that fall under the acute impact category include: airborne noise; underwater noise; land-based traffic; and water quality as related to turbidity.

To summarize, there are three major factors in determining whether a cumulative project warrants a quantitative **or modeling** approach to determine how it adds to a proposed project's impact. These are:

1) Temporal Overlap. If there is no overlap in time, purely acute effects do not add to the proposed project, so they need not be quantified.
2) Geographic Proximity. An acute impact cannot be additive if it is too far away.
3) Intensity. Intensity modifies the relevance of geographic proximity. The more intense the impact, the farther away it can be measured.

Lingering effects must be looked at differently in an environment like San Diego Bay or any urban area. Examples of lingering impacts include habitat destruction, and air emissions of criteria pollutants and precursors. It is not practical in general to measure lingering effects with regard to particular past, present, or reasonably foreseeable future projects, because there have been thousands of projects altering the bay over many years. The air quality is impacted by many diverse factors and millions of mobile and stationary sources all over the San Diego Air Basin (SDAB) and beyond. It becomes futile to try to list and quantify impacts of individual actions. This forces us to look at current impacted baseline conditions and current trends for the future and to derive or develop means of assessing significant impacts for various lingering effects. The resources that fall under the lingering impact category include air quality and biological resources-habitats and communities.

It should be noted that hazardous materials are handled by each individual industrial facility around the bay. Each facility is individually permitted and held responsible for such materials and wastes, such that they do not release such materials and wastes into the environment. These materials and wastes are contained. Therefore, these materials and wastes do not add to each other in the environment, unless they are mishandled. To anticipate varying scenarios where multiple facilities mishandle materials and wastes is just speculation. Contrast this with sources of impacts to other kinds of resources. Air emissions are released into the air, permitted or not, and mingle with other air emissions. Sources of in-water noise affect the environment while the noise is occurring. While regulatory compliance is a factor in determining significance of air quality and underwater noise impacts, the sources of impacts are still out there causing potential harm.

There are comprehensive regulatory systems now in place that did not exist when NEPA was first enacted. These regulatory systems are based on the current environmental baselines, reflecting past and present impacts, together with future trends and environmentally protective goals. Compliance or non-compliance with applicable environmental laws is therefore relevant to the term "significantly (see also 40 CFR 1508.27(b)(10)." Environmental regulation also offers a source of standards and thresholds that reflect environmental baseline conditions and future trends and goals. As a practical matter concerning air quality, this means that the screening criteria for "significance" were derived by adapting regulatory thresholds determined by the United States Environmental Protection Agency (USEPA). These are thresholds that become smaller and more stringent as the level of "nonattainment" of air quality standards in a given air basin becomes more serious. This methodology makes primary or direct impact air quality analysis inseparable from cumulative air quality analysis. They are the same because screening standards reflect the past, present, and foreseeable future impacts and regulatory goals.

In addition to the laws and regulations, there are studies such as the San Diego Bay Integrated Natural Resources Management Plan (INRMP) that also help with analyzing cumulative impacts. These studies document historical conditions leading up to the current baseline that reflects the cumulative impact of past actions. They also document future trends and goals, so that the significance of a project's impacts can be judged in light of those trends and goals. This becomes another example, where the primary or direct impact analysis cannot be separated from the cumulative impact analysis. There is no other meaningful way to determine significance of impact – primary, secondary, or cumulative – than to look at it in the context of the current baseline condition of the bay in light of future trends and goals.

The foregoing should not be taken to say that enumeration and quantification of impacts of individual cumulative projects is never appropriate for analyzing lingering impacts in an urban environment. It is possible that an individual future project could completely alter the baseline such that it should be individually considered. No such projects are presently reasonably foreseeable, in the project area.

It should also be noted that an impact may be both acute and lingering. In-water noise is an example, where the impact of the noise disappears completely after the noise is gone. However, noise can contribute to a lingering impact, by "take" of a protected animal. This is particularly true if mitigation such as gradual ramp up in pile driving is not used.

4.2.3 Quantitative Analysis for Cumulative Impacts

The first step in the process of considering which of these projects require quantitative analysis for acute impacts involved identifying the projects around the bay where there is a reasonable probability of temporal or project time overlap with the Proposed Action (P-151). The estimated start and end date for construction of the various projects is illustrated on Figure 4.1-2. The next factor is proximity – how close geographically are the projects to the location of P-151. Past, present, and reasonably foreseeable projects throughout San Diego Bay are illustrated on Figure 4.1-1. The third factor is intensity or magnitude of the relevant acute impacts. To warrant quantitative treatment, an impact must at least have some discreet, measurable impacts at the

site of P-151, and have at least some potential to significantly align with, magnify, or exacerbate P-151 environmental impacts.

Applying the above factors resulted in the selection of two nearby, concurrent projects for quantitative analysis:

- MILCON P-401 - Replace Fuel Storage Tanks and Facilities at NBPL
- SIO UCSD Marine Facility Research Vessel Berthing Pier Replacement

The estimated period of construction timeframes for P-401 and the Scripps Pier project partially overlap the estimated period of construction timeframe for P-151 (i.e., temporal), they are geographically located in the vicinity of P-151 (i.e., proximity), and some of the same resource areas would be affected (i.e., resource intensity). The remaining projects near the P-151 project area were not selected to be analyzed quantitatively because their timing, location, and expected resource impact intensity does not indicate a potential, in combination with P-151, to jointly cause significant environmental impacts.

The screening process also resulted in the consideration of two more distant projects in the Bay for quantitative analysis:

- MILCON P-327 - Pier 12 Replacement at NBSD
- MILCON P-440 - Pier 8 Replacement at NBSD

Although the estimated period of construction timeframes of P-327 and P-440 do not overlap, the estimated period of construction timeframes for projects P-327 and P-440 partially overlap the estimated period of construction timeframe for P-151. Although these projects are not in proximity, some of their acute impacts, such as water turbidity from dredging are relatively great (or intense) because they are sizable projects. Their intensity as to these impacts makes them worthy of closer look although they are not in close proximity to P-151. Based on this closer look, it was determined that the dredging associated with the P-327 project (and the P-327 project in total) would be completed before the P-151 dredging commences; therefore, there is no overlap or additive effect. Regarding underwater noise, although the P-440 project and P-151 project would overlap in time, the underwater noise from the P-151 project would not intersect or combine with the P-440 underwater noise due to the distance between these projects. The remaining cumulative projects throughout San Diego Bay were not selected to be analyzed quantitatively because their timing, location, and expected resource impact intensity would not significantly align with, magnify, or exacerbate P-151 environmental impacts.

4.3 CUMULATIVE IMPACTS ANALYSIS

This section addresses the additive effects of Alternative 1 and Alternative 2 evaluated in this EA in combination with the relevant actions described above in Section 4.1.

4.3.1 Habitats and Communities

As noted above under approach to analysis, the suite of biological resources falls under the lingering impact category.

With implementation of Alternative 1 or Alterative 2, the effects on habitats and communities would largely consist of temporary underwater noise and sediment disturbance to open water and benthic communities during construction and demolition. The Scripps Pier replacement project, which does not include dredging that would contribute to turbidity, would overlap in time with the Proposed Action and would add incrementally by a small amount to areas of marine water column and benthic habitat affected by the Proposed Action (noise is discussed in Section 4.2.2). However, the combined impacts would still be small in the context of the bay, temporary, and not significant in a cumulative sense.

Net long-term changes associated with the replacement of the existing pier by a slightly smaller pier and the deepening of the turning basin would be minor in the context of bay habitats, and not significant. Any permanent effects on eelgrass beds would be mitigated by use of the Navy's established eelgrass mitigation bank, which has proven to effectively replace eelgrass functions and values that are impacted by Navy projects. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to habitats and communities.

4.3.2 Fish

As noted above under approach to analysis, underwater noise falls under the acute impact category. With implementation of Alternative 1 or Alternative 2, the effects on fisheries, including Essential Fish Habitat (EFH), would largely consist of temporary underwater noise and sediment disturbance during construction and demolition. Mortality to fish is unlikely because potential Zones of Influence (ZOIs) for fish injury are confined to the immediate area around the pile being driven, and fish would most likely move away during the ramp-up procedure. Otherwise, the dispersal of fish away from especially loud underwater sound, or other behavioral reactions may occur, but these effects would be localized and not significant. The Scripps Pier replacement project would overlap in time with the Proposed Action and would add incrementally by a small amount to the cumulative disturbance of marine water column and benthic habitats used by fish.

The potential combined effects of pile driving noise from the Proposed Action and the Scripps Pier replacement project were modeled by Dr. Peter Dahl of the University of Washington using methods essentially similar to those used to model transmission loss for the Proposed Action (Appendix E.4), but with the sound levels from the two projects additive. The modeled scenario, a simultaneous pile strike, is shown in Figure 4.3-1. Because the sound level for the Scripps Pier replacement pile driver is much less than that of the impact pile driver for the steel piles needed for the replacement fuel pier, the Scripps Pier replacement project would not add significantly to the sound caused by the Proposed Action. The area where the two projects could have an additive effect in terms of disturbance is limited to the vicinity of the Scripps pier, where the received sound levels from the two projects could be approximately equal, adding to the disturbance of fish in that area. The combined impacts would still be small in the context of the bay, temporary, and not significant in a cumulative sense.

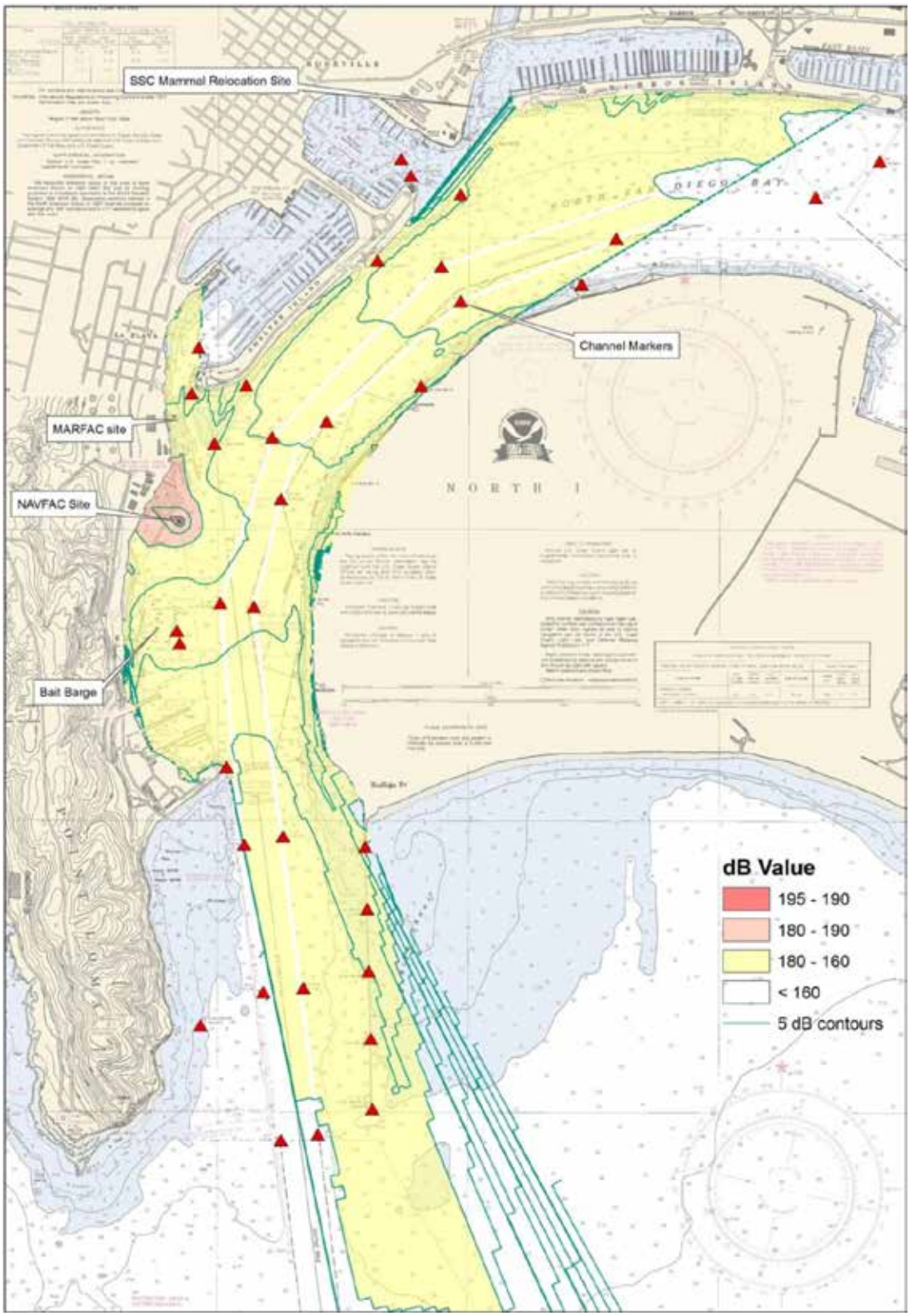


Figure 4.3-1 Combined Underwater Construction Sound Contours for the Proposed Naval Base Point Loma Fuel Pier Replacement (195 dB) and the Scripps Marine Facility Replacement Pier (175 dB)

P-151 would have no temporal overlap with P-327 (Pier 12 Replacement), but would overlap with P-440 (Pier 8 Replacement) at NBSD. As discussed in Sections 3.2.3 and 3.4.3, and shown for example in Figure 3.2-2, the maximum potential for underwater noise disturbance to marine mammals or fish from P-151 would not extend past Harbor Island, which is 5 mi (8 kilometers [km]) from the P-440 project site. P-440 construction involves installing concrete piles, which would have potential ZOIs of small spatial extent, similar to what is depicted in Figures 3.2-3 and 3.2-5, with very minor, temporary effects on fish. P-440 demolition may involve the use of vibratory extraction for non-steel piles, which would have a potential ZOI for marine mammals similar to that of Figure 3.2-7, extending up to 2-3 mi (4-5 km) from the P-440 site, but still several kilometers from the maximum ZOI of P-151. Marine mammals are uncommon in central San Diego Bay (Navy 2011) and are unlikely to move between the P-151 and P-440 project areas. For fish, the potential ZOI from vibratory extraction during P-440 would be limited to a small area around Pier 8 (see Table 3.2-4). This analysis indicates that there would be no overlap in the potential underwater noise effects of P-440 and P-151, and hence no potential for cumulative impacts.

4.3.3 Birds

With implementation of Alternative 1 or Alternative 2, the effects on birds would consist of direct as well as indirect effects of temporary noise and sediment disturbance during construction and demolition, as well as minor permanent changes in structural habitats which birds perch on and which may affect the distribution of forage fish. Birds are likely to avoid the immediate areas of construction and demolition due to loud, airborne noise. Fish would likely disperse away from these areas in response to underwater noise, but these effects are relatively small and localized in the context of the bay; similar structural and aquatic habitats are present throughout the northern and central parts of the bay. It is very unlikely that diving birds would remain underwater and in close proximity to pile driving for a sufficient time to incur injury. Pier replacement would result in a net reduction in covered bay surface and underwater structural habitat, with a corresponding increase in open water, but these changes are also minor in the context of the bay. Effects on eelgrass habitat would be minimized and mitigated as described above. Overall, localized effects on breeding and resting habitats would occur, but no effects on migratory bird populations are anticipated because of the Proposed Action.

The Scripps Pier replacement project would overlap in time with the Proposed Action and would add incrementally by a small amount to areas affected by airborne and underwater sound, and turbidity, but any combined impacts would still be small in the context of the bay and migratory bird populations. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to birds.

4.3.4 Marine Mammals

As shown in Figure 4.2-2, the combined underwater acoustic effect of the Scripps Pier replacement project and the Proposed Action is very small, and the potential for additive disturbance to marine mammals would be limited to the immediate vicinity of the Scripps pier.

Given that marine mammals are likely to avoid the Scripps pier location during that project's pile driving, no significant cumulative impact would be anticipated.

Other Navy, as well as non-Navy projects, in the San Diego Bay region have the potential to affect individual marine mammals, but Marine Mammal Protection Act (MMPA) compliance by all projects assures that effects on stocks of marine mammals remain negligible under the MMPA. Consultation on many projects and the sharing of research and monitoring results between the Navy and National Marine Fisheries Service (NMFS) also contributes to a better understanding of the potential effects of anthropogenic sound and other stressors on individuals as well as populations. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to marine mammals.

4.3.5 Threatened and Endangered Species

Federally listed threatened and endangered species that may occur in the areas affected by the Proposed Action include the California least tern and green sea turtle. Consistent with the Navy-U.S. Fish and Wildlife Service (USFWS) Memorandum of Understanding (MOU) (Appendix E.2), seasonal restrictions on underwater activities that could generate noise and turbidity would be implemented to avoid potential direct and indirect effects on least tern breeding habitat. The Scripps Pier replacement project would implement a similar seasonal restriction on pile driving. Navy monitoring would ensure that in the unlikely event that green sea turtles transit through a potential ZOI for acoustic effects, the activity would be stopped until the animal has departed. Hence for both species, the Navy has reached a conclusion of "may affect, not likely to adversely affect." For both of these species, ongoing programmatic consultations between the Navy and USFWS and NMFS ensure that Navy activities avoid and minimize potential effects. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to threatened and endangered species.

4.3.6 Water Resources

With implementation of Alternative 1 or 2, acute impacts on water quality would be localized and short-term. During demolition, construction, and dredging, protective measures would be implemented to minimize impacts to marine water quality: retention of the existing sheet pile, the use of catch devices and sheeting, and the NBPL Emergency Response Action Plan. The selected contractor would implement Best Management Practices (BMPs) to meet USACE and San Diego RWQCB permit conditions. As described in Section 3.6.3.2, *Marine Water Quality-Sediment Quality*, the Navy conducted sediment sampling in the proposed fuel pier and NMAWC construction footprints (Naval Facilities Engineering Command [NAVFAC] Southwest 2013a). Analytical results of the sediment samples indicate that sediment disturbance during construction and demolition at the proposed sites would not have significant water quality impacts (NAVFAC Southwest 2013a). As described in Section 3.6.3.2, *Marine Water Quality-Turning Basin,* sediment samples were analyzed from the proposed dredge footprint and found unlikely to cause significant water quality impacts during dredging (NAVFAC Southwest 2011). Temporary relocation of the Navy MMP to NMAWC as proposed is not

expected to result in additional exceedances of waters designated for contact recreation (REC-1) standards for indicator bacteria, fecal and total coliform, and is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. However, if results of monitoring to be conducted during the temporary relocation period should indicate greater than anticipated impacts to water quality, adaptive management measures would be implemented to reduce impacts to below a level of significance. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the selected temporary relocation site or discharge waste water. Demolition, construction, and dredging would not have significant impacts to bathymetry and circulation. Improved stormwater management capabilities for the proposed new fuel pier and the reuse of dredge sediments for nearshore replenishment are anticipated to be beneficial impacts.

As noted above in Section 4.2.2, *Acute Impacts and Lingering Impacts*, water quality as related to turbidity falls under the acute impact category. As stated above in Section 4.1.3 and shown on Figure 4.1-2, timing for the following projects is expected to coincide with the NBPL P-151 Fuel Pier Replacement Project: SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier project (2013-2014); MILCON P-327 - Pier 12 Replacement at NBSD (2013); and MILCON P-440 - Pier 8 Replacement at NBSD (2015 through 2016). There would be no temporal overlap of MILCONs P-327 and P-440 because construction for P-327 is estimated to end in 2013, 2 years before the estimated 2015 start date for P-440.

4.3.6.1 SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier (Overlap with Proposed Action 2013-2014)

The project would extract structural piles with cranes and possibly jetting methods (NAVFAC Southwest 2013b). Demolition is estimated to take 6 months. The 137 structural piles (24-in octagonal) for the wharf and pier would likely be installed with a diesel impact hammer. Concrete piles would likely be jetted into place for a portion of the length and then driven to the final tip elevation using the impact hammer (NAVFAC Southwest 2013b). The wharf's landside structural piles would likely be installed from shore using a mobile crawler crane. Pile installation is estimated to take 90 days. The primary fender piles (18-in square) and corner fender piles (13-in diameter) would be installed with a diesel impact hammer. Fender piles are not anticipated to require jetting and would likely be installed using a floating crane barge (NAVFAC Southwest 2013b).

Measures to minimize impacts to water quality would include the following (NAVFAC Southwest 2013b). Floating rafts would be placed under the pier and wharf to catch demolition debris. A Spill Prevention, Control, and Countermeasures Plan would be developed and implemented for the project (NAVFAC Southwest 2013b). To minimize potential releases of creosote, petroleum sheens, and turbidity in the waterway, piles would be quickly placed onto a receiving barge as they are removed from the subsurface. Piles would not be rinsed or washed in any way. The barge's storage area would have a row of hay or straw bales, or filter fabric, placed around the perimeter of the barge to contain runoff from the extracted piles. Temporary erosion and sedimentation control measures would be implemented throughout the project (NAVFAC Southwest 2013b).

The Scripps contractor would use only clean construction materials suitable for use in the oceanic environment (NAVFAC Southwest 2013b). The Scripps contractor would ensure that debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, and oil or petroleum products from construction are not placed where they may be washed by rainfall or runoff into waters of the United States (U.S.) (NAVFAC Southwest 2013b). Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland disposal site. Spill kits and cleanup materials would be present during construction in case of a leak into the surrounding water (NAVFAC Southwest 2013b).

The Scripps Institution of Oceanography Pier Replacement project does not involve dredging. Increased turbidity due to demolition and construction would be localized to the Scripps pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC Earth & Environmental, Inc. [AMEC] 2008). The short duration of the turbidity increase, and implementation the water quality protective measures by contractors for both projects would reduce turbidity associated with the two projects to less than significant. Therefore, the Scripps project would not result in a significant additive water quality impact with that of the Proposed Action (P-151).

4.3.6.2 MILCON P-327 - Pier 12 Replacement at NBSD (Overlap with Proposed Action 2013)

There would be no overlap of dredging activities for the two projects. Dredging for MILCON P-327 is estimated to be completed by end of September 2013 and dredging for the Proposed Action is estimated to commence in October 2013. Other MILCON P-327 underwater demolition and construction work would be completed before September 2013. As stated in Section 3.6.3.2, *Turning Basin* of this EA, the vast majority of sediments resuspended by dredging settle out of the water column near the dredge within 1 hour, and only a small fraction takes longer to resettle (USACE 2008). Should dredging for the Proposed Action begin on 1 October, any remaining turbidity from MILCON P-327 dredging would be minimal, and there would not be a significant additive impact to water quality.

4.3.6.3 MILCON P-440 - Pier 8 Replacement at NBSD (Overlap with Proposed Action 2015 through 2016)

The potential underwater activities that could potentially take place concurrently for both projects would be Proposed Action: dredging, pile removal, pile installation; MILCON P-440: pile removal and pile installation. Should this be the case, acute impacts to water quality would be minimized by the following:

- Increased turbidity due to sediment resuspension during demolition and construction activities would be limited to the areas immediately surrounding NBPL Pier 180 (Proposed Action pile removal and installation) and NBSD Pier 8 (MILCON P-440) (AMEC 2008). Turbidity due to pile removal/installation would return to background conditions within an hour after the activity ends (AMEC 2008).

For the reasons listed above, the acute impacts to water quality of the Proposed Action and MILCON P-440 would not be significant. Therefore, the temporal overlap of the two projects' acute impacts would not result in a significant additive impact to water quality.

In conclusion, the Proposed Action would overlap in proximity and time with the Scripps project, but demolition/construction would be localized to the work site, very short-lived, and minimized with BMPs. The Scripps project does not involve dredging. There would be no temporal overlap of dredging activities for the Proposed Action and MILCON P-327. MILCON P-440 does not involve dredging. Therefore, there would be no significant additive water quality impact from implementation of Alternative 1 or Alternative 2 and these three cumulative projects.

4.3.7 Hazardous Materials and Wastes

With implementation of Alternative 1 or Alternative 2, hazardous materials and wastes and solid wastes would be properly managed according to applicable federal and state regulations. Hazardous materials and wastes at the proposed Navy MMP temporary relocation site at the NMAWC would be removed and properly recycled or disposed before the site is modified for use by the Navy MMP. Hazardous materials/wastes would not be used or stored at the proposed temporary NMAWC site while occupied by the Navy MMP. Under Alternative 1, or Alternative 2, during the time the barges are at the temporary relocation site, the Everingham Brothers Bait Company would continue to manage fuel, hazardous materials, and hazardous wastes according to applicable state and county regulations (Everingham Brothers Bait Company 2012). Hazardous materials currently present at the fuel pier consist of bulk quantities of fuel, lubricating oil, and contaminated petroleum products contained in pipelines that are designed and operated in compliance with federal and state regulations, and undergo frequent inspections by the U.S. Coast Guard (USCG) and the California State Lands Commission (CSLC). The fuel pier follows Basewide BMPs for preventing and containing potential leaks and spills from the pipelines and follows the procedures in the NBPL Emergency Response Action Plan in the event of spills (see Section 3.7.3.2, Subsections Fuel Pier Demolition and Construction and Bulk Fuel Pipelines. Hazardous waste resulting from fuel pier demolition would include building materials falling under the Universal Waste Rule, creosote-treated wood components, and paint that may contain lead or other metals. All hazardous wastes would be properly characterized and disposed at appropriate facilities with sufficient receiving capacity. There are no existing Installation Restoration, Resource Conservation, and Recovery sites or County of San Diego Unauthorized Release Sites on or near the project area that would be affected by implementation of either alternative. The new fuel pier would be built and operated in compliance with all federal and state requirements for pipeline and bulk fuel safety.

The Everingham Brothers Bait Company properly manages and disposes of solid wastes aboard its two San Diego Bay bait barges. Temporary relocation of the barges under Alternative 1 or Alternative 2 would not change solid waste types, volumes, or management practices aboard the barges. Solid waste generated from demolition and construction associated with implementation of Alternative 1 or Alternative 2 would be evaluated for resale, recycling, and diversion in accordance with the Navy Region Southwest (NRSW) Integrated Solid Waste

Management Program to minimize the volume of waste sent to a landfill. For the reasons listed above, implementation of Alternative 1 or 2 would not have a significant impact with respect to solid waste.

As stated above in Section 4.1.3.1, timing for the SIO Pier Replacement project is expected to coincide with the NBPL P-151 Fuel Pier Replacement Project in 2013. The Scripps Pier project would be required to implement measures to minimize impacts relative to hazardous materials/wastes and solid wastes. Other reasonably foreseeable projects are not anticipated to take place concurrently with the Proposed Action, so potential impacts from those projects would be moderated over space and time. Therefore, when added to the impacts from other reasonably foreseeable projects, implementation of either Alternative 1 or Alternative 2 would not result in a significant cumulative impact to hazardous materials, hazardous wastes, and solid waste.

4.3.8 Airborne Noise

As noted above under approach to analysis, airborne noise falls under the acute impact category. With implementation of Alternative 1 or Alternative 2, airborne noise levels would be below established limits (NBPL fuel pier) or very short-term and intermittent (NMAWC Navy MMP temporary relocation site) and construction noise would cease upon completion of demolition/construction activities. Alternative 1 or Alternative 2 and most of the present and reasonably foreseeable projects would not likely occur at the same time and location; except the present project, Replace Fuel Storage Tanks and Facilities at NBPL (MILCONP-401) and the proposed Scripps Pier construction. MILCON P-401 has been underway and is scheduled for completion in January 2014 and the fuel pier project is expected to start in August 2013. The Scripps Pier Replacement project would not begin until the spring of 2014 and would not overlap the construction period of MILCON P-401. Cumulatively for noise impacts, the Proposed Action and the MILCON P-401 can be analyzed independently of the Proposed Action and the Scripps Pier projects since noise generating activities would occur at separate times.

The phase of MILCON P-401 that would overlap the beginning stage of Proposed Action would comprise closing decommissioned USTs in place: removing the tank tops and appurtenances, cleaning the interiors, and backfilling with concrete slurry or clean soil (NAVFAC Southwest 2013c). USTs 76-84 and 173-176 are scheduled for backfill between May and September 2013 (NAVFAC Southwest 2013d). USTs 76-84 are located in the northern part of NBPL and adjacent to residences in the La Playa neighborhood. USTs 173-176 are in the south-central area of NBPL near the Child Development Center (CDC). Earthmoving equipment associated with the backfilling work would be the source of airborne noise during the final phase of MILCON P-401. Once all submittals and approvals are complete and equipment is mobilized, site work for the Proposed Action would commence at the end of September 2013. The beginning stages of the Proposed Action would focus on constructing the temporary SSC marine mammal enclosures and relocating the SSC marine mammals to NMAWC. However, some site work would occur at the fuel pier including excavation and installing landside piping. Noise generating equipment required for backfilling the USTs would be a front-end loader and dump

trucks for Tanks 76-84. USTs 173-175 would also require the use of a compactor and water truck in addition to the excavator and dump trucks. Equipment required for shore side work at the fuel pier would also require an excavator and grader. Pile driving work for the Proposed Action would not start until March 2014 and would not overlap Project P-401. It is likely the MILCON P-401 UST backfilling work would be completed before the end of September when the fuel pier site work gets underway, but it is possible there could be overlapping work involving noise-generating equipment.

During the backfilling of USTs 76-84 and the early stages of fuel pier site work, noise levels at residences in La Playa would be dominated by the MILCON P-401 UST backfilling activities because the residences are only about 75 ft from the USTs, but 2,600 ft away from the fuel pier work area. Noise levels during the UST backfilling would be approximately 73.5 A-weighted decibels (dBA) at the La Playa residences closest to the USTs. Noise levels generated from the fuel pier construction reaching those same residences would be about 48.1 dBA. Since there would be such a large difference in noise levels from the two sources, and noise is added logarithmically, the 73.5 dBA from the UST backfilling would completely overpower the lesser noise from the fuel pier site work (48.1 dBA). The resultant noise level at the La Playa residences would not change from 73.5 dBA. Therefore, there would be no significant cumulative impacts in the La Playa neighborhood due to noise generated from implementation of Alternative 1 or Alternative 2 occurring at the same time as noise from MILCON P-401.

The other receptor potentially affected by cumulative noise impacts from MILCON P-401 and the Proposed Action would be the NBPL CDC. The CDC is about 780 ft away from USTs 173-176 planned for backfilling under MILCON P-401. Backfilling the USTs would generate outdoor noise levels of about 59.6 dBA at the CDC. Onshore earthmoving and construction for the fuel pier activities would be about 1,880 ft from the CDC. Grading and excavating activities for the Proposed Action would generate outdoor noise levels of 50.9 dBA at the CDC. The noise from the P-401 UST backfilling combined with the noise from the fuel pier site work would produce outdoor noise levels at the CDC that would be approximately 60.2 dBA. Since outdoor noise levels are reduced by 25 dBA inside a building with windows closed, 60.2 dBA would be reduced inside the CDC to 35.2 dBA, slightly above the classroom criteria of 35 dBA (60.2dBA - 25 dBA = 35.2 dBA). If the P-401 UST backfilling is completed in September 2013 as scheduled and the fuel pier onshore site work begins at the end of September as planned, there would be no overlap of noise-generating activities from the Proposed Action and MILCON P-401. Should the MILCON P-401 UST backfilling continue for several weeks or a month beyond the scheduled end date and overlap Proposed Action onshore construction, the cumulative noise impact would be very short-term and one of the BMPs described in Section 3.8.3.2 (noise monitoring for classroom criteria) could be implemented if additional noise attenuation is desired. Therefore, there would be no significant cumulative impacts to the NBPL CDC due to noise generated from implementation of Alternative 1 or Alternative 2 occurring at the same time as noise from MILCON P-401.

The SIO Pier Replacement project would be located approximately 400 ft from residential areas in the La Playa neighborhood north of NBPL. Assuming similar construction activities as

Alternative 1, estimated noise levels for the Scripps Pier project are shown in Table 4.2-1. Noise levels in La Playa would be strongly dominated by the noise generated at the Scripps Pier with 78.2 dBA when combined with Alternative 1, but would be 78.1 dBA if only the Scripps Pier noise is considered. On the other hand, noise levels at the NBPL CDC would be 64.6 dBA cumulatively but would be 63.2 dBA when Alternative 1 is considered by itself. Either case exceeds the classroom criteria, but the noise levels would not be continuous and it is likely that modern construction design and materials used in the CDC building would provide a sufficient sound buffer so that indoor noise levels would not exceed the classroom criteria. Some or all of the BMPs described in Section 3.8.3.2 (noise monitoring for classroom criteria, acoustic blankets around the pile driver, or use of pile cushions) could be implemented if additional noise attenuation is desired. Noise levels from the Scripps project alone would not exceed the San Diego construction noise ordinance limit of 75 dBA at La Playa because the UCSD/SIO would place the following requirements to limit noise levels (UCSD and Navy 2013).

- The contractor shall not exceed a 12-hour average sound level of 75 dBA at any noise-sensitive land use between 7:00 AM and 7:00 PM, Monday through Saturday. The contractor may employ the use of sound cushions or insulation blankets to meet this threshold.
- Construction equipment shall be properly outfitted and maintained with the manufacturer's recommended noise-reduction devices to minimize construction-generated noise.
- Stationary construction noise sources such as generators or pumps shall be located at least 100 ft from noise-sensitive land uses as possible.
- Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as possible.
- All neighboring land uses that would be subject to construction noise shall be informed at least 2 weeks prior to the start of each construction project, whenever possible.

Table 4.2-1. Cumulative Noise Levels at La Playa and NBPL CDC

Receptor Point	*Distance from Alternative1 or 2[1] Miles(km)*	*Distance from Scripps Pier Miles*	*Construction-Related Noise (dBA Leq)*		
			Alternative 1 or 2 only[1]	*Scripps Pier only*	*Combined noise levels*
La Playa	0.47 (0.73)	0.07(0.12)	62.3	<75	Scripps + 0.1
CDC NBPL (Building 377)	0.42 (0.68)	0.68 (1.1)	63.2[3]	59.0	64.6[2]

Notes [1]Approach pier construction used for cumulative impacts since it is the highest noise levels relative to La Playa.

[2] Exceeds recommended classroom criteria of 60 dBA Leq outdoor noise levels for an interior noise level of 35 dBA with windows closed. Refer to best management practices in Section 3.8.3.2 for noise monitoring for classroom criteria and additional noise reduction measures if results indicate further reductions are necessary.

The cumulative contribution from Alternative 1 or Alternative 2 would be negligible to the Scripps Pier noise because the difference is over 10 decibels (dB) and, at most, would raise the levels by one tenth of a dBA energy equivalent levels (Leq). Therefore, implementation of

Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative noise impacts.

In summary, there are two concurrent projects located near enough to the Proposed Action to potentially generate cumulative noise impacts: Replace Fuel Storage Tanks and Facilities at NBPL (MILCON P-401) and the SIO USCD Marine Facility Research Vessel Berthing Pier Replacement. For the reasons described above, the noise from the implementation of either Alternative 1 or Alternative 2, combined with noise from either of these two projects, would not result in a significant cumulative noise impact to the identified receptors: residences in La Playa near the northern border of NBPL, or the NBPL CDC.

4.3.9 Air Quality

4.3.9.1 Criteria Pollutants

Alternative 1

As noted above under approach to analysis, air quality falls under the lingering impact category. The region of influence (ROI) in this air quality cumulative effects analysis includes the SDAB. With implementation of Alternative 1 or Alternative 2, the minor impacts to air quality that could contribute to potential cumulative impacts would be from the short-term air emissions from trucks and vehicles used during the construction of the project. Operational air emissions from Alternative 1 would not change from existing conditions and would not result in long-term increases in air emissions. Cumulative projects would also be required to conform to Clean Air Act (CAA) conformity requirements and the SDAB State Implementation Plan (SIP) and would not produce significant amounts of air emissions.

Nominal cumulative impacts would result from Alternative 1, in conjunction with impacts from other potentially cumulative projects (listed in Section 4.1). For all projects, construction and operation activities would produce air emissions that would be well below applicable CAA conformity significance thresholds.

The one project that could have combined cumulative air impacts is the Scripps Pier construction project, which would occur at the same time as Alternative 1 and involve similar activities. The emissions associated with the Scripps Pier construction project were obtained from the Draft EA and Initial Study, SIO/UCSD Marine Facility Berthing Wharf and Pier Replacement (UCSD and Navy 2013). Table 4.2-2 presents a summary of the cumulative emissions from Alternative 1 and the Scripps Pier Replacement construction project.

Table 4.2-2. Cumulative Construction Emissions for NBPL Fuel Pier Replacement – Alternative 1 and Scripps Pier Replacement Project

Construction Year	*Emissions (tons/year)*					
	CO[1]	*VOCs*[2]	*NOx*[2,3]	*SOx*[3]	*PM_{10}*[3]	*$PM_{2.5}$*[3]
2013 – NBPL Fuel Pier	2.69	0.24	1.50	0.00	0.07	0.05
Total 2013	**2.69**	**0.24**	**1.50**	**0.00**	**0.07**	**0.05**
2014 – NBPL Fuel Pier	15.63	3.04	39.70	0.05	1.17	1.03
2014 – Scripps Pier	4	1	18	<1	2	<1
Total 2014	**19.63**	**4.04**	**57.70**	**<1**	**3.17**	**<2**
2015 – NBPL Fuel Pier	22.84	14.27	44.89	0.07	1.90	1.63
2015 – Scripps Pier	3	<1	7	0	1	<1
Total 2015	**25.84**	**15.27**	**51.89**	**0.07**	**2.90**	**2.63**
2016 – NBPL Fuel Pier	14.24	9.75	35.52	0.05	1.26	1.10
Total 2016	**14.24**	**9.75**	**35.52**	**0.05**	**1.26**	**1.10**
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.

(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.

(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.

(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDAPCD major source thresholds.

CO = carbon monoxide; NOx = nitrogen oxide; $PM_{2.5}$ = particulates less than 2.5 microns in diameter; PM_{10} = particulates less than 10 microns in diameter; SDAB = San Diego Air Basin; SOx = sulfur oxide; VOCs = volatile organic compounds.

The combined air emissions of Alternative 1 and cumulative projects would not contribute to an exceedance of an ambient air quality standard. As a result, proposed construction and operational activities would produce less than cumulatively considerable air quality impacts. Therefore, Alternative 1, in conjunction with the potentially cumulative projects listed in Section 4.1, would not result in significant cumulative impacts to air quality.

Alternative 2

The air quality impacts from Alternative 2 would essentially be the same as described under Alternative 1. Therefore, implementation of Alternative 2 would not result in significant cumulative impacts to air quality.

4.3.9.2 Greenhouse Gas (GHG) Cumulative Effects Analysis

The potential effects of GHG emissions are by nature global and cumulative and it is impractical to attribute climate change to individual activities. Therefore, an appreciable impact on global climate change would only occur when GHG emissions associated with Alternative 1 or

Alternative 2 are combined cumulatively with GHG emissions from other man-made activities on a global scale.

Alternative 1

Table 4.2-3 summarizes the annual GHG emissions that would occur with implementation of Alternative 1.

Table 4.2-3. Estimated Annual GHG Emissions – Alternative 1

Construction Year	*Metric tons per year*			
	CO_2	*CH_4*	*N_2O*	*CO_2e[1]*
2013	1,455	0.26	10.18	4,615
2014	4,898	1.32	6.26	6,843
2015	6,498	1.42	7.35	8,806
2016	5,178	1.58	6.20	7,133

Note: [1]$CO_2e = CO_2 + (21 * CH_4) + (310 * N_2O)$

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent

As an indication of the nominal relative magnitude of these emissions, total annual carbon dioxide equivalent (CO_{2e}) emissions in the U.S. were approximately 7 billion metric tons in 2008 (USEPA 2010). Total CO_{2e} emissions in California in 2008 were approximately 474 million metric tons (California Air Resources Board [CARB] 2011).

Potentially cumulative projects near Alternative 1 (listed in Section 4.1) could also release a nominal amount of GHGs from construction and operation activities when compared to the total annual CO_{2e} emissions in the U.S. In addition, in response to Department of Defense (DoD) directives such as EO 13221, *Energy Efficient Standby Power Devices* and EO 13423, *Strengthening Federal Environment, Energy, and Transportation Management*, the Navy has taken a number of steps to reduce GHG emissions from their activities. These actions include developing energy efficient technologies and weapons systems, improving military and civilian vehicles fuel efficiency, utilizing alternative fuel vehicles and electric vehicles, improving energy efficiency at Navy facilities, and installing solar and other renewable energy sources at Navy facilities. Therefore, when GHG impacts from Alternative 1 are added to the GHG impacts from the cumulative projects, there would not be significant GHG cumulative impacts to global climate change from implementation of Alternative 1.

Alternative 2

The GHG effects from implementation of Alternative 2 would be similar to those effects from Alternative 1. Therefore, there would not be significant GHG cumulative impacts to global climate change from implementation of Alternative 2.

4.3.10 Transportation and Circulation

As noted above under approach to analysis, transportation and circulation falls under the acute impact category. Traffic from present and reasonably foreseeable future projects is included in the Baseline condition, which consists of existing traffic volumes, plus an annual traffic growth factor. (Note that the traffic generation associated with past projects is included in the existing

traffic data collection.) The annual traffic growth factor includes traffic generated by each of the present and reasonably foreseeable future projects described above in Section 4.1, plus traffic generated by projected future projects lying outside the ROI, but whose trips would traverse the street network that provides access to the Proposed Action. As discussed in Section 3.10, increased traffic due to local and regional development is projected to result in Level of Service (LOS) E conditions on three street segments (Rosecrans Street from Nimitz Boulevard to North Harbor Drive, and from North Harbor Drive to Canon Street, and Canon Street from Rosecrans to Locust Street). However, the proposed project construction and operation would not add any additional trips to any street segments that are characterized by LOS E under Baseline conditions. Accordingly, the proposed project would not contribute toward any significant cumulative traffic effect.

The Scripps Pier and P-401 projects are cumulative projects located proximate to the Proposed Action whose traffic generation is included in the Baseline traffic scenario. As discussed above, construction activities for the proposed Scripps Pier replacement project are expected to occur at the same time as those of Alternative 1 or 2. According to data furnished by SIO UCSD through their engineering consultant (Anchor QEA 2012), up to 30 workers and 12 trucks may access the site on a daily basis during construction. Workers for the Scripps project would access that worksite using Rosecrans Street. Assuming one inbound and one outbound trip for each worker and truck, the Scripps Pier replacement project would add 84 daily vehicle trips to Rosecrans Street. The P-401 project has a traffic generation of 340 daily trips (Navy 2007). The addition of traffic from these two projects would result in an increase of 424 daily trips on segments of Rosecrans Street characterized by LOS E conditions (i.e., from Nimitz Boulevard to North Harbor Drive, and from North Harbor Drive to Canon Street; see Section 3.10). The change in the volume to capacity (V/C) ratio on these segments due to P-401 and Scripps Pier trips is 1.06 percent (i.e., 424 daily trips divided by the LOS E Capacity of 40,000). The City of San Diego's significance criteria is a 2.0 percent increase on segments characterized by LOS E or F. As noted above, because of the temporary relocation of MMP personnel, the Proposed Action would not add any trips to either of these segments.

The Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring. As shown in Figure 2-5, all of the in-water construction zone for the proposed fuel pier replacement project would be within an existing navigation restricted area (Security Zone) that is off-limits to civilian vessels. Most of the Scripps Pier in-water construction zone is in Navy waters, and it would lie within the Security Zone as well. There would be about 600 ft of open water between the part of the Scripps Pier construction zone that is outside the Security Zone and the southern tip of Shelter Island, leaving sufficient space for civilian vessels. Therefore, implementation of either Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1 would not result in significant cumulative impacts to transportation, circulation, and marine traffic.

4.3.11 Socioeconomics and Environmental Justice

Impacts to socioeconomics and environmental justice from Alternative 1 or Alternative 2 would be beneficial overall. There would be indirect, temporary, adverse impacts to the charter fishing

industry, which would be less than significant. It is likely that none of the reasonably foreseeable projects described in Section 4.1 would reduce beneficial impacts or exacerbate adverse impacts. Therefore, implementation of either Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to socioeconomics and environmental justice.

4.4 CUMULATIVE IMPACTS CONCLUSION

Cumulative impacts to the environmental resource areas evaluated herein from Alternative 1 or Alternative 2, in conjunction with other past, present, and reasonably foreseeable actions, would not be significant.

CHAPTER 5
OTHER NEPA CONSIDERATIONS

5.1 POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS

Implementation of Alternative 1 or Alternative 2 would be consistent with federal, regional, state and local plans, policies, and controls to the extent required by federal law and regulation. No potential conflicts have been identified. Table 5.1-1 provides a summary of environmental compliance with implementation of Alternative 1 or Alternative 2.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and other natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Although proposed demolition and construction activities would result in the consumption of fuel, concrete, and steel, Alternative 1 or Alternative 2 would not result in a significant irreversible or irretrievable commitment of resources at NBPL or NMAWC.

5.3 RELATIONSHIP BETWEEN SHORT-TERM ENVIRONMENTAL IMPACTS AND LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing a single development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use often eliminates the possibility of other uses being performed at that site.

Alternative 1 or Alternative 2 would, reversibly, dedicate parcels of land, equipment, and other resources to a particular use during a limited period of time. These resources would not be available for other productive uses throughout the duration of the project. However, these impacts are considered negligible, as the facilities and geographic areas associated with Alternative 1 or Alternative 2 are designated for and have historically accommodated the types of uses proposed. Therefore, Alternative 1 or Alternative 2 would not result in any impacts that would reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
NEPA (42 USC § 4321 *et seq.*) Department of the Navy Procedures for Implementing NEPA (32 CFR 775)	U.S. Navy	This EA has been prepared in accordance with the CEQ Regulations implementing NEPA and U.S. Navy NEPA procedures.
Coastal Zone Management Act (16 CFR § 1451 *et seq.*)	U.S. Navy	The Coastal Zone Management Act (CZMA) of 1972 (16 USC Section 1451) encourages coastal states to be proactive in managing coastal zone uses and resources. CZMA established a voluntary coastal planning program and participating states submit a Coastal Management Plan to the National Oceanic and Atmospheric Administration for approval. Under the CZMA, federal agency actions within or outside the coastal zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state management programs. Each state defines its coastal zone in accordance with the CZMA. Excluded from any coastal zone are lands the use of which by law is subject solely to the discretion of the federal government or which is held in trust by the Federal government (16 USC 1453). Accordingly, although Naval Base Point Loma land is federal government property and therefore, excluded from the coastal zone, the Navy nonetheless conducted an effects analysis as part of its determination of the action's effects for purposes of federal consistency review under the CZMA. This was done to factually determine whether the action (even if conducted entirely within a federal enclave) would affect any coastal use or resource. A Coastal Consistency Determination (CD-011-13) was prepared by the Navy and provided to the CCC (refer to Appendix A). The CCC concurred with the Navy's CD and found the project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).
CWA (§§ 401-402 and 404, 33 USC § 1251 *et seq.*)	USEPA, U.S. Army Corps of Engineers (USACE)	Alternative 1 or Alternative 2 would not involve the release of chemicals requiring an NPDES permit. A construction NPDES permit would be obtained that would remain in effect for the length of the project. The project would involve in-water demolition, dredging, and construction activities for which a CWA Section 404/ Rivers and Harbors Act Section 10 permit from the USACE would be obtained, along with the related Section 401 Water Quality Certification from the RWQCB.
CAA, as amended (42 USC § 7401 *et seq.*)	USEPA	Per CAA regulations, Alternative 1 or Alternative 2 would not compromise air quality attainment status or conflict with attainment status and maintenance goals established in the SDCAPCD SIP. A formal CAA conformity determination is not required. Alternative 1 or Alternative 2 would be in compliance with the CAA and would comply with all applicable SDCAPCD Rules and Regulations.
Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, 42 USC §§ 11001-11050.	U.S. Navy	The Navy would inform Local Emergency Planning Committees of Alternative 1 or Alternative 2 as required to assist them in developing plans to prepare for and respond to chemical emergencies.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
EO 11990, *Protection of Wetlands* (42 Federal Register 26961)	U.S. Navy	Alternative 1 or Alternative 2 would not impact wetlands (none are present in the proposed project areas at NBPL and NMAWC) and would be in compliance with EO 11990.
ESA (16 USC § 1531)	USFWS/NMFS	Alternative 1 or Alternative 2 are not likely to adversely affect any federally listed endangered or threatened species or critical habitat and the Navy made a no effect determination on the California least tern and western snowy plover. The Navy would fully comply with the Least Tern MOU presented in Appendix E.2 of this EA. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter (see Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles; therefore, Alternative 1 or Alternative 2 would be in compliance with the ESA.
Marine Mammal Protection Act of 1972 (16 USC § 1361-1407)	NMFS	Non-injury, Level B behavioral takes of marine mammals are likely to occur as a result of pier demolition and construction. With implementation of monitoring and ramp-up procedures as proposed, no Level A (permanent hearing loss) takes would occur, and Level B takes due to temporary hearing loss are unlikely to occur for Alternative 1 or Alternative 2. The Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A); therefore, Alternative 1 or Alternative 2 would be in compliance with the MMPA.
EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Register 7629)	U.S. Navy	There would be no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Alternative 1 or Alternative 2 would be in compliance with EO 12898.
EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (62 Federal Register 19885)	U.S. Navy	Under Alternative 1 or Alternative 2, the proposed project activities during demolition of the existing fuel pier and construction and operation of the proposed new fuel pier would take place within military facilities that are off-limits to the general public, and where children are not present. The shoreside construction zones would be fenced and warning signs would be posted to prevent unauthorized access. In-water construction zones would be marked with buoys and signs to restrict entry by civilian vessels. The proposed demolition of the existing fuel pier, and construction and operation of the new fuel pier would be performed in compliance with all applicable federal and state requirements for hazardous material and hazardous waste management, bulk fuel storage and transfer, and workplace safety. These measures would minimize environmental health and safety risks to the public overall, including children. For these reasons, Alternative 1 or Alternative 2 would not disproportionately expose children to environmental health risks or safety risks and would be in compliance with EO 13045.
EO 13089, *Coral Reef Protection* (63 Federal Register 32701)	U.S. Navy	Alternative 1 or Alternative 2 would not affect any coral reef ecosystem and would be in compliance with EO 13089.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
Magnuson-Stevens Fishery Conservation and Management Act 16 U.S.C § 1801, et. Seq. as amended by the Sustainable Fisheries Act of (Public Law 104-267)	NMFS	Alternative 1 or Alternative 2 would have minimal adverse effects on EFH for federally managed fish species within the Coastal Pelagic Species and West Coast Groundfish FMPs. These effects would be temporary and limited in scope, and eelgrass habitat shaded by the proposed fuel pier, and as impacted by the SSC Marine Mammal Program relocation, would be offset through use of the Navy's established eelgrass mitigation bank. Both Alternative 1 and Alternative 2 contain measures to avoid and minimize any potential adverse effects to EFH (see Appendix E.1). In conjunction with the NEPA process, the Navy consulted informally with NOAA/NMFS. An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis will be integrated into the Proposed Action (refer to Appendix A), therefore, Alternative 1 or Alternative 2 would be in compliance with the Magnuson-Stevens Fishery Conservation and Management Act.
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (66 Federal Register 3853)	U.S. Navy	Alternative 1 or Alternative 2 are not likely to have a measurable negative effect on migratory bird populations and would be in compliance with EO 13186.
NHPA (Section 106, 16 USC 470 *et seq*.)	Advisory Council in Historic Preservation, California State Historic Preservation Office	Alternative 1 or Alternative 2 would be designed to avoid effects on NRHP or eligible properties. Alternative 1 or Alternative 2 would not affect any *known* archaeological sites or other *known* cultural resources at NBPL, as none are found within the Area of Potential Effect (APE) at, as defined under the Navy Region Southwest (NRSW) Metro San Diego Programmatic Agreement (PA). The DFSP Fuel Pier (Pier 180, built in 1908 and 1942) has previously been determined by consensus and consultation to be ineligible for the National Register of Historic Places. The construction laydown area at NBPL would be staged outside the 100-meter APE buffer of identified historic properties in the nearby Fort Rosecrans Historic District. A 1997 investigation inventoried and evaluated all of NMAWC and concluded that NMAWC contains no built properties or archaeological resources eligible for listing in the National Register of Historic Places. However, while there are no identified built or archaeological historic properties within the APE at NBPL, there is a buried archaeological *potential* under the quay wall fill shoreside of the existing fuel pier. The project would implement on-site monitoring by qualified archaeologists to identify any such features or deposits encountered during site preparation excavations on the quay wall portion of the project area. Through these procedures, Alternative 1 or Alternative 2 would be in compliance with the NHPA.
Sikes Act Improvement Act (16 USC § 670a *et seq*.)	U.S. Navy	Alternative 1 or Alternative 2 would be in compliance with the Sikes Act Improvement Act.

5.4 GROWTH INDUCEMENT

CEQA Guidelines (§15126.2(d)) require that an environmental review document evaluate the growth inducing impacts of a proposed project:

"Discuss the way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects that would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristic of some projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

A project can bring about the potential for direct and/or indirect growth inducement. A project can lead to direct growth inducement if it involves the development of new housing units. A project can create the potential for indirect growth inducement if it would create sizable new permanent employment opportunities or if it would involve a substantial construction effort with sizable short-term employment opportunities that would indirectly stimulate the need for additional housing and services to support a large temporary population. A project would also have an indirect growth inducement effect if it would remove obstacles to additional growth and development, such as removing a constraint on a required public service, for instance additional public infrastructure such as new roads or increased utilities capacity.

The Point Loma Fuel Pier Replacement project would be a temporary construction project to replace existing infrastructure that is not intended for use by the general public; it would not be expected to induce growth either directly or indirectly. The project would not induce any direct growth because it would not involve the construction of new housing units. There would be no indirect growth because the project would provide no permanent new employment opportunities, and the temporary demand for construction employment could be filled by the existing construction labor supply of San Diego County. Also, since the project replaces existing infrastructure and enables the continuation of activities that currently take place, the project would not encourage, facilitate, or remove constraints on new activities that would lead to new growth.

[This Page Intentionally Left Blank]

CHAPTER 6
AGENCIES, ENTITIES AND PERSONS CONTACTED

Agencies

California Coastal Commission, Sacramento Office, Kate Huckelbridge, Energy, Ocean Resources, and Federal Consistency Representative

California Coastal Commission, San Francisco Office, Mark Delaplaine, Manager, Energy, Ocean Resources, and Federal Consistency

California Department of Fish and Wildlife, South Coast Region, Enforcement, San Diego Office, Bill Paznokas, Environmental Planning Section Chief

California State Lands Commission, Sacramento Office, CA, Sarah Sugar, Environmental Scientist

California State Lands Commission, Sacramento Office, CA, Drew Simpkin, Public Land Management Specialist

National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS Division), Habitat Conservation Division, Southwest Region, Southwest Region Office, Long Beach, California, Eric Chavez, Marine Habitat Resource Specialist

NOAA, NMFS Habitat Conservation Division, Southwest Region, Southwest Region Office, Long Beach, California, Bryant Chesney, Southern California Habitat Coordinator

NOAA, NMFS, Protected Resource Division, Southwest Region Office, Long Beach, California, Monica DeAngelis, Marine Mammal Biologist

NOAA, NMFS, Protected Resource Division, Southwest Region Office, Long Beach, California, Christina Fahy, Supervisory Fish Biologist

NOAA, NMFS, Protected Resource Division, Southwest Region Office, Long Beach, California, Bob Hoffman, Assistant Regional Administrator

NOAA, NMFS Protected Resources Division, Southwest Region Office, Long Beach California, Dan Lawson, Fish Biologist

Regional Water Quality Control Board, San Diego Office, David Barker, Supervising Engineer

Regional Water Quality Control Board, San Diego Office, Alan Monji, Environmental Scientist

U.S. Army Corps of Engineers (USACE), Robert R. Smith, Jr. Environmental Engineer/Civil Engineer Regulatory Project Manager Carlsbad Field Office

U.S. Coast Guard (USCG), Sector San Diego, Waterways Management Division, CDR Mike Dolan, Former Chief

USCG, Sector San Diego, Waterways Management Division, LT Marie Sevin, Former Chief

USCG, Sector San Diego, Waterways Management Division, Auxiliary Liaison, LT John Bannon

USCG, Sector San Diego, Response Dept./Air Sta Ops, CDR Jeremy Smith, Chief

USCG, Sector San Diego, Air Sta Ops, CDR Christopher Conley

USCG, Sector San Diego, Marine Events, MST1 Deborah Metzger

U.S. Environmental Protection Agency (USEPA), Wetlands Region 9 Southern California Field Office, Los Angeles, Jorine Campopiano, Environmental Scientist

USEPA, Dredging and Sediment Management Team (WTR-8) Region 9, Allan Ota, Oceanographer/Regional Ocean Dumping Program Coordinator

U.S. Fish and Wildlife Service, Carlsbad office, Sandy Vissman, Biologist

Entities

Coronado Yacht Club

Port of San Diego, Harbor Safety Committee

Port of San Diego, Wendy Ong, Asset Manager

Port of San Diego, Eileen Maher, Assistant Direction Environmental Services

Port of San Diego, Shannon Vitale, Assistant Redevelopment Planner

San Diego Port Tenants Association Sharon Bernie Cloward President

San Diego Yacht Club

Southwestern Yacht Club

Sportfishing Association of California

University of California San Diego (UCSD), San Diego Physical Planning, Catherine Presmyk, Assistant Director Environmental Planning

CHAPTER 7
PREPARERS AND CONTRIBUTORS

7.1 PREPARERS

7.1.1 Cardno TEC Santa Barbara

Project Management and Quality Assurance

Douglas Billings, B.S., Physical Geography/Geologic Sciences, Program/Project Manager, 27 years' experience

Margaret Bach, B.A., Geology, Deputy Project Manager, 18 years' experience

Christine Davis, M.S., Environmental Management, Quality Assurance, 13 years' experience

Selena Buoni, MPL (Master of Planning), Quality Assurance, 8 years' experience

Technical Analysts

Margaret Bach, B.A., Geology, Water Quality, Hazardous Materials and Wastes, 18 years' experience

Mike Dungan, Ph.D., Ecology and Evolutionary Biology, Biological Resources, 31 years' experience

David Kiernan, Masters in Urban and Regional Planning, Socioeconomics, 10 years' experience

Christopher Noddings, M.S., Environmental Science and Management, Biological Resources, 7 years' experience

Mary Nishimoto, Ph.D., Marine Science, Fish, 15 years' experience

Deirdre Stites, A.A., Geology, Graphics**,** 24 years' experience

7.1.2 Cardno TEC San Diego

Scott Barker, M.S. Civil Engineering and Master of City Planning, Transportation and Circulation, 22 years' experience

GIS and Graphic Design

Shannon Brown, B.S., Environmental and Resource Science, Geographic Information Systems, 4 years' experience

Jason Harshman, B.A., Geography, Geographic Information System, 6 years' experience

7.1.3 Cardno TEC Boise

James Campe, B.S., Naval Architecture and Offshore Engineering, Airborne Noise, 23 years' experience

7.1.4 Cardno TEC Honolulu

Robert Wardwell, AICP, B.A. Economics; M.S. in Environmental Science and M.B.A. Transportation/Logistics, Dredging and Sediment Quality, 35 years' experience

7.1.5 TEC Subcontractors

Barry Snyder, AMEC, San Diego Office, B.S., Marine Science; M.S., Marine Environmental Research, Senior Marine Scientist, 25 years' experience

Valorie Thompson, SRA, San Diego Office, Ph.D., Chemical Engineering, Air Quality Specialist, 21 years' experience

7.2 CONTRIBUTORS

Rob Chichester, NBPL Environmental Program Director Naval Facilities Engineering Command (NAVFAC) Southwest

Kari Coler, NEPA Planner, NAVFAC Southwest

LCDR Ricardo Collazos, Fleet Logistics Command San Diego, Naval Supply Systems Command

Mike Cornell, Senior Environmental Scientist, Naval Base San Diego, NAVFAC Southwest

Brian Gordon, Water Program Manager, Navy Region Southwest

Chris Eliff, Port Operations, Port Security, Navy Region Southwest

Stephen Frey, Fleet Logistics Center (FLC) San Diego Fuels Director, Naval Supply Systems Command (NAVSUP)

Delphine R. Iturralde, NBPL Explosives Safety Officer, N43 Public Works

CDR Frank Kim, SC, Regional Fuel Officer Fleet and Industrial Supply Center, San Diego, USN Southwest

Charlie Ketcham, Demolition Debris Manager, NAVFAC Southwest

Bryan Munson, Naval Base Coronado Botany Program Manager, NAVFAC Southwest

Nam D. Nguyen, Senior Project Manager, NAVFAC Southwest

Paul Patricio, Port Operations, Port Security, Navy Region Southwest

Mitchell A. Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC Southwest

Alberto Sanchez, Senior Civil Engineer, NAVFAC Southwest

Lisa Seneca, Senior Planner, NAVFAC Southwest

Suzanne Smith, N40 Environmental Fleet Environmental NEPA Coordinator, Navy Region Southwest

David Sproul, Cultural Resources Historian, NAVFAC Southwest

Alan Vancil, Regional Environmental Program Manager, NAVSUP Fleet Logistics Center San Diego, Naval Supply Systems Command

Mark J. Xitco Jr., Ph.D. U.S. Navy Marine Mammal Program Head, Space and Naval Warfare Systems Center Pacific

Andy Yatsko Ph.D., Archaeologist, Environmental Operations and Planning (N45) Natural and Cultural Resources, Navy Region Southwest NRSW

Project Engineering Contractors

Alan Alcorn, Moffatt & Nichol – Blaylock (MNB)

Jeff Seib, Burns and McDonnell Engineering Company (Burns and McDonnell), PE Project Manager Fueling Group

[This Page Intentionally Left Blank]

CHAPTER 8
REFERENCES

DOPAA

Burns and McDonnell Engineering Company (Burns and McDonnell). 2012a. Personal communication via email with J. Seib, PE Project Manager Fueling Group regarding height of fueling structures for proposed new fuel pier. 29 June.

_____ . 2012b. Personal communication via email with J. Seib, PE Project Manager Fueling Group regarding stormwater containment and other details of 35 percent design for replacement fuel pier. 21 March.

_____ . 2012c. Personal communication via email with J. Seib, PE Project Manager Fueling Group regarding fuel capacity and other details of 35 percent design for replacement fuel pier. 2 April.

Dahl, P. PhD Principal Engineer and Professor, and Farrell, D. Predoctoral Research Assistant I, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle. Acoustic Transmission Loss Model for North San Diego Bay. Unpublished data provided in a memorandum to M. Perdue, Senior Biologist, NAVFAC Southwest Coastal IPT dated January 25, 2011.

Department of Defense (DoD). 2006. MIL-STD-2007F. Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications. 13 December. http://www.wbdg.org/ccb/FEDMIL/std3007f.pdf. Website accessed 7 December 2010.

Everingham Brothers Bait Company. 2012. Personal communication via email with B. Everingham regarding the bait barges' operations and operational and physical requirements. 21 June.

Merkel & Associates, Inc. 2008. Marine Mammals Surveys in the Vicinity of the Point Loma Naval Complex, San Diego, California. Final Report. Prepared for NAVFAC SW. September.

Moffatt & Nichol – Blaylock (MNB). 2010. Personal communication with M. Martinez, S.E., regarding design capacity, site conditions at the existing and proposed Pier 180. 6 December.

_____ . 2011a. Rough Order Magnitude (ROM) Cost - (Navy) Mammal Pier Relocation Five Alternatives plus Optional Sites. Letter report to Mr. N. Nguyen, P.E. NFECSW Coastal IPT. 25 March.

_____ . 2011b. Personal communication with M. Martinez, S.E., via telephone and email regarding construction and removal of temporary Navy marine mammal facilities at the NMAWC site. March-April.

_____ . 2011c. Personal communication via telephone and email with L. Yoe, regarding construction and removal of temporary Navy marine mammal facilities at the NMAWC site. April.

_____ . 2011d. Personal communication via email from I. Canner, P.E. to L. Seneca NAVFAC Southwest Coastal IPT. Subject: P-151 Construction schedule, description of construction phases, pile driving, and equipment to be used. January- April

_____ . 2011e. Personal communication via email with F. A. Morales regarding demolition of the existing fuel pier components. April.

_____ . 2011f. Personal communication via email with A. Alcorn regarding use of steel structural pilings in the design of the new fuel pier. 14 December.

_____ . 2011g. Personal communication via email with L. Walcheff regarding new fuel pier design and construction. March.

_____ . 2012a. Redline revisions made by A. Alcorn, to Draft Environmental Assessment Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151) San Diego, California. Prepared by NAVFAC Southwest. May 2011. Revisions sent via email to L. Seneca, NAVFAC Southwest. 20 February.

_____ . 2012b. Personal communication via email with A. Alcorn regarding pile driving, construction schedule, and construction details. 30 March-6 April.

_____ . 2012c. Personal communication via telephone with C. Schulze regarding dimensions of the new fuel pier. July.

_____ . 2012d. Personal communication via email with A. Alcorn regarding potential dredging methods. 12 September.

_____ . 2013. Personal communication via email with A. Alcorn regarding design of the Navy marine mammal facilities at NMAWC. February.

National Oceanic and Atmospheric Administration (NOAA). 2012. Office of Coast Survey. Chart 18773 San Diego Bay. Edition 42. Edition Dated January 2011. http://www.charts.noaa.gov/OnLineViewer/18773.shtml. Website accessed 4 April.

Naval Facilities Engineering Command (NAVFAC). 2009. Site Specific Report. Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response. Naval Base Point Loma. Prepared by Engineering Service Center, Port Hueneme, California. November.

NAVFAC Southwest. 2010. Personal communication via email with L. Seneca, NAVFAC Southwest Coastal IPT, regarding amendment of regulated navigation zones to accommodate proposed replacement fuel pier. November.

_____ . 2011a. Fiscal Year (FY) 2013 MILCON P-151 Replace Fuel Pier, Naval Base Point Loma, San Diego, CA. Revised 35 percent Submittal. Basis of Design and Revised Drawings. Prepared by Burns and McDonnell. 5 August.

_____ . 2011b. Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging. March.

_____ . 2011c. Replace Fuel Pier P-151 Naval Base Point Loma California. Construction staging and mooring arrangement plans. 5 August.

_____ . 2011d. Personal communication via email with R. Chichester, NBPL Environmental Manager re: NMAWC facilities and buildings; relocation of existing MWR uses. April.

_____ . 2011e. Personal communication via email with L. Seneca, NAVFAC Southwest Coastal IPT, regarding temporary relocation of the Navy Marine Mammal Program. April.

_____ . 2011f. Personal communication via email with R. Chichester, NBPL Environmental Manager re: demolition waste management at NBPL. March

_____ . 2011g. Personal communication via telephone with C. Ketcham, Demolition Debris Manager, NAVFAC Southwest, regarding NAVFAC policy and procedures for disposal of construction/demolition waste from Navy construction projects at NBPL. 16 March.

_____ . 2011h. Personal communication via email with L. Seneca, NAVFAC Southwest Coastal IPT, regarding relocation of Navy marine mammals during fuel pier construction and dredging phases. April.

_____ . 2012a. Personal communication via email with M. Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC Southwest Coastal IPT, regarding potential Harbor Island temporary relocation sites for the Everingham Brothers Bait Company bait barges. Email included a map showing potential Harbor Island sites. 15 August.

_____ . 2012b. Personal communication via email with I. Elhag, Public Works re: EOD unit MU-1 switching locations from its current pier at SUBASE to Pier 619, currently used by EOD TEU-1. 28 March.

_____ . 2012c. Personal communication via email with M. Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC Southwest Coastal IPT, regarding potential baywide temporary relocation sites for the Everingham Brothers Bait Company bait barges. Email included a map showing potential sites. 2 May.

_____ . 2012d. Personal communication via email with M. Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC Southwest Coastal IPT, regarding potential Harbor Island temporary relocation sites for the Everingham Brothers Bait Company bait barges. Email included a map showing potential Harbor Island sites. 23 May.

_____ . 2013. Personal communication via email with M. Perdue, Senior Biologist and Deputy Dive Safety Coordinator, NAVFAC Southwest Coastal IPT, regarding use of STCC nearshore zone for dredge sediment beneficial reuse. April.

Navy Region Southwest (NRSW). 2007. Navy Region SW Waste Management Plan San Diego Metro Area. 25 January.

_____ . 2012. Personal communication via email with J. Beaty. Region Program Director (N31)COMNAVREG SW Port Operations. regarding proposed temporary relocation of the Everingham Brothers Bait Company San Diego Bay bait barges to locations 4, 4A, and 6 south and southeast of Harbor Island. May.

San Diego Association of Governments (SANDAG). 2009. Final Coastal Regional Sediment Management Plan for the San Diego Region. Prepared by Moffatt & Nichol. March.

Space and Naval Warfare Systems Center (SSC) Pacific. 2011a. Personal communication via email with M. Xitco, SPAWARSYSCEN—PACIFIC, regarding procedures and equipment to be used in relocating the marine mammals. April.

_____ . 2011b. M. Xitco, SPAWARSYSCEN—PACIFIC response to comments on Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151) Draft Environmental Assessment. May 2011. Comments submitted to L. Seneca, NAVFAC Southwest. 13 June.

_____ . 2012. Personal communication via email with M. Xitco, SPAWARSYSCEN—PACIFIC regarding a temporary Security Zone for NMAWC for the P-151 fuel pier replacement project. June.

Terra Costa Consulting Group, Inc. 2010. Limited Geotechnical Study Defense Logistics Agency Project Documentation for P-151. Prepared for Moffatt & Nichol-Blaylock. 15 January.

Tierra Data, Inc. (TDI). 2012a. Sediment Grain Size Distribution and Mean Grain Size - Offshore Disposal Sites compared to Pier 180 Dredging Site. 18 April.

_____ . 2012b. Marine Mammal Surveys, February-April 2012. Unpublished data. Prepared under contract to NAVFAC SW.

U.S. Army Corps of Engineers (USACE). 2012. Final Supplemental Environmental Assessment San Diego Harbor Maintenance Dredging Project San Diego County, California. 28 June.

U.S. Coast Guard (USCG). 2012. Personal communication via email from CDR J Smith, Assistant Sector Air Response Chief/Air Operations Officer San Diego. July.

U.S. Environmental Protection Agency (USEPA). 2011. Personal communication via email from J. Campopiano, Environmental Scientist, Wetlands Office United States Environmental Protection Agency- Region 9 Southern California Field Office, Los Angeles, to R.R. Smith, Jr. Environmental Engineer/Civil Engineer Regulatory Project Manager USACE Carlsbad Field Office, San Diego, and L. Seneca, NAVFAC Southwest Coastal IPT. Subject: FW: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - USEPA. 20 April.

U.S. Navy (Navy). 2007. Final Environmental Assessment (MILCON P-401) Replace Fuel Storage Tanks and Facilities, Naval Base Point Loma, San Diego, California. November.

_____ . 2010a. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Naval Base Point Loma, DFSP, NAVSUP FLC, and San Diego, California. January.

_____ . 2010b. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Appendix F Structural Evaluation and Seismic Analysis. Naval Base Point Loma, DFSP, NAVSUP FLC, San Diego, California. January.

_____ . 2010c. Personal communications via comments on the Draft DOPAA with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director. November – December.

_____ . 2010d. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Appendix C Hazardous Materials Survey Fuel Pier and Buildings 110 and 140. Prepared by Ninyo and Moore 22 December 2009. Naval Base Point Loma, DFSP, NAVSUP FLC, and San Diego, California. January.

_____ . 2010e. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Appendix H Cost Estimate Success. Prepared Moffett Nichol-Blaylock. January.

_____ . 2010f. Attachment D Dredging Study Replace Fuel Pier NBPL DFSP NAVSUP FLC San Diego. MILCON P-151.

_____ . 2011. Final Silver Strand Training Complex Environmental Impact Statement. January.

_____ . 2012a. Personal communication via interview with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding proposed fuel pier construction schedule and fuel pier operational downtime. May.

_____ . 2012b. Personal communication via email with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding personnel requirements for the existing and replacement fuel pier, 23 March.

_____ . 2012c. Personal communication via email with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding security zone distance for the replacement fuel pier,19 June.

_____ . 2012d. Personal communication via comments on the April 2012 Draft DOPAA Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151-DESC1306) Environmental Assessment from S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding MOTEMS conformance repairs for the existing fuel pier. April.

U.S. Pacific Fleet. 2009-2012. Marine Mammal Surveys of North San Diego Bay (24 June 2009; 13 October 2009; 16 February 2010; 12 April 2010; 13 November 2010; 28 March 2012). Unpublished data and reports prepared by Chip Johnson, Space and Naval Warfare Systems Command.

Resources Not Carried Forward

California State Historic Preservation Officer (CASHPO). 2005. Letter of concurrence from Milford Wayne Donaldson to P. A. Kennedy Environmental Program Manager, Commander of the Navy Region SW, regarding the ineligibility of the NAVSUP FLC (DFSP) Fuel Cantonment District for the National Register. Navy correspondence reference no. USN050110A. 8 December.

Everingham Brothers Bait Company. 2012. Personal communication via email with B. Everingham regarding lighting on the bait barges. November.

KEA Environmental. 1997 (Rebecca Allen, *et al*.) Historic and Archeological Resources Protection Plan, Appendix C Archeological and Architectural Survey for the Fleet Anti-Submarine Warfare Training Center, Pacific, San Diego, California.

National Oceanic and Atmospheric Administration (NOAA) 2012a. NOAA'S National Marine Fisheries Service. Southwest Regional Office-Protected Resources Division. Questions and Answers Regarding the Potential Deterrence of Pacific Harbor Seals, and California Sea Lions from Fishing Gear, Catch, and Property. Website accessed 5 September 2012. http://swr.nmfs.noaa.gov/deter/index.htm

_____ . 2012b. Personal communication with M. DeAngelis, Marine Mammal Specialist, Southwest Regional Office Protected Resources Division re: deterrence of marine mammals by private citizens. 11 September.

Naval Facilities Engineering Command (NAVFAC). 2009a. Site Specific Report. Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response. Naval Base Point Loma. November.

_____ . 2009b. NAVFAC P-307. Management of Weight Handling Equipment. Navy Crane Center. December. Website accessed 30 March 2011 https://portal.navfac.navy.mil/portal/page/portal/docs/doc_store_pub/p-307%20december%202009.pdf

NAVFAC Southwest. 2008. Personal communication with A. Yatsko, NBSD Cultural Resources Program Manager. January.

_____ . 2011a. FY 2013 MILCON P-151Replace Fuel Pier, Naval Base Point Loma, San Diego, CA. Revised 35 percent Submittal. Basis of Design. 5 August.

_____ . 2011b. Personal communication via email regarding preconstruction requirements for NAVFAC contractors with C. Reyes PE Construction Manager FEAD Point Loma. March.

_____ . 2012. Personal communication via telephone and email with A. Yatsko, NBSD Cultural Resources Program Manager, regarding historical and archaeological potential for the onshore excavation areas of the fuel pier replacement project site at Naval Base Point Loma. May.

Navy Region Southwest (NRSW). 2003. Programmatic Agreement Among the Commander Navy Region Southwest, the Advisory Council on Historic Preservation, and the California State Historic Preservation Officer Regarding Navy Region Southwest Undertakings with the San Diego Metropolitan Area, California. February.

_____ . 2012. Personal communication via email with J. Beaty. Region Program Director (N31)COMNAVREG SW Port Operations. regarding proposed temporary relocation of the Everingham Brothers Bait Company San Diego Bay bait barges to locations 4, 4A, and 6 south and southeast of Harbor Island. May.

Schmidt, Andrew and D. S. Byrd. 2004. Evaluation of Eligibility for the National Register of Historic Places NAVSUP FLC (DFSP) Point Loma, San Diego. Prepared for Commander Navy Region SW Environmental Department, Operations Division, San Diego, California. Natural and Cultural Resources Office by Jones & Stokes, Irvine, California. May.

Terra Costa Consulting Group, Inc. 2010. Limited Geotechnical Study Defense Logistics Agency Project Documentation for P-151. Prepared for Moffatt Nichol Blaylock. 15 January.

U.S. Army Corps of Engineers (USACE). 2008. EM 385-1-1. Safety and Health Requirements Manual. 15 September. Website accessed 30 March 2011 http://140.194.76.129/publications/eng-manuals/em385-1-1/2008_English/entire_2008_English.pdf

U.S. Coast Guard (USCG). 2012a. Personal communication via email from CDR J. Smith, Assistant Sector Air Response Chief/Air Operations Officer San Diego. October.

_____ . 2012b. Personal communication re: navigational aids via email from MST1 D Metzger, U.S. Coast Guard Sector San Diego Marine Events. October.

U.S. Navy (Navy). 2011. Final Silver Strand Training Complex Environmental Impact Statement. January.

_____ . 2012. Personal communication via email with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding security zone distance for the replacement fuel pier,19 June.

Biological Resource Habitats and Communities

Allen, L.G., A.M. Findlay, and C.M. Phalen. 2002. Structure and Standing Stock of the Fish Assemblages of San Diego Bay, California from 1994-1999. Bulletin of the Southern California Academy of Sciences 101:49-85.

Bay, S.M., D. Lapota, J. Anderson, J. Armstrong, T. Mikel, A.W. Jirik, and S. Asato. 2000. Southern California Bight 1998 Regional Monitoring Program: IV. Sediment Toxicity. Southern California Coastal Water Research Project. Westminster, CA. December 20. Available online at ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/339_bight98sedtoxrpt.pdf.

City of Encinitas, City of Solana Beach, City of Coronado, and City of Imperial Beach. 2008. Final Mitigated Negative Declaration for the Opportunistic Beach Fill Program in the Cities of Encinitas, Solana Beach, Coronado, and Imperial Beach. Prepared by EDAW, Inc. for Moffatt and Nichol. May.

Merkel & Associates, Inc. 2009. 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update. January.

National Marine Fisheries Service (NMFS). 2008. Caulerpa Control Protocol version 4- February 25, 2008. Available online at: http://swr.nmfs.noaa.gov/hcd/caulerpa/ccp.pdf.

Naval Facilities Engineering Command (NAVFAC) Southwest. 1994. Waterbird Survey: North and Central San Diego Bay, 1993. Project No. 211601000. May 20.

_____. 2000. San Diego Bay Integrated Natural Resources Management Plan, and San Diego Unified Port District. San Diego, CA. September.

_____. 2002. Naval Base Point Loma Integrated Natural Resources Management Plan. Naval Facilities Engineering Command, San Diego, California. July.

_____. 2008. Evaluation of Temporal and Spatial changes of Eelgrass (Zostera marina) within San Diego Bay using Permanent Transects. Prepared by Tierra Data Inc. February

_____. 2010. Characterization of Essential Fish Habitat in San Diego Bay. PHASE II: Qualitative Habitat Characterization and Mapping Report. Coastal IPT. Prepared by Merkel & Associates, Inc. September.

_____. 2011. Silver Strand Training Complex Environmental Impact Statement. United States Navy Pacific Fleet. January.

NAVFAC Southwest and Port of San Diego. 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft November 2011. San Diego, California. Prepared by Tierra Data Inc., Escondido, California.

North, W.J. and MBC Applied Environmental Sciences. 2001. Status of the Kelp Beds of San Diego and Orange Counties for the Years 1990 to 2000. Prepared for the Region Nine Kelp Survey Consortium.

Reine, K. and Clarke, D. 1998. Entrainment by hydraulic dredges – A review of potential impacts. Technical Note DOER-E1. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

San Diego Association of Governments (SANDAG) and U.S. Army Corps of Engineers. 2011. Revised Environmental Assessment/Final Environmental Impact Report for the San Diego Regional Beach Sand Project II.

Tierra Data, Inc. (TDI). 2007. Biological Resource Surveys: Naval Base Point Loma Fleet and Industrial Supply Center Fuel Farm. San Diego, CA. October.

_____. 2011. San Diego Bay Avian Species Surveys, 2009-2010. Final, May. Prepared for Naval Base Coronado and San Diego Unified Port District.

United States Army Corps of Engineers (USACE). 2009. Final Environmental Assessment for the San Diego harbor Maintenance Dredging Project, San Diego County, California. South Pacific Division; Los Angeles District. March.

Vantuna Research Group. 2006. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2005. Moore Laboratory of Zoology. Occidental College. February. 103 pp.

_____. 2009. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2008. Moore Laboratory of Zoology. Occidental College. February. 74 pp.

Fish

Allen, L. G. and D.J. Pondella II. 2006. Surf zone, coastal pelagic zone, and harbors. Pages 149-166 *in* Allen, L.G., D.J. Pondella II, and M.H. Horn (eds.). The ecology of marine fishes, California and adjacent waters. University of California Press.

Allen, L.G., A.M. Findlay, and C.M. Phalen. 2002. Structure and Standing Stock of the Fish Assemblages of San Diego Bay, California from 1994-1999. Bulletin of the Southern California Academy of Sciences 101:49-85.

California Department of Transportation (Caltrans). 2009. Final Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. February.

_____. 2010. Mad River Bridges Replacement Project Effects of Pile Driving Sound on Juvenile Steelhead. 24 March.

Dahl, P. 2012. Principal Engineer and Professor, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle. Email to M. Dungan, 7 May.

Fisheries Hydroacoustics Working Group. 2008. Memorandum: Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. Signed by NOAA's Fisheries Northwest and Southwest Regions, U.S. Fish and Wildlife Service Regions 1 and 8, California/Washington/Oregon Departments of Transportation, California Department of Fish and Wildlife, and the U.S. Federal Highway Administration. Available online at http://www.wsdot.wa.gov/NR/rdonlyres/4019ED62-B403-489C-AF05-5F4713D663C9/0/BA_InterimCriteriaAgree.pdf.

Hastings, M. C. and Popper, A. N. 2005. Effects of sound on fish. California Department of Transportation Contract 43A0139 Task Order, 1.

Halverson, M.B., B.M. Casper, C.M. Woodley, T.J. Carlson, and A.N. Popper. 2011. Predicting and mitigating hydroacoustic impacts on fish from pile installations. NCHRP Research Results Digest 363, Project 25-28, National Cooperative Highway Research Program, Transportation Research Board, National Academy of Sciences, Washington, D.C. Online at http://www.trb.org/Publications/Blurbs/166159.aspx.

Kipple, B.M. and C.M. Gabriele. 2007. Underwater noise from skiffs to ships in Piatt, J.F. and Gende, S.M., eds, Proceedings of the Fourth Glacier Bay Science Symposium, October 26-28, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5047, p. 172-175.

Merkel & Associates, Inc. 2009. 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update. January.

National Marine Fisheries Service (NMFS). 2010. Takes of Marine Mammals Incidental to Specified Activities; Piling and Structure Removal in Woodard Bay Natural Resources Conservation Area, Washington. Federal Register 75:48941-48947. 12 August.

Naval Facilities Engineering Command (NAVFAC) Southwest. 2000. San Diego Bay Integrated Natural Resources Management Plan, and San Diego Unified Port District. San Diego, CA. September.

_____. 2010. Characterization of Essential Fish Habitat in San Diego Bay. PHASE II: Qualitative Habitat Characterization and Mapping Report. Coastal IPT. Prepared by Merkel & Associates, Inc. September.

_____. 2011. Silver Strand Training Complex Environmental Impact Statement. United States Navy Pacific Fleet. January.

_____. 2012. 2011 Eelgrass and Bathymetry Survey GIS Data.

NAVFAC Southwest and Port of San Diego. 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft November 2011. San Diego, California. Prepared by Tierra Data Inc., Escondido, California.

Pacific Fishery Management Council (PFMC). 1998a. Essential Fish Habitat Coastal Pelagic Species. Modified from: Coastal Pelagics Species Fishery Management Plan [Amendment 8 to the Northern Anchovy Fishery Management Plan]; Pacific Fishery Management Council, Portland, OR.

_____. 1998b. The Coast Pelagic Fishery Management Plan. Pacific Management Fishery Council. 2130 SW Fifth Avenue, Suite 224, Portland, Oregon. http://www.pcouncil.org/cps/cpsfmp.html

_____. 2011. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon and Washington Groundfish Fishery, PFMC, Portland, OR. July. Available online at http://www.pcouncil.org/groundfish/fishery-management-plan/.

Popper, A.N. and M. C. Hastings. 2009. The effects of anthropogenic sources of sound on fishes. Journal of Fish Biology. 75:455-488.

San Diego Harbor Safety Committee. 2009. San Diego Harbor Safety Plan (Approved May 2009). Available online at: http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=38917.

Tierra Data, Inc. (TDI). 2011. San Diego Bay Avian Species Surveys, 2009-2010. Final, May. Prepared for Naval Base Coronado and San Diego Unified Port District.

U.S. Army Corps of Engineers (USACE). 2012. San Diego Harbor Maintenance Dredging Project, San Diego County, California. Final Supplemental Environmental Assessment. June.

Vantuna Research Group. 2006. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2005. Moore Laboratory of Zoology. Occidental College. February. 103 pp.

_____. 2009. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2008. Moore Laboratory of Zoology. Occidental College. February. 74 pp.

Washington State Department of Transportation (WSDOT). 2010. Keystone Ferry Terminal – vibratory pile monitoring technical memorandum. May 2010.

_____. 2012. Columbia River Crossing Test Pile Project Vibratory Extraction Sound Levels. Prepared by J. Coleman, David Evans and Associates, Inc. 1 August 2011.

Birds

Naval Facilities Engineering Command (NAVFAC) Southwest. 2011. Silver Strand Training Complex Environmental Impact Statement. United States Navy Pacific Fleet. January.

NAVFAC Southwest and Port of San Diego. 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft November 2011. San Diego, California. Prepared by Tierra Data Inc., Escondido, California.

San Diego Association of Governments (SANDAG) and U.S. Army Corps of Engineers. 2011. Revised Environmental Assessment/Final Environmental Impact Report for the San Diego Regional Beach Sand Project II.

Saunders, J. & Dooling, R. (1974). Noise-Induced Threshold Shift in the Parakeet (Melopsittacus undulatus). Proc Natl Acad Sci U S A, 71(5), 1962-1965.

Tierra Data, Inc. (TDI). 2011. San Diego Bay Avian Species Surveys, 2009-2010. Final, May. Prepared for Naval Base Coronado and San Diego Unified Port District.

Marine Mammals

Allen. B.M., and R. P. Angliss. 2010. Alaska Marine Mammal Stock Assessments, 2009. U.S. Dep. Commer., NOAA Technical Memorandum NMFS-AFSC-206, 276 p.

Allen, L.G., D. Pondella II, and M.H. Horn (eds). 2006. The Ecology of Marine Fishes –California and Adjacent Waters. University of California Press, Los Angeles. 660 pp.

American National Standards Institute (ANSI). 1986. Methods for measurement of impulse noise (ANSI S12.7-1986). New York: Acoustical Society of America.

Angliss, R.P. and R.B. Outlaw. 2008. Final Alaska marine mammal stock assessments 2007. NOAA Technical Memorandum NMFS-AFSC-180:1-253.

Antonelis, G.A., Jr., B.S. Stewart, and W.F. Perryman. 1990. Breeding characteristics of female northern fur seals (Callorhinus ursinus) and California sea lions (Zalophus californianus). Canadian Journal of Zoology 68:150-158.

Au, W.W.L. 1993. The sonar of dolphins. Springer-Verlag, New York. 277 pp.

_____ . 2000. Hearing in whales and dolphins: An overview. Pages 1-42 in Au, W.W.L., A.N. Popper, and R.R. Fay, eds. Hearing by whales and dolphins. New York, New York: Springer-Verlag.

Bailey, H., B. Senior, D. Simmons, J. Rusin, G. Picken, and P.M. Thompson. 2010. Assessing underwater noise levels during pile-driving at an offshore windfarm and its potential effects on marine mammals. Marine Pollution Bulletin 60:888-897.

Bearzi, M., C.A. Saylan, and A. Hwang. 2009. Ecology and comparison of coastal and offshore bottlenose dolphins (Tursiops truncatus) in California. Marine and Freshwater Research 60:584-593.

Bigg, M.A. 1981. Harbour seal Phoca vitulina Linnaeus, 1758 and Phoca largha Pallas, 1811. Pages 1-27 IN: S.H. Ridgway and R. Harrison, eds. Handbook of marine mammals, Volume 2: Seals. San Diego: Academic Press.

Blackwell, S.B. and C.R. Greene, Jr. 2002. Acoustic measurements in Cook Inlet, Alaska during August 2001. Greeneridge Report 271-2. Report from Greeneridge Sciences, Inc., Santa Barbara for National Marine Fisheries Service, Anchorage, AK. 43 p.

Blackwell, S.B., J.W. Lawson, and M.T. Williams. 2004. Tolerance by ringed seals (Phoca hispida) to impact pipe-driving and construction sounds at an oil production island. Journal of the Acoustical Society of America. 115(5): 2346-2357

Bonnell, M.L. and M.D. Dailey. 1993. Marine mammals. Pages 604-681 in Dailey, M.D., D.J. Reish, and J.W. Anderson, eds. Ecology of the Southern California Bight: A synthesis and interpretation. Berkeley, California: University of California Press.

Braham, H.W. 1984. Distribution and migration of gray whales in Alaska. Pages 249-266 in Jones, M.L., S.L. Swartz, and S. Leatherwood, eds. The gray whale Eschrichtius robustus. San Diego, California: Academic Press.

Brandt, M.J., A. Diederichs, K. Betke, and G. Nehls. 2011. Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. Marine Ecology Progress Series 421: 205–216. 17 January.

Calambokidis, J., G.H. Steiger, and J.C. Cubbage. 1987. Marine mammals in the southwestern Strait of Juan de Fuca: Natural history and potential impacts of harbor development in Neah Bay. Contract number DACW67-85-M-0046 Prepared for Seattle District Army Corps of Engineers, Seattle, Washington by Cascadia Research Collective, Olympia, Washington.

Calambokidis, J., J.D. Darling, V. Deecke, P. Gearin, M. Gosho, W. Megill, C.M. Tombach, D. Goley, C. Toropova, and B. Gisborne. 2002. Abundance, range and movements of a feeding aggregation of gray whales (Eschrichtius robustus) from California to southeastern Alaska in 1998. Journal of Cetacean Research and Management 4(3):267-276.

California Department of Transportation (Caltrans). 2001. Marine Mammal Impact Assessment for the San Francisco- Oakland Bay Bridge Pile Installation Demonstration Project. PIDP EA 012081

_____. 2006. Marine mammals and acoustic monitoring for the marine foundations at piers E2 and T1. January - September 2006. San Francisco - Oakland Bay Bridge East Span Seismic Safety Project. Contract No. 04-SF-80 KP 12.2/KP 14.3, 04-ALA-80 KP 0.0/KP 2.1. Prepared by SRS Technologies and Illingworth and Rodkin, Inc. Prepared for California Department of Transportation.

_____. 2007. Compendium of Pile Driving Sound Data. Report. Published Sept. 27, 2007.

_____. 2009. Final Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. February.

Carretta, J.V., M.S. Lowry, C.E. Stincomb, M.S. Lynn, and R.E. Cosgrove. 2000. Distribution and abundance of marine mammals at San Clemente Island and surrounding offshore waters: Results from aerial and ground surveys in 1998 and 1999. NMFS- SWFSC Administrative Report LJ-00-02:1-43.

Carretta, J.V., K.A. Forney, E. Oleson, K. Martien, M.M. Muto, M.S. Lowry., J. Barlow, J. Baker, B. Hanson, D. Lynch, L. Carswell, R. Brownell, J. Robbins, D.K. Mattila, K. Ralls, and M.C. Hill. 2012. U.S. Pacific Marine Mammal Stock Assessments: 2011. NOAA Technical Memorandum NMFS-SWFSC-488.

Chapman, C.J. and A.D. Hawkins. 1969. The importance of fish behaviour in relation to capture by trawls. FAO Fisheries Report 62(3): 717-729.

Crane, N.L. and K. Lashkari. 1996. Sound production of gray whales, Eschrichtius robustus, along their migration route: A new approach to signal analysis. Journal of the Acoustical Society of America 100(3):1878-1886.

Cummings, W.C. and P.O. Thompson. 1971. Gray whales, Eschrichtius robustus, avoid the underwater sounds of killer whales, Orcinus orca. Fishery Bulletin 69(3):525-530.

Cummings, W.C., P.O. Thompson, and R. Cook. 1968. Underwater sounds of migrating gray whales, Eschrichtius glaucus (Cope). Journal of the Acoustical Society of America 44(5):1278-1281.

Dahl, P. 2012. Principal Engineer and Professor, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle. Email to M. Dungan, 7 May.

Dahlheim, M.E. and D.K. Ljungblad. 1990. Preliminary hearing study on gray whales (Eschrichtius robustus) in the field. Pages 335-346 in Thomas, J. and R. Kastelein, eds. Sensory abilities of cetaceans: Laboratory and field evidence. New York, New York and London, England: Plenum Press.

Dahlheim, M.E., H.D. Fisher, and J.D. Schempp. 1984. Sound production by the gray whale and ambient noise levels in Laguna San Ignacio, Baja California Sur, Mexico. Pages 511-541 in Jones, M.L., S.L. Swartz, and S. Leatherwood, eds. The gray whale Eschrichtius robustus. San Diego, California: Academic Press.

Defran, R.H., D.L. Kelley, G.M. Shultz, A.C. Weaver, and M.A. Espinoza. 1986. The occurrence and movements of the bottlenose dolphin in the Southern California Bight. National Marine Fisheries Service Administrative Report LJ-86-36C. National Marine Fisheries Service, La Jolla, CA.

Defran, R.H. and D.W. Weller. 1999. Occurrence, distribution, site fidelity, and school size of bottlenose dolphins (Tursiops truncatus) off San Diego, California. Marine Mammal Science 15(2):381-393.

Defran, R.H., D.W. Weller, D.L. Kelly, and M.A. Espinosa. 1999. Range characteristics of Pacific Coast bottlenose dolphins (Tursiops Truncatus) in the Southern California Bight. Marine Mammal Science, 15(2):381-393. April.

Finneran, J.J. and A.K. Jenkins. 2012. Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis. SPAWAR Systems Center Pacific. April. Finneran, J.J., C.E. Schlundt, R. Dear, D.A. Carder, and S.H. Ridgway. 2002. Temporary shift in masked hearing thresholds (MTTS) in odontocetes after exposure to single underwater impulses from a seismic water gun. Journal of the Acoustical Society of America. 111: 2929-2940.

Finneran, J.J., R. Dear, D.A. Carder, and S.H. Ridgway. 2003. Auditory and behavioral responses of California sea lions (Zalophus californianus) to single underwater impulses from an arc-gap transducer. Journal of the Acoustical Society of America. 114(3): 1667-1677.

Finneran, J. J., D. A. Carder, C. E. Schlundt, and S. H. Ridgway, 2005. Temporary threshold shift in bottlenose dolphins (Tursiops truncatus) exposed to mid- frequency tones. Journal of the Acoustical Society of America 118:2696–2705.

Finneran, J.J. and D.S. Houser. 2006. Comparison of in-air evoked potential and underwater behavioral hearing thresholds in four bottlenose dolphins (Tursiops truncatus). Journal of the Acoustical Society of America 119(5):3181-3192.

Finneran, J.J. and D.S. Houser. 2007. Bottlenose dolphin (Tursiops truncatus) steady-state evoked responses to multiple simultaneous sinusoidal amplitude modulated tones. Journal of the Acoustical Society of America 121(3): 1775-1782. March.

Gailey, G., B. Wursig, and T.L. McDonald. 2007. Abundance, behavior, and movement patterns of western gray whales in relation to a 3-D seismic survey, Northeast Sakhalin Island, Russia. Environmental Monitoring and Assessment 134(1-3):75-91.

Gordon, J., D. Gillespie, J. Potter, A. Frantzis, M.P. Simmonds, R. Swift, and D. Thompson. 2004. A review of the effects of seismic surveys on marine mammals. Marine Technology Society Journal. 37: 16-34.

Govoni, J.J., L.R. Settle, and M.A. West. 2003. Trauma to juvenile pinfish and spot inflicted by submarine detonations. Journal of Aquatic Animal Health 15:111-119.

Hanggi, E.B. and R.J. Schusterman. 1994. Underwater acoustic displays and individual variation in male harbour seals, Phoca vitulina. Animal Behaviour 48:1275-1283

Hanni, K.D. and D.J. Long. 1995. Food habits of California sea lions at a newly established haulout in San Francisco Bay. Abstract in Eleventh Biennial Conference on the Biology of Marine Mammals, Dec. 14–18, Orlando, FL.

Hanser, S., E. Becker, and A. Kumar. 2012. Pacific Navy Marine Species Density Database. NAVFAC Pacific Technical Report. Available online at http://hstteis.com/Portals/0/hstteis/SupportingTechnicalDocs/HSTT_NMSDD_Technical_Report_4_May_2012%20no%20line%20numbers.pdf.

Hanson, M.T. and R.H. Defran. 1993. The behavior and feeding ecology of the Pacific coast bottlenose dolphin. Aquatic Mammals 19:127-142.

Harris. C.M. 1998. Handbook of acoustical measurements and noise control (3rd Edition). Huntington, NY: Acoustical Society of America.

Harvey, J.T. and B.R. Mate. 1984. Dive characteristics and movements of radio-tagged gray whales in San Ignacio Lagoon, Baja California Sur, Mexico. Pages 561-575 in Jones, M.L., S.L. Swartz, and S. Leatherwood, eds. The gray whale Eschrichtius robustus. San Diego, California: Academic Press.

Hastings, M. C. 1990. Effects of Underwater Sound on Fish. Document No. 46254-900206-01IM. Project No. 401775-1600, ATandT Bell Laboratories.

_____ . 2007. Calculation of SEL for Govoni *et al.* (2003, 2007) and Popper *et al.* (2007) Studies. Report for Amendment to Project 15218, JandS Working Group, 14 December 2007. 7 pp.

Hastings, M.C. and A.N. Popper. 2005. Effects of Sound on Fish. Report prepared by Jones and Stokes for California Department of Transportation, Contract No. 43A0139, Task Order 1.

Hawkins, A. 2005. Assessing the impact of pile driving upon fish. UC Davis: Road Ecology Center. Retrieved from: http://www.escholarship.org/uc/item/28n858z1

Henry, A.E., B.S. Stewart, and P.K. Yokem. 1995. Dynamics of dietary overlap between California sea lions and harbor seals near San Nicolas Island, California. Abstract in Eleventh Annual Conference on the Biology of Marine Mammals, Dec. 14–18, Orlando, FL.

Holcomb, K., J.K. Young, and L.R. Gerber. 2009. The influence of human disturbance on California sea lions during the breeding season. Animal Conservation 12:592-598.

Holt, M.M. 2008. Sound exposure and Southern Resident killer whales (Orcinus orca): A review of current knowledge and data gaps. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-89, 59 p. Available online at: http://www.nwfsc.noaa.gov/assets/25/6741_03042008_154832_OrcaSoundExposureTM89Final.pdf

Jenkins, K. 2012. Navy Marine Resource Specialist, SPAWAR Systems Center Pacific, San Diego. Email to M. Dungan. 22 May.

Jones, M.L. and S.L. Swartz. 2002. Gray whale Eschrichtius robustus. Pages 524-536 in Perrin, W.F., B. Würsig, and J.G.M. Thewissen, eds. Encyclopedia of marine mammals. San Diego, California: Academic Press.

Kastak, D. and R.J. Schusterman. 1998. Low-frequency amphibious hearing in pinnipeds: methods, measurements, noise, and ecology. Journal of the Acoustical Society of America 103(4):2216-2228.

_____ . 2002. Changes in auditory sensitivity with depth in a free-diving California sea lion (Zalophus californianus). Journal of the Acoustical Society of America 112(1):329-333.

Kastak, D., R.J. Schusterman, B.L. Southall and C.J. Reichmuth. 1999. Underwater temporary threshold shift induced by octave-band noise in three species of pinniped. Journal of the Acoustic Society of America. 106(2):1142-1148.

Ketten, D.R. 1992. The marine mammal ear: specializations for aquatic audition and echolocation. Pages 717-750 in D. Webster, R. Fay, and A. Popper, eds. The evolutionary biology of hearing. Springer-Verlag, Berlin.

_____ . 1995. Estimates of blast injury and acoustic trauma zones for marine mammals from underwater explosions. Pp. 391-407. In: R.A. Kastelein, J.A. Thomas, and P.E. Nachtigall (eds.). Sensory Systems of Aquatic Mammals. Woerden, The Netherlands: De Spil Publishers.

_____ . 1998. Marine mammal auditory systems: A summary of audiometric and anatomical data and its implications for underwater acoustic impacts. NOAA Technical Memorandum NMFS-SWFSC-256:1-74.

_____ . 2000. Cetacean ears. Pp. 43-108. In: W.W.L. Au, A.N. Popper, and R.R. Fay (eds.). Hearing by Whales and Dolphins. New York: Springer-Verlag. Krahn, M.M., M.J. Ford, W.F. Perrin, P.R. Wade, R.P. Angliss, M.B. Hanson, B.L.

Leatherwood, J.S. 1974. Aerial observations of migrating gray whales, Eschrichtius robustus, off southern California, 1969-72. Marine Fisheries Review 36(4):45-49.

Longmuir, C. and T. Lively. 2001. Bubble curtain systems for use during marine pile driving. Report by Fraser River Pile and Dredge Ltd., New Westminster, BC.

Lowry, M.S., C.W. Oliver, C. Macky, and J.B. Wexler. 1990. Food habits of California sea lions Zalophus californianus at San Clemente Island, California, 1981-86. Fishery Bulletin 88(3): 509-521.

Lowry, M.S., B.S. Stewart, C.B. Heath, P.K. Yochem, and J.M. Francis. 1991. Seasonal and annual variability in the diet of California sea lions Zalophus californianus at San Nicolas Island, California, 1981-86. Fishery Bulletin 89:331-336.

Malcolm, C.D., and D.A. Duffus. 2000. Subjective and statistical analysis of dive data from a TDR attached to a gray whale (Eschrichitius robustus). Journal of Cetecean Research and Management 2(3):177-182.

Malcolm, C.D., D.A. Duffus, and S.G. Wishniowski. 1996. Small scale behavior of large subjects: diving behavior of a grey whale. Western Geography. 5/6:35-44.

Malme, C.I., P.R. Miles, C.W. Clark, P.L. Tyack, and J.E. Bird. 1984. Investigations of the potential effects of underwater noise from petroleum industry activities on migrating gray whale behavior. Phase II, January 1984 migration. Prepared by Bolt, Beranek, and Newman, Cambridge, MA. Prepared for United States Minerals Management Service, Alaska, OCS Office, Anchorage, AK.

Malme, C.I., B. Wursig, J.E. Bird, and P.L. Tyack. 1986. Behavioral responses of gray whales to industrial noise: feeding observations and predictive modeling. Final Report, Outer Continental Shelf Environmental Assessment Program, Research Unit 675. Report No. 6265, BBN Laboratories Inc. August.

Marine Species Modeling Team. 2012. Determination of Acoustic Effects on Marine Mammals and Sea Turtles for the Hawaii-Southern California Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement. Naval Undersea Warfare Center Division Newport, Rhode Island. NUWC-NPT Technical Report 12,084. 12 March.

Mate, B.M. and J. Urbán-Ramirez. 2003. A note on the route and speed of a gray whale on its northern migration from Mexico to central California, tracked by satellite-monitored radio tag. Journal of Cetacean Research and Management 5(3):1-3.

Melin, S.R., R.L. DeLong, J. R. Thomason, and D.E. Valesquez. 1993. Breeding behavior of female California sea lions at San Miguel Island, California: winter 1992 and 1993. Abstract in Tenth Biennial Conference on the Biology of Marine Mammals, Nov.11–15, Galveston, TX.

Merkel & Associates, Inc. 2008. Marine Mammals Surveys in the Vicinity of the Point Loma Naval Complex, San Diego, California. Final Report. Prepared for NAVFAC SW. September.

Miller, G.W., R.E. Elliott, W.R. Koski, V.D. Moulton, and W.J. Richardson. 1999. Whales. In: Marine Mammal and Acoustical Monitoring of Western Geophysical's Open-Water Seismic Program in the Alaskan Beaufort Sea, 1998, LGL and Greeneridge, eds. LGL Report TA 2230-3. King City, Ont., Canada: LGL Ecological Research Associates, Inc., 109 pp.

Moore, S.E. and J.T. Clarke. 2002. Potential impact of offshore human activities on gray whales (Eschrichtius robustus). Journal of Cetacean Research and Management 4(1):19-25.

Moore, S.E., K.M. Wynne, J.C. Kinney, and J.M. Grebmeier. 2007. Gray whale occurrence and forage southeast of Kodiak, Island, Alaska. Marine Mammal Science 23(2):419-428. DOI: 410.1111/j.1748-7692.2007.00102.x.

Morton, A.B., and H.K. Symonds. 2002. Displacement of Orcinus orca (L.) by high amplitude sound in British Columbia, Canada. ICES Journal of Marine Science. 59: 71-80.

Moulton, V. D., Richardson, W. J., Elliott, R. E., McDonald, T. L., Nations, C., and Williams, M. T. 2005. Effects of an offshore oil development on local abundance and distribution of ringed seals (Phoca hispida) of the Alaskan Beaufort Sea. Marine Mammal Science, 21, 217-242.

Nachtigall, P.E., D.W. Lemonds, and H.L. Roitblat. 2000. Psychoacoustic studies of dolphins and whales. Pages 330-363 in Hearing by Dolphins and Whales. W.W.L. Au, A.N. Popper, and R.R. Fay, eds. Springer-Verlag, New York.

Nachtigall, P.E., J.L. Pawloski, and W.W.L. Au. 2003. Temporary threshold shift and recovery following noise exposure in the Atlantic bottlenose dolphin (Tursiops truncatus). Journal of the Acoustical Society of America 113:3425-3429.

Nachtigall, P.E., A.Supin, J.L. Pawloski, and W.W.L. Au. 2004. Temporary threshold shift after noise exposure in bottlenose dolphin (Tursiops truncatus) measured using evoked auditory potential. Marine Mammal Science 20:673-687.

National Marine Fisheries Service (NMFS). 2005. Endangered Fish and Wildlife; Notice of intent to prepare an environmental impact statement. 70 FR 1871.

_____. 2008. Taking of marine mammals incidental to specified activities; construction of the east span of the San Francisco-Oakland Bay Bridge. 73 FR 38180, July 3, 2008.

_____. 2009. Taking of marine mammals incidental to specified activities; construction of the East Span of the San Francisco-Oakland Bay Bridge. 74 FR 41684.

_____. 2010. Takes of Marine Mammals Incidental to Specified Activities; Piling and Structure Removal in Woodard Bay Natural Resources Conservation Area, Washington. Federal Register 75:48941-48947. 12 August.

National Research Council. 2003. Ocean Noise and Marine Mammals. National Academies Press, Washington D.C. 192 pp.

Naval Facilities Engineering Command (NAVFAC) Southwest and Port of San Diego. 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft. San Diego, California. Prepared by Tierra Data Inc., Escondido, California. November.

Nedwell, J. and D. Howell. 2004. A review of offshore windfarm related underwater noise. Subacoustic Report. October.

Nowacek, D.P., L.H. Thorne, D.W. Johnston, and P.L. Tyack. 2007. Responses of cetaceans to anthropogenic noise. Mammal Review. 37(2): 81-115.

O'Keeffe, D.J. and G.A. Young. 1984. Handbook on the environmental effects of underwater explosions. Naval Surface Weapons Center, Dahlgren and Silver Spring, NSWC TR 83-240.

Oxman, D.S. 1993. Seasonal abundance, movements, and food habits of harbor seals in Elkhorn Slough, California. Abstract in Tenth Biennial Conference on the Biology of Marine Mammals, Nov. 11–15, Galveston, TX.

Pearson, W.H., J.R. Skalski, and C.I. Malme. 1992. Effects of sounds from a geophysical survey device on behavior of captive rockfish (Sebastes spp.). Canadian Journal of Fisheries and Aquatic Sciences 49: 1343-1356.

Perryman, W.L., M.A. Donahue, J.L. Laake, and T.E. Martin. 1999. Diel variation in migration rates of Eastern Pacific gray whales measured with thermal imaging sensors. Marine Mammal Science 15)2):426-445.

Poole, M.M. 1984. Migration corridors of gray whales along the central California coast, 1980-1982. Pp. 389-407. IN: M. L. Jones, S. L. Swartz, and S. Leatherwood (eds.), The Gray Whale, Eschrichtius robustus. Academic Press, Inc., Orlando. 600 pp.

Popper, A.N. and M. Hastings. 2009. The effects of human-generated sound on fish. Integrative Zoology 4: 43-52.

Popper, A.N., T.J. Carlson, B.L. Southall, and R.L. Gentry. 2006. Interim Criteria for Injury of Fish Exposed to Pile Driving Operations: A White Paper.

Reeder, D.M. and Kramer, K.M. 2005. Stress in free-ranging mammals: integrating physiology, ecology, and natural history. Journal of Mammology 86: 225-235.

Rice, D.W. and A.A. Wolman. 1971. The life history and ecology of the gray whale (Eschrichtius robustus). American Society of Mammalogists, Special Publication 3. Lawrence, Kansas: American Society of Mammalogists.

Rice, D.W., A.A. Wolman, and D.E. Withrow. 1981. Gray whales on the winter grounds in Baja California. Reports of the International Whaling Commission 31:477-489.

Richardson, W.J., G.R. Greene, Jr., C.I. Malme, and D.H. Thomson. 1995. Marine mammals and noise. San Diego, CA: Academic Press. 576 pp.

Ridgway, S.H. 2000. The auditory central nervous system of dolphins. Pages 273-293 in W.W.L. Au, A.N. Popper, and R.R. Fay, eds. Hearing by Whales and Dolphins. Springer Verlag, New York.

Ridgway, S.H., D.A. Carder, R.R. Smith, T. Kamolnick, C. E. Schlundt, and W. R. Elsberry, 1997. Behavioral responses and temporary shift in masked hearing threshold of bottlenose dolphins, Tursiops truncatus, to 1-second tones of 141 to 201 dB re 1 µPa. Technical Report 1751, Revision 1. San Diego, California: Naval Sea Systems Command.

Rugh, D.J. 1984. Census of gray whales at Unimak Pass, Alaska, November - December 1977 - 1979. Pages 225-248 in Jones, M.L., S.L. Swartz, and S. Leatherwood, eds. The gray whale Eschrichtius robustus. San Diego, California: Academic Press.

Rugh, D.J., K.E.W. Shelden, and A. Schulman-Janiger. 2001. Timing of the gray whale southbound migration. Journal of Cetacean Research and Management 3(1):31-39.

San Diego Bay Harbor Safety Committee. 2009. San Diego Harbor Safety Plan (Approved May 2009).

Schlundt, C.E., J.J. Finneran, D.A. Carder, and S.H. Ridgway. 2000. Temporary shift in masked hearing thresholds of bottlenose dolphins, Tursiops tuncatus, and white whale, Delphinapterous leucas, after exposure to intense tones. Journal of the Acoustical Society of America 107:3496-3508.

Schlundt, C.E., R.L. Dear, D.A. Carder, and J.J. Finneran. 2006. Growth and recovery of temporary threshold shifts in a dolphin exposed to mid-frequency tones with durations up to 128 s. Journal of the Acoustical Society of America 120:3227A.

Scholik, A.R. and H.Y. Yan. 2001. Effects of underwater noise on auditory sensitivity of a cyprinid fish. Hearing Research 152:17-24.

_____. 2002. The effects of noise on the auditory sensitivity of the bluegill sunfish, Lepomis macrochirus. Comp. Biochemical Physiology A 133:43-52.

Schusterman, R.J. 1974. Auditory sensitivity of a California sea lion to airborne sound. Journal of the Acoustical Society of America, 56:1248-1251.

_____. 1977. Temporal patterning in sea lion barking (Zalophus californianus). Behavioral Biology, 20:404-408.

Schusterman, R.J. and R.F. Balliet. 1969. Underwater barking by male sea lions (Zalophus californianus). Nature 222(5199):1179-1181.

Schusterman, R.J., R. Gentry, and J. Schmook. 1966. Underwater vocalization by sea lions: Social and mirror stimuli. Science 154(3748):540-542.

_____ . 1967. Underwater sound production by captive California sea lions. Zoologica, 52:21-2 4.

Schusterman, R.J., R.F. Balliet, and J. Nixon. 1972. Underwater audiogram of the California sea lion by the conditioned vocalization technique. Journal of the Experimental Analysis of Behavior, 17:339-350.

Shelden, K.E.W., D.J. Rugh, and A. Schulman-Janiger. 2004. Gray whales born north of Mexico: Indicator of recovery or consequence of regime shift? Ecological Applications 14(6):1789-1805.

Skalski, J.R., W.H. Pearson, and C.I. Malme. 1992. Effects of sounds from a geophysical survey device on catch-per-unit-effort in a hook-and-line fishery for rockfish (Sebastes spp.). Canadian Journal of Fisheries and Aquatic Sciences 49: 1357-1365.

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene, C.R. Jr., Kastak, D., Ketten, D.K., Miller, J.H., Nachtigall, P.E., Richardson, W.J., Thomas, J.A. and Tyack, P.L. 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Special Issue of Aquatic Mammals. 33(4): 412-522.

Stevick, P.T., B.J. McConnell, and P.S. Hammond. 2002. Patterns of movement. Pages 185-216 in Hoelzel, A.R., ed. Marine mammal biology: An evolutionary approach. Oxford, United Kingdom: Blackwell Science.

Stewart, B.S. and P.K. Yochem. 1985. Feeding habits of harbor seals at San Nicolas Island, California, 1980-1985. Abstract in Sixth Biennial Conference on the Biology of Marine Mammals, Nov. 22–26, Vancouver, BC.

_____ . 1994. Ecology of harbor seals in the Southern California Bight. Pages 123-134 in W.L. Halvorson and G.J. Meander, eds. Fourth Channel Islands Symposium: Update on the Status of Resources. Santa Barbara Museum of Natural History.

Sumich, J.L. 1984. Gray whales along the Oregon coast in summer, 1977-1980. Murrelet 65:33-40.

Terhune, J. and S. Turnbull. 1995. Variation in the psychometric functions and hearing thresholds of a harbour seal. Pages 81-93. IN: R.A. Kastelein, J.A. Thomas, and P.E. Nachtigall, eds. Sensory Systems of Aquatic Mammals. De Spil Publishers, Woerden, Netherlands.

Tershy, B.R. and D. Breese. 1991. Sightings and feeding of gray whales in the northern Gulf of California. Journal of Mammalogy 72(4):830-831.

Thomson, D. H. and W. J. Richardson. 1995. Marine mammal sounds. Pages 159-204 in Richardson, W. J., C. R. Greene, Jr., C. I. Malme, and D. H. Thomson, eds. Marine mammals and noise. San Diego: Academic Press.

Thompson, P., D. Lusseau, T. Barton, D. Simmons, J. Rusin, and H. Bailey. 2010. Assessing the responses of coastal cetaceans to the construction of offshore wind turbines. Marine Pollution Bulletin 60:1200-1208.

Tierra Data, Inc. (TDI). 2012. Marine Mammal Surveys, February-April 2012. Unpublished data. Prepared under contract to NAVFAC SW.

Turl, C.W. 1993. Low-frequency sound detection by a bottlenose dolphin. Journal of the Acoustical Society of North America 94(5):3006-3008.United States Army Corps of Engineers (USACE). 2010.

U.S. Navy (Navy). 2001. Shock trial of the WINSTON S. CHURCHILL (DDG 81): final environmental impact statement.

_____. 2010. Incidental Harassment Authorization Application for Navy Training Conducted within the Silver Strand Training Complex. Update #3, Submitted to NMFS Office of Protected Resources. 28 December.

_____. 2011. Silver Strand Training Complex Final Environmental Impact Statement. Commander, United States Navy Pacific Fleet. January.

U.S. Pacific Fleet. 2009-2012. Marine Mammal Surveys of North San Diego Bay (24 June 2009; 13 October 2009; 16 February 2010; 12 April 2010; 13 November 2010; 28 March 2012). Unpublished data and reports prepared by Chip Johnson, Space and Naval Warfare Systems Command.

Urbán-Ramírez, J., L. Rojas-Bracho, H. Pérez-Cortés, A. Gómez-Gallardo, S.L. Swartz, S. Ludwig, and R.L. Brownell, Jr. 2003. A review of gray whales (Eschrichtius robustus) on their wintering grounds in Mexican waters. Journal of Cetecean Research and Management 5(3):283-295.

Urick, Robert J. 1983. Principles of underwater sound. 3rd ed. New York: McGraw-Hill.

Van Parijs, S.M., P.J. Corkeron, J. Harvey, S.A. Hayes, D.K. Mellinger, P.A. Rouget, P.M. Thompson, M. Wahlberg, and K.M. Kovacs. 2003. Patterns in the vocalizations of male harbor seals. Journal of the Acoustical Society of America 113(6):3403-3410.

Viada, S.T., R.M. Hammer, R. Racca, D. Hannay, M.J. Thompson, B.B. Balcom, and N.W. Phillips. 2008. Review of potential impacts to sea turtles from underwater explosive removal of offshore structures. Environmental Impact Assessment. 28: 267-285.

Ward, W.D. 1997. Effects of high intensity sound. In M.J. Crocker (Ed.) Encyclopedia of acoustics, Volume III. (pp 1497-1507). New York: John Wiley and Sons.

Wartzok, D., A.N. Popper, J. Gordon and J. Merrill. 2003. Factors affecting the responses of marine mammals to acoustic disturbance. Marine Technology Society Journal 37(4):6-15.

Washington State Department of Transportation (WSDOT). 2007. Underwater sound levels associated with driving steel and concrete piles near the Mukilteo Ferry Terminal. March 2007.

_____. 2010. Keystone Ferry Terminal – vibratory pile monitoring technical memorandum. May 2010.

_____. 2012. Columbia River Crossing Test Pile Project Vibratory Extraction Sound Levels. Prepared by J. Coleman, David Evans and Associates, Inc. 1 August 2011.

Wells, R.S., L.J. Hansen, A. Baldridge, T.P. Dohl, D.L. Kelly, and R.H. Defran. 1990. Northward extension of the range of bottlenose dolphins along the California coast. Pages 421-431 in S. Leatherwood and R.R. Reeves, eds. The Bottlenose Dolphin. San Diego Academic Press, San Diego.

Wolski, L.F., R.C. Anderson, A.E. Bowles, and P.K. Yochem. 2003. Measuring hearing in the harbor seal (Phoca vitulina): Comparison of behavioral and auditory brainstem response techniques. Journal of the Acoustical Society of America 113(1):629-637.

Yelverton, J.T., D.R. Richmond, E.R. Fletcher, and R.K. Jones. 1973. Safe distances from underwater explosions for mammals and birds. Lovelace Foundation, Albuquerque, DNA 3114T. http://stinet.dtic.mil/cgibin/GetTRDoc?AD=AD766952andLocation=U2anddoc=GetTRDoc.pdf.

Threatened and Endangered Species

California Department of Fish and Wildlife (CDFW). 2011. California Least Tern Breeding Survey: 2010 Season. Final Report. Prepared by Daniel A. Marschalek, CDFW South Coast Region. Revised 18 July. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=59326.

Massey, B. W. and J. L. Atwood. 1985. Application of Ecological Information to Habitat Management for the California Least Tern. Report No. 7-1985. Prepared for the U.S. Department of the Interior, Fish and Wildlife Service, Laguna Niguel, California.

Naval Base Coronado (NBC). 2012. Naval Base Coronado Weekly Tern and Plover Report: 23 April through 29 April.

Naval Facilities Engineering Command (NAVFAC) Southwest. 2004. Navy. Memorandum of Understanding Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California, 2004.

NAVFAC Southwest and Port of San Diego. 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft November 2011. San Diego, California. Prepared by Tierra Data Inc., Escondido, California.

Navy Region SW. 2008. Executive Summary Memorandum from Christopher Stathos, Commander Navy Region SW N40, to RADM Hering, Regional Commander, Navy Region SW. 24 July.

Richter, K. E. 2012. Turtle Data for San Diego Bay – P-151 Fuel Pier Replacement. March 24.

U.S. Army Corps of Engineers (USACE). 2009. Final Environmental Assessment for the San Diego harbor Maintenance Dredging Project, San Diego County, California. South Pacific Division; Los Angeles District. March.

U.S. Fish and Wildlife Service (USFWS). 2006. California least tern: 5-year review summary and evaluation. Carlsbad Fish and Wildlife Office, Carlsbad, CA. September. Available online at: http://www.fws.gov/cno/es/California%20least%20tern%205-year%20review.FINAL.pdf

_____. 2011. 2011 Summer Window Survey for Snowy Plovers on U.S. Pacific Coast with 2005-2010 Results for Comparison. Available online at: http://www.fws.gov/arcata/es/birds/WSP/documents/2011%20Breeding%20Window%20Survey%20range-wide.pdf.

_____. 2012. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. Federal Register; Vol. 77, No. 118. 19 June. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2012-06-19/pdf/2012-13886.pdf

USFWS and U.S. Navy. 2004. Memorandum of Understanding Between the U.S. Fish and Wildlife Service and U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California.

U.S. Navy (Navy). 2006. Tammy Conkle, Wildlife Biologist. U.S. Navy, Commander Navy Region SW. Personal communication on current statistics of California least tern. 20 November.

Water Resources

AMEC Earth & Environmental Inc. (AMEC). 2008. Water quality Monitoring Report P-440 Pier 8 Reconstruction and Pier 14 Demolition Project, Naval Base San Diego. March.

Burns and McDonnell Engineering Company (Burns and McDonnell). 2012. Personal communication via email with J. Seib, PE Project Manager Fueling Group regarding details of 35 percent design for replacement fuel pier. 21 March.

Chadwick, B. , J. Leather, K. Richter, S. Apitz, D. Lapota, D. Duckworth, C. Katz, V. Kirtay, B. Davidson, A. Patterson, P. Wang, S. Curtis, G. Key, S. Steinert, G. Rosen, M. Caballero, J. Groves, G. Koon, A. Alkirs, K. Meyers-Schulte, M. Stallard, S. Clawson, R. Streib Montee, D. Sutton, L. Skinner, J. Germano, and R. Cheng. 1999. Sediment Quality Characterization Naval Station San Diego Final Summary Report. Technical Report 1777. Space and Naval Warfare (SPAWAR) Systems Center San Diego. January.

Everingham Brothers Bait Company. 2012. Personal communication via telephone conversation with owners/operators. 10 May 2012.

Largier, John L. 1995. San Diego Bay Circulation, a Study of the Circulation of Water in San Diego Bay for the Purpose of Assessing, Monitoring and Managing the Transport and Potential Accumulation of Pollutants and Sediment in San Diego Bay. Final Report July 1, 1995. Scripps Institution of Oceanography Technical Report. http://repositories.cdlib.org/sio/techreport/8

Merkel & Associates, Inc. 2009. 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update. January.

Moffett & Nichol-Blaylock (MNB). 2011. Rough Order Magnitude (ROM) Cost - Mammal Pier Relocation Five Alternatives plus Optional Sites. Letter report to Mr. N. Nguyen, P.E. NFECSW Coastal IPT 25 March.

_____ . 2012a. Personal communication via email with A. Alcorn regarding construction schedule and construction details. 20 - 27 April.

_____ . 2012b. Personal communication via email with A. Alcorn regarding potential dredging methods. 12 September.

Naval Facilities Engineering Command (NAVFAC). 2009. Site Specific Report. Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response. Naval Base Point Loma. November.

NAVFAC Southwest. 2009. Storm Water Management Plan Update for Naval Base Point Loma Volume 3 of 5. Fleet Industrial Supply Center Point Loma California. October

_____ . 2011. Personal communication via email with R. Chichester, NBPL Environmental Manager re: stormwater and CPP management at the existing and replacement fuel piers. March-April.

_____ . 2012. Personal communication via email with R. Chichester, NBPL Environmental Manager re: stormwater permitting at NPBL and NMAWC. March

_____ . 2013a. Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Sediment Quality Relocation Area. Sediment Quality Investigation San Diego Bay San Diego, California. Prepared for Naval Facilities Engineering Command Southwest Coastal IPT by Tierra Data, Inc. March.

_____ . 2013b. Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation San Diego Bay, San Diego, California Prepared for Naval Facilities Engineering Command Southwest by Tierra Data, Inc. April.

National Oceanic and Atmospheric Administration (NOAA). 2012. Office of Coast Survey. Chart 18773 San Diego Bay. Edition 42. Edition Dated January 2011. http://www.charts.noaa.gov/OnLineViewer/18773.shtml. Website accessed 4 April.

Port of San Diego. 2007. State of the Bay. January.

Regional Water Quality Control Board (RWQCB). 1994. Water Quality Control Plan for the San Diego Basin (Basin Plan). 8 September. Website accessed 17 January 2011.

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

RWQCB. 2002a. Order No. R9-2002-0002. Waste Discharge Requirements for U.S. Navy Naval Base Point Loma San Diego County. 11 September. Website accessed 16 January 2011. http://www.swrcb.ca.gov/sandiego/board_decisions/adopted_orders/orders2002.shtml

_____ . 2002b. Fact Sheet. Order No. R9-2002-0002. Waste Discharge Requirements for U.S. Navy Naval Base Point Loma San Diego County. 11 September. Website accessed 16 January 2011. http://www.swrcb.ca.gov/sandiego/board_decisions/adopted_orders/orders2002.shtml

_____ . 2011. Division of Water Quality. National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality Order 99-08-DWQ. Website accessed 21 January 2011. http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/finalconstpermit.pdf

Space and Naval Warfare Systems Center (SSC) Pacific. 2012a. Personal communication via email with M. Xitco, SPAWARSYSCEN—PACIFIC, regarding coatings for marine mammal program equipment and animal enclosures. September.

_____ . 2012b. Personal communication via email with M. Xitco, SPAWARSYSCEN—PACIFIC regarding NPDES permit coverage for Navy marine mammal program point source discharges.

State Water Resources Control Board (SWRCB). 2005. California Ocean Plan. Water Quality Control Plan Ocean Waters of California. January.

_____ . 2012. Impaired Water Bodies. 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report. California 2010 303(3) combined list table (combines category 4a, 4b,and 5). 303 (d) list- Excel file (without potential sources). Website accessed 26 September. http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Terra Costa Consulting Group, Inc. 2010. Limited Geotechnical Study Defense Logistics Agency Project Documentation for P-151. Prepared for Moffatt & Nichol Blaylock. 15 January.

Tierra Data, Inc. (TDI). 2010. Characterizing the Spatial and Temporal Variation in Turbidity and Physical Water Quality Characteristics in San Diego Bay - A Study to Determine a Cost-Efficient Strategy for Long term Monitoring. A Project for: Environmental Projects to Benefit San Diego Bay San Diego Unified Port District Environmental Services Department Final Report. March. Website accessed 21 January 2011. http://www.portofsandiego.org/environment/projects-a-progress-reports.html

U.S. Army Corps of Engineers (USACE). 2008. Technical Guidelines for Dredging Contaminated Sediments. Environmental Laboratory ERDC/EL TR-08-29. Website accessed 20 January 2011. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-29.pdf

_____ . 2009. Final Environmental Assessment for the San Diego Harbor Maintenance Dredging Project. Prepared by USACE South Pacific Division, Los Angeles District. San Diego County, California. March.

_____ . 2012. San Diego Harbor Maintenance Dredging Project San Diego County, California. Final Supplemental Environmental Assessment. June.

U.S. Environmental Protection Agency (USEPA). 2005. Factsheet: Ocean Dumping and Dredged Material Management. Office of Water, Office of Wetlands, Oceans and Watersheds. Website Accessed 16 January 2012. http://water.epa.gov/type/oceb/oceandumping/dregedmaterial/factsheet_oceandumping.cfm

_____ . 2011. Personal communication via email from J. Campopiano, Environmental Scientist, Wetlands Office United States Environmental Protection Agency- Region 9 Southern California Field Office, Los Angeles, to R.R. Smith, Jr. Environmental Engineer/Civil Engineer Regulatory Project Manager USACE Carlsbad Field Office, San Diego, and L. Seneca, NAVFAC Southwest Coastal IPT. Subject: FW: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - USEPA. 20 April.

U.S. Navy (Navy). 2007. Final Environmental Assessment (MILCON P-401) Replace Fuel Storage Tanks and Facilities, Naval Base Point Loma, San Diego, California. November.

_____ . 2009. Swimmer Interdiction Security System (SISS) Final Environmental Impact Statement Naval Base Kitsap-Bangor Silverdale Kitsap County Washington. September.

_____ . 2010a. Personal communications via telephone and emails with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding the physical facilities, procedures, and operations at the existing fuel pier, the proposed replacement fuel pier and the P-401 construction project, September-December.

_____ . 2010b. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Naval Base Point Loma, DFSP, NAVSUP FLC, and San Diego, California. January.

_____ . 2011. Final Silver Strand Training Complex Environmental Impact Statement. January.

Hazardous Materials and Wastes

Burns and McDonnell. 2012. Personal communication via email with J. Seib, PE Project Manager Fueling Group regarding details of 35 percent design for replacement fuel pier. 2 April.

CH2MHill Kleinfelder. 2012. Draft 2011 Site Management Plan, Naval Base Point Loma, San Diego, CA. January.

City of San Diego. 2011. Environmental Services Department. Miramar Landfill. Website accessed 2 February 2011. http://www.sandiego.gov/environmental-services/miramar/

County of San Diego. 2002. Department of Environmental Health. Unified Facility Program Permit HK57-180134. Owner/Operator Name CMDR Navy Region SW. Facility Name: NAVSUP FLC (DFSP)/Pt. Loma Bayside. 28 February.

_____ . 2008. Compliance Inspection Report USN-NAVSUP FLC (DFSP) Point Loma Fuel Farm. 2 December.

_____ . 2011. Personal Communication with L. Apecechea, Site Assessment and Mitigation Program Land and Water Quality Division via email regarding unauthorized release

Department of Defense (DoD). 2004. DoD Explosives and Ammunition Safety Standards. DoD 6055.9-STD. October.

Everingham Brothers Bait Company. 2012. Personal communication via telephone conversation with owners/operators. 10 May 2012.

Moffatt & Nichol-Blaylock (MNB). 2010. Personal communication via email with M. Martinez, S.E., regarding design capacity, site conditions at the existing and proposed Pier 180. 6 December.

Naval Base San Diego (NBSD). 2012. Personal communication via email with L. Morales, Naval Base San Diego/Naval Base Point Loma Explosives Safety Officer. 26 April.

Naval Facilities Engineering Command (NAVFAC). 2001. NAVFAC Instruction 11010.45 (3) Comprehensive Regional Planning Instruction. May. Website accessed 28 January 2011. https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_docs_pp/policy/navfac_policyinstr_pp_tab

_____ . 2009. Site Specific Report. Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response. Naval Base Point Loma. November.

NAVFAC Southwest. 2009. Storm Water Management Plan Update for Naval Base Point Loma Volume 3 of 5. Fleet Industrial Supply Center Point Loma California. October.

_____ . 2010a. Personal communication via email with A. Vancil, Lead Environmental Project Manager, regarding hazardous materials and wastes at the existing fuel pier. September.

_____ . 2010b. Personal communication via email with R. Chichester, IEPM regarding hazardous materials and wastes at the existing fuel pier. September.

_____ . 2010c. Personal communication via email with L. Seneca, Coastal IPT, regarding explosives safety at NBPL fuel pier. October-November.

_____ . 2010d. Site Inspection for Munitions MRP Site 100: San Diego Bay Primary Ship Channels. April. (Factsheet). Provided via email by D.L. Belton, QEP, NBSD Lead Remedial Project Manager Navy - Environmental Restoration Program NAVFAC Southwest - Coastal IPT 2730. November.

_____ . 2011a. Personal communication via email with R. Chichester, NBPL Environmental Manager re: NMAWC facilities and buildings; relocation of existing MWR uses. April.

_____ . 2011b. Personal communication via telephone with C. Ketcham, Demolition Debris Manager, NAVFAC Southwest, regarding NAVFAC policy and procedures for disposal of construction/demolition waste from Navy construction projects at NBPL. 16 March.

_____ . 2011c. A. Basche, P.E., Lead Remedial Project Manager, Coastal IPT, NAVFAC Southwest. Response to comments on Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151) Environmental Assessment. May 2011. Comments submitted to L. Seneca, NAVFAC Southwest. 6 June.

_____ . 2011d. Personal communication via email with A. Vancil, Regional Environmental Program Manager NAVSUP Fleet Logistics Center San Diego, regarding construction and testing requirements for the new fuel pier. March.

_____ . 2012. Personal communication via email with A. Basche, P.E., Lead Remedial Project Manager, Coastal IPT, NAVFAC Southwest. October.

_____ . 2013a. Personal communication via telephone and email with M. Cornell, Senior Environmental Scientist, regarding investigation of Areas of Concern MFL 50, 59, and 60, and AOPC 8. January –February.

_____ . 2013b. Personal communication via telephone and email with M. Cornell, Senior Environmental Scientist, regarding Navy Explosives Safety Submittal Determination Request (ESS DR) process for the Proposed Action. May.

Navy Compass. 2010. Official SW Region News. America Recycles Day NRSW turns trash into cash. 15 November. Website accessed 1 February 2011. http://www.navycompass.com/top-stories/top-stories/2437-mc2-alexander-ameen

Navy Region Southwest (NRSW). 2000. Memorandum of Understanding among the Commander, Navy Region, SW, Commander, Marine Corps Air Bases, Western Area, and the City of San Diego. 28 March.

_____ . 2005. Community Relations Plan. Naval Base Point Loma Installation Restoration Program San Diego California. 15 August.

_____ . 2006. Regional Construction and Demolition Debris Landfill Diversion COMNAVREGSWINST11530:1A (Navy Region SW). 02 October.

_____ . 2007. Navy Region Southwest Waste Management Plan San Diego Metro Area. 25 January.

_____ . 2010. NRSW/NAVFAC Construction and Demolition Debris Program. Powerpoint Presentation prepared by Leslie L. McLaughlin, NRSW Solid Waste Program Manager, N457. June. Website accessed 1 February 2011. http://e2s2.ndia.org/pastmeetings/2010/tracks/Documents/9927.pdf

Regional Water Quality Control Board (RWQCB). 2005. Personal communication J. Robertus Executive Officer, San Diego RWQCB, to Ms. Theresa Morley, Navy Region SW Assistant Chief of Staff for Environmental Subject: Final Closure of Underground Storage Tank (UST) 115 and 115B Fuel Farm Point Loma, California (SerN45JIB.tm/0417). Website accessed 1 February 2011 http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607380862

Shaw Environmental, Inc. 2007. Pipeline Pressure Test Report. Pier 180 Pipelines. Fleet & Industrial Supply Center. Point Loma, San Diego, California. October.

State Water Resources Control Board (SWRCB). 2003. Draft Amended Functional Equivalent Document. Consolidated Hotspots Cleanup Plan. 29 August. Website accessed 31 January 2011. http://www.waterboards.ca.gov/water_issues/programs/bptcp/docs/dfed_complete.pdf

_____ . 2008. Draft Staff Report Water Quality Control Plan for Enclosed Bays and Estuaries. Part 1. Sediment Quality and Appendix D Toxic Hot Spots. 18 July. Website accessed 31 January 2011. http://www.swrcb.ca.gov/water_issues/programs/bptcp/docs/sediment/071808_draftstaffreport.pdf

_____ . 2011a. GeoTracker Environmental Database for Regulated Facilities in California. Case # 9 UT 4154 and 9 UT 4154. Website accessed 1 February. http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607380862

_____ . 2011b. GeoTracker Environmental Database for Regulated Facilities in California. Case #16535-POI 61 Website accessed 23 April. http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607380862

_____ . 2012. GeoTracker Environmental Database for Regulated Facilities in California. http://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=92101. Website accessed 14 May.

U.S. Navy (Navy). 2010a. Personal communications via telephone and emails with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding the physical facilities, procedures, and operations at the existing fuel pier, the proposed replacement fuel pier and the P-401 construction project September-December.

_____ . 2010b. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Naval Base Point Loma, DFSP, and San Diego, California. January.

_____ . 2011. Personal communications via telephone and emails with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director regarding the physical facilities, procedures, and operations at the existing fuel pier and the proposed replacement fuel pier, January.

_____ . 2012a. Personal communication via email with S. Frey NAVSUP FLC (DFSP) San Diego Fuels Director, regarding Tanks 115A and 115B. 1 May.

_____ . 2012b. Personal communication via email with S. Frey NAVSUP FLC (DFSP) San Diego Fuels Director, regarding operational safety at the fuel pier. 12 April.

_____ . 2012c. Personal communication via email with S. Frey NAVSUP FLC (DFSP) San Diego Fuels Director, regarding historical ammunition handling at the fuel pier. 18 December.

Airborne Noise

American National Standards Institute (ANSI). 2002. Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools. Vol. S12.60-2002.

City of San Diego 2007. Draft General Plan Final Program Environmental Impact Report. Noise. September. Website accessed 27 December 2010. http://www.sandiego.gov/planning/genplan/pier.shtml Accessed 27 December 2010.

_____ . 2010. San Diego Municipal Code. Chapter 5, Public Safety, Morals and Welfare, Article 9.5 Noise Abatement and Control, Section 59.5.0404 Construction Noise. Website accessed 27 December 2010. http://docs.sandiego.gov/municode/MuniCodeChapter05/Ch05Art9.5Division04.pdf.

Engineering Toolbox.com. 2010. Outdoor Ambient Sound Levels. Website accessed 27 December 2010. http://www.engineeringtoolbox.com/outdoor-noise-d_62.html

Federal Interagency Committee on Urban Noise (FICUN). 1980. Guidelines for Considering Noise in Land Use Planning and Control. June.

Lazarus H. 1990. New Methods for Describing and Assessing Direct Speech Communication Under Disturbing Conditions, Environment International, 16: 373-392.

Moffatt & Nichol-Blaylock (MNB). 2011. Personal communication via email from I. Canner, P.E. to L. Seneca NAVFAC Southwest Coastal IPT. Subject: P-151 Construction schedule, description of construction phases, pile driving, and equipment to be used. January-April

_____ . 2012. Personal communication via email with A. Alcorn regarding pile driving, construction schedule, and construction details. 30 March-6 April.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model (RCNM), Software Version 1.1. December

U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Report Number 550/9-74-004. March.

U.S. Navy (Navy). 2007. Final Environmental Assessment (MILCON P-401) Replace Fuel Storage Tanks and Facilities, Naval Base Point Loma, San Diego, California. November.

Air Quality

California Air Resources Board (CARB). 2007. OFFROAD Model.

_____ . 2011. EMFAC2007 Model.

_____ . 2012. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

Delmag. 2012. Pile Driving Hammer Specifications, http://www.hammersteel.com/delmag-diesel-hammers.html. Accessed April 30.

San Diego County Air Pollution Control District (SDCAPCD). 2012. Rules and Regulations. http://www.sdapcd.org/rules/current_rules.html

U.S. Environmental Protection Agency (USEPA). 2000. Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data. EPA420-R-00-002. February.

_____ . 2012. The Green Book Nonattainment Areas for Criteria Pollutants. http://www.epa.gov/oaqps001/greenbk/.

Transportation and Circulation

City of San Diego. 1998. Traffic Impact Study Manual. July.

_____ . 2010. Rosecrans Corridor Mobility Study. February.

Naval Facilities Engineering Command (NAVFAC) Southwest. 2011. Personal communication via email with R. Chichester, NBPL Environmental Manager re: Existing NBPL commuting patterns. April.

Shaw Environmental & Infrastructure. 2007. Draft Traffic Impact Study MILCON P-401 Projected NAVSUP FLC Fuel Farm. Point Loma, San Diego. March.

San Diego Association of Governments (SANDAG). 2012. Demographics and Other Data, Average Daily Traffic Volumes. Online at: http://www.sandag.org/resources/demographics_and_other_data/transportation/adtv/index.asp. Accessed 3 May 2012.

Transportation Research Board. 2010. Highway Capacity Manual, Volumes 1-3. Washington, DC. December.

U.S. Navy (Navy). 2010. Personal communication via email with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding operations, personnel and vehicle requirements for the existing and replacement fuel piers, September.

_____ . 2012. Personal communication via email with S. Frey, NAVSUP FLC (DFSP) San Diego, Fuels Director, regarding personnel requirements for the existing and replacement fuel pier, 23 March.

Socioeconomics and Environmental Justice

California Department of Fish and Wildlife (CDFW). 2010. California Recreational Fisheries Survey. Sample data available on the Recreational Fisheries Information Network: http://www.recfin.org/.

California Department of Transportation (Caltrans). 2011. California County-Level Economic Forecast 2011-2040. Available online at: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2011/Caltrans_2011_Forecasts_rev1.pdf. Accessed: 11 April 2012.

Everingham Brothers Bait Company. 2012. Personal communication (discussion meeting) with owners/operators on 2 May 2012.

Naval Facilities Engineering Command (NAVFAC) Southwest. 2011. Fiscal Year (FY) 2013 MILCON P-151 Replace Fuel Pier, Naval Base Point Loma, San Diego, CA. Revised 35 percent Submittal. Basis of Design and Revised Drawings. Prepared by Burns and McDonnell. 5 August.

National Oceanographic and Atmospheric Administration (NOAA). 2001. Marine Expenditures in the Pacific Coast Region, 2000. NMFS-F/SPO 49. October, 2001.

U.S. Bureau of Labor Statistics (BLS). 2012a. Local Area Unemployment Statistics. Accessed 16 April 2012.

_____ . 2012b. Quarterly Census of Employment and Wages. Accessed 16 April 2012.

_____ . 2012c. Consumer Price Index. All Urban Consumers. U.S. City Average. http://www.bls.gov/cpi/. Accessed 9 May 2012.

U.S. Census Bureau (Census). 1990. Decennial Census 1990. Census of Population and Housing. Available online at: http://www.census.gov/prod/www/abs/decennial/1990.html. Accessed: 10 April 2012.

_____ . 2000. Decennial Census 2000. Summary Files 1 and 3. Available online at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed: 10 April 2012.

_____ . 2007a. 2007 Economic Census. Geographic Area Series. Available online at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed 16 April 2012.

_____ . 2007b. 2007 Economic Census. Transportation and Warehousing: Geographic Area Series: Summary Statistics for the United States, States, and Metro Areas: 2007. Available online at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed 16 April 2012.

_____ . 2009. US Population Projections. Available online at: http://www.census.gov/population/www/projections/2009cnmsSumTabs.html. Accessed: 11 April 2012.

_____ . 2010a. Decennial Census 2000. Summary File 1. Available online at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed: 10 April 2012.

_____ . 2010b. American Community Survey 5-Year estimate 2006-2010. Available online at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed: 10 April 2012.

Cumulative Impacts

AMEC Earth & Environmental Inc. (AMEC) 2008. Water quality Monitoring Report P-440 Pier 8 Reconstruction and Pier 14 Demolition Project, Naval Base San Diego. March.

Anchor QEA. 2012. Personal communication via email with J. Horwitz, Seattle, WA, regarding trip generation and likely travel routes for proposed Scripps pier site during construction. April.

California Air Resources Board (CARB). 2011. California Greenhouse Gas Emissions Inventory: 2000-2009. December. http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-09_report.pdf.

Everingham Brothers Bait Company. 2012. Personal communication (discussion meeting) with owners/operators on 2 May 2012.

Naval Facilities Engineering Command (NAVFAC) Southwest. 2011. Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging (Navy MILCON Project P-151) March.

_____ . 2013a. Draft Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Sediment Quality Relocation Area. Sediment Quality Investigation San Diego Bay San Diego, California. Prepared for Naval Facilities Engineering Command Southwest Coastal IPT by Tierra Data, Inc. January.

_____ . 2013b. Personal communication via email with R. Loomis regarding demolition/construction details and water quality protection measures for the Scripps

Institution of Oceanography (University of California San Diego) Nimitz Marine Facility Research Vessel Berthing Pier. January.

_____ . 2013c. Personal communication via email with A. Vancil, Lead Environmental Project Manager, regarding closure in place of NBPL underground storage tanks. January.

_____ . 2013d. Personal communication via email with T. Addis, regarding MILCON P-401 construction activities and equipment to completion. January.

San Diego Association of Governments (SANDAG). 2012. Environment Shoreline Management 2012 Regional Beach Sand Project. http://www.sandag.org/index.asp?projectid=358&fuseaction=projects.detail. Website accessed 9 July 2012.

U.S. Army Corps of Engineers (USACE). 2008. Technical Guidelines for Dredging Contaminated Sediments. Environmental Laboratory ERDC/EL TR-08-29. Website accessed 20 January 2011. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-29.pdf

_____ . 2012. San Diego Harbor Maintenance Dredging Project, San Diego County, California. Final Supplemental Environmental Assessment. June.

U.S. Environmental Protection Agency (USEPA). 2010. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008. 15 April. http://www.epa.gov/climatechange/Downloads/ghgemissions/508_Complete_GHG_1990_2008.pdf.

U.S. Navy (Navy). 2007. Final Environmental Assessment (MILCON P-401) Replace Fuel Storage Tanks and Facilities, Naval Base Point Loma, San Diego, California. November.

_____ . 2011. Silver Strand Training Complex Environmental Impact Statement. United States Navy Pacific Fleet. January.

University of San Diego and U.S. Department of the Navy. 2013. Draft Environmental Assessment and Initial Study SIO/UCSD MARFAC Berthing Wharf and Pier Replacement. February.

Appendix A

Agency Correspondence

[This Page Intentionally Left Blank]

Appendix B

Public Involvement

[This Page Intentionally Left Blank]

Appendix C

Unified Facilities Criteria (UFC)

[This Page Intentionally Left Blank]

Appendix D

Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging (MILCON Project P-151)

[This Page Intentionally Left Blank]

Appendix E

Marine Biological Resources

[This Page Intentionally Left Blank]

Appendix E.1

Essential Fish Habitat Assessment for NBPL Fuel Pier Replacement and Dredging (MILCON P-151)

[This Page Intentionally Left Blank]

Appendix E.2

Memorandum of Understanding Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California

[This Page Intentionally Left Blank]

Appendix E.3

Approval for Use of Established Eelgrass Mitigation Bank Credits

[This Page Intentionally Left Blank]

Appendix E.4

Acoustic Transmission Loss Model for Pile Driving

[This Page Intentionally Left Blank]

Appendix E.5

Ambient Underwater Sound Measurements in San Diego Bay

[This Page Intentionally Left Blank]

Appendix F

Airborne Noise Modeling Data

[This Page Intentionally Left Blank]

Appendix G

Record of Non-Applicability for Clean Air Act Conformity (RONA) and Air Quality Data

[This Page Intentionally Left Blank]

Appendix H

Traffic Count Data

[This Page Intentionally Left Blank]

Appendix I

Water and Sediment Quality Investigation

[This Page Intentionally Left Blank]

Appendix A

Agency Correspondence

[This Page Intentionally Left Blank]

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY EDMUND G. BROWN, *Governor*

CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

April 15, 2013

Captain S.F. Adams
Commanding Officer
Department of the Navy
Naval Base Point Loma
140 Sylvester Road
San Diego, CA 92106-3521

RE: **CD-011-13**, Consistency Determination, U.S. Navy, Fuel Pier Replacement and Dredging Project, Naval Base Point Loma, San Diego Co.

Dear Captain Adams:

On April 10, 2013 by a unanimous vote, the California Coastal Commission concurred with the above-referenced consistency determination for the Navy's Fuel Pier Replacement and Dredging Project at Naval Base Point Loma. The Commission found the project to be consistent to the maximum extent practicable with the California Coastal Management Program.

Sincerely,

Kate Huckelbridge
Energy, Ocean Resources and
Federal Consistency

cc: San Diego District office

DEPARTMENT OF THE NAVY
NAVAL BASE POINT LOMA
140 SYLVESTER ROAD
SAN DIEGO, CALIFORNIA 92106-3521

IN REPLY REFER TO:
5090
Ser N45/028
January 23, 2013

Mr. Mark Delaplaine
California Coastal Commission
Federal Consistency Supervisor
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Delaplaine:

SUBJECT: COASTAL CONSISTENCY DETERMINATION FOR FUEL PIER REPLACEMENT AND DREDGING ENVIRONMENTAL ASSESSMENT

I am submitting this Coastal Consistency Determination (CCD) for the Environmental Assessment for the Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151/DESC1306). The proposed project is needed to provide improved safety features and improved fuel receipt and delivery capability at the NBPL Defense Fuel Support Point (DFSP) to service existing and future classes of naval vessels.

This submittal is in compliance with Section 930.35 (d) of the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations (15 CFR 930). The Navy has determined that the proposed action would have no adverse effect to coastal resources for the reasons identified in enclosure (1).

I request your concurrence on this proposed project. When completed, please fax letter of concurrence to Ms. Suzanne Smith, Fleet NEPA Coordinator at (619) 532-2283. If you have any questions or need additional information, please contact her (619) 532-2284.

Sincerely,

S. F. ADAMS
Commanding Officer

Enclosure: 1. Coastal Consistency Determination

COASTAL CONSISTENCY DETERMINATION FOR THE FUEL PIER (PIER 180) REPLACEMENT AND DREDGING PROJECT (P-151) AT NAVAL BASE POINT LOMA

In accordance with the Federal Coastal Zone Management Act of 1972, as amended, Section 307 (c) (1), the United States Department of the Navy (Navy) has determined that the proposed project – Fuel Pier Replacement and Dredging, located at Naval Base Point Loma (NBPL) Defense Fuel Support Point (DFSP) (Figure 1), San Diego, California is consistent to the maximum extent practicable with the California Coastal Act or 1976 (Cal. Pub. Resources Code § 30200 to 30265.5) and would not adversely affect coastal resources for the reasons stated in this document. The proposed project requires the demolition of an inadequate existing fuel pier (Pier 180), temporary relocation of the Navy's Marine Mammal Program, dredging in approach and turning basin areas for a new pier, dredged material for beneficial reuse or disposal at an approved ocean disposal site, construction of a new double-deck fuel pier, and provision of associated pier utilities in support of fuel transfers (Figure 2). This information is provided pursuant to 15 Code of Federal Regulations 930.36.

PROJECT LOCATION

Naval Base Point Loma is located on the Point Loma Peninsula along the western side of San Diego Bay within the City of San Diego in San Diego County, California. It is approximately 1.1 miles west of Naval Air Station North Island and approximately four miles west of downtown San Diego. The DFSP is located within the north and eastern boundaries of NBPL. The DSFP fuel pier is located on San Diego Bay at NBPL. It currently serves as a fuel depot for loading and unloading tankers and U.S. Navy underway replenishment vessels that refuel ships at sea, fueling Navy, Department of Homeland Security, Department of Defense and foreign navy vessels, as well as transferring fuel to the local replenishment vessels and other small craft operating in San Diego Bay. The fuel pier is critical to the mission of the Navy and is the largest active Navy fueling facility in the vicinity. More than 42 million gallons of fuel are stored at NBPL DFSP, monthly operation consist of receiving more than 11 million gallons of fuel and fueling operations to an average of 43 ships.

PROJECT OVERVIEW

The propose action is one in a series of projects submitted to the Commission to replace and upgrade Navy piers in San Diego Bay. This submittal is similar to previously concurred with consistency determinations for pier construction and dredging in San Diego Bay (Naval Base San Diego CCND-011-011, CD-031-01, CD-51-94, CD-64-92, CD-51-87 and at Naval Air Station North Island CD-89-99) as well as DFSP fuel facility infrastructure upgrades (CD-046-07 NBPL Fuel Storage and Distribution Facility). In those decisions, the Commission found that the projects were allowable uses for dredging and filling of coastal waters for pier construction and berth deepening, that dredge spoils were suitable ocean disposal because they met Green Book standards, and that the projects complied with water quality, commercial and recreational fishing, beach replenishment, public access and recreation, and environmentally sensitive habitat policies of the Coastal Zone Management Act.

The purpose of the proposed action is to provide improved safety features and improved fuel receipt and delivery capability at the NBPL Defense Fuel Support Point (DFSP) to service existing and future classes of naval vessels. For a detailed description of the proposed action, refer to the NBPL Fuel Pier Replacement Draft Environmental Assessment.

The proposed action to upgrade the existing fuel pier is needed because:

1. The existing fuel pier is over 100 years old, is in poor condition and does not meet new fueling technology capabilities;
2. The existing fuel pier is not consistent with the modern standards (including seismic safety standards) set out in the California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) regulations;
3. The existing fuel pier lacks adequate deep water berthing capability, thus cannot safely accommodate all of the existing and future classes of vessels;
4. Dredging and sediment disposal are needed to deepen an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities;
5. Improved fueling features and capabilities are needed to service the current and projected future demand of vessels, which is expected to increase by 30 to 35 percent by 2018; and
6. Navy and DHS need adequate and safe ship fueling facilities now and in the future to accomplish their missions of security and national defense.

There are 3 alternatives proposed: (1) Pier replacement and associated dredging; (2) Delayed dredging; and (3) No action.

There are five key elements associated with Alternative 1 of the proposed action:

- ***Temporary Relocation of the Navy MMP***

  Before the pier replacement activities begin, the Navy Marine Mammal Program (MMP) would be temporarily relocated to the Navy's Morale, Welfare and Recreation marina (MWR) located at the Naval Mine and Antisubmarine Warfare Command (NMAWC), a part of NBPL that is over three kilometers away from the fuel pier (Figures 2 and 3). Limited construction at NMAWC would occur and Navy marine mammal enclosures would be towed from the existing facilities to the temporary NMAWC site. Guide piles, 18 inches square, would be installed with a diesel hammer pile driver and serve as anchors for the floating enclosures. The temporary Navy MMP enclosures would extend about 150 ft beyond the NMAWC boundary into state waters, and a 100 ft bayward temporary security zone would be established around them. Approximately 320 ft of open water would remain for navigation between the temporary security zone and West Harbor Island. After completion of the new fuel pier, the Navy marine mammal enclosures would be moved back to their original location adjacent to the fuel pier and the temporary facilities at NMAWC would be removed.

- ***Phased Demolition and Removal of the Existing Fuel Pier***

  Demolition and removal of the existing fuel pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. During demolition, 1,471 piles and fenders would be removed. Piles outside of the new approach segment would be cut off at the mudline, while piles within the approach segment would be pulled via dry-pull, vibratory hammer or jetting.

- ***Phased Construction of a Replacement Fuel Pier***

  A new double-deck fuel pier, including four additional dolphins to increase mooring capability, would be constructed that would provide flexibility in fueling multiple vessel types (Figures 4, 5, 6 and 7). The new pier would meet MOTEMS requirements for seismic performance. The proposed design would have a total area that is 5,315 square feet and would be 0.12 acre smaller than the area of the existing fuel pier. The angled approach segment of the new pier would be 700 ft long from shore bayward and 50 ft wide.

  The replacement double-deck pier structure, including mooring dolphins, would consist of steel pipe piles, supporting concrete pile caps and cast-in-place concrete deck slabs. The sizes of the steel piles (36 to 48 inch diameter) are dependent on water depth, subsurface soil conditions, and the mass of the deck structure. Additionally, 24-in diameter pre-stressed concrete piles and 16-in diameter concrete-filled fiberglass piles would be used. The top of the lower deck would be set at 13 ft MLLW, approximately 5 ft above extreme high tide. The new pier upper deck elevation would be 28 ft above MLLW and 20 ft above extreme high tide. The upper deck would have sufficient height needed for the pier fuel loading arms to safely reach fuel transfer points on the majority of larger ships. There would be a 3.5 ft high concrete barrier around the upper deck perimeter, so the combined double deck structure would stand at 31.5 ft MLLW.

  There would be no pile driving or other in-water construction or demolition during the least tern foraging season (from April 1 through September 15) of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to three years to complete.

- ***Regulated Navigation Zone***

  The existing U.S. Coast Guard (USCG) Security Zone would be amended as needed to provide adequate security standoff distance to the east for the proposed new fuel pier alignment and turning basin (Figures 8 and 9). Due to the angled alignment, the new pier berthing segment north end would extend about 100 ft beyond the existing fuel pier, and the berthing south end would extend bayward about 300 ft beyond the existing fuel pier. However, as with the existing fuel pier, the new fuel pier would lay entirely within a USCG navigation Restricted Area. The amended security standoff would allow 700 ft of open water between the Restricted Area and the navigation channel for use by civilian vessels.

- ***Dredging and Sediment Disposal***

  Dredging and sediment disposal are needed to deepen an existing turning basin to safely accommodate current and future deep draft berthing capabilities (Figure 8). Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineering (USACE). It is projected that 80,000 CY of sand dredge from 17.9 acres within the adjacent turning basin would be removed from the project site. USEPA specified

beneficial reuse for near-shore replenishment as the appropriate placement. The dredged sediments would be hauled by barge to a beneficial reuse site south of the Imperial Beach pier (Figure 10). Under Alternative 1, dredging could be done before, during, or after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. It is anticipated that dredging would take approximately three months to complete. However, there would be no dredging during the California least tern foraging season, April 1 to September 15.

Under Alternative 1, the footprint of the new fuel pier would be 5,315 sqft (0.12 acre) smaller than the existing fuel pier.

Although not an element of the P-151 NBPL Fuel Pier Replacement Project, the Environmental Assessment (EA) addresses the temporary relocation of the Everingham Brothers San Diego Bay bait barges. The Navy is not relocating the bait barges. The viable bait barge relocation options and potential environmental impacts of relocating the bait barges are discussed in the EA.

Under Alternative 2, the proposed action would be the same as Alternative 1 except dredging would occur years after completion of construction of the fuel pier.

Under the No-Action Alternative, the Navy would not implement the demolition of the existing Fuel Pier, construction of the new fuel pier facility, or dredging activities. The no-action alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the proposed project. However, it does provide a measure of the baseline conditions against which the potential effects of the proposed project can be compared.

Demolition and construction would be phased over a four year period (Figure 11). Work (including pile driving) would occur between the hours of 7:00 AM and 4:00 PM, Monday through Friday. New pier construction would occur concurrently with demolition of the existing pier, beginning with the north section. Fueling operations would continue during demolition and construction. Construction and dredging activities would take place outside the San Diego Harbor navigation channel. The new pier construction zone is approximately 1,200 ft from the channel.

The public scoping period was conducted between 28 April and 11 June, 2012. During the public scoping period, a public meeting was held on 3 May, 2012. The draft EA was available for public review 20 October through 19 November, 2012 and a public meeting was held on 14 November, 2012. Project informational displays and subject matter experts were available to discuss the project with the public, answer questions and facilitated an opportunity for the public to provide written comments.

SUMMARY OF EFFECTS

As defined in Section 304 of the Coastal Zone Management Act, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government." NBPL is owned and operated by the Navy. Although the Navy does not own the adjacent submerged lands affected by the proposed action, they do have navigational servitude (exclusive use) of them.

The Navy analyzed the impacts of the proposed project by looking at reasonably foreseeable direct and indirect effects on any coastal use or resource, and reviewing relevant management

program enforceable policies (15 CFR 930.33[a][1]) and the Coastal Resources Planning and Management Policies (CRPMP). Sections of the California Coastal Act applicable to this proposed action, as determined by the Navy, include: Article 2 – Public Access (Section 30210); Article 3 - Recreation (Section 30220); Article 4 – Marine Environment (Sections 30231, 30232 and 30233); Article 5 – Land Resources (Sections 30240 and 30244); and Article 6 – Development (Sections 30251 and 30253). Sections and Articles of the California Coastal Act not addressed below are not relevant to the proposed action.

Article 2 - Public Access (CRPMP Section 30210)

Section 30210 - Maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Access to NBPL, including the DFSP project area and MMP relocation to NMAWC, is controlled by the Navy and is restricted to military personnel, Department of Defense employees, and authorized contractors. Public access to the project area is prohibited. Surrounding land uses adjacent to the DFSP project area are designated for fuel storage, fuel transfer and refueling activities which include waterfront fueling operations, fueling vehicles and equipment storage and fuel facility parking lots. The project would be compatible with existing adjacent land uses, and no changes would occur to public access or recreational opportunities.

Temporary changes to uses of the waters offshore from NMAWC and Harbor Island during the relocation of the Navy MMP and the bait barges, respectively, would not adversely affect recreational or commercial navigation in San Diego Bay. Permanent amendments to the U.S. Coast Guard security zone to provide adequate security standoff distance for the proposed new fuel pier alignment would not affect recreational or commercial navigation because there would be 700 ft of open water between the new Security Zone Boundary and the federal navigation channel. Therefore, there would be no effect to public access.

Article 3 - Recreation (CRPMP Section 30220)

Section 30220 – Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

The water areas under and immediately adjacent to the DFSP fuel pier and adjacent to NMAWC are within established U.S. Coast Guard security zones and are not considered water-oriented recreational activity areas. The project area is adjacent to the San Diego Bay navigation channel which is accessible for public private and commercial water-oriented recreational activities. The proposed project, which is outside the navigation channel but within restricted use areas, would not adversely affect coastal water-oriented recreational activity areas within the navigation channel and throughout San Diego Bay.

Article 4 – Marine Environment (CRPMP Sections 30231, 30232 and 30233)

Section 30231 – Biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

The project would have no long-term effects on biological productivity or water quality. Implementing standard construction Best Management Practices (BMPs), such as a comprehensive debris management plan and spill prevention and cleanup plan, would avoid or minimize the potential for accidental releases of debris or fuels during construction.

During demolition, construction, and dredging, protective measures would be implemented to minimize impacts to marine water quality. Protective measures for demolition and construction include implementation of a construction National Pollutant Discharge Elimination System (NPDES) permit; a construction Storm Water Pollution Prevention Plan (SWPPP); the NBPL Integrated Contingency Plan (ICP) for Oil and Hazardous Substance Spill Prevention and Response Facility Response Plan; and the use of catch devices and sheeting. Existing pipelines on the pier would be drained and cleaned prior to removal. Obsolete piping would be removed back to closest main trunk to avoid dead end pipes being abandoned or closed in place.

Activities associated with pier replacement, including demolition, dredging, and construction would likely disturb and re-suspend a portion of the bottom sediments within the project area. Disturbances of bottom sediments may cause the following impacts on marine water quality: formation of localized but temporary turbidity plumes with elevated concentrations of suspended particles and decreased light transmittance; localized but temporary decreases in dissolved oxygen concentrations in bottom waters; and localized and temporary increases in contaminant concentrations in the water column.

To minimize turbidity, protective measures would include retention of the existing sheet pile, cutting piles at mudline and use of a clamshell dredge. Consequently, effects would be localized and temporary because suspended sediments eventually would settle from the water to the bottom. These changes would not cause toxicity to aquatic organisms or increase potentials for contaminant bioaccumulation. Additionally, removal of existing creosote wood pilings removes a potential source for polycyclic aromatic hydrocarbons (PAHs) from the water body.

Stormwater accumulating on the lower deck and rainfall from the 85th percentile storm event accumulating on the upper deck would be collected on the new pier and sent to the Fuel Oil Reclamation (FOR) receipt tank for treatment. Underflow scuppers on the upper deck would permit a portion of the runoff from large storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay. Concrete containment curbs, with controllable sumps, would be incorporated into the pier deck design surrounding all fueling arms, fueling risers and fuel pipes.

Section 30232 – Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Modern spill containment would be provided for all piping, fueling arms and ancillary equipment. The Navy maintains detailed plans to prevent fuel spills at fuel facilities and to respond in the event spills do occur. State regulations mandate that the operator of a storage tank facility must prepare a Spill Prevention Control and Countermeasure plan (SPCC) in accordance with the guidelines of 40 CFR 112.7. The DFSP facility SPCC has been integrated into its Integrated Contingency Plan (ICP). The proposed project would require an update to the ICP to take into account the new fuel pier design, construction and operation. Updates to the ICP shall be fully implemented as soon as possible.

The Emergency Response Action Plan (The Red Plan) is an abbreviated, critical action plan contained in the facility's ICP that discusses key actions to be taken in the early stages of a response to an oil or hazardous substance spill. The ICP is DFSP's in-depth response plan that addresses all aspects of a response: organization, assessment, recommended cleanup methods, environmental considerations, establish priorities, training, preventive maintenance and other required items.

The proposed fuel pier upgrade would reduce oil spill risk, therefore the proposed project is in compliance with Section 30232.

Section 30233 – Diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no less feasible environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

Additionally, dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for these purposes to appropriate beaches or into suitable longshore current systems.

The project would require dredging in berthing and approach areas for the new fuel pier and beneficial reuse and/or disposal of an estimated 80,000 CY of dredged sediments. Sediment samples from the proposed dredge footprint were analyzed in November 2010 and were found to be suitable for nearshore disposal. Dredging in the deepest areas within the new pier and dredge footprint would not be dredged as it is lower than the proposed dredge depth (-40 ft mean lower low water level). All dredge operations would comply with Clean Water Act Section 404 and be in accordance with a dredging permit issued by the Army Corps of Engineering, and a Clean Water Act Section 401 water quality certification from the San Diego Regional Water Quality Control Board. Beneficial reuse of the proposed dredged material would be implemented as much as possible and would have a beneficial effect as nearshore replenishment.

There would be minor, localized temporary increases to circulation caused by vessel movement, in-water demolition and construction, and dredging. The increases would cease when each particular activity ends.

Based on the above analysis, all water quality impacts would be temporary and localized, therefore, there would be no long-term effects to water quality.

Article 5 – Land Resources (CRPMP Sections 30240 and 30244)

Section 30240 – (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas, and (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The beach and adjacent strand and coastal habitat inshore of the fuel pier and southward along the shore would not be used for any purpose.

Aquatic species occurring in the immediate area of the proposed project area may be lost or displaced directly by project activities such as noise and equipment or indirectly by short-term changes such as suspended sediments, turbidity, dissolved oxygen and light diffusion. However, would be expected to return to the project area upon project completion.

The project region is located within a general area designated as Essential Fish Habitat (EFH) by two Fishery Management Plans, the Pacific Coast Groundfish and Coastal Pelagic Species. Temporary effects to EFH species may occur from increased suspended sediments and increased noise levels from dredging and pier construction activities, such as pile driving. However, EFH species are highly mobile and would likely leave the project area during demolition, dredging, and construction activities and return when these activities cease.

Eelgrass

A Caulerpa survey and final pre-construction and post-construction eelgrass survey would be conducted.

Proposed project design considerations include position of the new fuel pier and temporary location of the MMP pens at NMAWC to be situated in a manner to avoid and/or minimize eelgrass disturbance. Additional minimization and avoidance measures include pier extension into deeper water to minimize dredging, leaving sheet piling in place to minimize sediment and eelgrass disturbance, use of mooring dolphins to reduce size of pier footprint and to minimize bay shading. During demolition and construction of the fuel pier, minor and short-term impacts would occur to approximately 0.05 acres of eelgrass surveyed in 2011 and an additional 0.05 ac of habitat that historically supports eelgrass. Eelgrass impacts from the temporary relocation of the Navy MMP, approximately 0.67 ac of eelgrass surveyed in 2011 and an additional 0.32 ac of habitat that historically supports eelgrass, would occur. This area represents a tiny fraction of that which is found within and adjacent to San Diego Bay, approximately 0.0027% and 0.0058% respectively. Eelgrass impacts would be minor and temporary and would be temporarily offset by using the eelgrass mitigation bank. Upon successful reestablishment of eelgrass within impacted areas, the bank would be credited.

Fish

Fish communities would be temporarily affected by in-water construction and demolition. The potential for injury to fish would exist at close ranges to impact pile driving, although fish are likely to move away from pile being driven. Temporary behavioral reactions, without long-term effects to fish populations, would be anticipated. Soft-start procedures (ramp-up/dry fire) would be used to provide warning and/or give fish and marine mammals a chance to leave the area.

Birds

Birds on the water regularly experience the noise and disturbance of passing vessels. The project area is routinely subject to elevated noise and activity of workers, equipment and vessels associated with common industrial practices. Project-related noise is not expected to have long-term effects on migratory birds. Indirect affects to foraging due to reduced visibility or changes in prey distribution in response to turbidity or noise would be localized and intermittent. San Diego Bay is a known least tern foraging area. While there are no least tern nesting areas in the vicinity of the project area, no in-water demolition, construction, or dredging activities would occur during the least tern breeding season (April 1 through September 15). The Navy would

abide by conservation measures established in the current Tern Memorandum of Understanding.

Green Sea Turtle

No sea turtle habitat would be impacted by any project activities, and sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction, demolition and pile driving activities. Any sea turtles present in the general vicinity during any phase of the project activities would be able to detect and avoid the noise and associated in-water activities.

Marine Mammals

Noise from the proposed project, specifically pile driving, construction and demolition would result in minor behavioral changes in marine mammals. Specific species are the California sea lions, harbor seals, gray whales and coastal bottlenose dolphins. The Navy would apply for and obtain an Incidental Harassment Authorization (IHA) for anticipated takes before beginning underwater demolition and pile driving activities.

Visual monitoring for sensitive species would be conducted for the duration of the proposed project. If seen within visual range prior to or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting.

Therefore, through the use of preventative measures, adverse effects to sensitive habitat would be temporary and minor.

Section 30244 – Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Previous cultural resources investigations confirm that no historic properties are present within the Area of Potential Effect (APE). The DFSP Fuel Pier has previously been determined by consensus and consultation to be ineligible for the National Register of Historic Places because it lacks historic and architectural significance. While the project area has no known archaeological resources, its onshore quay wall lay-down area is on land created as a leveled platform cut-and-filled from original bayshore terrain to provide for coal storage as part of the Navy's Point Loma Coaling Station (ca. 1905). This and a subsequent 1940s filling that raised and extended the quay wall overlie a now-buried beach and adjacent tidelands of the original, late 18th and early 19th century port of San Diego. This area was referred to as La Playa and was originally used in the Spanish-Mexican-era hide trade with American merchant ships from New England. This now buried beach was the location of hide houses and a custom house, with residences and other associated structures set further back from the bay. From here cargos were hauled by road to the Pueblo of San Diego. There is a potential archaeological evidence of the described maritime activity to be preserved beneath the fill.

Ground disturbance on this onshore area, as it pertains to this project, provides a currently unknown potential for affecting buried archaeological deposits, assuming such exist. The project area falls under the coverage of the San Diego Metropolitan Area Programmatic Agreement (Metro Area PA) executed in February 2003 between Commander, Navy Region Southwest (CNRSW), the Advisory Council on Historic Preservation, and the California State Historic Preservation Officer. Under Stipulation 9 of the PA, the Navy would provide for archaeological monitoring of ground disturbing activities within areas of known or provisional

archaeological sensitivity during the construction and demolition phase of the proposed project. Monitoring would not be required for in-water project activities like dredging or pier demolition.

Therefore, there is potential that the proposed project would have no adverse effect to cultural resources.

Article 6 - Development (CRPMP Sections 30251 and 30253)

Section 30251 – The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

The proposed project would not affect views available to the public and would be consistent with the industrial visual aesthetic of DFSP Fuel Pier and the adjacent military and industrial areas (Figures 7 and 12). Construction activities would be visible to military and government personal working near the fuel pier, boaters transiting near the project area, and from multiple view corridors around San Diego Bay. However, fuel pier construction activities would be short-term and would occur in a developed area that is accessible only to military personnel. After construction, the project area would be visually consistent with fuel facility buildings in the foreground and adjacent areas. Therefore, there would be no adverse effect to aesthetics.

Section 30253 – (c) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Board as to each particular development.

The project would follow applicable San Diego County Air Pollution Control District (SDCAPCD) rules. Project construction emissions would not exceed the annual conformity *de minimis* thresholds identified for the San Diego Air Basin (SDAB). Therefore, the proposed action would conform to the SDAB State Implementation Plan and would not trigger a conformity determination under the Clean Air Act, as amended.

In accordance with the Federal Coastal Zone Management Act of 1972, as amended, Section 307 (c)(1), this Coastal Consistency Determination demonstrates that the proposed action would be undertaken in a manner as to not adversely affect coastal uses or resources. The Navy respectfully requests your concurrence. If you need additional information, or if you have any questions, please do not hesitate to contact Suzanne Smith at (619) 532-2284 or email Suzanne.M.Smith@navy.mil.

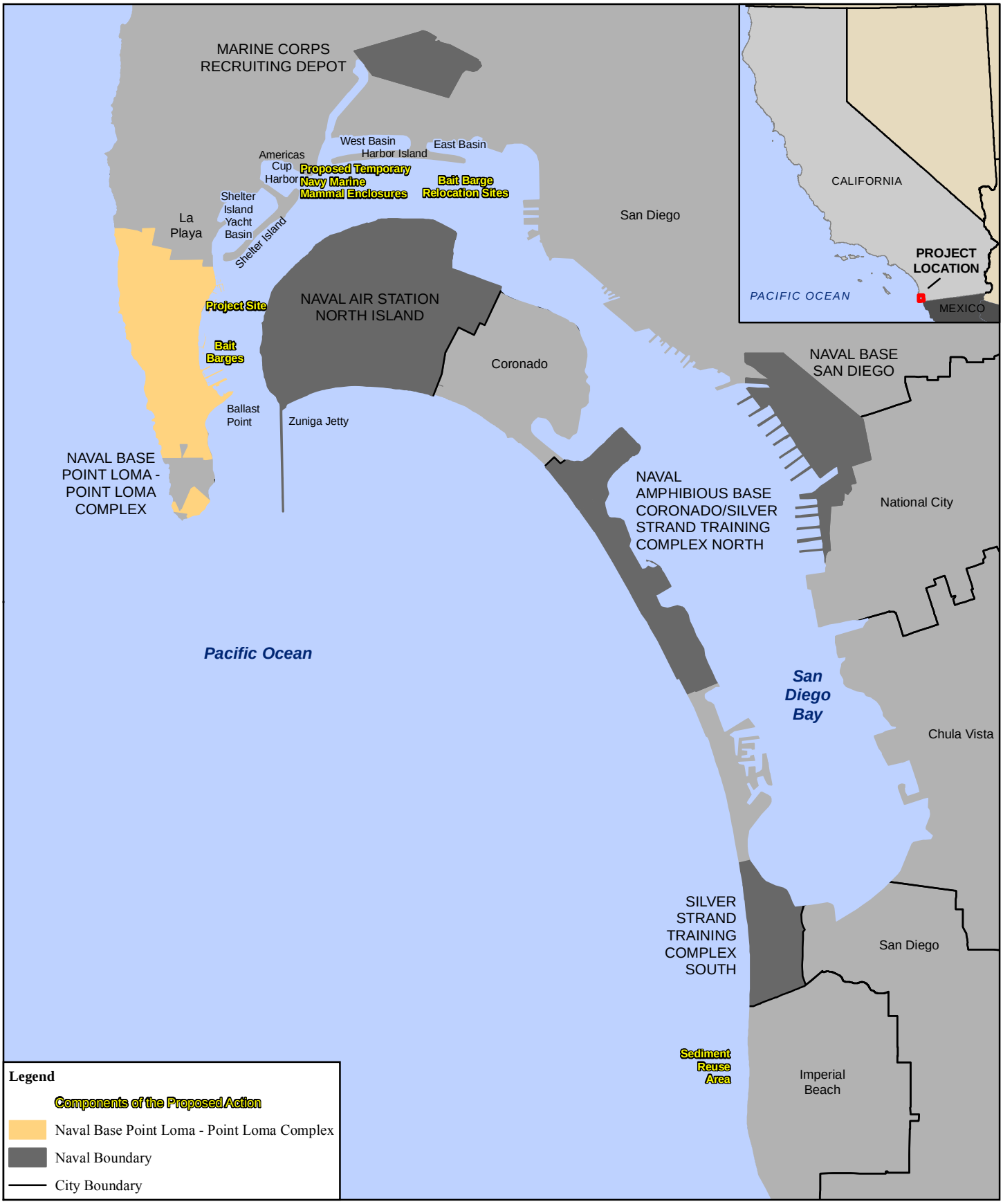
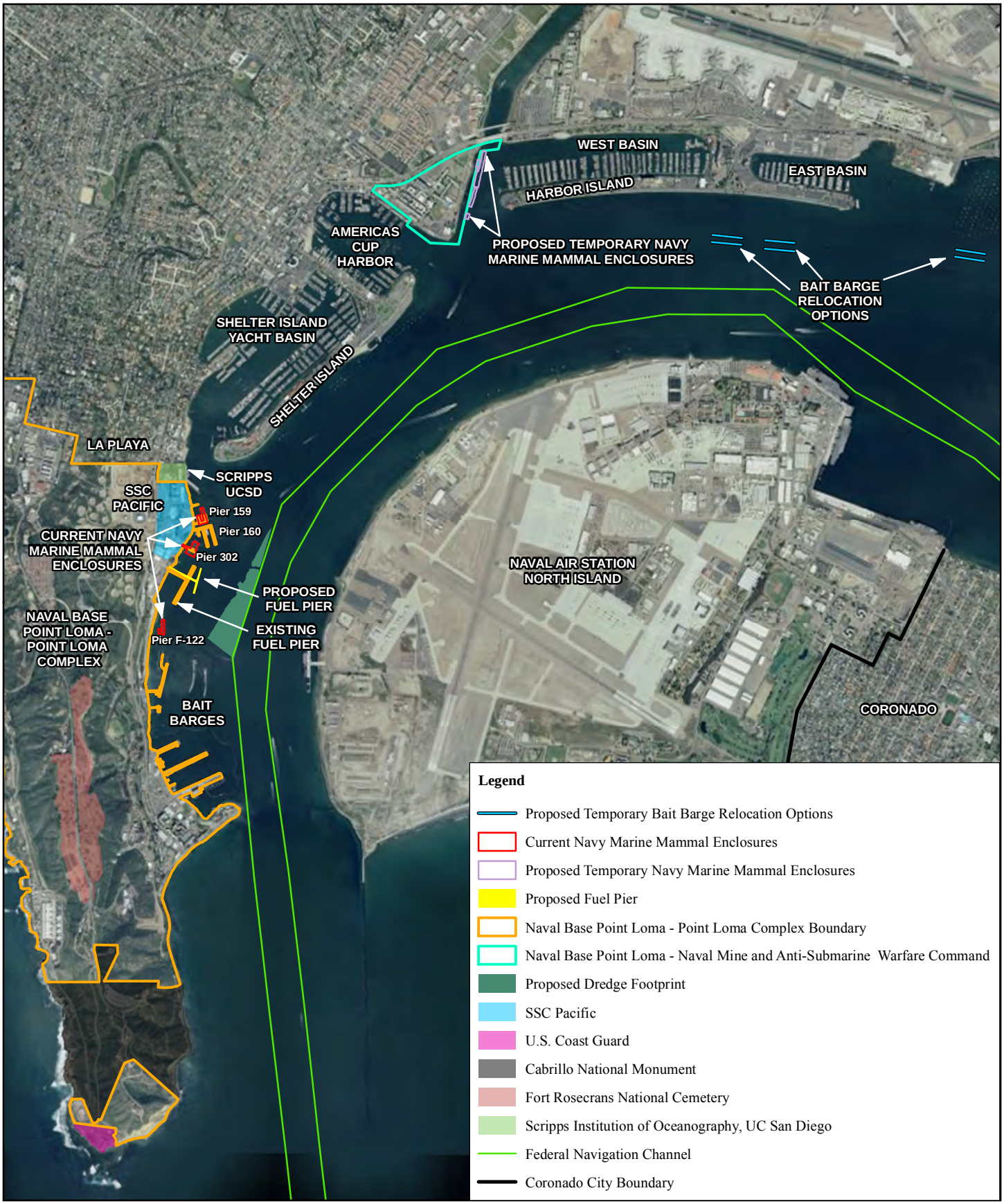


Figure 1
Regional Location - Pier 180 Replacement
Naval Base Point Loma - Point Loma Complex



0 0.2 0.4
Kilometers
Miles
0 0.2 0.4

N

Figure 2
Project Site Map



Figure 3
Proposed Configuration of Temporary Navy Marine Mammal Enclosures at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607

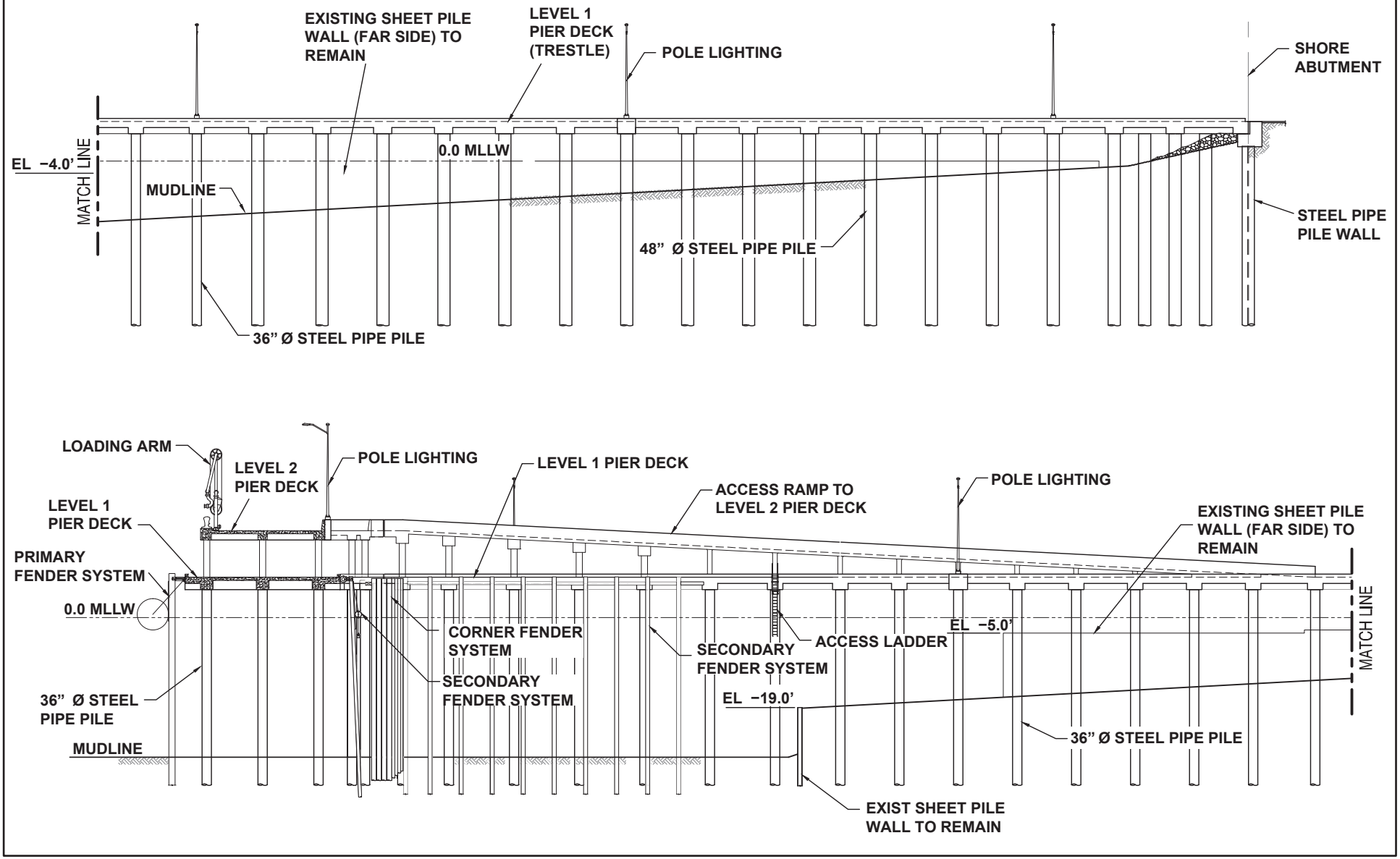


Figure 4
Proposed New Fuel Pier
Approach Segment (Side View)

Note: Not to scale. Entire length not shown.

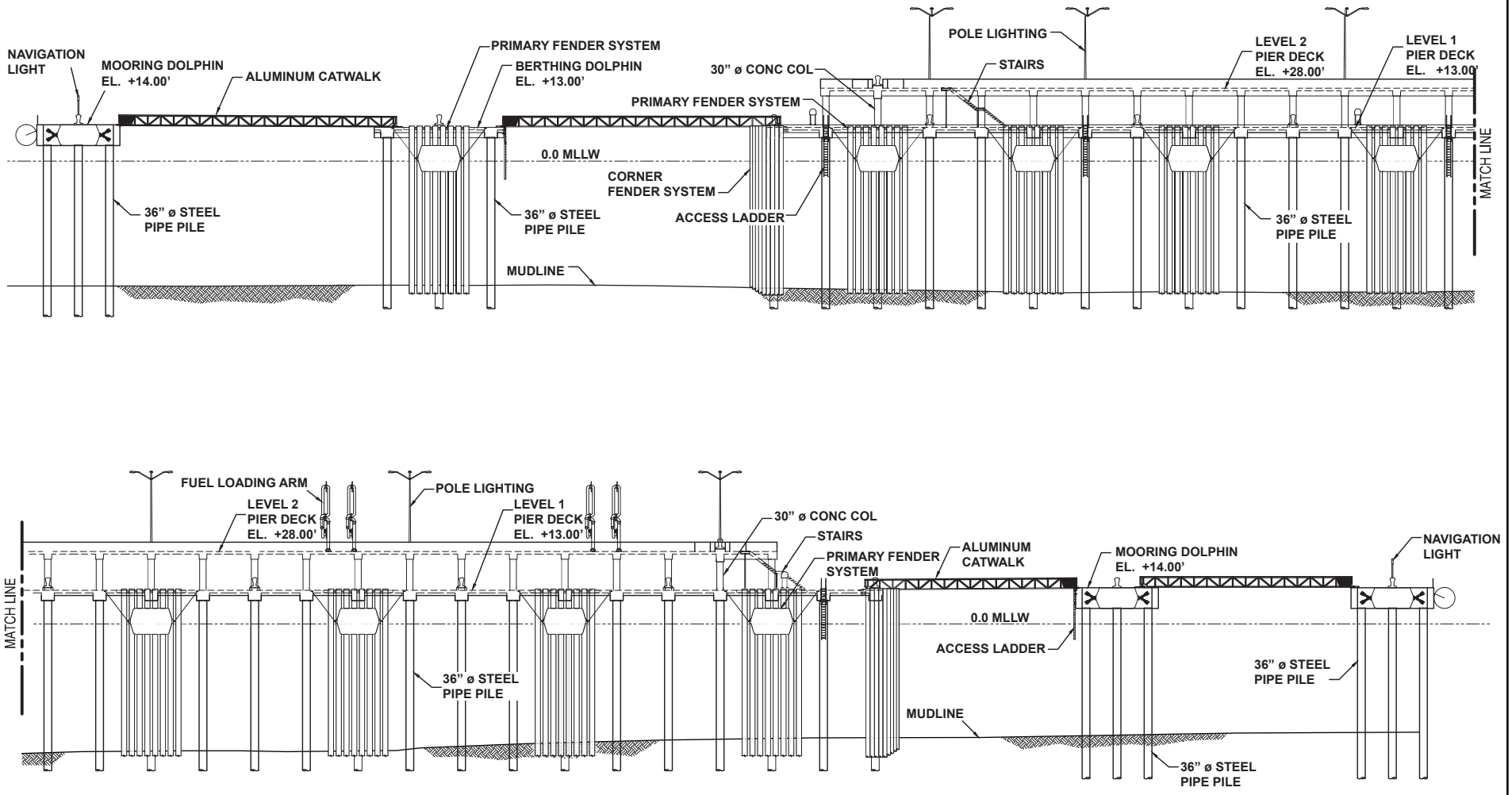


Figure 5
Proposed New Fuel Pier
Berthing Segment (Side View)

Note: Not to scale. Entire length not shown.

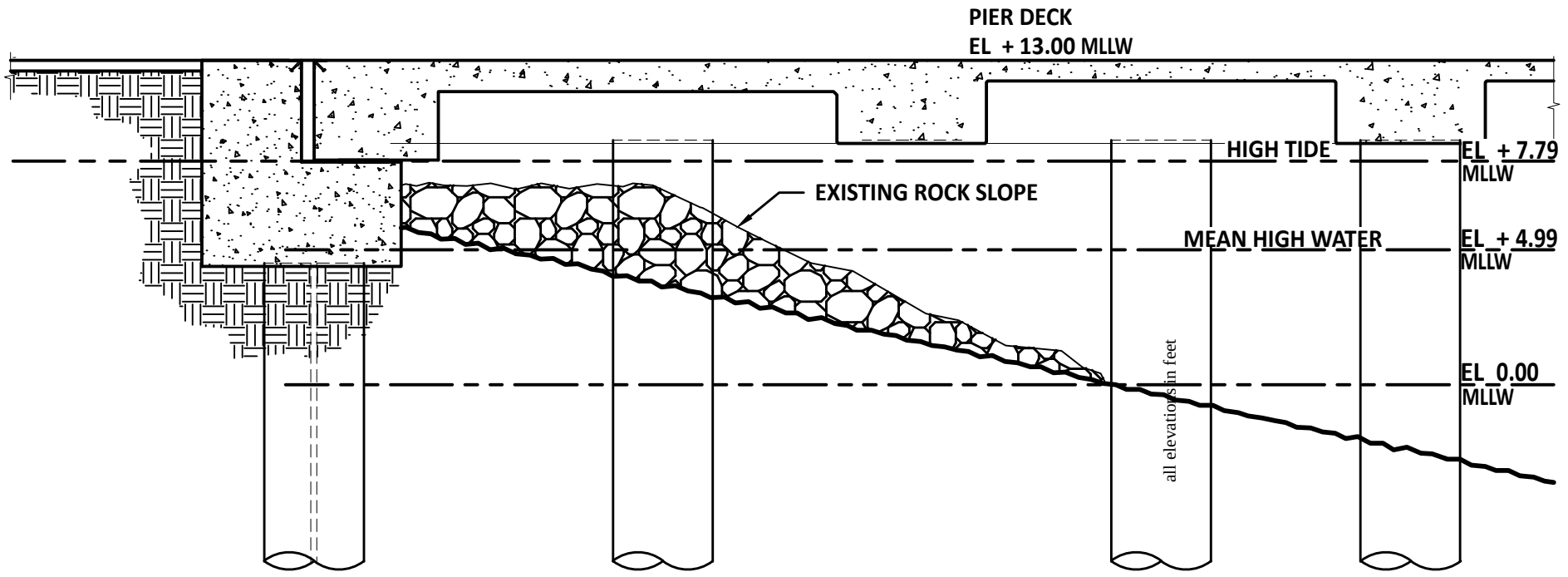


Figure 6
Proposed New Fuel Pier
Approach Segment at Shore Abutment (Side View)

Notes: Not to scale. Entire length not shown.
MLLW = Mean Lower Low Water Level (reference datum).
All elevations in feet.



Figure 7A
Existing Fuel Pier



Figure 7B
New Fuel Pier

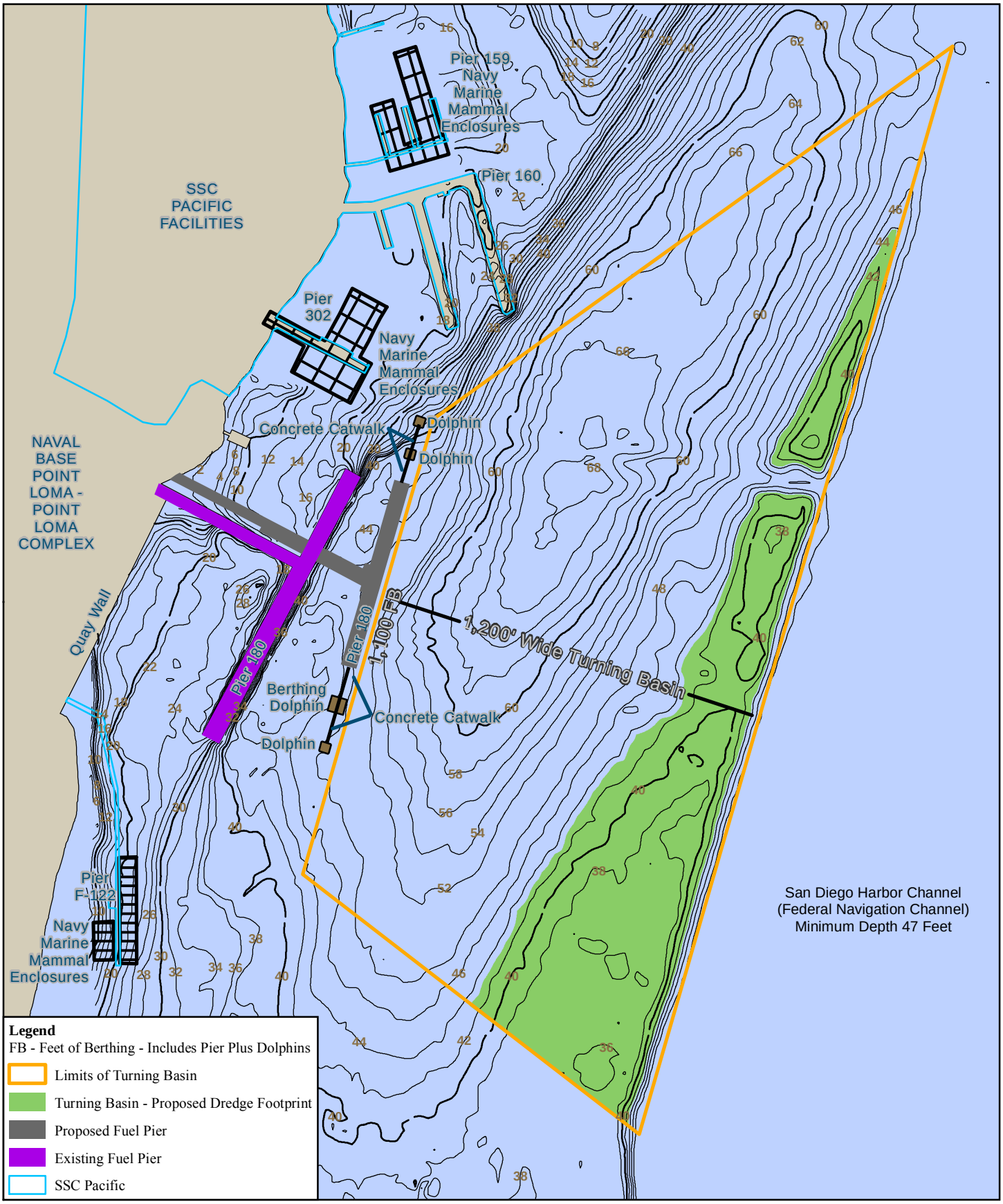


Figure 8
Proposed New Fuel Pier and
Turning Basin Dredge Footprint

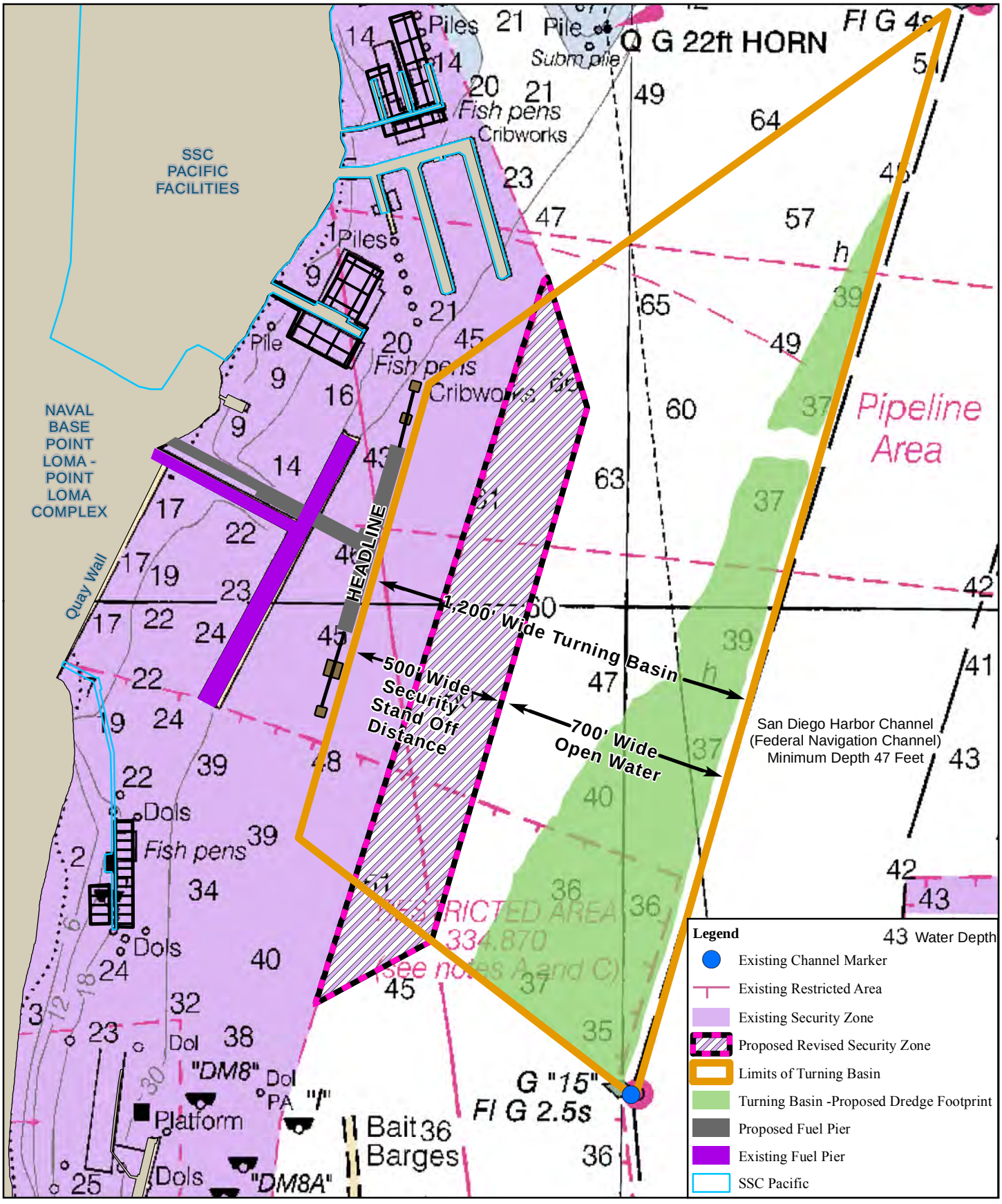


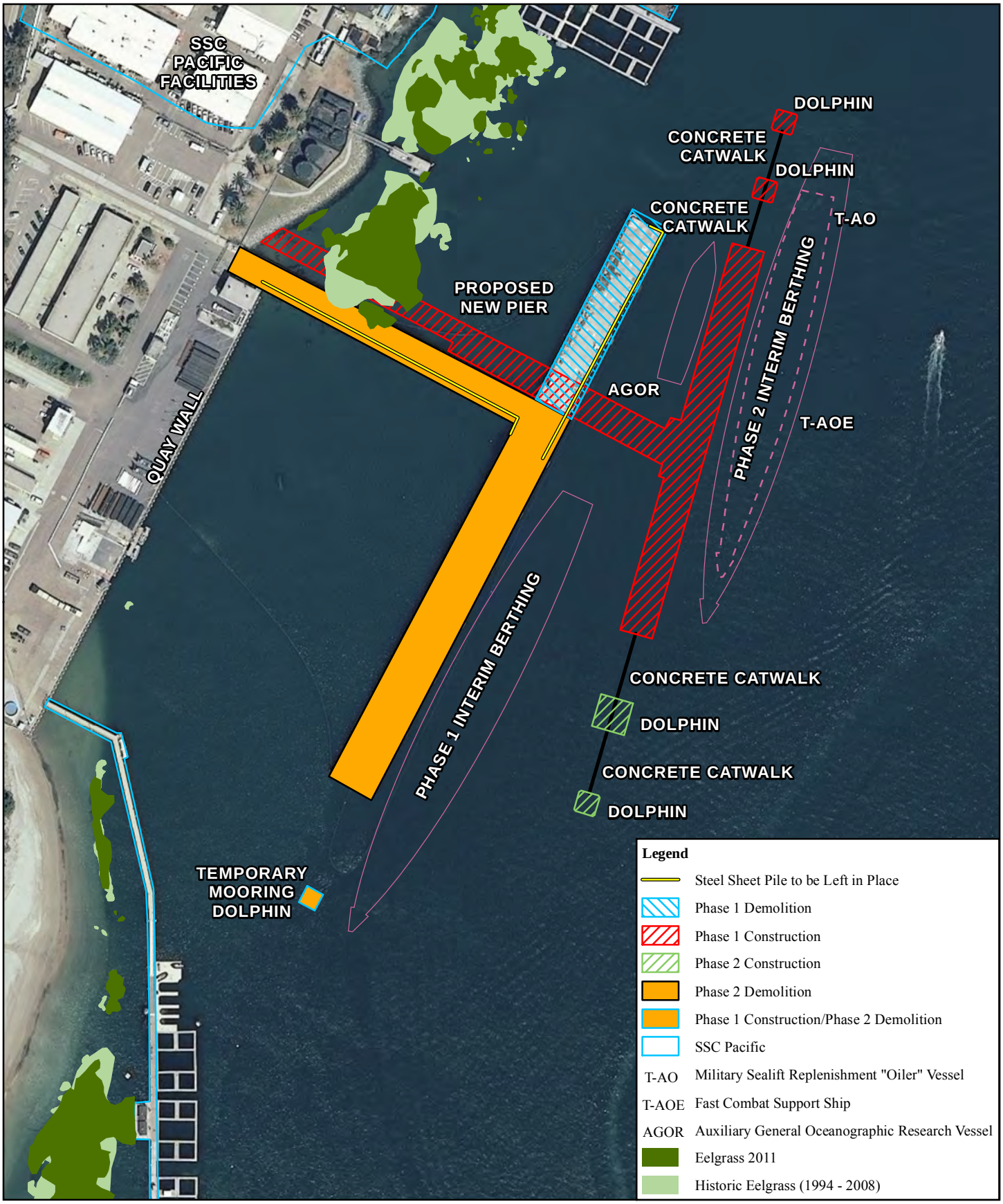
Figure 9
Regulated Navigation Zones



0 100 200
Meters
Feet
0 200 400

Figure 10
Imperial Beach Sediment
Beneficial Reuse Receiver Site

N



0 25 50
Meters
Feet
0 100 200

Figure 11
Demolition and Construction Phasing Plan

N



Figure 12A
Existing Fuel Pier - View from San Diego Bay



Figure 12B
New Fuel Pier - View from San Diego Bay

From: Campopiano.Jorine@epamail.epa.gov
To: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT
Cc: Sanchez, Alberto S CIV NAVFAC SW; Ota.Allan@epamail.epa.gov; Silverstein, David E CIV NAVFAC SW; Coler, Kari J CIV NAVFAC SW, OPME; Nguyen, Nam D CIV NAVFAC SW, SDNS; Basinet, Richard J CIV NAVFAC SW; Smith, Robert R SPL
Subject: RE: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - US EPA and Corps Determination
Date: Tuesday, May 10, 2011 1:47:41 PM

Hi Lisa - EPA agrees with your summary below.

Jorine Campopiano
Environmental Scientist, Wetlands Office
United States Environmental Protection Agency- Region 9
Southern California Field Office
600 Wilshire Boulevard, Suite 1460
Los Angeles, CA 90017
213-244-1808, 213-244-1850(FAX)
campopiano.jorine@epa.gov

From: "Seneca, Lisa A CIV NAVFAC SW, Coastal IPT" <lisa.seneca@navy.mil>
To: Jorine Campopiano/R9/USEPA/US@EPA, "Smith, Robert R SPL" <Robert.R.Smith@usace.army.mil>
Cc: "Sanchez, Alberto S CIV NAVFAC SW" <alberto.sanchez@navy.mil>, "Nguyen, Nam D CIV NAVFAC SW, SDNS" <nam.d.nguyen@navy.mil>, Allan Ota/R9/USEPA/US@EPA, "Silverstein, David E CIV NAVFAC SW" <david.silverstein@navy.mil>, "Basinet, Richard J CIV NAVFAC SW" <richard.basinet@navy.mil>, "Coler, Kari J CIV NAVFAC SW, OPME" <kari.coler@navy.mil>
Date: 05/10/2011 12:47 PM
Subject: RE: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - US EPA and Corps Determination

---

Hello Jorine -- Thank you, this is just to memorialize our calls on this topic:

The NBPL P151 SUAD determination below would not be impacted if project budgetary constraints cause the Navy to dredge to a lesser depth than previously planned because:

-- the sediment was already fully characterized and found suitable by USEPA/USACE for unconfined aquatic disposal, and

-- reducing the dredge depth would not allow for any departure from the originally identified dredge footprint.

Though the Navy desires to perform the full original dredge scope, market conditions may determine the dredging volume that can be included in P151.

Thank you and please correct me if I've misstated any of the above.
v/r, Lisa

-----Original Message-----
From: Smith, Robert R SPL [mailto:Robert.R.Smith@usace.army.mil]
Sent: Wednesday, April 20, 2011 17:23
To: Campopiano.Jorine@epamail.epa.gov; Seneca, Lisa A CIV NAVFAC SW, Coastal IPT
Cc: Ota.Allan@epamail.epa.gov; Bob Hoffman; Bryant Chesney; Mark Delaplaine (E-mail); dlilly@coastal.ca.gov; christina.fahy@noaa.gov; emaher@portofsandiego.org; sandy_vissman@fws.gov; wpaznokas@dfg.ca.gov; Dan Lawson; Eric Chavez; amonji@waterboards.ca.gov; Michael.B.Dolan@uscg.mil; Silverstein, David E CIV NAVFAC SW; Ser, Mike H CDR NAVFAC SW, SDNS; Hochstein, Patrick CDR NAVFAC SW, TYRS; Xitco, Mark J Jr CIV SPAWARSYSCEN-PACIFIC, 71510; Smith, Suzanne M CIV CNRSW, N40 Env; McKay, Deborah E CIV SPAWARSYSCEN-PACIFIC, 83210; Basinet, Richard J CIV NAVFAC SW; Coler, Kari J CIV NAVFAC SW, OPME; Perdue, Mitchell A CIV NAVFAC SW; Sanchez, Alberto S CIV NAVFAC SW; Desrochers, Michele A CIV NAVFAC SW; Ripley, Robert J CTR CSCS
Subject: RE: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - US EPA and Corps Determination

All,

The Corps has reviewed the USN Fuel Pier SAP dated March 2011 and agrees with EPA that the project dredging amount of 87,000 cy has met all requirements of Tier 2 Bulk Chemistry Analysis and Tier 3 Bioassay and Bioaccumulation studies and is suitable for ocean disposal. We would still need to complete

our permit decision for the final approval of using LA-5 and still support a expeditious review of the beneficial reuse alternatives discussed yesterday. Per our meeting yesterday though we may need to amend the SAP later once the disposal site is tentatively agreed on by the agencies. Thanks to Mitch/Kari/Lisa yesterday for a job well done and we look forward to the submittal document/draft Section 404(b)(1) alternatives analysis for the beneficial reuse alternatives and the next meeting and welcome comments.

Robert Revo Smith Jr., P.E.
Environmental Engineer/Civil Engineer
Regulatory Project Manager Carlsbad Field Office
6010 Hidden Valley Rd, Suite 105
San Diego, CA 92011-4213
(760) 602-4831/cell (760) 683-4454
fax (760) 602-4848
email robert.r.smith@usace.army.mil

Assist us in better serving you!
You are invited to complete our customer survey, located at the following link:
http://per2.nwp.usace.army.mil/survey.html
Note: If the link is not active, copy and paste it into your internet browser.

-----Original Message-----
From: Campopiano.Jorine@epamail.epa.gov
[mailto:Campopiano.Jorine@epamail.epa.gov]
Sent: Wednesday, April 20, 2011 12:46 PM
To: Smith, Robert R SPL; lisa.seneca@navy.mil
Cc: Ota.Allan@epamail.epa.gov; Bob Hoffman; Bryant Chesney; Mark Delaplaine (E-mail); dlilly@coastal.ca.gov; Smith, Robert R SPL; christina.fahy@noaa.gov; emaher@portofsandiego.org; sandy_vissman@fws.gov; wpaznokas@dfg.ca.gov; Dan Lawson; Eric Chavez; amonji@waterboards.ca.gov; Michael.B.Dolan@uscg.mil; Silverstein, David E CIV NAVFAC SW; Ser, Mike H CDR NAVFAC SW, SDNS; Hochstein, Patrick CDR NAVFAC SW, TYRS; Xitco, Mark J Jr CIV SPAWARSYSCEN-PACIFIC, 71510; Smith, Suzanne M CIV CNRSW, N40 Env; McKay, Deborah E CIV SPAWARSYSCEN-PACIFIC, 83210; Basinet, Richard J CIV NAVFAC SW; Coler, Kari J CIV NAVFAC SW, OPME; Perdue, Mitchell A CIV NAVFAC SW; Sanchez, Alberto S CIV NAVFAC SW; Desrochers, Michele A CIV NAVFAC SW; Ripley, Robert J CTR CSCS
Subject: Naval Base Point Loma Fuel Pier Replacement and Dredging - Suitability Call - US EPA

Robert -

EPA has reviewed the Sampling and Analysis Results Report for Naval Base Point Loma Fuel Pier Replacement and Dredging (Navy MILCON Project P-151) dated March 2011 pursuant to EPA's authorities under Sections 404 of the Clean Water Act (CWA) and the Marine Protection, Research and Sanctuaries Act (MPRSA). In summary, EPA finds all 87,000 cy of proposed dredged material suitable for unconfined aquatic disposal.

Please be aware that the suitability determination does not represent EPA's concurrence to dispose of the material at LA-5. This requires a separate EPA authorization. Based on the materials physical and chemical properties (86% sand and clean), EPA will not concur on disposal of the material to LA-5 until a beneficial use alternatives analysis is completed that demonstrates that no other less damaging alternatives exist. Based on discussions at the April 19, 2011 meeting with the Navy, beneficial use alternatives that include both in-bay habitat restoration and nearshore beach nourishment sites, are under development and will be presented to the agencies. EPA recommends that the beneficial use alternative selected be consistent with existing San Diego Bay planning efforts and Regional Sediment Management plans.

Please see detailed determination below.

Authorities

Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), Public Law 92-532, specifies that all proposed operations involving the transportation and dumping of dredged material into ocean waters have to be evaluated to determine the potential environmental impact of such activities. This is performed by the Secretary of the Army, using criteria developed by the Administrator of the EPA. In accordance with Section 103 of the MPRSA, the USACE is the permitting authority for dredged material, subject to EPA review.

The material to be dredged was evaluated in accordance with the ocean testing manual, commonly referred to as the "Green Book". The manual contains technical guidance for determining the suitability of dredged material for ocean disposal through chemical, physical, and biological evaluations. The technical guidance is intended for use by regulators in evaluating dredged-material compliance with the United States Ocean Dumping Regulations. Integral to the manual is a tiered-testing procedure for evaluating compliance with the limiting permissible concentration (LPC) as defined by the ocean-dumping regulations. One of the main purposes of Section 103 of the MPRSA is to regulate and limit adverse ecological effects of ocean dumping of dredged material. Consequently, the regulations emphasize evaluative techniques such as bioassays and bioaccumulation testing, which provide relatively direct estimates of the potential for environmental impact.

Project Description and Summary of Testing

Pier 180 is an active fuel pier that serves approximately 40 ship fueling operations per month. Over 42 million gallons of fuel are stored at Point Loma and more than 11 million gallons of fuel is used every month to service

vessels. The Navy proposes to demolish the 100 year old, seismically deficient Pier and replace it with a modern facility. The new Pier will include steel pilings (as per April 19, 2011 discussions), and will be in deeper water outboard of the existing structure. The proposed layout would include a 1,200 foot wide turning basin with a design dredge depth of -41 feet MLLW with an additional 2 foot dredge allowance. The total dredging volume is estimated to be 87,000 cy.

Samples were collected from 10 representative sites within the dredging footprint and composited into two samples. Samples were received by the lab November 15, 2010. Composite 1 consisted of stations TB-1 to TB-5 (AREA 1) and Composite 2 consisted of stations TB-6 to TB-10 (AREA 2). Full Tier III testing was conducted on the two composite samples.

The sediment consisted of fine and medium grain sands with an underlying layer of coarse sand mixed with shell hash. Area 1 & 2 were roughly 86% sand, 10 percent silt and 2 percent clay with trace amounts of gravel. The composites were analyzed for 128 constituents, including heavy metals, pesticides, organotins, PAHs, phenols, and PCBs. Sediment for the composite samples did not exceed any sediment benchmark screening criteria (ERL/ERMs).

Solid and suspended phase bioassays were conducted on the sediments. Sediment exposures to amphipods (Eohaustorius estuarius) and polychaete (Neanthes arenaceodentata) from Area 1 and Area 2 demonstrated high survival rates (96 and 92%, respectively). Test results of the suspended particulate phase demonstrated that the sediments were not toxic to mysid shrimp or inland silverside minnows at any concentration .

Bioaccumulation testing used the polychaete worm (Nereis virens) and the bent nose clam (Macoma nasuta). The bent nose calm showed 98% survival in Area 1, and 95% survival in Area 2. The worms showed 98% survival rate in Area 1 and 88% in Area 2. Several metals were detected in the bioaccumulation results as well as the reference sample. Although some were statistically significant than reference, all of the detection levels were low and the project sample results were approximately the same as those found in the reference sample.

LPC - Findings

Water Column: The concentration of dissolved plus suspended contaminants, after allowance for initial mixing, does not exceed 0.01 of the acutely toxic concentration beyond the boundaries of the disposal site within the first 4 h after dumping or at any point in the marine environment after the first 4 h. Therefore, the dredged material complies with the water-column toxicity criteria of paragraphs 227.13(c)(2)(ii) and 227.13(c)(3) (Appendix A).

Whole sediment: Mortality in the dredged material is not statistically greater than in the reference sediment, or does not exceed mortality in the reference sediment by at least 10% (20% for amphipod). Therefore, the dredged material meets the LPC for benthic toxicity and complies with the benthic bioassay criteria of paragraph 227.13(c)(3) (Appendix A).

Bioaccumulation: Tissue concentrations of contaminants of concern (lead, mercury, zinc, phthalates) in organisms exposed to dredged material statistically exceed those of organisms exposed to the reference material.

When the bioaccumulation of contaminants in dredged-material tests statistically exceeds that in the reference-material tests, the following factors should be assessed to evaluate LPC compliance.
* * * * *Number of species in which bioaccumulation from the dredged material is statistically greater than bioaccumulation from the reference material
* * * * *Number of contaminants for which bioaccumulation from the dredged material is statistically greater than bioaccumulation from the reference material
* * * * *Magnitude by which bioaccumulation from the dredged material exceeds bioaccumulation from the reference material
* * * * *Toxicological importance of the contaminants whose bioaccumulation from the dredged material statistically exceeds that from the reference material

* * * * *Phylogenetic diversity of the species in which bioaccumulation from the dredged material statistically exceeds bioaccumulation from the reference material
* * * * *Propensity for the contaminants with statistically significant bioaccumulation to biomagnify within aquatic food webs (Biddinger and Gloss, 1984; Kay, 1984)
* * * * *Magnitude of toxicity and number and phylogenetic diversity of species exhibiting greater mortality in the dredged material than in the reference material
* * * * *Magnitude by which contaminants whose bioaccumulation from the dredged material exceeds that from the reference material also exceed the concentrations found in comparable species living in the vicinity of the proposed disposal site.

These and perhaps other factors are complexly interrelated; i.e., the acceptable level of each factor depends on its interaction with all other factors. After considering these factors, EPA has determined that the Dredged material meets the LPC for bioaccumulation and complies with the benthic criteria of paragraph 227.13(c)(3) (Appendix A).

Suitability Determination
Based on the testing results, EPA has determined that 87,000 cy of material from the Naval Base Point Loma Fuel Pier Replacement and Dredging (Navy MILCON Project P-151) is Suitable for Aquatic Disposal (SUAD) at LA-5.

Please contact me with any questions or concerns.

Jorine Campopiano
Environmental Scientist, Wetlands Office

United States Environmental Protection Agency- Region 9
Southern California Field Office
600 Wilshire Boulevard, Suite 1460
Los Angeles, CA 90017
213-244-1808, 213-244-1850(FAX)
campopiano.jorine@epa.gov

-----Original Message-----
From: Eric Chavez - NOAA Federal [mailto:eric.chavez@noaa.gov]
Sent: Monday, May 20, 2013 12:14 PM
To: Perdue, Mitchell A CIV NAVFAC SW
Cc: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT; Billings, Doug
Subject: Re: FW: P-151 Updated Figure of Beneficial Reuse Site

That site is also acceptable to NMFS.

On Mon, May 20, 2013 at 11:59 AM, Perdue, Mitchell A CIV NAVFAC SW <mitchell.perdue@navy.mil> wrote:
> Hi Eric - My Bad - it's actually boat lanes 8 and 9 (see graphic). Please respond to that location.
>
> Thanx, Mitch
>
> Mitchell A. Perdue, CRM, DDC
> Senior Biologist
> Deputy Dive Safety Coordinator
> Naval Facilities Engineering Command Southwest Coastal IPT
> 2730 McKean St., Bldg 291 San Diego, CA 92136-5198 Phone - (619)
> 556-7594 FAX - (619) 556-0195 email - mitchell.perdue@navy.mil
>
>
> -----Original Message-----
> From: Eric Chavez - NOAA Federal [mailto:eric.chavez@noaa.gov]
> Sent: Monday, May 20, 2013 11:36 AM
> To: Perdue, Mitchell A CIV NAVFAC SW
> Cc: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT; Billings, Doug
> Subject: Re: FW: P-151 Updated Figure of Beneficial Reuse Site
>
> Hi Mitch,
>
> The proposed area within Boat Lanes 9 and 10 looks like an appropriate disposal site that would avoid impacts to sensitive habitat. Thanks for the update, and I'm glad you were able to use the nearshore mapping data for this project as well.
>
> Eric
>
> On Mon, May 20, 2013 at 10:42 AM, Perdue, Mitchell A CIV NAVFAC SW <mitchell.perdue@navy.mil> wrote:
>> Eric:
>>
>> Per our discussion, we are moving the beneficial reuse site from imperial Beach to our alternative location in the southern two boat lanes off of Naval Amphibious Base (see attached). Disposal will be

the same as described in the EFH Analysis and EA (Near-Shore). Per the EHS Analysis, we are avoiding any HAPC's and hard substrate.
>>
>> Thank you for your time.
>>
>> I believe Lisa needs an email response from you acknowledging receipt.
>>
>> R, Mitch
>>
>> Mitchell A. Perdue, CRM, DDC
>> Senior Biologist
>> Deputy Dive Safety Coordinator
>> Naval Facilities Engineering Command Southwest Coastal IPT
>> 2730 McKean St., Bldg 291 San Diego, CA 92136-5198 Phone - (619)
>> 556-7594 FAX - (619) 556-0195 email - mitchell.perdue@navy.mil
>
>
>
> --
> Eric Chavez
> Habitat Conservation Division
> NOAA's National Marine Fisheries Service

--
Eric Chavez
Habitat Conservation Division
NOAA's National Marine Fisheries Service



0 150 300
Meters
Feet
0 500 1,000

Source: NAVFAC Southwest 2012

Figure 2-10
Proposed P-151 Dredge Material
Beneficial Reuse Site

N

-----Original Message-----
From: Smith, Robert R SPL [mailto:Robert.R.Smith@usace.army.mil]
Sent: Monday, June 10, 2013 3:51 PM
To: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT; Ota.Allan@epa.gov; barry.snyder@amec.com; Coler, Kari J CIV NAVFAC SW, OPME
Cc: Alan.Monji@waterboards.ca.gov
Subject: RE: P151 Beneficial Reuse Site at NBC Deemed Acceptable to USEPA and USACE

Lisa,

Can you ensure that the SAPr document has this latest info and resubmit the SAPr back to me so I have a clean SAPr document with the final disposal site and results for the final SAPr approval. Thanks.

Robert Revo Smith Jr., P.E., M. ASCE
Environmental Engineer/Civil Engineer
Senior Regulatory Project Manager Carlsbad Field Office
5900 La Place Ct., Suite 100
Carlsbad, CA 92008
(760) 602-4831/cell (760) 683-4454
fax (760) 602-4848
email robert.r.smith@usace.army.mil

Assist us in better serving you!
You are invited to complete our customer survey, located at the following link:
http://per2.nwp.usace.army.mil/survey.html
Note: If the link is not active, copy and paste it into your internet browser.

Building Strong and Taking Care of People!

-----Original Message-----

From: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT
[mailto:lisa.seneca@navy.mil]
Sent: Monday, June 10, 2013 2:20 PM
To: Ota.Allan@epa.gov; Smith, Robert R SPL; barry.snyder@amec.com; Coler, Kari J CIV NAVFAC SW, OPME
Cc: Alan.Monji@waterboards.ca.gov
Subject: P151 Beneficial Reuse Site at NBC Deemed Acceptable to USEPA and USACE
Importance: High

Good Afternoon -- This is memorialize the results of last Thursdays' (6 JUN 13) telcon relating to P151 (NBPL Fuel Pier Replacement and Dredging) beneficial reuse of dredge materials (DM). During that call Kari Coler outlined the Navy's test results and updated proposal for beneficial reuse of DM nearshore of NBC (also described below and in the attached documents). USEPA and USACE expressed support for the Navy's updated P151 DM beneficial reuse proposal. No additional submittals were requested by either agency.

Please correct me if I'm wrong above or have misstated anything. Thank you very much for your assistance.

v/r, Lisa
Lisa Seneca
Sr. NEPA Planner
Coastal IPT - NAVFAC Southwest
619.556.9167

-----Original Message-----
From: Coler, Kari J CIV NAVFAC SW, OPME
Sent: Tuesday, June 04, 2013 1:10 PM
To: Monji, Alan@Waterboards; Allan Ota; Smith, Robert R SPL
Cc: Seneca, Lisa A CIV NAVFAC SW, Coastal IPT
Subject: FW: P151 Beneficial Reuse Grain Size Data - NBC Beneficial Reuse Proposal
Importance: High

Hello All,

The Pier 180 (MILCON Project P-151) dredge material sediment characterization conducted in November of 2010 resulted in a determination of Suitability for Unconfined Acquatic Disposal and indicated a large percentage of coarse grained material and low concentrations of contaminants within the existing sediments. The Navy originally proposed beneficial reuse nearshore from Imperial Beach (see attached DEC 2012 correspondence) after confirming that site's compatibility/geotechnical suitability through the cited reconnaissance level investigation. As we've discussed, the Navy is now proposing to instead perform P151 beneficial reuse nearshore from the Silver Strand Training Center (NBC).

As Pier 180 is an active military installation, current and historic activities at the site do pose a minor risk of discarded military munitions (DMM) in the dredged sediments. Although the DMM potential in the dredged material is minimal, it is sufficient enough to negate beach replenishment disposal options based on Navy disposal policies

In support of the DEC 2012 correspondence nearshore sediment samples were collected from three potential receiver sites: Naval Base North Island (NBNI), Naval Base Coronado (NBC), and the Imperial Beach nearshore replenishment area (IBNR) Figure 1. Sediment sampling transects were

deployed by divers within each potential receiver site. Three paired samples were collected from the surficial sediments (top 6-in.) in each nearshore area. Sample locations were equally spaced along the sampling transect in 20-m intervals with two separate samples collect at each individual location. Sediment samples were transferred with a completed chain of custody to Calscience Environmental Laboratories in Garden Grove, CA for geotechnical analysis using the EPA approved laser diffraction method (American Society for Testing and Materials [ASTM] 2001).

The reconnaissance level survey results indicate that on a geotechnical basis, the dredged material and potential receiver site grain sizes are compatible (Table 1). Average grain size for all samples tested for the NBC site was .182 -mm compared with .250-mm at the Pier 180 site. In addition, the greater than 80 percent coarse grain size fractions found within the dredged material samples (86.5 percent for pier 180 composite areas), further suggests that this material is suitable for nearshore disposal.
This was a reconnaissance level survey to support alternatives analysis. The Navy believes the data collected is of sufficient resolution to facilitate regulatory review for a suitability determination of Pier 180 sediments for beneficial reuse at the NBC area.

Alan -- I will FEDEX this information to you shortly.

Any questions, please let us know.

Kari

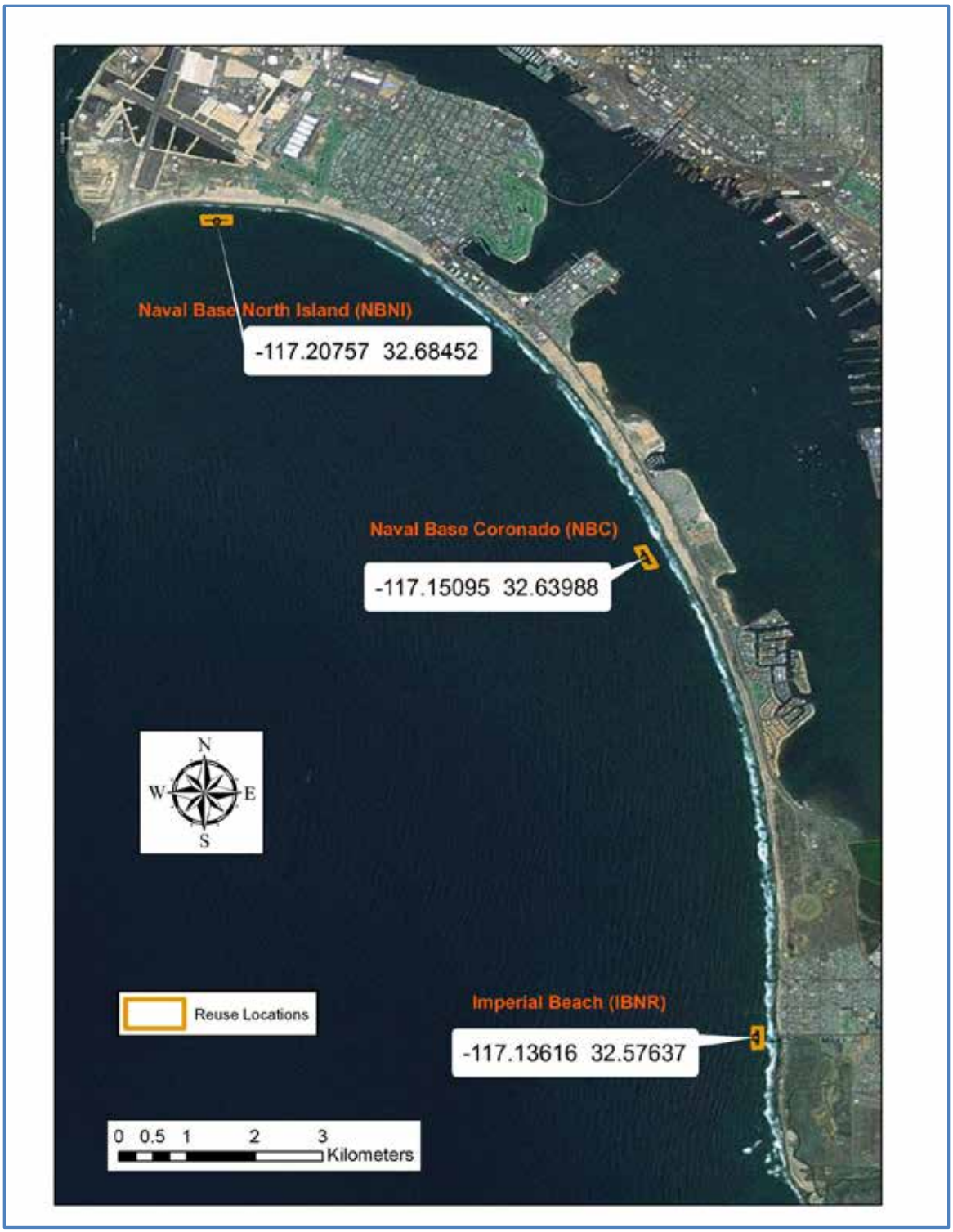


Figure 1. Potential receiver sites and associated sediment sampling locations.

Table 1. Sediment Grain Size Distribution and Mean Grain Size – Nearshore Receiver Sites compared to Pier 180 Dredging Site

Site Location	Site ID	Units	Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Total Sand	Silt	Clay	Total Silt + Clay	Mean Grain Size (mm)	Sample Description
Potenial Nearshore Reuse Site	NBNI-1	%	0	0.13	3.07	28.61	54.01	10.8	96.62	2.63	0.75	3.38	0.226	Fine Sand
	NBNI-2	%	0	0.34	4.09	29.2	53.01	9.82	96.46	2.77	0.77	3.54	0.235	Fine Sand
	NBNI-3	%	0	0.37	3.78	29.51	53.81	9.16	96.63	2.63	0.74	3.37	0.235	Fine Sand
	NBNI-4	%	0	0.19	4.05	27.49	53.79	11	96.52	2.71	0.77	3.48	0.229	Fine Sand
	NBNI-5	%	0	0.3	4.13	31.38	52.17	8.97	96.95	2.31	0.74	3.05	0.240	Fine Sand
	NBNI-6	%	0	0.46	4.49	31.02	52.43	8.61	97.01	2.29	0.7	2.99	0.244	Fine Sand
	NBC-3-1	%	0	0.2	3.46	9.41	49.78	32.29	95.14	3.94	0.93	4.87	0.175	Fine Sand
	NBC-3-2	%	0	0.26	4.24	10.9	43.2	33.9	92.5	6.51	1	7.51	0.177	Fine Sand
	NBC-3-3	%	0	0.29	2.86	8.62	46.33	35.42	93.52	5.47	1.01	6.48	0.166	Fine Sand
	NBC-3-4	%	0	0.26	3.48	11.7	60.08	21.19	96.71	2.44	0.85	3.29	0.191	Fine Sand
	NBC-3-5	%	0	0.18	3.18	12.29	60.55	20.68	96.88	2.28	0.84	3.12	0.190	Fine Sand
	NBC-3-6	%	0	0.1	3.11	12.4	61.3	19.9	96.81	2.33	0.86	3.19	0.190	Fine Sand
	IBNR-1	%	0	0.41	6.02	40.29	42.79	8.98	98.49	0.91	0.61	1.52	0.269	Medium Sand
	IBNR-2	%	0	0.38	5.51	27.01	51.11	13.8	97.81	1.48	0.71	2.19	0.238	Fine Sand
	IBNR-3	%	0	0	3.69	52.4	38.5	4.31	98.9	0.54	0.55	1.09	0.278	Medium Sand
	IBNR-4	%	0	0.32	2.08	13.69	61.14	19.98	97.21	1.99	0.8	2.79	0.189	Fine Sand
	IBNR-5	%	0.04	0.37	2.67	15.2	61.59	17.7	97.53	1.68	0.76	2.44	0.200	Fine Sand
	IBNR-6	%	0	0.52	2.85	19.4	60.69	14.3	97.76	1.53	0.72	2.25	0.212	Fine Sand
Pier 180	Area 1	%	0.03	2.38	5.95	30.18	41.55	6.75	86.81	10.54	2.62	13.2	0.220	Fine Sand
	Area1 Dup.	%	0.03	2.77	3.85	29.94	42.63	6.84	86.03	11.27	2.67	13.9	0.210	Fine Sand
	Area 2	%	0.24	8.23	19.2	33.97	18.55	6.72	86.67	10.41	2.69	13.1	0.320	Medium Sand

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

May 16, 2013

In response, refer to:
2013/9545:DDL

Mitch Purdue
U.S. Department of the Navy
Navy Region Southwest
937 No. Harbor Drive
San Diego, California 92132-0058

Dear Mr. Purdue:

NOAA's National Marine Fisheries Service (NMFS) has reviewed a letter from the U.S. Department of the Navy (Navy), received March 5, 2013, initiating informal consultation on the replacement of a fuel pier and associated improvement, termed the P-151 Fuel Pier Replacement Project (project), planned for the Point Loma area in San Diego Bay, California. The purpose of this project is to upgrade the current operational capacity and meet modern safety standards (including seismic) for a fuel pier dock that has been in operation for over 100 years. NMFS has also reviewed the supporting project description and background information provided by the Navy, including a draft Environmental Assessment (EA) prepared by the Navy in October, 2012. In addition, there have been numerous direct exchanges and project briefings between Navy and NMFS staff as the proposed project has been in development since at least 2011. In response, NMFS offers the following response pursuant to section 7 of the Endangered Species Act (ESA), and comments pursuant to the Marine Mammal Protection Act (MMPA).

Proposed Project

The proposed project is a large demolition and construction project that involves a series of complex actions that are slated to occur over a period of several years. For the purposes of this consultation, the proposed action includes: (1) temporary relocation of the Navy Marine Mammal Program (MMP); (2) demolition and removal of the existing 1.63 acre fuel pier (Pier 181); (3) construction of a new 1.51 acre fuel pier immediately adjacent to the location of the existing fuel pier; and (4) dredging and sediment disposal of approximately 80,000 cubic yards (cy). These proposed activities would occur at Naval Base Point Loma (NBPL), located near the entrance into San Diego Bay in San Diego, California.

Summaries of the various project activities are provided below:

Temporary Relocation of the Navy Marine Mammal Program

Before the pier replacement activities begin, the Navy MMP would be temporarily relocated from the existing locations at Piers 159, 160, and 302 to the north of the fuel pier, and Pier F-122 to the south, to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL located over three kilometers away from the existing fuel pier. This will be done to avoid disruption to their

to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL located over three kilometers away from the existing fuel pier. This will be done to avoid disruption to their working dolphins and sea lions from the noise and activities of the project. Limited construction at NMAWC would involve installation of approximately 50 18" concrete piles with a diesel impact hammer. Some infrastructure including the existing marine mammal enclosures would be towed from the existing facilities to the temporary NMAWC site. The Navy expects that this relocation process will take approximately 90 days to complete. After completion of the new fuel pier, the Navy marine mammal enclosures would be moved back to their original location adjacent to the fuel pier and the temporary facilities at NMAWC would be removed.

Phased Demolition and Removal of the Existing Fuel Pier

Demolition and removal of the existing fuel pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. The majority of the demolition work will be conducted over water on barge-mounted equipment, including cranes and excavators. In total, over 1,400 wood and concrete piles as well as 24 steel and 34 plastic piles will be removed from the existing fuel pier structure. Pile removal will initially be attempted by dry-pulling with cranes. A vibratory hammer or pneumatic chipper may be also used to loosen piles. Jetting of piles may also occur, and as a last resort, piles that will not come free will be cut at the mudline. Debris from removing the current fuel pier, including approximately 4,280 cy of concrete, 739 creosote treated timber piles, 680 tons of steel, 4 tons of wiring, and 3,100 linear feet of plastic fender material, would be reused, recycled, or disposed of as appropriate.

Phased Construction of a Replacement Fuel Pier

A new, double-deck fuel pier would be constructed that would provide flexibility in fueling multiple vessel types, meet Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements for seismic performance, and have a total area that is 5,315 square feet/0.12 acre (sq ft/ac) smaller than the area of the existing fuel pier. The current fuel pier has approximately 71,180 sq ft of decking. The proposed new fuel pier would have approximately 65,865 sq ft, which is an overall decrease in the shading of San Diego Bay. Approximately 554 piles are expected to be installed, including: 77 48" and 228 36" steel pipe piles; 164 24" concrete piles; and 84 16" concrete filled fiberglass piles. The exact number of 48" piles will be determined upon completion of an initial 12 pile indicator testing program that will verify the driving conditions and establish the final driving lengths prior to fabrication of the final production piles that would be used to construct the new pier. Steel piles will be initially set with a vibratory hammer, and finished with an impact hammer. Concrete piles will be jetted initially and finished with an impact hammer. Fiberglass piles will be installed with an impact hammer. The approximate productivity of the proposed project assumes an average of 2 steel and 5 concrete or fiberglass piles per day. There would be no pile driving or other in-water construction or demolition during the least tern foraging season (from April 1 through September 15) of each year that the project is ongoing. All demolition and construction activities will occur during the daylight hours. Due to these restrictions on in-water construction, pile driving for the new fuel pier could take up to three years to complete.

Dredging and Sediment Disposal

Dredging and sediment disposal are needed to deepen the existing turning basin for the existing fuel pier, so that the basin can safely accommodate current and future deep draft berthing capabilities for the new fuel pier. The new fuel pier will require a minimum 1,200 ft wide turning basin between the

navigation channel and the east side of the pier. The design depth of the turning basin is 40 ft mean lower low water (MLLW), with 2 ft of design tolerance. In order to achieve this depth, approximately 80,000 cy of material will be dredged, with an average 2,000-4,000 cy of dredging occurring per day. Dredging may occur using either a clamshell bucket or hopper dredge. Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE), but USEPA specified beneficial reuse for nearshore replenishment as the appropriate placement. The dredged sediments would be hauled by barge to a beneficial reuse site south of the Imperial Beach pier. Under the proposed project, dredging could be done before, during, or after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. It is anticipated that dredging would take approximately three months to complete. However, there would be no dredging during the California least tern foraging season, April 1 to September 15.

Endangered Species Act Consultation

1. Effects on Green Sea Turtles:

In the letter received March 5, 2013, requesting ESA Section 7 informal consultation with NMFS, the Navy determined that the action may affect, but was not likely to adversely affect, green sea turtles (*Chelonia mydas*). Green turtles are the only species identified by the Navy listed under the ESA and under NMFS' jurisdiction that could be expected to occur in the proposed action area and may be affected by this project. South San Diego Bay serves as important habitat for a resident population of up to about 60 juvenile and adult green turtles in this area (Eguchi *et al.* 2010). Based on genetic analyses and tracking studies conducted by NOAA's Southwest Fisheries Science Center, green turtles found in San Diego Bay likely represent the endangered population of turtles breeding on the Pacific coast of Mexico. There are no areas designated as critical habitat under the ESA in San Diego Bay.

Scientists believe that San Diego Bay may be one of the northern-most foraging areas for green turtles, with the shallow inlet providing valuable food resources such as marine algae and seagrass. While some of the San Diego Bay green turtles are year-round residents, others migrate through central and north San Diego Bay in order to reach their southern breeding grounds, located in the southern state of Michoacán, Mexico, and at the Revillagigedos Islands, offshore central Mexico. Since the early 1960s, sea turtles have been sighted aggregating in the vicinity of the South Bay Power Plant, where warm water effluent was discharged throughout the year. During the warm summer months, the turtles generally moved out of the effluent channel and into the Bay, especially when temperatures within the channel exceed 90°F. During incursions of warm equatorial currents (e.g., during El Niño events), more turtles have been found within the Bay. In December, 2010, the South Bay Power Plant shut down operations permanently, and NMFS is currently in the process of studying any response from the green sea turtles in San Diego including changes in their distribution and movement patterns within the Bay.

Green turtles are also attracted to the high concentrations of eelgrass in San Diego Bay, and the presence of this important food item and habitat for other preferred prey species likely influences sea turtle activity patterns within the Bay (Lemmons *et al.* 2011). Evidence from telemetry studies prior to the plant shut down show that they generally move back and forth between eelgrass beds and the warm effluent channel, with little time spent in between. Data generated from tag-recapture studies suggest that San Diego Bay is a productive habitat for green sea turtles, with green turtles from the Bay showing fast growth rates comparable to green turtles found in more tropical environments

(Eguchi *et al.* 2012). Surveys show that the sea turtles generally foraged and could typically be located within the confines of the South Bay, in relative proximity to the effluent channel (MacDonald *et al.* 2012). Because scientists have generally focused their studies to the south Bay, however, less is known of sea turtle movement within the central and northern areas of the Bay, including the importance of eelgrass beds in these areas to the turtles in the Bay. Recent information produced from monitoring during construction activities and a research project designed to track green turtle movements throughout the Bay have indicated some green turtle activity outside of south San Diego Bay during the winter months (Mitch Purdue, Navy, personal communication, April 11,2013). Satellite tracking telemetry studies have revealed that individuals which are heading back to nesting beach sites in Mexico typically leave the Bay in late March and April (Jeff Seminoff, NMFS, personal communication, February 24, 2009).

Potential impacts to any green turtles in the area from the project primarily arise from disturbance or injury to sea turtles as a result of demolition or construction activities, including use of cranes, boats, dredges, and other equipment as needed (e.g. vibratory pile hammer) to temporarily relocate the Navy MMP, demolish the existing fuel pier, construct the new fuel pier, and dredge the turning basin. Any turtle present in the project area could receive significant injuries if struck by a vessel or equipment being used. Any turtle that was caught inside or struck by the dredge would likely receive significant injuries that could be fatal. Other potential impacts include disturbance or degradation of any habitat that sea turtles may beneficially use as a result of this project. These types of construction activities can also be relatively loud and have the potential to disturb any animals that are in the vicinity. In particular, the installation of 36" or 48" steel piles is likely to generate substantially more sound than other construction projects in San Diego Bay that NMFS has consulted on with the Navy in the past. The anticipated underwater noise levels from impact and vibratory pile driving on these size piles, in conjunction with the proximate locations of California sea lion (*Zalophus californianus*) haulouts and the general seasonal abundance of several marine mammal species in the northern part of San Diego Bay and the adjacent ocean waters outside the entrance, have prompted the Navy to apply to NMFS for incidental harassment authorization (IHA) for marine mammals under the MMPA (refer to the Draft EA from the Navy for more detail).

NMFS is currently in the process of determining safety criteria (*i.e.,* guidelines) to protect marine mammals exposed to underwater sound. However, pending adoption of these guidelines, NMFS has preliminarily determined, based on past projects, consultations with experts, and published studies, that 180 dB re 1 μPa_{RMS} (for cetaceans) and 190 dB re 1 μPa_{RMS} (for pinnipeds) are the impulse sound pressure levels that can be received by marine mammals without injury. Marine mammals have shown behavioral changes when exposed to impulse sound pressure levels of 160 dB re 1 μPa_{RMS}. For more continuous sounds, such as vibratory pile driving, 120 dB μPa_{RMS} has been identified as a threshold for behavioral change; for example, beyond this threshold, hauled animals flush into the water and/or move to increase their distance from construction related activities, such as noise associated with pile-driving, presence of a crane barge, the presence of workers, or unfamiliar activity in proximity to the area where they are hauled out. Based on models of sound projection that may be expected to occur as a result of this proposed action, specifically installation of large steep piles (36" and 48"), the Navy has predicted the range of influence from the project location where sound levels will exceed these thresholds. Locally, source sound levels during the driving of large steel piles are estimated to be 195 dB re 1 μPa_{RMS} and 180 dB re 1 μPa_{RMS} for impact and vibratory pile driving, respectively.

Currently, there are no similar guidelines for safety criteria that directly relate to sea turtle injuries or behavioral response changes resulting from sound levels. In general, NMFS and other federal

agencies have relied upon the noise criteria for marine mammals (cetaceans or pinnipeds) and the safety zones that have been employed for projects to minimize the risk of injury to these species as a conservative proxy for managing impacts of very loud sound on sea turtles. While sea turtle hearing has not been studied nearly as much as marine mammal hearing, the general consensus is that, given what is known about the relative complexity of hearing and underwater communication abilities of many marine mammal species compared to sea turtles, it is likely that most, if not all, marine mammals species are more sensitive to underwater sound than sea turtles. Regardless of the specific noise exposure that sea turtles might experience during this proposed project, it is likely that disturbance from this project will lead to turtles avoiding the immediate project area once the activity has commenced, reducing the likelihood of turtles coming in direct contact with construction equipment.

In their letter, received March 5, 2013, the Navy indicated they would employ avoidance and minimization measures to avoid adverse effects to green sea turtles. In conjunction with the Navy's proposed marine mammal monitoring associated with this project, qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring would extend to the limit of potential behavioral effects to marine mammals from underwater sound. Specifically, monitoring would extend to the underwater 160 dB re 1 μPa_{RMS} isopleth for impact pile driving and to either the underwater 120 dB re 1 μPa_{RMS} isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound $\leq$ median ambient sound), whichever is less, for vibratory pile driving. A 10-meter buffer zone would also be monitored during other in-water operations of equipment and vessels. Monitoring would commence at least 15 minutes prior to the activities; if a sea turtle is seen within these ranges described above prior to or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. Prior to the start of pile driving or dredging each day, after each break of more than 30 minutes, and if any increase in the intensity is required, the Navy would use a soft start or ramp-up procedure to allow animals in the area to disperse. Specifically, the soft start procedure for pile driving requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure will be repeated two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets. The Navy believes that this will prevent adverse effects to green sea turtles.

(i) Effects on sea turtles in the construction site (including encounters with cranes, boats, and dredges)

In assessing the risk of this project, NMFS considers the location of project activities in relation to the probability that green turtles may be found in the vicinity. As the project area for the fuel pier replacement lies within Naval Base Point Loma in the northern part of San Diego Bay, including the MMAWC facility 3 kilometers from the existing fuel pier, the probability that vessels or construction equipment will encounter any sea turtles is low as turtles as they are not likely to spend much time, if any, present in the north part of San Diego Bay near the proposed project area. While it is possible that turtles could be transiting in/out of San Diego Bay past Point Loma, turtles are expected to be swimming in the water column and not immediately along the shore within the confines of Naval Base Point Loma and the active working waterfront, and therefore, are not likely to encounter vessels and equipment associated with the proposed project activities, including dredging. Although sound levels from pile driving which could injure sea turtles are expected to be reached in the construction

site, sea turtles are not expected to be in the zone of impact when such impact occurs for the reasons discussed herein. As proposed by the action agency, if a sea turtle is seen in the construction site prior to or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. In addition, if any turtles are in the construction site area but avoid detection, the use of ramp-up procedures to slowly increase the intensity of pile-driving gives sea turtles an opportunity to detect the commencement of project activities and an opportunity to move away; based on our understanding of their behavior they are expected to avail themselves of this opportunity. Adequate habitat exists beyond the construction zone, with adequate carrying capacity to support any avoiding sea turtles without any reduction in their fitness. As a result, the risk of direct contact and injury or death as a result of the proposed project is discountable or insignificant.

(ii) Effects on turtles from sound beyond the immediate construction site

There is an additional consideration for the effects of the project extending beyond the immediate project area, as noise levels loud enough to produce behavioral changes to marine mammals may be generated by the driving of large steel piles extending throughout most of the northern portion of San Diego Bay out into the ocean (e.g. in excess of 160 dB re 1 μPa_{RMS} during impact pile driving and 120 dB re 1 μPa_{RMS} during vibratory pile driving). Although these sound propagation models do not project increased sound levels into the southern part of San Diego Bay, sea turtles may occasionally be found in the northern part of San Diego. Sound pressure levels of the magnitude that are expected to be produced by this proposed project may have deleterious effects on sea turtles if they interfere with communication, foraging or resting behavior, or predator/prey detection. More significantly, acoustic overexposure to loud sounds can lead to a temporary or permanent loss of hearing (termed a temporary or permanent threshold shift). As mentioned above, NMFS has yet to establish specific noise criteria for sea turtles exposure to underwater sound. While the number of published studies on the impacts of sound on sea turtles is small, the available data does suggest that sea turtles have higher hearing thresholds at frequencies where construction sound is concentrated (Ridgeway *et al.* 1969; Lenhardt 1994; Bartol and Ketten 2003; Martin *et al.* 2012). In one test where caged green and loggerhead sea turtles were exposed to single air gun sounds, the trials showed that above a received level of 166 dB re 1 μPa_{RMS}, the turtles noticeably increased their swimming activity compared to nonoperational periods, with swimming time increasing as air gun sound pressure levels increased during close approach. Above 175 dB re 1 μPa_{RMS}, behavior became more erratic, possibly indicating the turtles were in an agitated state (McCauley *et al.* 2000). Assuming the levels identified in that study are reasonable indications of the sound levels that may affect sea turtles, the monitoring program that has been proposed as part of this project to protect marine mammals should be sufficient to minimize the risk of adverse effects from loud noise produced by construction to sea turtles to the point at which no reduction in individual fitness is expected to occur. The duration of any exposure to high sound levels is expected to be minimal, as sound sources will cease shortly after detection of a turtle, and that turtle will most likely head out of the area before or shortly after noise levels get loud. Given that green sea turtles are not likely to spend much time in north San Diego Bay to begin with, avoidance of this portion of San Diego Bay for any period of time is not likely to limit their ability to forage or have any detectable effect on health. While some eelgrass is located in the north part of San Diego Bay, most all of the sizeable eelgrass beds are located in other portions of San Diego Bay that should not be affected by the proposed project. Additionally, pile driving activity will only occur during the daytime hours, and will not occur from April 1 through September 15 for the duration of this project. As a result, sea turtles should have adequate periods of time where they are free to transit in and out of San Diego without any risk of exposure to loud sound, including April when they might be expected to head south for mating and nesting. Therefore, the potential

effects of noise disturbance are expected to be insignificant and discountable given the proposed mitigation and monitoring requirement that the Navy will employ, the low probability that sea turtles will be in north San Diego Bay for any length of time, and the lack of any detectable impact on health that avoidance of north San Diego Bay would have on green sea turtles.

(iii) Effects on turtles from habitat impacts

Although the northern portion of San Diego Bay does not appear to be the typical location of green turtle presence in the Bay, it is possible that green turtles may occasionally take advantage of any available eelgrass habitat in that area temporarily or while transiting out of San Diego Bay. As part of the proposed project, the Navy has conducted an Essential Fish Habitat (EFH) consultation with NMFS, which includes assessment of potential impacts to eelgrass habitat. In the project description, the Navy highlights several design features of the newly constructed fuel pier that minimize the potential for impacts to eelgrass habitat, including reducing the pier footprint nearshore and alignment of the pier to avoid current and historical areas of eelgrass presence. In total, the Navy expects that the fuel pier replacement will affect 0.1 acres of eelgrass habitat. The temporary relocation of the Navy MMP is also expected to affect eelgrass habitat, as the physical structures that house the marine mammals will be placed in an area that does currently or has historically support about 1.0 acre of eelgrass. Green sea turtles do not appear to commonly use north San Diego Bay. Accordingly, the loss of the proposed amount of eelgrass in north San Diego Bay is not expected to be noticeable by the turtles, as eelgrass beds in this area are not believed to be as important in sustaining the foraging needs of green sea turtles as those eelgrass beds in other parts of San Diego Bay. Any turtle that may occasionally visit the northern part of San Diego Bay would be expected to be a temporary visitor that was not likely to remain in the area long, even without any disturbance to the existing eelgrass habitat in that area. The remaining eelgrass habitat in north San Diego Bay is expected to be sufficient to provide the same minimal foraging needs of turtles that are passing through the area that would have been required prior to this proposed project.

Upon completion of the project, the Navy will remove the temporary MMP structures, and eelgrass may be reestablished in the impacted area shortly after the project ceases. As a result, the insignificant amount of eelgrass habitat impacts described above may only be temporary; nevertheless, as such regrowth is not reasonably certain to occur, we do not rely on regrowth for the purposes of this analysis.

Furthermore, some of the eelgrass habitat that has been created through the Navy's bank includes some limited areas within north San Diego Bay. While the loss of a small portion of eelgrass habitat in north San Diego would not be expected to have a significant effect on green sea turtles for the reasons stated above, the resultant eelgrass habitat in north San Diego Bay, in part resulting from the Navy's bank activities, is expected to adequately maintain or improve the habitat function for any turtles that do pass through the area.

Based on all of the above (except for the regrowth potential as specifically noted) , NMFS concurs with the Navy's determination that the proposed action may affect, but is not likely to adversely affect, green sea turtles.

As part of ongoing research to understand the ecology of green sea turtles in San Diego Bay in cooperation with the Navy, NMFS requests that any observations of sea turtles made in the vicinity of the project area during this proposed project be communicated to NMFS regional staff at the earliest convenience. NMFS regional staff also requests to be notified when major construction

activities commence begin and end each season, in order to keep NMFS researchers and other partners in San Diego Bay abreast of changing conditions that may influence sea turtle behavior or movements in the Bay.

2. Effects on WNP Gray Whales:

As mentioned previously, the Navy has applied for an IHA under the MMPA for potential harassment of marine mammals, including gray whales (*Eschrichtius robustus)*, as a result of the sound pressure levels produced from the driving of large steel piles during this proposed project. There are two recognized gray whale stocks in the North Pacific, the eastern North Pacific (ENP) and the western North Pacific (WNP), which is listed as endangered under the ESA. Historically, the WNP gray whales were considered geographically isolated from the ENP stock; however, recent information is suggesting more overlap exists between these two stocks. It is also possible that WNP gray whales that migrate within the range of the ENP gray whales, specifically along the coastal waters of San Diego, could be found within the acoustic zone of influence where sound pressure levels exceed established thresholds for potential behavior change resulting from proposed project activities. Two WNP gray whales have been satellite-tracked from Russian foraging areas east along the Aleutian Islands, through the Gulf of Alaska, and south past the coasts of Washington and Oregon to the southern tip of Baja California in one case (Mate *et al.* 2011) and in the other case, where the satellite tag remained on the animal longer, back to Sakhalin Island (IWC 2012). Comparisons of ENP and WNP gray whale photo-identification catalogs have thus far identified 22-24 WNP gray whales occurring on the eastern side of the basin (IWC 2012; Weller *et* al. 2011; Burdin *et al.* 2011). During one field season off Vancouver Island, WNP gray whales were found to constitute 6 of the 74 (8.1%) of photo-identifications (Weller *et al.* 2012). In addition, two genetic matches of WNP gray whales off Santa Barbara, California have been made (Lang *et al.* 2011). Thus, a portion of the WNP gray whale population is assumed to have migrated, at least in some years, to the eastern North Pacific during the winter breeding season (Burdin *et al.* 2012; Urban *et al.* 2012).

The Navy's IHA application suggests that 1 gray whale may be exposed to sound pressure levels in excess of the thresholds for behavioral change (160 dB re 1 μPa_{RMS}) for up to 15 days each year during the 3-year term of this project. It is expected that any gray whale that could be found within the acoustic zone of influence and exposed to loud noise during the proposed action is presumably one that is idle for a period of time around the entrance to San Diego Bay instead of continuing directly along its migratory path. The current minimum population estimate for ENP gray whales is 19,126 (Carretta *et al.* 2012). The most recent estimate of WNP gray whale abundance is 137 individuals (IWC 2012). At any given time during the migration, WNP gray whales could be part of the approximately 20,000 gray whales migrating through the Southern California Bight offshore of San Diego, but the chance that any given whale that would diverge from the migration and linger near or into San Diego Bay would be a WNP gray whale is extremely small with a probability of less than 1%, even if the entire population of WNP gray whales were part of the annual gray whale migration. While it is possible that any gray whale found near San Diego Bay could be a WNP gray whale, the likelihood remains extremely low.

NMFS also considers the likely impact of a WNP gray whale exposure to the proposed project. Under the proposed project monitoring, the Navy will be monitoring for the presence of gray whales and other marine mammals. The area where sound levels are expected to cause injury to marine mammals will be monitored and project construction activities will not be conducted while marine mammals, specifically gray whales, are present in the shutdown zone range (e.g., in excess of 190 dB re 1 μPa_{RMS}), which is expected to be within 100 meters of pile driving operations at the most. In

addition, the Navy will be employing ramp-up mitigation measures to slowly increase the intensity of sound produced giving any gray whale in the area that was not initially observed a chance to detect the oncoming presence of construction activities and the opportunity to move further away to avoid injury. Any whales that might initially be in the zone of influence of potentially injurious sound levels should receive ramp-up sound levels that will cause them to move out of the area prior to exposure to potentially injurious sound levels. As a result, in the unlikely event that a WNP gray whale was in the project area, it would not expected to be exposed to any injurious sound levels. NMFS also expects that any gray whales that may perceive the sound of construction activities as they approach San Diego Bay are likely to avoid entering the Bay and approaching the proposed project area, and will likely resume their migration route along the coast. Avoidance of the project area and San Diego Bay in general is not likely to cause any harm to individuals, since gray whales that are near San Diego are either on their way to mating/birthing grounds in Mexico or to summer foraging locations in Alaska and do not rely upon entering the bay for breeding, rearing, migrating, feeding, or sheltering. Consequently, it is unlikely that any effects to gray whales from this proposed action will lead to decreased fitness or survival.

Based on the above, the likelihood that a WNP gray would be adversely affected by this proposed project is insignificant and discountable. As a result, NMFS concludes that the proposed action may affect, but is not likely to adversely affect, WNP gray whales.

As part of the monitoring efforts that are associated with the proposed action, NMFS requests that any photos of gray whales taken in the vicinity of the proposed action be submitted to NMFS regional staff for comparison with photo-identification catalogs that are available for WNP gray whales.

This concludes informal consultation for the proposed action. Reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered; or (3) a new species is listed or critical habitat designated that may be affected by the action. As noted above, injury or death of sea turtles or WNP gray whales are not expected from this project; evidence of such an outcome would require re-initiation under (1) of this paragraph. In such a case, the Navy should immediately cease operations and contact our regional stranding coordinator, Sarah Wilkin, at (562) 980-3230.

Please note that consultation under the ESA does not affect Navy's obligations under the MMPA with regard to the underlying action.

Marine Mammal Protection Act Comments

Marine mammals are protected under the Marine Mammal Protection Act (MMPA) (16 U.S.C. § 1361 et. seq.). Under the MMPA, it is generally illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. Except with respect to military readiness activities and certain scientific research conducted by, or on behalf of, the Federal Government. "Harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration,

breathing, nursing, breeding, feeding, or sheltering. Please note that this letter does not provide Incidental Harassment Authorization (IHA) for any marine mammals; any authorization will come from NMFS Office of Protected Resources, in Silver Spring, Maryland. These comments are provided to facilitate direct coordination with the local NMFS Southwest Regional Office responsible for marine mammal conservation in the area of the proposed project.

California sea lions, Pacific harbor seals (*Phoca vitulina richardii*), and bottlenose dolphins (*Tursiops truncates)* may be found in the project area, as defined by the range of sound levels that approach or exceed noise criteria for behavioral changes or physical harm that may be produced by the driving of large steel piles. Gray whales may also be found in the project area; however, for the reasons discussed above, the project is not expected to result in physical harm to such whales by the driving of large steel piles. As a result of the sound modeling on the potential impacts of the proposed action, in combination with marine mammal surveys of San Diego Bay and the surrounding waters conducted by the Navy over the last few years, the Navy has applied to NMFS for an IHA under the MMPA for incidental harassment of all four of these species over the course of this project. The IHA application is currently under review by NMFS Office of Protected Resources.

In addition to any monitoring or reporting that might be required pursuant to an IHA by NMFS Office of Protected Resources, in the unlikely event of an injury or mortality of a marine mammal due to this project, please immediately contact our regional stranding coordinator, Sarah Wilkin at (562) 980-3230. As part of the Navy's ongoing efforts to understand the sound levels generated by large construction activities in San Diego Bay in cooperation with NMFS, including pile removal and installation, NMFS is anticipating that the Navy will be collecting data on the sound attenuation associated with the driving of various types of piles. NMFS believes this information will be invaluable in understanding the impact of future projects that may occur in San Diego Bay, as well as other places. NMFS fully encourages the Navy to conduct these studies and requests that any data gathered on the sound pressure levels produced by these activities or impacts to any living marine resources resulting from this project be shared to NMFS regional staff at the earliest convenience. NMFS regional staff is available to help assist in these studies or interpretation of data as needed upon request from the Navy.

Thank you for consulting with NMFS and consideration of our comments. If you have any questions pursuant to this letter or other ESA or MMPA issues, please contact Dan Lawson at (562) 980-3209 or Dan.Lawson@noaa.gov, or Monica DeAngelis at (562) 980-3232 or Monica.DeAngelis@noaa.gov, respectively.

Sincerely,

Rodney R. McInnis
Regional Administrator

cc: Jeffrey Seminoff, Southwest Fisheries Science Center
Administrative File: 151422SWR2013PR00094

References

Bartol, S.M. and D. Ketten. 2003. Auditory brainstem responses of multiple species of sea turtles. In: Gisner, R., ed. Environmental consequences of underwater sound (ECOUS) abstracts, May 12-16, 2003. Office of Naval Research: Arlington, VA.

Burdin, A. M., D. Weller, O. Sychenko, and A.L. Bradford. 2012. *"Western Gray Whales off Sakhalin Island, Russia: A Catalog of Photo-Identified Individuals"*. 205 individuals. Period 1994-2011.

Carretta, J.V., E. Oleson, D.W. Weller, A. Lang, K.A. Forney, J. Baker, B. Hanson, K. Martien, M.M. Muto, M.S. Lowry, J. Barlow, D. Lynch, L. Carswell, R.L. Brownell, D.K. Mattila, and M.C. Hill. 2013. U.S. Pacific Marine Mammal Stock Assessment: 2012. U.S. Department of Commerce Technical Memorandum, NOAA-TM-NMFS-SWFSC-504.

Eguchi, T., J.A. Seminoff, R.A. LeRoux, P.H. Dutton, D.L. Dutton. 2010. Abundance and survival rates of green turtles in an urban environment: coexistence of humans and an endangered species. Marine Biology 157:1869-1877.

IWC. 2012. Extracts from the IWC64 Scientific Committee report relevant to the WGWAP. International Whaling Commission.

Lang, A. R., D.W.Weller, R. LeDuc, A.M. Burdin, V.L. Pease , D. Litovka ,V. Burkanov, R.L. Brownell, Jr.. 2011. Genetic analysis of stock structure and movements of gray whales in the eastern and western North Pacific. International Whaling Commission.

Lemmons, G., R. Lewison, L. Komoroske, A. Goas, C.T. Lai, P. Dutton, T. Eguchi, R. LeRoux, and J. Seminoff. 2011. Trophic ecology of green sea turtles in a highly urbanized bay: Insights from stable isotopes and mixing models. Journal of Experimental Marine Biology and Ecology 405:25-32.

Lenhardt, M.L. 1994. Auditory behavior of loggerhead sea turtle (*Caretta caretta*). In: K.A. Bjorndal, A.B. Bolten, D.A. Johnson, and P.J. Eliazar (compilers). Proceedings of the 14th Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-351.

Martin, K.J., S.C. Alessi, J.C. Gaspard, A.D. Tucker, G.B. Bauer, and D.A. Mann. 2012. Underwater hearing in the loggerhead turtle (*Caretta caretta*): a comparison of behavioral and auditory evoked potential audiograms. Journal of Experimental Biology 215:3001-3009.

Mate, B., A. Bradford, G. Tsidulko, V. Vertyankin, and V. Ilyashenko. 2011. Late-feeding season movements of a western North Pacific gray whale off Sakhalin Island, Russia and subsequent migration into the eastern North Pacific. International Whaling Commission-Scientific Committee, Tromso, Norway.

McCauley, R. D., Fewtrell, J., Duncan, A. J., Jenner, C., Jenner, M.-N., Penrose, J. D. 2000. Marine Seismic Surveys: Analysis and Propagation of Air-gun Signals; and Effects of Air-gun Exposure on Humpback Whales, Sea Turtles, Fishes and Squid. (R99-15, pp. 198). Western Australia: Centre for Marine Science and Technology.

Ridgeway, S.H., E.G. Wever, J.G. McCormick, J. Palin, and J.H. Anderson. 1969. Hearing in the giant sea turtle, *Chelonia mydas*. Proc. Nat. Acad. Sci (USA) 64:884-890.

Weller, D. W., Klimek, A., Bradford, A.L., Calambokidis, J., Lang, A.R., Gisborne, B., Burdin A.M, Szaniszlo, W., and Brownell RL, Jr. 2011. Movements of western gray whales from the Okhotsk Sea to the eastern North Pacific. International Whaling Commission-Scientific Committee, Tromso, Norway.

Urbán J. R., D. Weller, O. Tyurneva, S. Swartz, A. Bradford, Y. Yakovlev, O. Sychenko, H. Rosales N., S. Martínez A., A. Burdin, and A. Gómez-Gallardo U. 2012. Photographic comparison of the western and Mexican gray whale catalogues: 2012. Laguna San Ignacio Ecosystem Science Program, June 2012.

Weller, D. W. A. Klimek, A.L. Bradford, J. Calambokidis, A.R. Lang, B. Gisborne, A.M. Burdin, W. Szaniszlo, J. Urbán, A. Gomez-Gallardo Unzueta, S. Swartz, and R.L. Brownell, Jr. 2012. Movements of gray whales between the western and eastern North Pacific. Endangered Species Research 18:193-199.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

January 22, 2013

In response, refer to:
SWR/F/SWR1:EC

Commander Mike Ser
Naval Facilities Engineering Command Southwest
Coastal IPT
2730 McKean St., Building 291
San Diego, California 92136-5198

Dear Commander Ser:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Navy's Essential Fish Habitat (EFH) Assessment for the Fuel Pier Replacement Project at Naval Base Point Loma along the northern edge of San Diego Bay, California. NMFS offers the following comments pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA).

Issues pertaining to the Endangered Species Act or Marine Mammal Protection Act will be addressed in a separate consultation process by NMFS staff in the Protected Resources Division (PRD). Therefore, the Navy should continue to coordinate with PRD on those issues.

Proposed Action

For purposes of this consultation, the proposed action would include: 1) demolition of the existing 1.63 acre fuel pier (Pier 180); 2) construction of a new 1.51 acre pier facility; 3) temporarily relocating the Navy's Marine Mammal Program to the Naval Mine and Antisubmarine Warfare Command approximately 3 kilometers away; 4) relocating the commercial bait barges approximately 5 kilometers from the project site; and 5) dredging an estimated 80,000 cubic yards (cy) of sediment, transporting the material by barge and depositing it in the nearshore zone south of the Imperial Beach Pier. Project demolition, construction and dredging would occur in two phases to maintain fueling capabilities during the construction process, which would begin in 2013 and be completed in 2017.

Pier 180 is the largest active Navy fueling facility in the vicinity, delivering and receiving more than 11 million gallons of fuel every month. The pier has exceeded its designed service life of 50 years, and some portions of the facility are over 100 years old. As a result, it has structural deficiencies and does not meet current seismic requirements. Significant damage in a moderate earthquake is considered likely, with potential failure of the pile foundations expected to occur in a major seismic event. The new pier facility would meet modern seismic criteria and be capable of supporting current and future fueling needs of the Navy and Department of Homeland Security

Pile removal may include dry-pulling with a barge-mounted crane, or cutting them off at the mudline if a pile cannot be completely removed. A vibratory hammer or pneumatic chipper may be used to loosen the piles, and if those methods are ineffective, the piles may be loosened by jetting. Debris from removing Pier 180, including approximately 4,280 cy of concrete, 739 creosote-treated timber piles, 680 tons of steel, 4 tons of wiring, and 3,100 linear feet of plastic fender material would be reused, recycled, or disposed of as appropriate.

The new pier will require the installation of both 48-inch (77 piles) and 36-inch (228 piles) diameter steel wall pipe piles. The remaining 249 piles would be a combination of 24-inch concrete and 16-inch concrete-filled fiberglass piles. A vibratory hammer would be used to install the steel pilings for the majority of the embedment. The last 10-15 feet would require 30 to 120 minutes of driving with an impact hammer. Concrete piles would be jetted first, and then driven with an impact hammer to complete the installation. Fiberglass piles, which do not need to be driven deeply, would be installed with an impact hammer. Data on sound propagation will be collected during pile installation and removal using hydroacoustic monitoring to validate or refine estimates of acoustic effects to marine mammals.

The Navy's Marine Mammal Program is being temporarily relocated to the Naval Mine and Antisubmarine Warfare Command approximately 3 kilometers away to help avoid potential impacts to the trained marine mammals from construction-related noise. Similarly, the commercial bait barges are being relocated approximately 5 kilometers from the project site to help reduce potential noise impacts to bait fish and the marine mammals attracted to the barges.

Dredging in the turning basin would be performed down to a maximum depth of 42 feet mean lower low water (MLLW), including overdredge allowance, to remove shoaled material and allow current and future deep draft vessels to safely access the pier. Testing of material at the dredge site, located outside the Federal navigation channel, has confirmed a lack of contamination and a high percentage of sand. Therefore, the 80,000 cy of material is slated for beneficial reuse at a receiver site south of the Imperial Beach Pier. On average, the amount of material deposited daily at the disposal site would be 2,000 cy.

Finally, once construction of the new pier is completed, the quaywall would be rebuilt. This process would include placing approximately 100 cy of concrete and removing two closed underground storage tanks.

Measures are being implemented to minimize impacts to eelgrass resources within the vicinity of the project area. These measures include aligning the pier to minimize eelgrass disturbance, extending the pier into deeper water to minimize dredging, keeping existing sheet piling in place to minimize sediment and eelgrass disturbance, and the use of mooring dolphins to reduce the size of the new pier footprint and minimize bay shading. Regarding the measure to decrease the footprint of the facility, the new structure would be approximately 1.51 acre in size, reducing overwater coverage associated with the fuel pier by .12 acre.

Magnuson-Stevens Fishery Conservation and Management Act Comments

Action Area

The proposed project occurs within EFH for various federally managed fish species within the Pacific Coast Groundfish and Coastal Pelagic Species Fishery Management Plans (FMPs). In addition, the project occurs within estuarine and eelgrass habitat, which are designated as habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

Effects of the Action

The resuspension of sediments from construction activities, including pile removal and installation, would adversely affect EFH because of increased turbidity and/or increased exposure to contaminants. Increased turbidity in aquatic systems can reduce light penetration, alter pH and dissolved oxygen levels, smother fish spawning areas and food supplies, bury benthic invertebrates, hamper filtering capabilities of filter feeders, clog and harm the gills of fish, interfere with feeding behaviors and substantially reduce overall biological productivity (Benfield and Minello 1996, Gabr *et al.* 2004). The resulting increase in turbidity from pile jetting can vary substantially depending upon substrate particle size. General observations made by Gabr *et al.* (2004) based on field research are that the diameters of the debris zones caused by jetting are roughly equivalent to the jetted depth of the pile, and the volume of debris around the annulus of the pile is equal to, or slightly more than, the inserted volume of the pile.

Contaminants contained within the pile, and in the surrounding substrate due to leaching from the pile or release from the pier (*i.e.*, discharges from boats or prior activities at the site) can be released during construction, especially pile driving and removal. Disruption of the bottom sediments can recirculate toxic metals, hydrocarbons, hydrophobic organics (*e.g.*, dioxins), pesticides, pathogens, and nutrients into the water column (Hanson *et al.* 2003). These substances can cause direct toxicological impacts to exposed fish, indirect impairment of the productivity of aquatic ecosystems, impacts to aquatic vegetation, and reduced oxygen levels. Toxic organics and metals, pathogens, and viruses absorbed or adsorbed to fine-grained particulates may become biologically available to organisms either in the water column or through food chain processes (Hanson *et al.* 2003). Similarly, creosote-treated piles may break during removal releasing polycyclic aromatic hydrocarbons (PAHs) into the bay. PAHs are known to cause cancer, reproductive anomalies, and immune dysfunction, impair growth and development and cause other detrimental effects to fishes over time (NMFS 2009). Research has demonstrated that contaminants introduced into marine environments and taken up by marine organisms are generally passed or magnified through the foodweb, subsequently affecting animal reproduction and population viability (Johnson *et al.* 1991, O'Neill *et al.* 1995, West 1997).

Pile driving can generate intense underwater sound pressure waves that may affect fish behavior, injure or kill fish. Of particular concern is the driving of steel piles with an impact hammer, which is expected to generate a peak sound level of 210 decibels (dB) at 10 meters according to the EFH Assessment. Popper and Hastings (2009) completed a review of information on the effects of anthropogenic sources of sound on fishes. Their review covers the wide range of potential effects from underwater sound, but notes a lack of peer-reviewed literature on the issue. The type and severity of the impact can vary greatly depending upon several factors, including the magnitude of the sound, proximity of habitat or fish to the sound, marine community characteristics, size and body type of fish, and type of water body (e.g., enclosed bay, open ocean, *etc.*). Behavioral responses observed during experiments with herring and rockfish ranged from avoidance (fish move slowly away from the sound source) to alarm (fish gathered together, fled at high speed, dove repeatedly, and quickly changed directions) to startle (fish severely flexed their bodies and then swam at high speed without changing direction, or shuddered with each blast) (Schwarz and Greer 1984, Pearson *et al.* 1992). Fish mortality resulting from pile driving activities has also been observed up to a distance of 50 meters (Caltrans 2001). Eggs and larvae, which are often either stationary or move primarily as a result of wave or currents, may be more susceptible to sound exposure due to their inability to move quickly away from a sound source. Although there is a paucity of data on impacts to eggs and larvae from sound pressure waves, the effects can range from mortality to reduced growth rates (Popper and Hastings 2009). In their review of available information, Popper and Hastings (2009) identify data gaps on the effects of various sound types to fish and the need for a set of systematic studies to provide that important information.

In 2008, NMFS, in collaboration with the U.S. Fish and Wildlife Service, California Department of Fish and Game, and state transportation agencies, established the interim criteria for injury to fish from pile driving activities. The interim criteria identified the onset of injury from impact pile driving to occur at sound pressure levels of 206 dB peak and 187 dB accumulated sound exposure level (SEL) for fish equal or greater than 2 grams. For those fish less than 2 grams, the accumulated SEL was set at 183 dB. Although the Navy acknowledged these criteria in the EFH Assessment, they consider them conservative and have not adopted them.

Overwater structures and associated activities affect the ecological functions of habitat through the alteration of habitat controlling factors, including light regime, wave energy, substrate and water quality. These alterations can, in turn, interfere with habitat processes supporting the key ecological functions of fish spawning, rearing, foraging, and refugia. Nightingale and Simenstad (2001) identify the potential mechanisms of impact overwater structures can pose to nearshore habitats. Some of the impacts that may result from the proposed overwater structure and related activities (*e.g.,* piling installation/removal) include: 1) reduced light levels and altered ambient light patterns; 2) altered wave and tidal energy patterns; 3) substrate disturbance and smothering; 4) an increase of non-indigenous species; and 5) elevated levels of toxics, nutrients, and bacteria. These impacts can limit plant growth and recruitment, alter plant and animal assemblages, affect animal behavior, modify substrate type, alter sediment transport and distribution, and facilitate the replacement of native species with exotics. For example, light is the single most important factor affecting aquatic plants (Hauxwell *et al.* 2003). Light levels underneath overwater structures have been found to fall below threshold levels for photosynthesis of diatoms, benthic algae, eelgrass, associated epiphytes and other autotrophs (Burdick and Short 1999). These

photosynthesizers are an essential part of nearshore habitat and the estuarine and nearshore food webs that support many species of marine and estuarine fishes and invertebrates.

As mentioned previously, measures are being taken to minimize impacts to eelgrass habitat. However, eelgrass impacts can not be completely avoided, and approximately .1 acre of existing eelgrass, or habitat that has supported eelgrass in the past (*i.e.*, historical eelgrass), would be permanently shaded as a result of pier construction. In addition, approximately 1.0 acre of existing and historical eelgrass habitat would be temporarily impacted due to the relocation of the Navy's marine mammal pens. To compensate for these eelgrass impacts, the Navy is proposing to use credits from their existing eelgrass mitigation bank in San Diego Bay.

The adverse effects of dredging on EFH may include: 1) direct removal/burial of organisms; 2) turbidity/siltation effects, including light attenuation from turbidity; 3) alteration to hydrodynamic regimes and physical habitat; 4) release of oxygen consuming substances; 5) entrainment; 6) noise disturbances; and 7) contaminant release and uptake. Dredging operations would impact approximately 10.6 acres in San Diego Bay.

Another potential project concern is the spread of the invasive alga *Caulerpa taxifolia* from project activities. As you may be aware, this alga was introduced to our coastline. Evidence of harm that can result from an uncontrolled spread of the alga has already been seen in the Mediterranean Sea where it destroyed local ecosystems, impacted commercial fishing areas, and affected coastal navigation and recreational opportunities. Although it is not known to be present within San Diego Bay, it was detected in two other locations in Southern California. If the invasive alga is present within the project area, the bottom disturbing activities would adversely affect EFH by promoting its spread and increasing its negative ecosystem impacts. The proposed project includes a provision to complete a *Caulerpa taxifolia* survey in accordance with the current Caulerpa Control Protocol to address this concern.

EFH Conservation Recommendations

Based upon the above effects analysis, NMFS has determined that the proposed action would adversely affect EFH for various federally managed fish species within the Pacific Coast Groundfish and Coastal Pelagic Species FMPs. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH Conservation Recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1) Due to limited data regarding, and inconsistency between the Navy's and NMFS' positions on, potential impacts to fishes from pile driving, there is an obvious need to gain a better understanding of these potential impacts (ranging from behavioral to lethal effects) within San Diego Bay. This project presents a unique opportunity to conduct an experiment to gather important data about pile driving activities in San Diego Bay, including the installation of large diameter, steel piles. Therefore, NMFS recommends that the Navy coordinate with us to develop an experimental study as part of this project to collect sufficient information on the physiological and behavioral effects to fish from pile driving to better evaluate these impacts. The

information gathered during this study should help facilitate the review of similar projects in the future and inform measures to address impacts to EFH.

2) NMFS is concerned that project activities may release contaminants back into suspension resulting in potential adverse impacts to EFH. Therefore, prior to jetting piles, the Navy should analyze sediments adjacent to Pier 180 to determine if elevated levels of any contaminants of concern are present. Results should be submitted to NMFS by March 1, 2013 to allow coordination between the Navy and NMFS on any measures (in addition to those listed in Conservation Recommendations 3 and 4 below) that may be warranted.

3) When removing piles, the permittee should minimize the suspension of sediments and disturbance of the substrate. Measures to help accomplish this include, but are not limited to, the following: a) if practicable, remove piles with a vibratory hammer, rather than jetting them, or using the direct pull or clamshell method; b) encircle the pile, or piles, with a silt curtain that preferably extends from the surface of the water to just above the substrate; c) the operator should first hit or vibrate the pile to break the bond between the sediment and pile to minimize the potential for the pile to break, as well as reduce the amount of sediment sloughing off the pile during removal; d) remove the pile slowly to allow sediment to slough off at, or near, the mudline; and e) for creosote-treated wood piles, if it is not possible to remove the pile without breaking it, or if it is infeasible to remove the entire pile, the pile should be cut below the mudline.

4) The creosote-treated pile removal process should be monitored for any contamination on the water surface by creosote oils. A containment boom should be employed around the work area to capture and remove any debris or noticeable oil from the creosote-treated piles. Additionally, if any sheen associated with oil contamination is observed at the water surface, oil absorbent materials should be used to remove all oil residues.

Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the Navy must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations.

Fish and Wildlife Coordination Act Comments

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the MSA. The EFH Conservation Recommendations provided above also serve as FWCA recommendations to compensate for negative impacts to fish and wildlife resources that may result from project activities.

Please contact Mr. Eric Chavez at (562) 980-4064, or via email at Eric.Chavez@noaa.gov if you have any questions concerning this EFH consultation or require additional information.

Sincerely,

Steven A. Edmondson
Assistant Regional Administrator
for Habitat Conservation

References

Benfield, M.C., and T.J. Minello. 1996. Relative effects of turbidity and light intensity on reactive distance and feeding of an estuarine fish. Environmental Biology of Fishes 46: 211-216.

Caltrans. (2001). Pile installation demonstration project, fisheries impact assessment. PIDP EA 012081. San Francisco–Oakland Bay Bridge East Span Seismic Safety Project. Caltrans Contract 04A0148 San Francisco, CA: Caltrans.

Gabr, M.A., Borden, R.H., Denton, R.L., Smith, A.W., 2004. Characterization of jetting-induced disturbance zone and associated ecological impacts. Report to the North Carolina Department of Transportation, Report No. FHWA/NC/2006-09. 251 p.

Hanson, J., M. Helvey, and R. Strach (eds.). 2003. Nonfishing Effects on West Coast Groundfish Essential Fish Habitat and Recommended Conservation Measures (Version 1). National Marine Fisheries Service. August 2003.

Johnson, L.L., E. Casillas, M. Myers, L. Rhodes, and O.P. Olson. 1991. Patterns of oocyte development and related changes in plasma estradiol 17B, vitellogenin, and plasma chemistry in English sole (*Parophrys vetulus*). Journal of Experimental Marine Biology and Ecology 152: 161-85.

NMFS. 2009. The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions. National Marine Fisheries Service, Southwest Region. October 2009. 58p.

Nightingale, B., and C.A. Simenstad. 2001. Overwater structures: marine issues. White Paper Research Project T1803, Task 35. WSDOT.

O'Neill, S.M., J.E. West, and S. Quinnell. 1995. Contaminant monitoring in fish: overview of the Puget Sound Monitoring Program Fish Task. Puget Sound Research `95 Proceedings. In: E. Robichaud (ed.) Puget Sound Water Quality Authority.

Popper, A.N. and M. C. Hastings. 2009. The effects of anthropogenic sources of sound on fishes. 26 Journal of Fish Biology. 75:455-488.

West, J. 1997. Protection and restoration of marine life in the inland waters of Washington State, Puget Sound/Georgia Basin Environmental Report Series: Number 6. Puget Sound Water Quality Action Team.

Appendix B

Public Involvement

[This Page Intentionally Left Blank]

Summary of Public Comments from EA Scoping and Public Comments on the Draft EA

(This page intentionally left blank)

Naval Base Point Loma Fuel Pier Replacement and Dredging
Environmental Assessment
Summary of EA Scoping Comments and Draft EA Comments

This Appendix summarizes the public comments the Navy received by correspondence, either in person at the scoping meeting or Draft EA public meeting, or via postal mail or email, during the scoping comment period and Draft EA public comment period. The comments are categorized by the following subject areas:

1) Marine Biological Resources
2) Water Quality
3) Hazardous Materials and Waste
4) Air Quality
5) Socioeconomics and Environmental Justice
6) Transportation and Circulation
7) Public Health and Safety
8) Construction
9) Purpose and Need/Cost
10) NEPA Process/Public Involvement
11) Noise
12) Visual and Aesthetics
13) Recreation
14) Bait Barge Relocation & Alternatives

This appendix contains a table of comment summaries for each of the above topics. Also contained in each table are numbers (in the case of scoping comments) or letters (in the case of Draft EA comments) that link the comment to a specific comment document or documents. Key Table 1 on the next page identifies, by an assigned number, the individual scoping comment documents by the person or group that submitted them. Key Table 2 on the subsequent page identifies, by an assigned letter, the specific comment documents received during the Draft EA comment period by the person or group that submitted them. Topical Tables 1 through 14 include summary comments and "Scoping Commenters" and "Draft EA Commenters" columns to indicate the numbers or letters that link the comments to the commenters. Multiple submittals from a single individual were grouped under a single number or letter.

This format allows the Navy to review the information in the topical groupings and not only identify the important issues but understand the number of commenters that might hold similar feelings.

Key Table 1 – Scoping commenter number designations used in comment summary tables

Nongovernmental Organizations	
1	Peugh, James – San Diego Audubon Society – scoping comments – 5-26-12
2	Towbridge, Ian – San Diegans for Open Government – scoping comments – 6-9-12
3	Witkowski, Jill – San Diego Coastkeeper – scoping comments – 5-25-12
Community Groups	
4	Caldwell, Nick – Naval Base Point Loma Community Liaison Group – scoping comments – 6-11-12
5	Gilhooly, Jim – Restoration Advisory Board – scoping comments – 5-3-12
6	Hopkins, David – Challenged America – scoping comments – 5-6-12
Fishing Groups/Marinas/Yachting Groups	
7	Benstead, Roy – Southwestern Yacht Club – scoping comments – 6-10-12
8	Brown, Brad – Silvergate Yacht Club – scoping comments – 6-7-12
9	Clark, Kyle – San Diego Yacht Club – scoping comments - 6-8-12
10	Cooke, Colleen – Cortez Racing Association – scoping comments – 6-11-12
11	Dodson, Paul –Coronado Yacht Club Rod & Reel Club – scoping comments – 5-6-12
12	Driscoll, John – San Diego Yacht Club – scoping comments – 6-10-12
13	Graff, Susan – Cortez Racing Association – scoping comments – 6-10-12
14	Hardaker, Cleve – Recreational Boaters of California – scoping comments – 6-10-12
15	Hull, Lynn – Southwestern Yacht Club, Anglers – scoping comments – 6-10-12
16	Johnson, Jeff – San Diego Yacht Club – scoping comments – 6-8-12
17	Leslie, Eric – Harbor Island/West Marina – scoping comments – 5-28-12
18	Longenecker, Geoff – Southwestern Yacht Club – scoping comments – 6-10-12
19	O'Brien, Chris – Southwestern Yacht Club – scoping comments – 6-10-12
20	Pearce, Lee – Cortez Racing Association – scoping comments – 6-4-12
21	Saad, Joe – Cortez Racing Association – scoping comments – 6-5-12
22	Skewes, Chuck – Ullman Sails San Diego – scoping comments – 6-9-12
23	Wood, Don – Navy Broadway Complex Coalition – scoping comments – 6-14-12
Members of the Public	
24	Aeling, Dan – member of the public – scoping comments – 6-11-12
25	Alberts, Brad – member of the public – scoping comments – 6-9-12
26	Ames, Randy – member of the public – scoping comments – 6-9-12
27	Boyd, Brent – member of the public – scoping comments – 6-10-12
28	Bravo, Alex – member of the public – scoping comments – 6-10-12
29	Breider, Cindy – member of the public – scoping comments – 6-11-12
30	Cahen, Darroch – member of the public – scoping comments – 6-10-12
31	Carter, Stephen – member of the public – scoping comments – 6-6-12
32	Case, Dennis – member of the public – scoping comments – 6-6-12 and 6-10-12
33	Cattle, David – member of the public – scoping comments – 6-9-12
34	Clements, Mark – member of the public – scoping comments – 6-11-12
35	Cloyd, David – member of the public – scoping comments – 6-10-12
36	Coalson, Ron – member of the public – scoping comments – 6-8-12
37	Coit, Elese – member of the public – scoping comments – 6-6-12
38	Collins, Mike – member of the public – scoping comments – 6-10-12
39	Concors, Suzie – member of the public – scoping comments – 6-9-12

40	Conner, Dennis – member of the public – scoping comments – 6-10-12
41	Day, Rick – member of the public – scoping comments – 6-9-12
42	Deforest, John – member of the public – scoping comments – 6-10-12
43	Dillon, Ryan – member of the public – scoping comments – 6-10-12
44	Doster, Paul – member of the public – scoping comments – 6-9-12
45	Eddy, Lynne – member of the public – scoping comments – 6-9-12
46	Ericson, Keith – member of the public – scoping comments – 6-11-12
47	Faith, Chuck – member of the public – scoping comments – 6-11-12
48	Fontaine, Michael – member of the public – scoping comments – 6-10-12
49	Goldberg, Karen – member of the public – scoping comments – 6-7-12
50	Golembiewski, Daniel – member of the public – scoping comments – 6-9-12
51	Goodwin, Laura – member of the public – scoping comments – 6-11-12
52	Graham, Scott – member of the public – scoping comments – 6-9-12
53	Hale, Marcus – member of the public – scoping comments – 6-11-12
54	Hancock, Carl – member of the public – scoping comments – 6-6-12
55	Hartman, Richard – member of the public – scoping comments – 6-9-12
56	Haymaker, Susan – member of the public – scoping comments – 6-7-12
57	Howell, Steve & Lucy – members of the public – scoping comments – 6-9-12
58	Innis, Doug – member of the public – scoping comments – 6-10-12
59	Isaacson, Corey – member of the public – scoping comments – 6-10-12
60	Jackson, Dennis – member of the public – scoping comments – 6-10-12
61	Jackson, Eric – member of the public – scoping comments – 6-10-12
62	James, John – member of the public – scoping comments – 6-10-12
63	Jones, Ann – member of the public – scoping comments – 6-10-12
64	Jones, Dianna – member of the public – scoping comments – 6-9-12
65	Karris, George – member of the public – scoping comments – 6-10-12
66	Kirk, Mike – member of the public – scoping comments – 6-10-12
67	Lane, Robb – member of the public – scoping comments – 6-9-12
68	Lawrence, Shala – member of the public – scoping comments – 6-10-12
69	Lippitt, Joshua – member of the public – scoping comments – 6-10-12
70	Lorence, Ryan – member of the public – scoping comments – 6-6-12
71	LTCOL Hatch, Mike – member of the public – scoping comments – 6-12-12
72	Lundberg, Lyle – member of the public – scoping comments – 6-9-12
73	Machado, Ed – member of the public – scoping comments – 6-11-12
74	Madruga, Robert – member of the public – scoping comments – 6-10-12
75	McGee, Fred – member of the public – scoping comments – 6-11-12
76	McQueen, Tim – member of the public – scoping comments – 6-9-12
77	More, Carole – member of the public – scoping comments – 6-9-12
78	Morrisey, Patrick – member of the public – scoping comments – 6-11-12
79	Nackel, Tracy – member of the public – scoping comments – 6-11-12
80	Nagel, Fred – member of the public – scoping comments – 6-11-12
81	Neiger, Anne – member of the public – scoping comments – 6-9-12
82	Niedringhaus, Drew – member of the public – scoping comments – 6-10-12
83	O'Neil, Joanne – member of the public – scoping comments – 6-9-12
84	Pearlman, Mike – member of the public – scoping comments – 6-10-12
85	Peek, Robert – member of the public – scoping comments – 6-6-12

86	Pipewheezr – member of the public – scoping comments – 6-9-12
87	Posner, William – member of the public – scoping comments – 6-9-12
88	Randall, Robert – member of the public – scoping comments – 6-6-12
89	Rogers, Susan – member of the public – scoping comments – 6-10-12
90	Roland, George – member of the public – scoping comments – 6-9-12
91	Romero, Linda – member of the public – scoping comments – 6-9-12
92	Sage, Kevin – member of the public – scoping comments – 6-9-12
93	Schaeffer, Garry – member of the public – scoping comments – 6-7-12
94	Schnoor, Casey R. – member of the public – scoping comments – 6-9-12
95	Seneca, Michael – member of the public – scoping comments – 6-10-12
96	Shaffer, Walter – member of the public – scoping comments – 6-9-12 and 6-11-12
97	Sharp, Lee – member of the public – scoping comments – 6-9-12
98	Soria, Yvonne – member of the public – scoping comments – 6-5-12
99	Stadel, Pat – member of the public – scoping comments – 6-6-12
100	Steele, Tim – member of the public – scoping comments – 6-10-12
101	Teren, Daylen – member of the public – scoping comments – 6-9-12
102	Van Fleet, Kenneth – member of the public – scoping comments – 6-7-12
103	Vieregg, Dave – member of the public – scoping comments – 6-11-12
104	Vissman, Sandy – member of the public – scoping comments – 5-3-12
105	Voigt, John – member of the public – scoping comments – 6-11-12
106	Walicki, Tad – member of the public – scoping comments – 6-9-12
107	Ward, Tony – member of the public – scoping comments – 6-10-12
108	Weiss, Howard – member of the public – scoping comments – 5-22-12
109	Whiting, Carolyn – member of the public – scoping comments – 6-10-12
110	Worcester, Stevens – member of the public – scoping comments – 6-9-12
111	Wright, Steve – member of the public – scoping comments – 6-11-12
Private Businesses	
112	Capita, Robert E. – Arsea Marine, Inc. – scoping comments – 6-8-12
113	Droz, Vicki – Willis Allen Real Estate – scoping comments – 6-10-12
114	Freed, Mark – Landmark Development Services, Inc. – scoping comments – 6-10-12
115	Kinner, Ann – Seabreeze Books and Charts – scoping comments – 6-8-12
116	Landauer, Nick – Smart Marine Services – scoping comments – 6-9-12
117	Ohlmann, Kat – San Diego Sunroad Boat Show – scoping comments – 6-9-12
118	Reitz, Ronald – Quality Claims Management Corp. – scoping comments – 6-11-12
119	Templin, Dick – Communication Wiring Specialists, Inc. – scoping comments – 6-9-12

Key Table 2 – Draft EA commenter letter designations used in comment summary tables

Nongovernmental Organizations	
a	Witkowski, Jill – San Diego Coastkeeper – Draft EA comments – 11-28-12
Community Groups	
b	Gilhooly, Jim – Restoration Advisory Board – Draft EA comments – 11-14-12
Fishing Groups/Marinas/Yachting Groups	
c	Dodson, Paul – Coronado Yacht Club Rod & Reel Club – Draft EA comments – 11-15-12
d	Fay, Alan – El Capitan Sportfishing – Draft EA comments – 11-14-12
e	Saad, Joe – Cortez Racing Association – Draft EA comments – 11-14-12
Members of the Public	
f	Ericson, Keith – member of the public – Draft EA comments – 10-23-12
g	Ferreira, Tino – member of the public – Draft EA comments – 11-14-12
h	Weiss, Howard – member of the public – Draft EA comments – 11-16-12

Table 1. Marine Biological Resources		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about natural shoreline destruction and impact on species	1	
2. Concern about potential loss of foraging value for waterfowl in the proposed area	1	
3. Concern about impact of underwater demolition on marine life	3	
4. Concern about compliance with the Marine Mammal Protection Act and Endangered Species Act	3	
5. Concern that proposed bait barge relocation will cause accumulation of marine mammals	44, 60, 93, 110	
6. Request for information regarding impact of proposed bait barge relocation on the seal and sea lion population	95, 102	
7. Concern about the seals accompanying the bait barges being subject to greater risk of injury	96	
8. Concern about aquatic life impacts from dredging		a
9. Concern about impacts on California least tern		a

Table 2. Water Quality		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impacts on water and sewer system during demolition and construction	3	
2. Concern about compliance with the Coastal Act, the Clean Water Act, the Rivers and Harbors Act and Ocean Plan and Basin Plan water quality standards	3	
3. Concern about water quality impacts from dredging	3	a, b, h
4. Concern about impact of proposed bait barge relocation on water quality	28, 113, 115	
5. Concern about impact of proposed bait barge relocation on water circulation	28, 113	
6. Concern that proposed bait barge relocation will create contamination due to stagnant water	44	
7. Concern about impact of proposed bait	47	

Table 2. Water Quality		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
barge relocation on water pollution		
8. Concern about the stance of the San Diego Regional Water Quality Control Board	84	
9. Request for information regarding mandates set by San Diego Regional Water Quality Control Board to clean up bay pollutants	95	
10. Concern about marine mammal urine potentially causing a red tide	108	
11. Concern that chemical testing methods are misleading		a
12. Concern about water quality impacts from temporary relocation of Marine Mammal Program		a
13. Concern about measures to reduce water pollution and wastewater discharge		b
14. Suggestion that a program for monitoring conditions and build up of sediment in the turning basin and boat channels should be implemented into operational procedures		b
15. Concern about water quality at Naval Mine and Anti-Submarine Warfare Command		h

Table 3. Hazardous Materials and Waste		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concerns about management of hazardous materials, non-hazardous waste, and potential oil and chemical spills	1, 3	a
2. Concern about debris management and best management practices	3	
3. Concern about sediment contamination and disposal related to proposed dredging	5	
4. Suggestion to expand fueling operations across bay to avoid moving the bait barges and contain potential spills	12	
5. Concern that potential impacts from hazardous substances are insufficiently considered		a
6. Concern about measures to reduce solid waste and contaminated soil		b

Table 4. Air Quality		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impact of proposed bait barge relocation on air quality	74	
2. Concern about impacts on air quality by increased fueling and boating		a
3. Concern that there are significant impacts on air quality		a
4. Concern about measures to reduce air pollution		b

Table 5. Socioeconomics and Environmental Justice		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impact of proposed bait barge relocation on revenue to the city and/or private businesses, including hotels and restaurants	13, 25, 41, 43, 44, 51, 52, 68, 76, 79, 80, 88, 94, 101, 102	
2. Concern about impact of proposed bait barge relocation on costs to boaters, including increased fuel consumption	15, 44, 48	
3. Concern about impact of proposed bait barge relocation on Everingham Bros. Bait Co. business	15, 53, 76	
4. Concern about impact of proposed bait barge relocation on tourism	24, 39, 43, 51, 57, 58, 65, 66, 89, 91, 97, 101, 102, 103, 106, 113, 116	
5. Concern about impact of proposed bait barge relocation on bait quality	28, 66, 75, 95, 111	
6. Concern about impact of proposed bait barge relocation on the fishing industry	28, 53, 58, 75, 76, 95	
7. Concern about financial impact of proposed bait barge relocation on Maritime Museum and Harbor Island	39	
8. Bait barges are important to community	53	

Table 6. Transportation and Circulation		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impact of proposed bait barge relocation on navigation, boat traffic and sailboat races	3, 6, 8, 9, 10, 13, 15, 16, 19, 20, 21, 22, 25, 28, 30, 33, 35, 36, 41, 42, 45, 46, 48, 51, 57, 59, 60, 61, 64, 65, 66, 68, 70, 71, 72, 78, 79, 80, 81, 82, 87, 88, 89, 90, 93, 94, 96, 97, 99, 100, 101, 105, 111, 114, 115, 116, 119	a
2. Concern about impact on Point Loma traffic	5	
3. Question about consideration of alternative flight and mooring operations	8	
4. Concern about accessibility to bait barges due to the proposed temporary relocation	21, 44	
5. Concern about length/extension of proposed pier and its effects on navigating the bay	22, 27	
6. Concern that bait barges could break away and block the channel	41	
7. Concern that the Navy does not compare traffic impacts with baseline traffic level		a

Table 7. Public Health and Safety		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about lead and asbestos containment and impacts on worker safety	3	
2. Concern about impact of proposed bait barge relocation on safety	4, 6, 9, 14, 15, 16, 18, 25, 28, 33, 38, 41, 48, 52, 55, 64, 74, 79, 80, 93, 94, 96, 97, 107, 110, 112, 115	
3. Concern that height of proposed fuel pier will create a wind shadow and unsafe sailing conditions	22, 12	
4. Concern about decreased safety zone around fueling ships	22	
5. Concern about impact of fuel pier extension on navigation and safety	27	
6. Concern about impact of proposed bait barge relocation on pollution	28	

Table 7. Public Health and Safety		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
7. Concern that ship and boat wakes could pose risk to the bait barge and employees	32	
8. Concern about impact of proposed bait barge relocation on safety due to increased wake action	32, 47, 74, 84	
9. Concern about impact of proposed bait barge relocation on safety near Harbor Island	111	
10. Concern about impact of proposed bait barge relocation on water quality, in relation to public health	113	
11. Concern that the movement of the Marine Mammal Program would negatively impact public health and safety		h

Table 8. Construction		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Suggestion that dimensions of new fuel pier should be governed by the number and size of vessels, high and low tides and flood levels	5	
2. Concern about cathodic protection for steel structures because salt water environments are highly corrosive	5	
3. Concern about proposed relocation of Marine Mammal Program effect on West Marina's plans for pile driving	17	
4. Suggestion to run fuel lines under the bay and utilize existing facilities at North Island	27	
5. Concern about odors and debris from the construction barges working on the pier	115	
6. Concern about environmental consequences from fuel pier demolition		a
7. Request that the Navy check fuel pier plans for utility connections, underwater layout, steel structural member underwater, foundations, piles and cathodic protection prior to demolition		b
8. Request that the Navy check soil characteristics, groundwater level and ease of excavation prior to demolition		b

Table 9. Purpose and Need/Cost		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about budget	5	

Table 10. NEPA Process/Public Involvement		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about comment period dates	3	
2. Concern about online commenting feature	3	
3. Request for information regarding an Environmental Impact Statement and the scoping process or the development of an Environmental Impact Statement	3, 23	a
4. Concern that alternatives were not analyzed thoroughly enough	8	
5. Thank you for an informational open house, helpful staff and/or the opportunity to submit comments	20, 104	
6. Request for information regarding the environmental impact of the proposed bait barge relocation	67	
7. Request to see an environmental quality report	84	
8. Request for information about further opportunity for public involvement	95	
9. Request for contact information	98	
10. Concern about Navy's lack of outreach to boating community	108	
11. Request for more transparency into the study	110	
12. Concern about lack of alternatives for temporary relocation of Navy Marine Mammal Program		a
13. Concern that the report revealed a significant environmental impact		a
14. Concern that cumulative impact conclusions were not based on substantial evidence		a
15. Concern that dredging impacts on geology and topography were not analyzed		a
16. Suggestion that underwater inspections need to be made on channel and turning basin to determine the condition of the channel walls and bottoms		b

Table 10. NEPA Process/Public Involvement		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
17. Asked if partial or full Environmental Impact Statement was completed for existing fuel pier		b
18. Suggestion that the Navy apply for an environmental exemption if no historic, biological or other environmental impacts exist		b
19. Request for a three-dimensional model of the proposed fuel pier		g

Table 11. Noise		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impacts of pile driving noise on marine life and other wildlife	3	
2. Concern about noise from the proposed bait barge relocation	28, 44, 47, 69	
3. Concern about noise from accompanying seal and sea gull populations	86, 115, 117	

Table 12. Visual and Aesthetics		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about visual aesthetics related to the proposed bait barge relocation	7, 9, 18, 21, 24, 29, 30, 31, 33, 35, 38, 39, 42, 45, 46, 48, 51, 54, 56, 59, 60, 65, 68, 69, 74, 79, 80, 86, 89, 91, 93, 99, 100, 101, 103, 105, 106, 107, 109, 110, 111, 112, 113, 115, 116, 117	
2. Concern about impact of proposed bait barge relocation on odor	21, 25, 28, 33, 41, 42, 43, 44, 45, 47, 56, 59, 64, 68, 71, 74, 77, 80, 86, 94, 101, 103, 106, 112, 115, 117	
3. Concern about proposed bait barge relocation resulting in increased bird droppings	71, 101	
4. Concern about impact of debris on aesthetics	103	

Table 13. Recreation		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Concern about impact of proposed bait barge relocation on recreation and/or the enjoyment of local sailors	10, 14, 24, 37, 52, 57, 66, 68, 74, 81, 89, 110, 113	
2. Concern about impact of proposed bait barge relocation on recreational fishing community, including the loss of bait receivers	11, 58, 95	
3. Concern about impact of proposed bait barge relocation on boating community	37, 57, 58, 66, 70, 105, 117	

Table 14. Bait Barge Relocation & Alternatives		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
1. Opposition to bait barge relocation sites in San Diego Bay	2, 9, 25, 26, 35, 37, 39, 44, 45, 49, 56, 61, 64, 70, 72, 73, 77, 83, 85, 89, 90, 93, 99, 101, 118	
2. Concern about impact of proposed bait barge relocation Alternatives 4 and 4A	4, 112	
4. Suggestion to move bait barges to the east side of Zuniga Jetty	7, 52	
5. Suggestion that Alternatives 6 would have far less detrimental impacts	9	
6. Request for the bait barges to be temporarily relocated to Harbor Island or across from the U.S. Coast Guard station	21	
7. Suggestion to move bait barges to south entrance of Shelter Island	25	
8. Suggestion for Navy to look into other locations for proposed bait barge relocation	26, 31, 64	
9. Suggestion to move bait barges to private property as is the case in Dana Point and Marina Del Rey	32	
10. Concern that bait barge company is getting free anchorage	32	
11. Request that the bait barges not be relocated to Harbor Island	34, 50, 63, 73	
12. Suggestion to move bait barges to where the New Zealand America's Cup Syndicate is located	36	
13. Suggestion to move bait barges east of Harbor Island	40	

Table 14. Bait Barge Relocation & Alternatives		
Summarized Comment	**Applicable Comment Set**	
	Scoping Commenters	**Draft EA Commenters**
14. Suggestion to move bait barges to northwest entrance of America's Cup harbor	42	
15. Suggestion to use Zuniga Jetty as bait barge location	48	
16. Question about other locations under consideration for the proposed bait barge relocation	49	
17. Support for anchorage 216 and would like to see the current location of the bait barges used again in the future	53	
18. Suggestion to move the bait barges south of Ballast Point	55, 58, 60, 111	
19. Support for Alternative 6	62, 82	
20. Suggestion to move bait barges across channel	71	
21. Request that the bait barges not be relocated to San Diego Maritime Museum location	73	
22. Suggestion to move bait barges beyond the jetty on the Coronado side	77	
23. Suggestion to move bait barges to North and/or South bay	90, 97	
24. Suggestion of the jetty by the harbor police office outside of Shelter Island as an alternate location for the bait barges	92	
25. Request for information why contractor cannot work around current location of bait barges	95	
26. Request for more information on proposed bait barge relocation alternatives	98	
27. Suggestion that bait barge should be made smaller due to less demand for bait	116	
28. Request that the bait barges be relocated to the San Diego Maritime Museum location	117	
29. Request for selection of Option 4A instead of Option 6A for the temporary bait barge relocation		c, d
30. Request for selection of Option 6A instead of Option 4A for the temporary bait barge relocation		e, f

Public Comments on the Draft EA

(This page intentionally left blank)

Original Inquiry

Name : Keith Ericson

Title :

Assn :

Date : 10/23/12 17:31

Phone :

Fax :

Email : [redacted]

Of the options offered I prefer the relocation of the bait barges to option 6A. KE-1

Naval Base Point Loma
Fuel Pier Replacement and Dredging
Draft Environmental Assessment (EA)

Open House Public Meeting Comment Form

Date: November 15th, 2012

Thank you for your comments on the Naval Base Point Loma Fuel Pier Replacement and Dredging Draft EA. Comments must be postmarked or received by **Nov. 19, 2012**, and may be submitted at the open house public meeting or via mail to the address below. Comments may also be submitted online at **http://www.piersystem.com/go/doc/4275/1355631/.**

Please Print

As a member of The Coronado Yacht Club (23 yrs.), and as The Rod and Reel Chairman (19 yrs.) and as CYC Commodore in 2008, I am very familiar with The Everingham Bros. Bait Co. and the transition of San Diego Bay .

I have attended two open house sessions on this subject and see Option 4A most desireous in my opinion, speaking as a long time boater and angler on San Diego Bay (56 yrs.). PD-1

Option 4A is just outside of the navigational channel and located in a wide open area and would further allow for a more convenient operation while handling the distrubution of live bait to the many anglers of the San Diego area. Respectfully Submitted

1. Name: Paul S. Dodson, Chairman "Rod and Reel Club"
2. Organization/Affiliation (if applicable): Coronado Yacht Club
3. Address: [redacted]

   Paul S. Dodson
4. Do you wish to withhold your name and address from public review or from disclosure under the Freedom of Information Act (FOIA)? [ ] NO [ ] YES

Please give this form to one of the U.S. Navy representatives, place in the comment box or mail to:

NBPL Fuel Pier Replacement Project Manager
Naval Facilities Engineering Command Southwest, Coastal IPT
2730 McKean St., Building 291
San Diego, CA 92136-5198

Naval Base Point Loma
Fuel Pier Replacement and Dredging
Draft Environmental Assessment (EA)

NAVSUP
Naval Supply Systems Command
Fleet Logistics Center
San Diego

Open House Public Meeting Comment Form

Date: 11-14-12

Thank you for your comments on the Naval Base Point Loma Fuel Pier Replacement and Dredging Draft EA. Comments must be postmarked or received by **Nov. 19, 2012**, and may be submitted at the open house public meeting or via mail to the address below. Comments may also be submitted online at **http://www.piersystem.com/go/doc/4275/1355631/.**

Please Print

CRA would like to see the Bait Barges moved to the proposed location 6A - Not 4A.

JS-1

1. Name: Joe Saad - Staff Commodore
2. Organization/Affiliation (if applicable): Cortez Racing Association
3. Addre[redacted]
4. Do you wish to withhold your name and address from public review or from disclosure under the Freedom of Information Act (FOIA)? [X] NO [ ] YES

Please give this form to one of the U.S. Navy representatives, place in the comment box or mail to:

NBPL Fuel Pier Replacement Project Manager
Naval Facilities Engineering Command Southwest, Coastal IPT
2730 McKean St., Building 291
San Diego, CA 92136-5198

Naval Base Point Loma
Fuel Pier Replacement and Dredging
Draft Environmental Assessment (EA)

NAVSUP
Naval Supply Systems Command
Fleet Logistics Center
San Diego

Open House Public Meeting Comment Form

Date: 11-14-12

Thank you for your comments on the Naval Base Point Loma Fuel Pier Replacement and Dredging Draft EA. Comments must be postmarked or received by **Nov. 19, 2012**, and may be submitted at the open house public meeting or via mail to the address below. Comments may also be submitted online at **http://www.piersystem.com/go/doc/4275/1355631/.**

Please Print

Please construct 3D version of the photos to get a true picture of the new size & its effect from the bay view. TF-1

1. Name: Tino Ferreira
2. Organization/Affiliation (if applicable): _____
3. Address: [redacted]
4. Do you wish to withhold your name and address from public review or from disclosure under the Freedom of Information Act (FOIA)? [X] NO [ ] YES

Please give this form to one of the U.S. Navy representatives, place in the comment box or mail to:

NBPL Fuel Pier Replacement Project Manager
Naval Facilities Engineering Command Southwest, Coastal IPT
2730 McKean St., Building 291
San Diego, CA 92136-5198

Naval Base Point Loma
Fuel Pier Replacement and Dredging
Draft Environmental Assessment (EA)

Open House Public Meeting Comment Form

Date: 11-14-2012

Thank you for your comments on the Naval Base Point Loma Fuel Pier Replacement and Dredging Draft EA. Comments must be postmarked or received by **Nov. 19, 2012**, and may be submitted at the open house public meeting or via mail to the address below. Comments may also be submitted online at **http://www.piersystem.com/go/doc/4275/1355631/.**

Please Print

PLEASE DECIDE TO USE OPTION 4A. IT MAKES THE MOST SENSE AND ITS PLACEMENT IN THE BAY IS OPTIMUM FOR THIS PROJECT. AF-1

1. Name: ALAN FAY
2. Organization/Affiliation (if applicable): EL CAPITAN SPORTFISHING
3. Address: [redacted]
4. Do you wish to withhold your name and address from public review or from disclosure under the Freedom of Information Act (FOIA)? [X] NO [ ] YES

Please give this form to one of the U.S. Navy representatives, place in the comment box or mail to:

NBPL Fuel Pier Replacement Project Manager
Naval Facilities Engineering Command Southwest, Coastal IPT
2730 McKean St., Building 291
San Diego, CA 92136-5198

U.S. Navy, Naval Base Point Loma Fuel Pier Replacement and Dredging Environmental Assessment (EA)

NAVSUP
Naval Supply Systems Command
Fleet Logistics Center San Diego

Open House Information Session Comment Form

Date: 11/14/2012

Thank you for your comments on the Naval Base Point Loma Fuel Pier Replacement and Dredging EA. Comments must be postmarked or received by **May 28, 2012**, and may be submitted at this open house session or via mail to the address below. Comments may also be submitted online at **http://www.piersystem.com/go/doc/4275/1355631/**

Please Print

ATTENTION → PROJECT MGR
P-151

SEE ENCLOSURES

JG-1

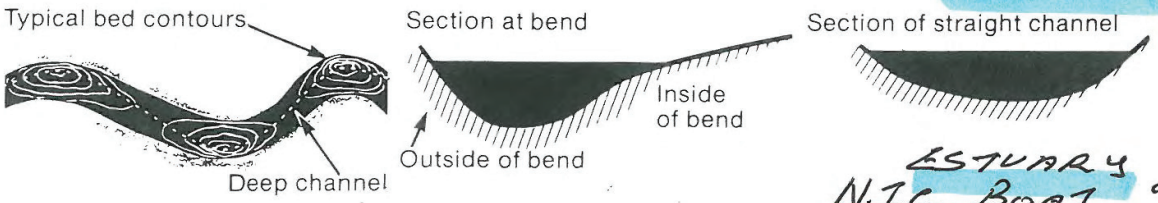
1. Name: JIM GILHOOLY
2. Organization/Affiliation (if applicable): HOMEOWNERS FOR GREEN / SAFE PT. LOMA & PCPB & R.A.B.
3. Address: [redacted]
4. Do you wish to withhold your name and address from public review or from disclosure under the Freedom of Information Act (FOIA)? [X] NO [ ] YES

Please give this form to one of the U.S. Navy representatives, place in the comment box or mail to:

P-151 Project Manager
Naval Facilities Engineering Command Southwest
Attn: (OPUE2.LS)
2730 McKean St., Building 291
San Diego, CA 92136-5198

SAN DIEGO BAY, NAVIGATIONAL CHANNEL & TURNING BASIN

N.T.S.



ESTUARY
N.T.C. BOAT CHANNEL ?

PROJECT P-151

REPLACEMENT, MODERNIZATION OF FUEL PIER, DREDGING & IMPROVEMENT OF EXISTING TURNING BASIN & DEEP WATER CHANNEL TO ACCOMMODATE MAXIMUM SHIPPING & BARGE DIMENSIONS AS A (LENGTH — BEAM — DRAFT) REQUISITE FOR 21ST. CENTURY FUEL OPERATIONS

JG-2

NOTE

THE PHASED DEMOLITION OF THE OLD FUEL PIER AND THE CONSTRUCTION OF THE NEW DOUBLE-DECK FUEL PIER PLUS THE DREDGING, WIDENING & STRAIGHTENING OF CERTAIN AREAS OF THE TURNING CHANNEL BASIN SHOULD GUARANTEE SAFE AND EFFICIENT OPERATIONS - WELL INTO THE FUTURE.

SEDIMENTATION IS ONE OF KEY ISSUES THE NAVY NEEDS TO RESOLVE PRIOR TO FINAL DESIGN.

SUBSURFACE - UNDERWATER INSPECTIONS HAVE TO BE MADE ON CHANNEL & TURNING BASIN TO DETERMINE CONDITION OF CHANNEL WALLS & BOTTOMS.

TOXICITY TESTS, SEISMIC REFLECTION & REFRACTION SURVEYS SHOULD BE PERFORMED; IN ORDER THAT ALL DREDGED SEDIMENT IS SUITABLE FOR BENEFICAL REPLENISHMENT.

A PROGRAM FOR MONITORING CONDITION AND BUILDUP OF SEDIMENT IN THE TURNING BASIN AND BOAT CHANNELS SHOULD BE IMPLEMENTED INTO OPERATIONAL PROCEDURES.

Detoxing San Diego Bay

70 MILLION CLEANUP 4-18-2012

APPROVED BY SAN DIEGO REGIONAL WATER CONTROL BOARD

F.Y.I

A TOTAL OF SIX(6) AGENCIES & COMPANIES ARE INVOLVED IN THE LARGEST SEDIMENT CLEANUP PROPOSED FOR SAN DIEGO BAY. THIS PROJECT WILL SET THE TONE FOR REMEDIATION OF SEVERAL OTHER DREDGING SITES AROUND THE BAY, INCLUDING THE NEW NAVY FUEL PIER & THE FEDERAL NAVIGATIONAL CHANNEL & BENDS.

NOTE

THE REGIONAL WATER BOARD NAMED THE FOLLOWING GROUPS RESPONSIBLE FOR CONTAMINATED SEDIMENT AREAS;

1) B.A.E. SYSTEMS
2) CAMPBELL INDUSTRIES
3) NASSCO.
4) THE NAVY
5) CITY OF SAN DIEGO
6) SAN DIEGO GAS & ELECTRIC.

Jim Gilkerson

11/8/2012

JG-2 cont.

NOTE

Offshore dredging project likely to be cause of blast

SOLANA BEACH

An offshore dredging project may have been behind an explosion along the Solana Beach shoreline Wednesday afternoon.

No one was hurt in the blast, which happened about 4:30 p.m. on the beach at Fletcher Cove, sheriff's Lt. Jeff Maxin said. He said the early investigation indicated the blast was caused by a pipe associated with the dredging project.

Detoxing San Diego Bay

P-151

PROJECT — FUEL PIER REPLACEMENT & DREDGING

PRIOR TO, AND THROUGH FINAL ACCEPTANCE OF THE PROJECT, THE NAVY & ITS CONTRACTORS WILL HAVE TO PROVIDE EFFECTIVE CONTROL SYSTEMS FOR;

AIR POLLUTION — IMPLEMENT MONITORING STATIONS DURING DEMOLITION & CLEAN UP.

Types of Air Pollutants

Gases and Vapors
Small size particles normally make these air pollutants difficult to remove. Methods include absorption, adsorption or incineration. Common polluting gases include sulfur dioxide and trioxide, hydrogen chloride, chlorine, and oxides of nitrogen. Vapors include hydrocarbons, trace metals, fluorine, and others.

Liquid Particulates
Easy to remove in above-3 micron size; below 3 microns and in sub-micron sizes, special equipment is required to remove particulates, normally at higher cost. Special problems can occur when liquids are highly flammable or corrosive. Common examples include sulfuric acids and other acids, organic compounds, and even water in some cases.

Solid Particulates
Same degrees of difficulty exist with solid particulates as with liquids related to micron size. Soluble solids can be removed by adding water to dissolve and cause them to drain from filter mechanisms. Insoluble solids require other forms of control. Examples are fly ash, products of incomplete combustion, dust, chemical compounds, and minerals.

Odors
Odors are normally in gas or vapor forms. They cause irritation and undesirable reactions when perceived by the olfactory sensors. Common sources are chemical plants, paper mills, stockyards, slaughterhouses, and some food processing operations.

JG-2 cont.

* WELDING FUMES (AIR CONTAMINANTS → 29 C.F.R.-SARA TITLE III

** FUGITIVE DUST (ARISING FROM MECHANICAL DISTURBANCE OF DEMOLITION & CONSTRUCTION OPERATIONS.) & NOISE

XXX - DIESEL TRUCKS - NO TUNE-UPS - EVERY 90 DAYS

WATER POLLUTION

Sources of Water Pollution

Floating materials
Oils, greases, foam and other solids lighter than water. They make streams unsightly; retard plant growth; interfere with natural reaeration of the stream; destroy natural vegetation; are toxic to fish and aquatic life. A fire hazard is also created when there are excessive amounts of oil on the surface.

Suspended matter
Insoluble materials such as particles of metal, coal, dust, sand, food, sludge, and chemical slurries which either wash up on the banks as unsightly slime and sludge, or slowly settle to the bottom of the stream. They smother useful purifying micro-organisms; ruin spawning and breeding grounds of fish; use up dissolved oxygen to produce noxious gases and odors.

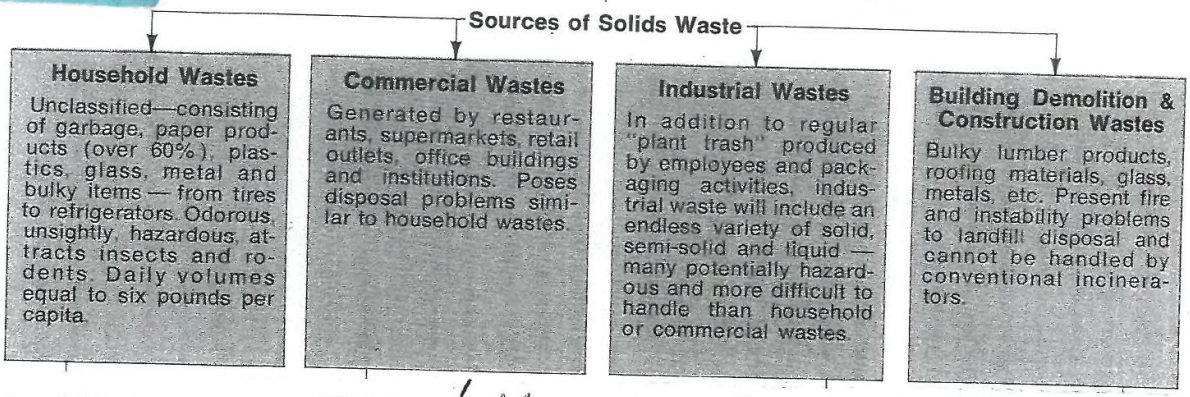
Dissolved solids
Acids, alkalies, heavy metals, insecticides, cyanides and other toxics, make water undrinkable and destroy aquatic life, and cause objectionable taste and odor. Organic matter is attacked by oxygen-consuming microbes; oxygen is depleted by chemical reducing agents. Algae growth may be promoted and desirable fish and vegetation may die.

Detoxing San Diego Bay

P-151

PROJECT – FUEL PIER REPLACEMENT & DREDGING

SOLID WASTE



CONTAMINATED SOIL (DREDGED CHANNEL) BASIN & VINTAGE FUEL OIL EQUIPMENT. (PIPING, VALVES, PUMPS ETC)

QUESTIONS

A) DOES THE NAVY INTEND TO SALVAGE & RECYCLE THESE COMPONENTS — ?

B) DOES NAVY INTEND TO APPLY THERMAL TREATMENT TO BURN OFF CONTAMINENTS ?

C) DOES THE NAVY INTEND TO DISPOSE & SHIP OFF-SITE / HAUL TO ARIZONA / NEVADA

JG-2 cont.

WASTEWATER DISCHARGE - THE FWPCA's MECHANISM FOR LIMITATIONS ON WASTEWATER DISCHARGE IS ESTABLISHED UNDER SECTION 402.

THIS IS REFERRED TO AS N.P.D.E.S (NAT. POLLUTANT DISCH. ELIM. SYSTEM) UNDER THIS PROGRAM ANY PERSON RESPONSIBLE FOR DISCHARGE OF A POLLUTANT INTO WATERS OF U.S.A. MUST APPLY & OBTAIN – A PERMIT

THE E.P.A IS THE ISSUING AUTHORITY FOR ALL PERMITS UNTIL THE STATE ELECTS TO TAKE OVER THE PROGRAM.

NOTE PERMITS ISSUED BY STATE ARE SUBJECT TO REVIEW BY E.P.A. (ENVIRONMENTAL PROTECTION AGENCY)

THE FISH & WILDLIFE SERVICE AND THE NATIONAL MARINE FISHERIES SERVICE HAVE PUBLISHED LISTS OF "THREATENED" OR "ENDANGERED PLANT AND ANIMAL SPECIES CRITICAL HABITATS AS DEFINED BY ENDANGERED SPECIES ACT.

THESE LISTS ARE CODIFIED @ 50 C.F.R. 17 AND ARE AMENDED CONTINUOUSLY.

THE ACT ALSO REQUIRES THAT ALL FEDERAL AGENCIES ENSURE THEIR ACTIONS IN APPROVING PROJECTS IN THE AREA DO NOT "JEOPARDIZE" THE EXISTENCE OF ANY LISTED SPECIES OR RESULT IN THE DESTRUCTION OR ADVERSE MODIFICATION OF THE WILDLIFE HABITATS.

THE ACT REQUIRES THAT A BIOLOGICAL ASSESSMENT BE CONDUCTED TO DETERMINE WHETHER THE SPECIES OR WILDLIFE AREA IS AFFECTED BY THE PROPOSED PROJECT. ADDITIONALLY THIS ASSESSMENT MUST BE REVIEWED FOR ADEQUACY BY THE U.S. FISH AND PARKS WILDLIFE SERVICE AND MUST BE COMPLETED BEFORE ANY CONSTRUCTION OF THE PROPOSED PROJECT BEGINS.

THE FISH AND PARK WILDLIFE CO-ORDINATION ACT REQUIRES THE FEDERAL AGENCY (PARK SERVICE) TO LICENSE, PERMIT AND OTHERWISE AUTHORIZE A PROPOSED PROJECT TO CONSULT WITH OTHER AGENCIES ADMINISTERING WILDLIFE RESOURCES IN THE PROJECT AREA.

THE ACT DEFINES WILDLIFE SOURCES BROADLY TO INCLUDE, BIRDS-FISH-MAMMALS AND OTHER WILD ANIMALS AS WELL AS VEGETATION UPON WHICH THE WILDLIFE DEPENDS.

THE DEVELOPER HAS ADDRESSED NONE OF THE ABOVE.

NO ENVIRONMENTAL IMPACT REPORT.

JG-2 cont.

ATTENTION NAVY PROJECT MGR. F.Y.I PAGE 1 / 2.

SUBJECT REPLACEMENT NAVY FUEL PIER PROJECT. P-151

REF. ENVIRONMENTAL IMPACT STATEMENT

THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969, COMMONLY REFERRED TO AS N.E.P.A, DECLARES A NATIONAL ENVIRONMENTAL POLICY. THIS POLICY IS A GENERAL COMMITMENT BY THE FED. GOVERNMENT TO "USE ALL PRACTICABLE MEANS" TO CONDUCT FED. ACTIVITIES IN A WAY THAT WILL PROMOTE THE GENERAL WELFARE AND THAT WILL BE IN HARMONY WITH THE ENVIRONMENT.

IN SEVERAL INSTANCES DURING THE PAST DECADES, FEDERAL AGENCIES (ARMY – NAVY – AIR FORCE) WERE RELUCTANT TO UNDERTAKE THE FULL-SCALE PREPARATION OF AN E.I.S. IN PLACE THEREOF, SUCH AGENCIES WERE WILLING TO EXERCISE ONE OF SEVERAL OPTIONS SUCH AS STATUTORY EXEMPTION FROM N.E.P.A REQUIREMENTS, BASED ON CONTENTS OF THE PERMIT OR LICENSE APPLICATION; MAKE A FINDING OF NO SIGNIFICANT IMPACT OR NEGATIVE DECLARATION EXPLAINING WHY THE AGENCY NEED NOT PREPARE AN E.I.S. OR ENDORSE A PREVIOUS E.I.S PREPARED FOR SIMILAR OR PREVIOUS ACTIVITY.

QUESTION WAS A PARTIAL OR COMPLETE ENVIRONMENTAL IMPACT STATEMENT MADE ON EXISTING FUEL PIER ___ ?

JG-2 cont.

IF THIS IS THE CASE.
UNDER SECTION 15302. ARTICLE 19 OF GUIDELINES FOR EXEMPTIONS
"REPLACEMENT OR RECONSTRUCTION"
THE NAVY MAY QUALIFY FOR AN EXEMPTION IN DRAFTING A PARTIAL OR COMPLETE ENVIRONMENTAL IMPACT STATEMENT.

NOTE AVOIDING MAJOR CONSTRAINTS POSED BY N.E.P.A. & C.E.Q.A. ON PREPARATION OF E.I.S, WILL ALLOW THE PROJECT TO PROCEED ON TIME AND AVOID LICENSING & LEGISLATIVE ACTIONS, WHICH CONSUME PROJECT RESOURCES.

BASED ON THE RECORD OF THE EXISTING FUEL PIER SHOWING NO HISTORIC, BIOLOGICAL OR OTHER ENVIRONMENTAL IMPACTS THE NAVY SHOULD APPLY FOR ENVIRONMENTAL EXEMPTION UNDER SECTION 15302 - REPLACEMENT/RECONSTRUCTION (SEE ENCLOSURE)

JG-2 cont.

4

CEQA

The California Environmental Quality Act

Title 14. California Code of Regulations
Chapter 3. Guidelines for Implementation of the
California Environmental Quality Act

Article 5. Preliminary Review of Projects and Conduct of Initial Study

Sections 15060 to 15065

15060. Preliminary Review

(a) A lead agency is allowed 30 days to review for completeness applications for permits or other entitlements for use. While conducting this review for completeness, the agency should be alert for environmental issues that might require preparation of an EIR or that may require additional explanation by the applicant. Accepting an application as complete does not limit the authority of the lead agency to require the applicant to submit additional information needed for environmental evaluation of the project. Requiring such additional information after the application is complete does not change the status of the application.

JG-2 cont.

(b) Except as provided in Section 15111, the lead agency shall begin the formal environmental evaluation of the project after accepting an application as complete and determining that the project is subject to CEQA.

(c) Once an application is deemed complete, a lead agency must first determine whether an activity is subject to CEQA before conducting an initial study. An activity is not subject to CEQA if:

(1) The activity does not involve the exercise of discretionary powers by a public agency;

(2) The activity will not result in a direct or reasonably foreseeable indirect physical change in the environment; or

(3) The activity is not a project as defined in Section 15378.

(d) If the lead agency can determine that an EIR will be clearly required for a project, the agency may skip further initial review of the project and begin work directly on the EIR process described in Article 9, commencing with Section 15080. In the absence of an initial study, the lead agency shall still focus the EIR on the significant effects of the project and indicate briefly its reasons for determining that other effects would not be significant or potentially significant.

Authority: Section 21083, Public Resources Code; Reference: Sections 21080(b), 21080.2 and 21160, Public Resources Code.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code; Reference: Section 65944, Government Code; Section 21060.2, Public Resources Code.

PROJECT ?

B

DETERMINATION OF

ENVIRONMENTAL EXEMPTION

Pursuant to the California Environmental Quality Act (CEQA) and State CEQA Guidelines

Agency: CITY OF SAN DIEGO Project No.: Date: JULY 11, 2007

Action/Permit(s): CITY COUNCIL APPROVAL

Description of Activity: Authorizing the Mayor to enter into an Agreement for the Purchase and Sale of Biogas between the City of San Diego, and BOC Merchant Production, Inc. for an initial term of 10 years; and enter into the BUDG Site Lease for approximately 31,000 square feet of previously graded land within the City-owned Metropolitan Wastewater Department's (MWWD) Point Loma Wastewater Treatment Plant. This action includes approval for BOC Merchant Production, Inc. to construct concrete pads on a previously graded piece of land and install the necessary equipment to facilitate the processing of excess digester gas from the PLWTP and transport off-site for sale to local users. No historical, biological or other environmental impacts would result from this activity. ?

Location of Activity: The proposed activities would take place within the City-owned Point Loma Wastewater Treatment Plant within the Peninsula Community Planning Area in the City and County of San Diego.

(CHECK BOXES BELOW)

1. [X] This activity (Entering into two Agreements) is **NOT SUBJECT TO CEQA** pursuant to:

   [X] Section 15060(c) (3) of the State CEQA Guidelines (the activity is not a project as defined in Section 15378).

2. [X.] This project is EXEMPT FROM CEQA pursuant to State CEQA Guidelines Section checked below:

? Not True

? Need copy of section

ARTICLE 19 of GUIDELINES CATEGORICAL EXEMPTIONS (Incomplete list)		ARTICLE 18 of GUIDELINES STATUTORY EXEMPTIONS (Incomplete list)	
Section	Short Name	Section	Short Name
[X] 15301	Existing Facilities	[ ] 15261	Ongoing Project
[ ] 15302	Replacement or Reconstruction	[ ] 15262	Feasibility and Planning Studies
[X] 15303	New Construction or Conversion of Small Structures	[ ] 15265	Adoption of Coastal Plans and Programs
[ ] 15304	Minor Alterations to Land	[ ] 15268	Ministerial Projects
[ ] 15305	Minor Alteration in Land Use	[ ] 15269	Emergency Projects
[ ] 15306	Information Collection	[ ] Other	
[ ] 15311	Accessory Structures		
[ ] 15312	Surplus Government Property Sales		
[ ] 15315	Minor Land Divisions		
[ ] 15317	Open Space Contracts or Easements		
[ ] 15319	Annexation of Existing Facilities and Lots for Exempt Facilities		
[ ] 15325	Transfer of Ownership of Interest in Land to Preserve Open Space		
[ ] Other			

? ?

JG-2 cont.

It is hereby certified that the City of San Diego has determined the above activity to be exempt:

Myra Herrmann

Myra Herrmann, Senior Planner
Environmental Analysis Section

Distribution:

Exemption or Project file
Tom Alspaugh, Project Manager - MWWD (MS 901A)

C:\myfiles\I drive files\MHerrmann\City Projects\BUDG.doc

ENVIRONMENTAL CONSIDERATIONS

THE PURPOSE OF THE INITAL STUDY IS TO IDENTIFY THE POTENTIAL FOR ENVIRONMENTAL IMPACTS ASSOCIATED WITH PROJECT PURSUANT TO N.E.P.A & C.E.Q.A

INITIAL STUDY CHECKLIST

REFERENCES

I. Aesthetics / Neighborhood Character

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

___ Local Coastal Plan.

II. Agricultural Resources / Natural Resources / Mineral Resources

___ City of San Diego Progress Guide and General Plan.

___ U.S. Department of Agriculture, Soil Survey - San Diego Area, California, Part I and II, 1973.

___ California Department of Conservation - Division of Mines and Geology, Mineral Land Classification.

___ Division of Mines and Geology, Special Report 153 - Significant Resources Maps.

___ Site Specific Report: _____.

III. Air

___ California Clean Air Act Guidelines (Indirect Source Control Programs) 1990.

___ Regional Air Quality Strategies (RAQS) - APCD.

___ Site Specific Report: _____.

IV. Biology

___ City of San Diego, Multiple Species Conservation Program (MSCP), Subarea Plan, 1997

___ City of San Diego, MSCP, "Vegetation Communities with Sensitive Species and Vernal Pools" maps, 1996.

JG-2 cont.

___ ___ City of San Diego, MSCP, "Multiple Habitat Planning Area" maps, 1997.

____ Community Plan - Resource Element

____ California Department of Fish and Game, California Natural Diversity Database, "State and Federally-listed Endangered, Threatened, and Rare Plants of California," January 2001.

____ California Department of Fish & Game, California Natural Diversity Database, "State and Federally-listed Endangered and Threatened Animals of California," January 2001.

____ City of San Diego Land Development Code Biology Guidelines.

____ Site Specific Report:_____ _____.

V. Energy N/A

____ _____ _____.

VI. Geology/Soils

___ ___ City of San Diego Seismic Safety Study.

____ U.S. Department of Agriculture Soil Survey - San Diego Area, California, Part I and II, December 1973 and Part III, 1975.

___ ___ Site Specific Report: *Geosoils, Inc., dated* *and Addendum dated*

VII. Historical Resources

___ ___ City of San Diego Historical Resources Guidelines.

___ ___ City of San Diego Archaeology Library.

____ Historical Resources Board List.

____ Community Historical Survey

___ ___ Site Specific Report:___

JG-2
cont.

VIII. Human Health / Public Safety / Hazardous Materials

___ San Diego County Hazardous Materials Environmental Assessment Listing, 1996.

___ San Diego County Hazardous Materials Management Division

___ FAA Determination

___ State Assessment and Mitigation, Unauthorized Release Listing, Public Use Authorized 1995.

___ Airport Comprehensive Land Use Plan.

___ Site Specific Report: *Phase I Site Assessment, Limited Phase II Site Assessment, dated and by .*

IX. Hydrology/Water Quality

___ Flood Insurance Rate Map (FIRM).

___ Federal Emergency Management Agency (FEMA), National Flood Insurance Program - Flood Boundary and Floodway Map.

JG-2 cont.

___ Clean Water Act Section 303(b) list, dated May 19, 1999, http://www.swrcb.ca.gov/tmdl/303d_lists.html).

X. Land Use

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

___ Airport Comprehensive Land Use Plan

___ City of San Diego Zoning Maps

___ FAA Determination

XI. Noise

___ Community Plan

___ Site Specific Report: _____.

___ San Diego International Airport - Lindbergh Field CNEL Maps.

___ Brown Field Airport Master Plan CNEL Maps.

___ Montgomery Field CNEL Maps.

___ San Diego Association of Governments - San Diego Regional Average Weekday Traffic Volumes.

___ San Diego Metropolitan Area Average Weekday Traffic Volume Maps. SANDAG.

___ City of San Diego Progress Guide and General Plan.

___ Site Specific Report: _____.

XII. Paleontological Resources

___ City of San Diego Paleontological Guidelines.

___ Demére, Thomas A., and Stephen L. Walsh, "Paleontological Resources City of San Diego," Department of Paleontology San Diego Natural History Museum, 1996.

___ Kennedy, Michael P., and Gary L. Peterson, "Geology of the San Diego Metropolitan Area, California. Del Mar, La Jolla, Point Loma, La Mesa, Poway, and SW 1/4 Escondido 7 1/2 Minute Quadrangles," California Division of Mines and Geology Bulletin 200, Sacramento, 1975. JG-2 cont.

___ Kennedy, Michael P., and Siang S. Tan, "Geology of National City, Imperial Beach and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California," Map Sheet 29, 1977.

___ Site Specific Report:_____

XIII. Population / Housing

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

___ Series 8 Population Forecasts, SANDAG.

___ Other: _____.

XIV. Public Services

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

XV. Recreational Resources

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

___ Department of Park and Recreation

___ City of San Diego - San Diego Regional Bicycling Map

___ Additional Resources:_____.

XVI. Transportation / Circulation

___ City of San Diego Progress Guide and General Plan.

___ Community Plan.

___ San Diego Metropolitan Area Average Weekday Traffic Volume Maps, SANDAG.

___ San Diego Region Weekday Traffic Volumes, SANDAG.

___ Site Specific Report:

XVII. Utilities N/A

___ _____.

XVIII. Water Conservation N/A

___ Sunset Magazine, New Western Garden Book. Rev. ed. Menlo Park, CA: Sunset Magazine.

JG-2 cont.

World Wide Engineering Services Company (WWESCO)

FUEL PIER → DEMOLITION

UNDERWATER INSPECTION

PRIOR TO DEMOLITION,
CHECK FUEL PIER PLANS FOR UTILITY CONNECTIONS (ELECT. - GAS - WATER - FUEL)
" " " " FOR TOTAL UNDERWATER AREA & LAYOUT.
" " " " FOR STEEL STRUCTURAL MEMBER UNDERWATER
" " " " FOR FOUNDATIONS, PILES, CAISSONS, CATHODIC PROTECTION ETC;
CHECK SOIL CHARACTERISTICS (SEDIMENT - SAND - CLAY - ROCKY)
" GROUND WATER LEVEL.
" EASE OF EXCAVATION / DEMOLITION @ OCEAN, BAY BOTTOM.
VISUAL EXAMINATION & UNDERWATER INSPECTION WILL PROBALLY REVEAL HIGHLY CORROSIVE ENVIRONMENT AROUND PIER TERMINALS, PILINGS, MOORING DOLPHINS AND UNDERDECK STRUCTURALS WITH HEAVY ANAEROBIC BACTERIA COATING.
THIS WOULD TEND TO INDICATE HIGH SULFIDE CONTENT.
ASSOCIATED FUEL PIPING SYTEMS (STEEL) AND UTILITY CONDUIT PIPING ARE MOST LIKELY TO BE CONDUIT OR NON-CONDUCTIVE PLASTIC (POLYBUTYLENE OR POLYETHYLENE)
BASED ON THE $10, MILLION CLEANUP NOW BEING PUSHED BY SAN DIEGO REGIONAL WATER CONTROL BOARD ON SAN DIEGO BAY
THE NAVY SHOULD TAKE THE TIME TO ENSURE THAT ALL DEBRIS UNDERWATER & SURFACE (CONCRETE - STRUCTURAL - WOOD - PLASTIC) AND THE ASSOCIATED FUEL & UTILITY SYSTEMS, LEAD, PAINT & ASBESTOS ARE REMOVED FROM THE TOTAL FUEL PIER AREA & ITS CHANNELS & TURNING BASINS.

JG-2
cont.

World Wide Engineering Services Company (WWESCO)

FUEL PIER → DEMOLITION

UNDER WATER & GROUND INSPECTIONS

* REVIEW FUEL PIER DRAWINGS & PLANS PRIOR TO BOTH GROUND & UNDERWATER DEMOLITION WORK.

PLANNING THE WORK – DRAW UP WORK SCHEDULE WITH START/FINISH DATES

A careful study should be made of the PIER structure to be torn down and its surroundings. A DEFINITE PLAN OF PROCEDURE SHOULD THEN BE MAPPED OUT AND FOLLOWED CLOSELY THROUGHOUT THE ENTIRE COURSE OF THE JOB.

NOTE THIS FUEL PIER DEMOLITION IS ESSENTIALLY A BACKFIT PROJECT. WHICH ALLOWS CONTINUED OPERATION OF FUEL PIER SEGMENTS TO THE SOUTH OF DEMOLITION

JG-2 cont.

W.W.E.S.C.O.
3451 TRUMBULL STREET
SAN DIEGO, CA 92106

WWESCO
WORLDWIDE ENGINEERING SERVICES COMPANY

HAZARDS OF SOME DEMOLITION JOBS

- USE OF EXPLOSIVES ? N/A.
- CONFINED SPACE ENTRY
- ENVIRONMENTAL EXPOSURES
  - PCBs
  - ASBESTOS
- DELIBERATE COLLAPSE OF PIER STRUCTURES / VESSELS
- HANDLING OF CONCRETE UNITS CONTAMIN. SOIL PUMPING FUEL LINE
  - POST TENSIONED
  - PRE-STRESSED
- OPERATIONS AROUND ENERGIZED WIRES & EQUIPMENT
- EXCAVATION & TRENCHING (N/A)
- OPERATIONS OVER WATER (SAN DIEGO BAY) FLOATING DEBRIS SUBMERGED POLLUTION ?

SEE ENCLOSURE.

JG-2
cont.

World Wide Engineering Services Company (WWESCO)

FUEL PIER DEMOLITION

ORDER OF PROCEDURE
FOR WATER & GROUND

The demolition should always proceed systematically, SEGMENT by SEGMENT, and the work on the upper LEVELS should be completed before any of the supporting members or other important parts on the lower LEVELS are disturbed. By proceeding in this manner, dangerous conditions, such as weak and unsupported walls, BEAMS, ETC., may be eliminated.

JG-2
cont.

W.W.E.S.C.O.
3451 TRUMBULL STREET
SAN DIEGO, CA 92105

WWESCO
WORLDWIDE ENGINEERING SERVICES COMPANY

HAZARDS FREQUENTLY ENCOUNTERED DURING DEMOLITION WORK

- COLLAPSE OF STRUCTURE / FUEL PUMPING VALVES / CONTAMINATION PIPING ETC
- BEING STRUCK BY FALLING DEBRIS
- FALLS
  - SAME LEVEL
  - RAISED LEVEL
- CUTS AND ABRASIONS
  - SHARP/JAGGED MATERIALS
- PENETRATION
  - EXPOSED NAILS OR SIMILAR OBJECTS
- STRAINS - MANUAL LIFTING
- BEING STRUCK/CRUSHED BY HEAVY EQUIPMENT
- BEING BURNED - TORCH WORK
- TRUCKING AND ROAD EXPOSURES

JG-2
cont.

MISCELLANEOUS FUEL PIER STRUCTURES MEMBERS, SUPPORTS

Care should be used in handling sheet metal roofing and cornices, and no broken glass should be left lying about in the building.

PIER Stairs and stair railings should be left in place as long as possible.

Do not allow material to accumulate on a floor so as to overload it.

Do not overload hoists and elevators. Observe posted load limits.

PIER Scaffold used for demolishing walls should be self-supporting. It is not advisable to use scaffolds built outside the walls on outriggers.

Use special care when removing beams which are embedded in party walls to avoid collapse of the wall.

All projecting nails in boards, planks, and timber should be removed or bent over.

JG-2 cont.

World Wide Engineering Services Company (WWESCO)

W.W.E.S.C.O.
3451 TRUMBULL STREET
SAN DIEGO, CA 92106

DEMOLITION BALLS

THE PRINCIPAL HAZARDS IN THE USE OF DEMOLITION BALLS ARE:

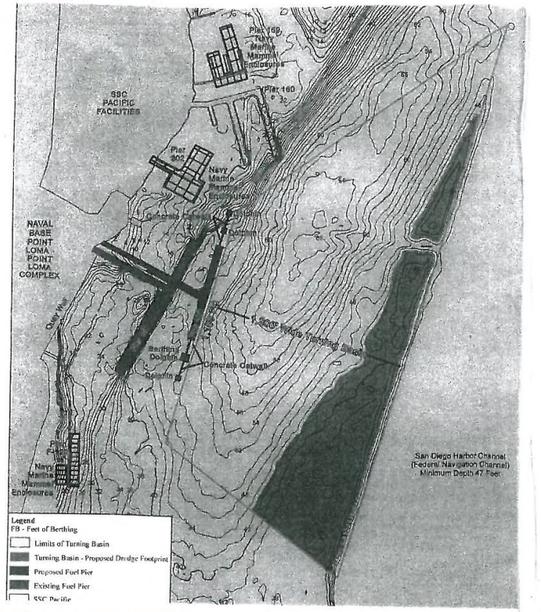
- INJURY FROM FLYING FRAGMENTS OR FALLING DEBRIS
- INJURY FROM THE SWING OR REBOUND OF THE WEIGHT
- PREMATURE STRUCTURAL COLLAPSE DUE TO EITHER IMPROPER APPLICATION OF THE WEIGHT OR TO OVERLOADING OF THE STRUCTURE
- EQUIPMENT FAILURE, SUCH AS ROPE BREAKAGE, BOOM COLLAPSE, OR TIPPING
- DAMAGE TO UTILITIES, ESPECIALLY PIPELINES, ELECTRIC LINES, OR SEWERS
- DAMAGE TO ADJACENT STRUCTURES OR INSTALLATIONS DUE TO VIBRATION SET UP BY THE IMPACT OF THE WEIGHT

JG-2 cont.

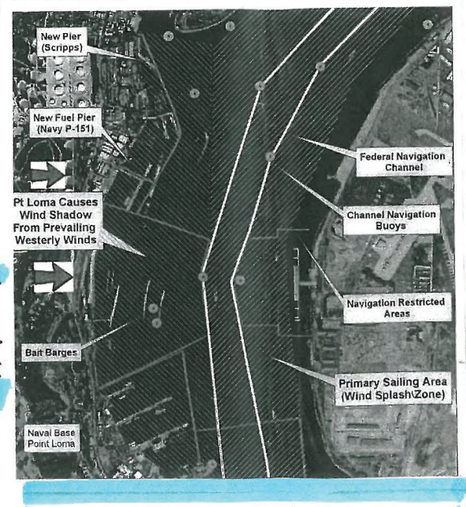
Dredging

A program of monitoring sediment buildup will help operating personnel to determine when dredging will be required. Operational procedures should incorporate plans and arrangements to dredge the sediment promptly as soon as the accumulation reaches a predetermined elevation. Three types of dredging methods are generally applicable to the sediment accumulation ←→ hydraulic, clam shell, and pneumatic.

1. Hydraulic dredging consists of an operation where a pump moves a slurry of water and sediment from the bottom of an intake area and transports it through a piping system to a discharge point. The concentration of slurry averages around 1200 grams per liter. The hydraulic dredging equipment can be mounted either on a barge anchored in the forebay area or on a specially built supporting platform upstream of the intake.
2. Dredging by clam shell requires enough room for the crane to operate around the area to be dredged. This usually means that it can operate only from the shoreline. Because of this constraint, the reach of the clam shell may become a limitation on its feasibility in wide intakes. Also, sediment contained in corners of the forebay area cannot possibly be removed easily and a diver's help may be necessary to remove sediment in such locations. The method has an advantage in narrow intakes in that the crane can be operated from the shoreline itself.
3. Pneumatic dredging uses the differential pressure due to the hydrostatic head of river water itself to fill a submerged cylinder with the dredged mixture. As soon as the cylinder is filled with sediment, the inlet valve of the cylinder closes. The cylinder is then filled with compressed air, which forces the slurry out through the delivery valve and a discharge pipe. The sediment dredged by this method contains a high percentage of solids, typically 60 percent to 80 percent by volume.



SEDIMENTATION ONE OF KEY ISSUES TO RESOLVE PRIOR TO FINAL DESIGN



ESTIMATES OF SEDIMENT ACCUMULATIONS IN NAVIGATIONAL CHANNEL & TURNING BASIN // BOAT CHANNEL

1) THE FIRST STEP IS TO MAKE SUBSURFACE UNDERWATER INSPECTIONS USING MARINE DIVERS OR TWO(2) MAN SUBMARINE, CHECKING CHANNEL BOTTOM & WALLS FOR SCOURING, DEPTH & VERTICAL SLOPE.
2) OBTAIN DATA ON SEDIMENT LOAD (BED/SUSPENDED) FROM U.S. GEOLOGICAL SURVEYS & U.S. COAST GUARD. FIELD MEASUREMENTS. (ANNUAL FIELD MEASUREMENTS ARE AVAILABLE)
3) RUN TOXICITY TESTS ON SEDIMENT TO AVOID LATER CONTAMINATION @ FUTURE SEDIMENT DEPOSIT SITES.
4) SEISMIC REFLECTION // REFRACTION SURVEYS

N.T.C. ESTUARY BOAT CHANNEL PROBLEM ?

3.2.10 SPAWAR IR Site 22: Former Fuel Pipeline



SPAWAR IR Site 22 Pipeline

IR Site 22 was a pipeline that was used to move ily waste from ships and submarines docked at he piers. It periodically contained diesel fuel used o load ships bound for sea. The pipeline was ermanently abandoned in November 1993. An nvestigation of the site to evaluate the soils and roundwater is scheduled.

RESULTS

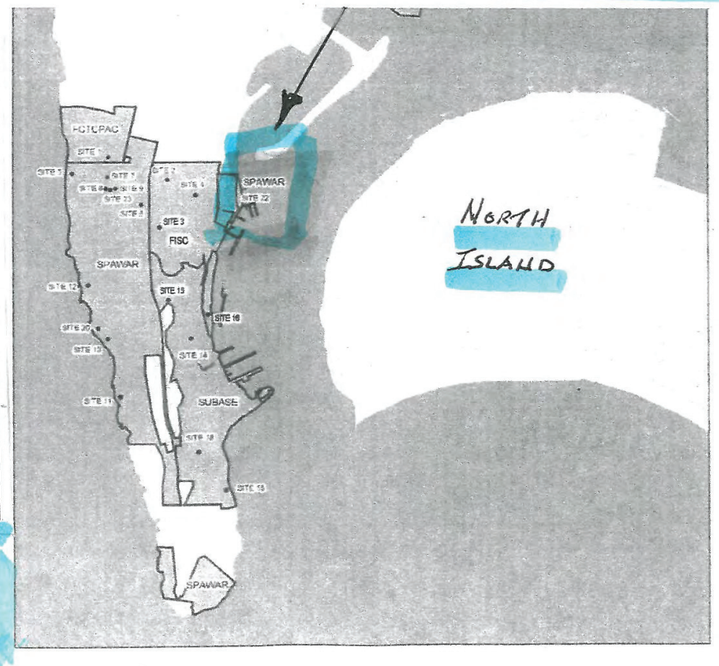
SPAWAR Site 22: Pipeline Break

Background: A break was discovered in the FISC fuel pipeline as it runs through the SPAWAR Complex. An SI was conducted in 2004/2005 and remediation occurred in 2006.

Closed: FY 07

25 February 2010

CHECK SAMPLE TEST RESULTS FOR CONTAMINATION



JG-2
cont.

PRIORITY MAIL

D STATES POSTAL SERVICE

0311 0240 0001 0160 8036

UNITED STATES POSTAL SERVICE

1006

92136

SAN DIEGO,CA
02105
NOV 16, '12
AMOUNT

$5.90
00078346-08

ate Mailing Envelope

at usps.com

From:/Expéditeur: H WEISS

[redacted]

TIONAL RESTRICTIONS APPLY:

'orms are required. Consult the
ıal Mail Manual (IMM) at pe.usps.gov
ıtail associate for details.

To:/Destinataire: P-151 NEPA PROJECT MANAGER
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

[redacted]

2730 McKEAN STREET, BLDG 291
SAN DIEGO, CA 92136-5198

Country of Destination:/Pays de destination:

PS000010000014

Please Recycle

EP14F November 2011 © U.S. Postal Service
This packaging is the property of the U.S. Postal Service® and is provided solely for use in sending Priority Mail® shipments.

Response

Environmental Impact Study (draft) for the Naval Base Point Loma Fuel Pier Replacement and Dredging

This response is submitted in addition to any previous communication with a prior date submitted directly to the Navy by me or forwarded to the Navy by any other source. This response includes new and material research, data and information based on surveys of the San Diego Bay. HW-1

Submitted by;

Howard Weiss

[redacted]

The EA's determination that *"Hydrodynamic models for San Diego Bay indicate that water quality, circulation, and tidal flushing are similar at both locations; therefore, waste from the Navy MMP is not a concern at the NMAWC location (SSC Pacific 2012b)*, **is not properly supported. This determination appears to be the result of wishful thinking rather than objective findings.** HW-2

This response to the EA was prepared by a non compensated concerned citizen who has experience in the field of investigations and preparation of position papers for review by administrative law judges. Please excuse and minor errors in punctuation and grammar. Since my retirement the executive secretary who corrected such errors is no longer available to proof read. This response to the EA replaces all previous documents submitted by me directly to the Navy or forwarded to the Navy by any other organization. This response contains new and material research not previously identified. The goal of this response to the EA is to insure full disclosure of information and accuracy of the information contained in the submitted EA report. The position being advanced in this response to the EA is that the Navy should develop a more focused plan to move the marine mammal program. The impact moving the mammals would have on the west basin can be legitimately questioned. Additionally, the reverse impact the area at NMAWC would have on the mammals was not fully developed. Failure to develop a more focused EA can result in unexpected delays that will cost the tax payers more money and create animosity in the community. There are issues involved in the Navy's plan that can result in court sanctioned delays if legal actions are advanced by The Progressive Animal Welfare Society, Greenpeace, PETA or the Humane Society of The United States, as was done when the Navy attempted to move mammals to Bangor Washington.

In addition to the issues raised in the first paragraph of this response to the EA, the long term status of the Navy's Marine Mammal Program is being addressed. Identifying an alternative that considers longer term solutions and reduces animosity in the community is the recommendation being made by the author of this response to the EA. The long term status of the Navy's MMP would need to consider the eventual retirement of the mammals. The eminence of retirement of these mammals is discussed by a SPAWAR expert at www.thesecuritynetwork.org/TMS2009/Cynthia_Smith.ppt *(print out of tile 4)*. The website also identifies that a new site (conducting site surveys) for the retired mammals is being considered. This reference to conducting site survey implies that the current location of the pens may not be considered an optimum site for the retirement of the mammals and moving the retired mammals is being considered. The best bet for these animal rights groups and the Navy would be to talk to Washington and convince the budget committees to take the opportunity right now to fund moving the entire program to the eventual retirement home where the mammals can spend the rest of their days HW-3

Moving the mammals for three to five years to NMAWC then retiring the program shortly thereafter and facing heavy lobbies to move the retired mammals again would best be described as a short sighted resolution that only benefits the local contractors. A resolution that allows the mammals to be returned to the current location after the completion of the fuel pier as stated in the EA where the mammals will be kept in the 30 X 30 pens with occasional ventures into the surrounding ocean during their retirement would not satisfy the animal rights activists, is labor intensive and expensive.

A review of the literature authored by animal rights activists and conversations with editors for highly visible animal rights organizations makes it clear to me that the activists will demand that the retired mammals be moved to areas much larger than the existing pens. This would be the first step in their vision that the mammals be returned to an environment that most represents the mammals natural environment . Such environment allowing for the possibility that the mammals can be re-socialized and kept in a manner allowing socialization on a 24/7 basis when retired.

Although, individuals involved within the Navy's MMP have indicated on their website that they are planning for the day the mammals will be retired, no specific vision for the retired mammals has been

announced. The animal rights activists feel that the vision the Navy and their contractors have for the retirement of the mammals should already be in sufficient stages of development to be made public. The animal rights activists are concerned that the Navy will favor an alternative that brings the mammals closer to human interaction and away from a return to conditions that most resemble the environment experienced by the mammals prior to capture. Activists have told me they are very dissatisfied with the plan to temporarily move the mammal pens to NMAWC due to the fact that NMAWC is too close to significant human activity. HW-3 cont.

IDENTIFICATION OF STUDIES AND DATA RELATED TO POLLUTANTS.

It should be noted that there are areas of the EA which site and discuss in great detail the rational and research (with author and date) addressing a specific area of concern. These detailed analyses include results of studies of the fish and mammal species, grasses, topography, birds and noise levels. However, the areas of concern addressed in this response to the EA deal with subjects whereby the EA makes gross, sweeping declarations of no impact without identifying specific results from any applicable study and in some cases are no more than bare conclusions based on speculation and conjecture which is not probative under other areas of administrative law.

A bare conclusion, even when reached by a health care professional is not probative without a factual predicate in the record. Miler v. West, 11 Vet. App. 345, 348 (1998).

The source of these determinations which are unsupported by data or identifiable research studies is referenced on page 345 as being personal emails. The determinations stated in the emails are second hand interpretations of reports rather than quoted conclusions from an identified report. References to the existence of a report without identifying the report by title, date or author would result in a remand in the area of law familiar to me. The determinations made in the emails concern the issue of hydrologic science. There is no information that establishes that the author of the emails could be considered an expert in hydrologic science. Thus, it is not established that this individual has any more expertise than myself. However, the core rebuttal points in my response to the opinions derived from emails are based on specific terminology quoted from identified studies including a report from Luke Dudek. The Navy developed the Luke Dudek report and it should be in their possession. It was a study of the NTC/MCRD estuary.

HW-4

The position advanced in the EA that the distribution pattern of the pens at the proposed new location is more spread out and presents a situation that allows for the water at the proposed new location to be superior than the current location of the pens, appears to be totally unsupportable.

This response to the EA does not focus on the noise levels caused by the pile drivers as it will be experienced by the mammals at NMAWC. The EA does identify expected levels of noise that will be experienced by the mammals at MNWAC. An individual concerned with the level of noise was of the opinion that the data provided in the EA was based on projections that have been tweaked or based on wishful thinking. This problem is not being addressed in this response to the EA because even if there were issues with noise levels, there are known measures identified in other Navy reports indicating that noise levels from pile drivers can be abated without significant effort. The Navy would obviously implement these abatement remedies to protect the mammals.

<u>Flushing and Waste Concentration</u>

The issue of flushing identified in the first paragraph of this response to the EA impacts several questionable determinations of no impact including; no impact to recreational activities due to bacteriological contamination, no risk from storm drain contaminants due to sufficient flushing, no risk of fecal coliform bacteria failing to flush from the mammal pens and no risk of nutrients causing red tide blooms. There is no evidence within the EA that the determinations of no impact were supported by specific research data and is not represented as anything other than interpretations of studies that were not specifically comparative studies designed to make such determinations. The failure to

develop a fully informed comparative analysis between the current location of the pens and NMAWC resulted in the unreliable determination noted on page 220 line 36 stating, *"Hydrodynamic models for San Diego Bay indicate that water quality, circulation, and tidal flushing are similar at both locations; therefore, waste from the Navy MMP is not a concern at the NMAWC location (SSC Pacific 2012b)..* The referenced (SSC Pacific 2012 b) email does not quote specific conclusions from hydrographic studies and does not identify studies specifically designed to make a comparative assessment addressing the flushing characteristics between the current location of the mammal pens and NMAWC. This is a bare conclusion unsupported by identifiable facts.

HW-4 cont.

The EA's analysis of the marine water quality identifies four hydrodynamic sections of the bay (page 210) and discusses the ability of these sections to flush. However, the EA fails to identify any tidal studies specific to the shallow water area adjacent to NMAWC. Such studies are known to exist. One study addressing the area proximate to NMAWC specifically identified flushing issues indicating the area of shallow water west of Harbor Island as having contradictions and eddies right in the area of the proposed new location of the mammal pens. The study actually refers to the fact that there is a flushing "short circuit" in the area of the shallow waters west of Harbor Island. (Bacteriological Source Investigation Marine Corp Recruit Depot/Naval Training Center Estuary. 1982. Author – Luke Dudek). The Luke Dudek report also states that these flushing problems were identified in several other studies. The Luke Dudek report states *"Two past studies, one buy the U.S. Corp. of Engineers in 1971 and one by the U.S. Navy Hydrographic Office in 1959, confirm minimal tidal interaction between the west basin and the main channel of San Diego Bay"*.

HW-5

the Harbor Island West Basin. The channel waters in the NTC Estuary apparently shift back and forth within a tidal prism. The NTC Estuary and the adjacent Harbor Island West Basin are considerably more shallow than the bulk of San Diego Bay. This condition tends to isolate the whole area, including the NTC Estuary, from the tidal water exchanges in San Diego Bay. VI-1	Standard depth charts of the San Diego Bay show the18 foot contour line running from the southwest point outside the Harbor Island Peninsula to the mouth of the America's Cup Harbor. All of the mammal pens at the proposed new location at NMAWC will be inside the 18 foot contour line

HW-6

Keep in mind the contemporaneousness of a report cannot be the sole reason for rejecting a report. Newer reports must rebut issues addressed in older reports.

The EA states on page 498 line 6 "*The residence time of water in the north bay where the proposed project area is located is short except for side basins where commercial and marina activities are located*".This is the only determination in the EA that could remotely be used to determine that the flushing characteristics at the current location of the pens and NMAWC are similar. If the determination of similarity between the current location of the pens and NMAWC were founded on a numerical modeling study the determinations could easily be contradicted by another study more specific to a local area such as the Luke Dudek report. Additionally, the reference on page 498 line 6 identifying a short residency time in the north bay excludes side basins. The determinations made in pages 219-221 do not explain how it was determined that NMAWC was not considered a "side basin" where commercial and marina activities are located. This is especially important considering the Luke Dudek determination considered the shallow water area resulted in the entire area as being isolated. The Luke Dudek study showed that a drogue was placed on a receding tide in between dock 100 of Harbor Island West and the boat docks at NMAWC (see attached drogue studies). This drogue did not even drift to the mouth of the America's Cup Harbor. No drogue studies were referenced in the EA as being performed at the current location of the mammal pens.

HW-7

Page 220 line 31, 32 of the EA states, *"At the proposed NMAWC site, the Navy mammals' enclosures would be more spread out and dispersed than at their current location, so waste concentrations would be expected to be lower at NMAWC".*

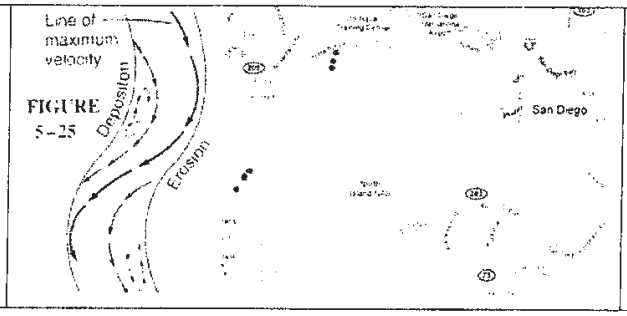
The EA identifies that the pens will be "more spread out" at NMAWC allowing for a determination that this distance would somehow create lower levels of waste concentration than the distribution pattern at the current location of the pens. The position advance in the EA that the new location allows the pens to be distributed over a larger area appears to be a complete misunderstanding of the relevant facts. The current location of the mammal pens consists of multiple locations starting from the mouth of the Shelter Island Harbor and ending at an area past the current location of the fuel pier. A review of the overhead photos and maps contained within the EA shows that the distance between the most southerly pens and the most northerly pens at the current location is approximately 2800 feet. The distance from the north end of the docks at NMAWC to the fleet dock is slightly over 1700 feet. Contrary to the EA claim that the pens will be distributed over a larger area at NMAWC than the current location, the pens at the proposed new location are distributed more evenly over a significantly shorter distance than the current location.

The pens at the current location are located in three areas with larger gaps in between these three areas than the gaps between the three docks at NMAWC. Although, the pens at the current location are actually distributed over a larger area than the proposed pen configuration at NMAWC, there is an area at the current location of the mammal pens where a portion of the pens are distributed in a pattern that is more box shaped than the pattern at the proposed new location. There might be a slightly higher concentration of bacteria in the area were the configuration of the pens is more box shaped and lower concentrations in the other areas of the pens. There is no data showing that the pens will cover more square footage at either location. HW-8

When considering waste concentration the direction of tidal flow relative to the placement of the pens must also be considered. The pens at the current location are distributed in three sections that are offset from the center line of the channel. Due to principals of channel morphology discussed later in this response to the EA, the direction of the flow and tidal excursion as it passes the three locations of the pens at the current location of the pens is not easily predictable. However, the possibility that the flow pattern would not direct fecal matter from one of the three sections of pens at the current location into another of the three sections of pens is real. Additionally, the possibility that current velocity may be faster at the current location of the mammal pens and distribute the excrement over a larger area is also real when considering principals of channel morphology. The distribution of the pens at NMAWC will result in all the pens being in a straight line parallel to the center of the channel. A problem occurs at NMAWC due to the fact that the Luke Dudek drogue study shows that a drogue placed in a position that would be proximate to the center of the proposed distribution pattern at NMAWC drifted in a straight line parallel with the direction of the pens. The drogue did not even drift to the mouth of the America's Cup Harbor on an outgoing tide. Basically, there is short back and forth flow parallel to the center of the channel at the proposed mammal pen location at NMAWC. In the study mentioned by Luke Dudek, the drogue traveled a distance in an open channel that is shorter than the distance from the northern most pens to the southern most pens as proposed at NMAWC. One straight line of continuous netting could easily cause more slowing of tidal velocity compared to the open channel at NMAWC and the 3 offset positions at the current location of the pens. Given these factors, the concentration of waste can accumulate directly under the mammal pens for a significantly longer period of time at NMAWC. It is not obvious that the distribution pattern of the pens at NMAWC will result in lower concentrations of waste. A determination that the "more spread out" pen distribution pattern at NMAWC results in lower concentrations of waste than the current location of the pens would be subject to other more comprehensive method of proof than a simple comparative analysis of the length of the pen distribution.

There are other considerations more relevant to the issue of comparative distribution patterns of the pens. The most glaring issue effecting the movement of an object or substance is the velocity of the current. The velocity of the current could dominate all other factors when assessing the comparative difference between the current and the proposed mammal pen locations. There is no data or discussion indicating that principals of channel morphology were addressed when comparing the relative ability of each area to remove the excrement. Considering that the current location of the mammal pens is on the outside bank of a gradual channel bend in a large high volume channel and the area at NMAWC can be best described as a short straight channel situated between the west basin channel and the main San Diego Bay channel, the potential for flow disruption based on convergence at NMAWC should be identified using principals of channel morphology.

Principals of channel morphology show that eddies, contradiction and changing velocities of flow can occur within short distances of each other within a channel (see figure 5-25). The scour effect is most prevalent in an area of higher velocity. There are obvious differences between the position of the pens at the current location and the pens at NMAWC relative to the various contours of the main channel of the San Diego Bay. As such a determination of comparative velocity would require significant research. It should be noted that the outside bank will be the north and northwest side of the bay on both incoming and outgoing tide. In the absence of a study showing that principals of channel morphology were used to determine the line of maximum velocity and identify eddies and contradictions within the San Diego Bay channel and NMAWC, the determination addressing waste concentrations was not founded on a fully developed factual basis. Until such time the EA identifies a channel morphology study by title, date and author, the evidence within the EA is not fully developed. Such study should be confirmed by onsite drogue tests or chemical/isotopic tracer analysis. HW-8 cont.

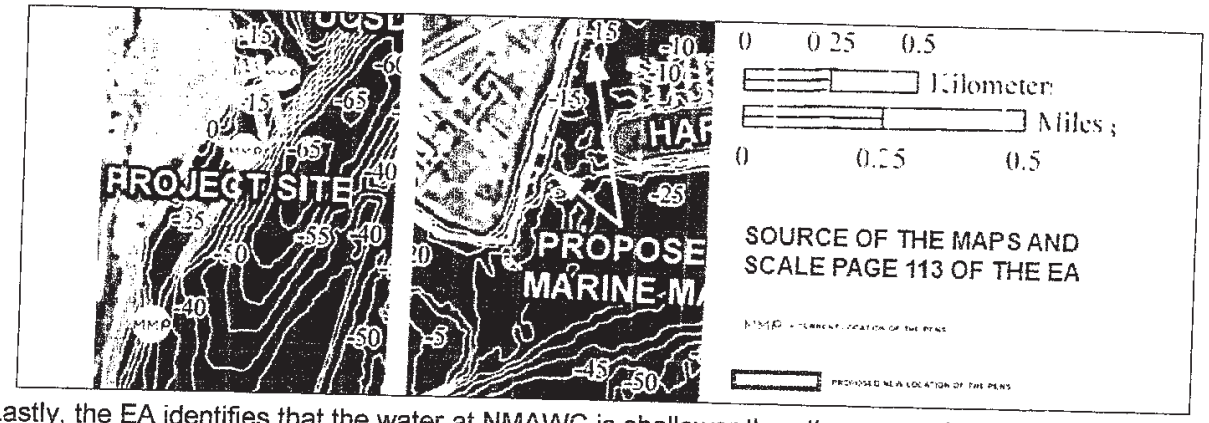
http://ijolite.geology.uiuc.edu/08SprgClass/geo593-geog595/Mauricio%20Perillo%20Mar%2025%20Turbulent%20structure%20in%20a%20river%20bend.pdf SOURCE OF FIGURE 5-25		Standard aerial view of San Diego Bay showing potential variable line of maximum velocity due to the curved shape of the bay

Additional issues involving the removal of waste due to flushing and circulation would involve an evaluation of tidal exchange relative to bottom contours and the depth of the water with consideration given to "tidal excursion". Tidal excursion is reduced and complicated by eddies (URL associated with figure 5). The EA fails to compare the distance from the respective locations of the pens to shelves and deeper channels within the bay. The reports identified in the flushing section of this response to the EA identify shallow water as inhibiting tidal exchange. Longer tidal excursion could move waste to slopes and deeper channels that are proximate to the mammal pens. As such an evaluation of the distance from the respective locations of the mammal pens to deeper water can be as valuable if not more valuable to the understanding of the concentration of waste as an assessment identifying that the pens are "more spread out" The superficiality of the reports in the EA requires clarification and development on this issue.

The EA fails to specifically identify the distance from the majority of the mammal pens at the current location of the pens to water that exceeds a depth of 40 feet. This distance is less than 500 feet. The distance from the pen closest to a depth greater that 40 at NMAWC is 1500 feet. The pen distribution at the current location is parallel to the deeper channels of the bay. It is three to five times farther to water greater than forty feet at the proposed new location of the pens than it is at current location of

the pens. This is because the pens at NMAWC start at a greater distance from water deeper than 40 feet and are in a line that goes even farther away from the deep water. The position being advanced in this response to the EA is that the "more spread out" distribution patterns of the pens identified in the EA would not be a dominate factor when determining the concentration level of waste in the area of the mammal pens at NMAWC. Rather the factors not specifically identified as being addressed in the hydrographic studies used by the Navy including; comparative analysis of the velocity and direction of the current and the distance from the respective pen location to slope or deeper water within the bay would be dominating and must be addressed.

HW-8 cont.



HW-9

Lastly, the EA identifies that the water at NMAWC is shallower than the current location. Unfortunately, once again no specific depth data was provided in the EA. As discussed in detail later in this response to the EA there is a subjective report from the owner of a sailboat at NMAWC that the depth under his boat, which is located within the area of the pens shown by the superimposed red lines on the pen location chart in the EA, drops below 6 feet at low tide. There is no evidence his opinion or my reporting of his opinion is not credible. Thus, this subjective report needs to be confirmed or denied by further investigation. Simply looking at tide charts may not provide accurate information. If it is possible that the containment nets will be sitting on the bottom at NMAWC an issue arises involving an artificial obstruction that will complicate the scouring ability of the current to remove waste.

The issues of channel morphology, and the various distances between the current location of the pens and NMAWC to deeper waters create a complex analytical problem that would only result in a ball park projection. However, such projection could show a significant difference in the relative abilities of each location to remove waste. As such, spot checking different tidal conditions by dumping the equivalent of the expected daily deposits of mammal urine and feces or traceable substitute at NMAWC and monitoring the area with consideration given to variables resulting from seasonal water temperature and UV light changes would be a good start to any determination of the ability of the NMAWC area to flush waste material.

HW-10

In summary, the EA does not provide any reliable foundation supporting a determination of sameness between the existing and proposed new location for the mammal pens as identified in pages 219 thru 221 of the EA. This unsupported determination of sameness between the current location of the mammal pens and the proposed new location presents concern in numerous areas addressed by the EA. The problems related to flushing can impact all issues of contamination and nutrients addressed in this response to the EA. These areas of concern and others are addressed in the following pages of this response to the EA.

IDENTIFICATION OF THE ISSUES SECONDARY TO FLUSHING CHARACTERISTICS

The EA identifies and discusses four general categories of pollutants including; nutrients, bacteria, metals and petro chemicals. The study determined that there were no significant issues associated with pollutants. The determination of projected nutrient levels from mammal excrement at NMAWC was based on invalid comparisons of the flushing characteristics between the current location and the proposed new location rather than area specific experimentation. The issue of expected increase in bacteria levels at the site of the proposed new location of the mammal pens was based on a flawed projections. The projection assumed the flushing characteristic were the same at the current location of the mammal pens and the proposed new location. The study of heavy metals does not identify that any tests were performed closer than 600 feet from the proposed new location of the mammal pens. Tests for petro chemical pollution were not specific to either the current location of the mammal pens or the proposed new location. Additionally, the vague references to petro chemical pollution were not inclusive of the actual levels identified, times of year the tests were performed and last but not least what agency involved in overseeing the marine mammal program reviewed such tests and determined the tests were sufficient to provide a full understanding of the pollution levels. The question remains as to whether or not over sight organizations made a determination there would be no negative impact on the mammals as a result of moving the mammals to the proposed new location. HW-11

BACTERIA FROM THE MAMMALS EFFECTING CONTACT WATER SPORTS

The EA states (page 220 line 26) *"Water quality at private marinas located about 500 ft to the east across San Diego Bay and Spanish Landing Beach, 0.6 mile northeast of the proposed temporary Navy MMP relocation site at NMAWC would not likely be affected due to the intervening distance and tidal flushing that would further reduce bacterial levels. Therefore, no significant bacterial impact to water quality would occur."* All references to tidal flushing in pages 219 – 220 are being challenged on the basis that the individuals or individuals who made this determination were not fully informed and relied on studies not specifically designed to address the flushing characteristics of the NMAWC area.

The 0.6 mile distance is being questioned. The distance from the north end of the proposed location of the mammal pens to the Spanish Landing beach is less than 0.3 miles as determined by a review of the charts shown in the EA and a laser range finder. Most importantly, the issue is not the distance from the mammal pens to the Harbor Island West boat dock or Spanish Landing beach. The issue is whether or not bacteria levels will impact any area outside the 100 foot perimeter/no entry zone. HW-12

The distance from the northern most mammal pen at the proposed new location to the rock line at Spanish Landing is 150 yards. This area constitutes the mouth of the MCRD estuary. Almost every boat, jet ski, kayak, paddle board or wind surfer, rented from MCRD and Harbor Island businesses going toward the main channel of San Diego Bay will leave and return within feet of the 100 foot restricted area. These individuals will likely continue traveling within feet of the restricted area the entire distance of the mammal pens toward the main channel. The S.D.P.D requires that kayaks, paddle boarders and wind surfers stay away from the middle of narrow navigation areas. Additionally, Spanish Landing and NTC Park are popular launch sites for all of the fore mentioned contact water sport (rec 1) activities as defined by the SWRCB. The individuals launching from Spanish Landing primarily turn toward the main channel and will also pass within feet of the 100 foot restricted area while traveling the entire distance of the mammal pens toward the main channel. See pictures on page 17 of this response to the EA.

Fishermen can be seen fishing daily from the rock line at Spanish landing within 200 yards of the HW-13

north end of the proposed new location for the mammal pens. Observations of these fishermen have shown they cast their lines as close to the existing boat docks at NMAWC as possible. The reasoning being that, fish like structure. These fishermen may also be inclined to cast as close to any buoy line or structure that is part of the new mammal pens. Fishing is not allowed proximate to the current location of the mammal pens. How will the fish at NMWAC be impacted? If there is a negative impact, would warning signage be required? HW-13 cont.

The EA states "*The bacteria levels measured weekly at the current Navy marine mammal enclosures are on average, an order of magnitude below the SWRCB Water-Contact Standards for total and fecal coliform bacteria (SSC Pacific 2012c; State Water Resources Control Board 2005)*". This statement only addresses average levels. The tests at the current location of the pens could be totally irrelevant to the conditions at NMAWC due to the flushing problems identified in the flushing section of this response to the EA. The most significant concern is the back and forth motion and eddy conditions in the area of NMAWC. The SWRCB may not consider average levels adequate in an area where there are significant water contact activities, such as the area between the Harbor Island fuel dock and NMAWC. Rental businesses in the West basin would be impacted by closures. HW-14

BACTERIA FROM THE NAVY'S MAMMALS EFFECTING THEMSELVES

The EA states "*The bacteria levels measured weekly at the current Navy marine mammal enclosures are on average, an order of magnitude below the SWRCB Water-Contact Standards for total and fecal coliform bacteria (SSC Pacific 2012c; State Water Resources Control Board 2005)*". It is not clear that the State Water Resources Control Board would have reason to test water any closer than 100 yards from the mammal pens. The tests could have been performed no closer than 100 yards from the mammal pens (current restricted distance for water sports activities). HW-15

For reason identified in the Flushing and Waste Concentration section of this response to the EA any predictions of bacteria and waste concentration conditions at NMAWC based on projections of data collected at the current location of the pens is being disputed as not reliable

Standards for total and fecal coliform bacteria under 9 CFR 3.106 were not addressed in the EA. The Code of Federal Regulations was the basis upon which water quality standards were disputed in the Bangor Washington case. There are specific differences between 9 CFR 3.106 and SWRCB standards in the frequency of testing. 9 CFR 3.106 requires that substandard conditions be monitored over a 96 hour period. Immediate correction is required of a substandard condition that exceeds this time period under 9 CFR 3.106 A review of standard tide charts showed that minimal tidal variations (less than 5 feet) between high tide and low tide can last for a period of six days.

Page 221 line 5 of the EA states, "*Consistent water quality testing of the NMAWC site has shown that the water quality there is sufficient to ensure the health of the Navy marine mammals while they reside there (SSC Pacific 2012b).* In the absence of specific data this statement has no supportable foundation. The use of a non specific term to describe the frequency of events such as "consistent" would not be considered has having probative value under other areas of administrative law. Probative data would identify if the tests were daily, weekly, monthly etc. Tests determining the conditions at NMAWC should identify the exact month, date and time of the test due to various tidal conditions. The absence of specific data results in the statement shown on page 221 line 5 as being a bare conclusion without supporting rational. A bare conclusion without supporting rational has no probative value under other areas of administrative law. HW-16

A bare conclusion, even when reached by a health care professional is not probative without a factual predicate in the record. Miler v. West, 11 Vet. App. 345, 348 (1998)

Additionally, even if there is specific data such information cannot be reliably integrated into a prediction of future total levels of bacteria that would result from the bacteria added to the area at NMAWC by 100 mammals. This is due to the fact that the expected levels of added contamination from the mammals were expected to be flushed by tidal forces at rates that were based on the unreliable assumption that the flushing characteristics at the current location are similar to NMAWC

If in fact it cannot be determined that the flushing and circulation conditions at the current location of the mammal pens is the same as NMAWC serious consideration should be given to any plan to move the mammals to NMAWC. The potential numerous issues identified in this response to the EA identifying issues with velocity of the current, the eddy conditions at the end of the pen distribution, the minimal back and forth motion and the straight line pen distribution pattern that parallels the straight line flow of the channel the depth issue could result in each single issue identified as being capable of causing exponential decreases in the ability of the area at NMAWC to scour waste concentrations. Tests taken within the lower limits of the pens could show a significant increase in bacteria compared to the current location of the pens. HW-16 cont.

Literature outside the EA states the Navy MMP complies with the Code of Federal Regulations. It is unclear if the Navy has been afforded a variance from the CFR standard for total and fecal bacteria or if the Navy presumes to have a variance. Reasons why the EA failed to discuss the standards in the Code of Federal Regulations were not contained within the EA. In any event the Code of Federal regulation should be considered as it was in Bangor Washington until such time a variance is identified. Such variances may be required to be renewed for all issues identified in this response to the EA, including increased wind trough exposure detailed later in my response to the EA. HW-17

The EA stated that discharge from winter storms caused the levels of bacteria to rise in the area of the current location of the mammal pens. The discharge of varying flows of winter storm runoff coming from the 66" storm drain 100 feet from the pens at NMAWC, adds yet another factor not shown to be contributing to the base levels of bacteria at the current location of the mammal pens.

BACTERIA FROM THE STORM DRAINS AFFECTING THE MAMMALS

Page 221 line 5 of the EA states "Because consistent water quality testing of the NMAWC site has shown that the water quality there is sufficient to ensure the health of the Navy marine mammals while they reside there (SSC Pacific 2012b)". This statement has no probative value (see Miler v. West referenced above). This statement does not identify when the tests were performed, what types of chemicals or bacteria was the target of the tests and what levels of pollutants were found. The statement does not even mention that it tested for coliform bacteria or that they tested after winter storms. This is a significant omission considering the presence of a large 66" storm drain less than 100 feet and concrete 6' X 10' flume located 220 feet from the proposed pen location at NMAWC.

Even if this test data is made available the results cannot be reliably integrated into a prediction of future total levels of bacteria that would result from the combination of bacteria from storm runoff and bacteria added to the area by 100 mammals. This is due to the fact that the expected levels of added contamination from the mammals was projected to be flushed by tidal forces at rates that were based on unreliable projections of the flushing characteristics at NMAWC HW-18

The EA did not identify known storm drains at either location of the mammals. Thus, it is not evident the individual or individuals making a determination of similarity were fully informed. Visual inspection of the areas from the water does not allow for the identification of storm drains in the area of the current location of the mammal pens. The two large storm drains seen dumping various levels of year round runoff within yards of the proposed new mammal pens can be a trickle up to a torrent that is visible all the way past the existing boat docks at NMAWC. The Luke Dukek report states that the 66" drain services 300 acres of residential property west of Rosecrans Ave.

Due to the proximity of storm drains to the mammals at NMAWC and the variable amounts of runoff, the most reliable test would involve a constant recording device rather than episodic tests. This is due to the fact that **consistency of past tests cannot predict future events when activities occurring within the service area of the drain system are not under the strict control of the Navy.** It is not clear as to the location of storm drains or their service areas at the present locations of the pens. It appears as though the service areas would predominantly service the Point Loma Sub base. **The Luke Dudek report shows that the 66" storm drain and 6' x 10' open flume that services the Rosecrans area are not within the control of the Navy and specifically states "the possibility of illegal discharges entering the storm drain system from beyond military property also exists".**

Storm drains can be dump sites for many hazardous substances. It is no surprise to somebody who has spent a little time in a marina that some boat owners dump their septic holding tanks right in areas were the boats are 3 feet apart. What is so different about an RV owner? The only difference is that the 2 large storm drains at NMAWC empty in close proximity to the mammals. The population of San Diego RVer's illegally living on the streets has been identified in media reports for years. Shelter Island parking lots are a very popular area for RV dwellers. Page 279 of the EA (census) identifies this area as a low income area. The census bureau counts homeless RV populations. RV's are often seen commuting north of Shelter Island Drive, in the wider sections of Rosecrans Ave. Where are they going? There are no RV parks in the area. What is to stop an RV'er who does not want to spend the gas money to drive over to Mission Bay to dump their holding tank from pulling up to a hillside storm drain during storm runoff conditions and dumping their septic tank? RV septic tanks can hold up to 172 gallons. 50 gallon tanks are common. Quickly dumping with a 4" dia. hose in a hillside drain above Rosecrans Ave. would result in the smelly contents being washed out of the catch basin quicker than storm drains on level ground. What if a resident of the hillside area did not dump his septic tank as he was leaving the RV park because there was a line of RV's waiting to use the dump station. This resident gets home and decides to take the lazy way out and dump the tank in a storm drain. A trailerable fishing boat owner who has been told it will cost $400.00 to drain 170 gallons of water contaminated gas in his boat parks his trailer in front of a storm drain then sends a 25 foot garden hose down a storm drain and mixes the fuel with storm runoff. Consider that diesel does not present the explosive hazard that gasoline does. Lastly, anybody who has worked or lived at the bottom of foothills knows that raw sewage from blocked sewer lines escapes through manhole covers and runs into the storm drains.

HW-18 cont.

Unless the Navy can show with reasonable certainty that these mammals should not be afforded the same protections humans are afforded by many government agencies from the impact of storm drain runoff, moving the mammals pens in front of residential storm drains at NMAWC should be forbidden.

The restrictions noted in the table below would exclude the NMAWC area from being considered safe for humans after a storm. The signs posted at the beach after storms do not say "only enter this area to swim or surf if you are being closely monitored by medical professionals and are vaccinated". The EA has not indicated that there has ever been a population of captive or wild marine mammals that has survived living three to five years in immediate proximity to residential storm runoff without experiencing ongoing health issues related to runoff.

http://www.beachapedia.org/Health_Threats_from_Polluted_Coastal_Waters 'an epidemiological study in Santa Monica Bay found that there is an increased health risk when swimming within 400 yards of a flowing storm drain. Personal examples of extreme health effects from exposure to polluted runoff .....include: Chris O'Connel had a cut on his arm and went in Mission Bay, San Diego after a rain event. His arm became infected with the Streptococcus bacteria and he almost died. Three operations and two and half weeks in the hospital saved his life.
http://publichealth.lacounty.gov/phcommon/public/media/mediapubhpdetail.cfm?prid=748. LOS ANGELES - warning signs advising beach visitors, swimmers, and surfers to avoid the ocean water for a half- mile north and a half-mile south of the storm drain located at Will Rogers State Beach, near Pacific Palisades.....raw sewage.

The question may arise as to whether or not it would be better to not increase the risk of the mammals contracting diseases from the *toxoplasma gondii bacteria* or increase risk and rely on treatment. These bacteria have been found in marine mammals. These bacteria are associated with cats and rodents. It is now suspected of being transmitted from the cats and rodents to anchovies and sardines. The bacteria (*toxoplasma gondii)* are cited in the literature (http://www.newscientist.com/article/dn14037-the-worlds-most-successful-bug-hits-dolphins.html) as most likely being transmitted to dolphins when consuming small fish. The bacteria only remain in the carrier fish for six to eight hours. This makes the proximity of the infected cats to the anchovies and the other mackerel or queenfish that could eventually be consumed by the Navy's mammals very important. Fish feeding on the anchovies such as queenfish and mackerel then carry the bacteria after eating the anchovies. Dolphins are known to feed on anchovies, queenfish and mackerel.

For reasons discussed in detail below, if there are problems recognizing and controlling diseases caused by *toxoplasma gondii* due to logistics, ineffectiveness of treatment ,etc. it would be required that the mammals not be inclined to eat any, living, dead or stunned fish that may enter their pen. It is obvious to any fisherman who spends a significant amount of time on their boat in the West basin of San Diego bay that fish chasing the schools of anchovies will jump out of the water onto the docks or impact docks and slipped boats with great force. Of interest is that it appears that the Navy's mammals at times are trained to eat dead fish thrown into the water by the trainers. Small boats are seen traveling the bay with a trainer standing on the bow tossing food in front of the mammals as they swim next to the boat. It has been heard that this procedure is called "chipping or chunking".

The EA fails to note that unlike the area surrounding the current location, the West basin (including the estuary) has three miles of shore line covered by large rocks that start above the water line and continue to the harbor floor. Feral cats are known to live in shoreline rocks. There are only scattered rock formations like these in Shelter Island and adjacent to the current location of the mammal pens. Additionally, there are significant rock lined water side areas on the San Diego bay side of Shelter Island. However, principals of channel morphology make it hard to predict the exact path of the outgoing tide. The Shelter Island basin could easily push any water flow parallel to the bay side of Shelter Island away from the current location of the pens and into the deeper areas of the bay. There have been no reports of feral cat populations in the rock formations at NMAWC. It would not be expected that there would be feral cats located in the rock formations at the current base where the mammals are located. HW-19

There are significant populations of anchovies and sardines that swim in large schools along the shallow water following the rock lines of the west basin. Schools of anchovies have been seen in several areas of San Diego pinned against these rocks by schools of fish feeding on the anchovies for days. Local fishermen and Port District maintenance employees have seen reoccurring populations of feral cats in rock formations along the entire West basin starting at the Harbor Island Bridge and including Spanish landing and Cancer Survivors Park. Fishermen launching boats early in the morning at MCRD, report large cat populations in the rocks on both sides of the MCRD estuary. Fishermen and Port District employees have reported to me, sightings of feral cat populations in rock formations as close as 200 yards from the north end of the proposed location of the mammal pens.

Considering, the various locations of the mammals at the current location of the pens are not as close to known feral cat populations as the area at NMAWC, the possibility that the mammals will be at increased risk for taxoplasma gondii bacteria at NMAWC is real. Considering the short time the bacteria remains in the gut of anchovies, queenfish or makeral he proximity of the feral cats to the anchovies and the proximity of the anchovies to the mammals is a significant factor. Any fecal matter from cats and rodents is being continually washed into the harbor by the changing tide.

It should be noted that there is a significant residential area that would be expected to produce storm

drain and shoreline runoff into the Shelter Island harbor. However, this runoff is not as focused as the runoff coming from the large drain pipe that is only yards from the docks at the proposed new location of the pens. The Shelter island residential runoff could pose a similar problem to the general area of the current location of the pens as would the storm drains at the NMAWC location. It would just be a question of which is a greater risk, discharge pipes at 100 feet and known population of feral cats within 200 yards of the pens at NMAWC or a large basin that would have a population of domestic cats in adjacent housing. There is no location identified in the literature where a large population of mammals are maintained 24/7 for years that is closer to a source of this bacteria than NMAWC. HW-19 cont.

Even though Tributyltin is illegal to use for marine applications there is no such restriction on exterior residential paints. Tributyltin can leach from these paints for years. Testing for Tributyltin should be performed at NMAWC. Testing should encompass seasonal variations. A full understanding of the problems presented by variable seasonal runoff must be investigated in advance of moving the mammals otherwise an uninformed plan to move the mammals would be experimentation with no potential to produce useful knowledge and should be forbidden. HW-20

NUTRIENTS ADDED TO THE AREA EFFECTING PHYTOPLANKTON BLOOMS

The issue of increased nutrients triggering red tide blooms was summarily dismissed based on a claim that hydrodynamic studies show that the current location of the mammal pens and the proposed new location are similar and there have been no red tide bloom at the current location of the pens. Based on the circulation and flushing reports identified in the Flushing an Waste Concentration section of this response to the EA specific to flushing patterns of the area at NMAWC, a determination of similarity between the current and proposed locations of the mammal pens for the assessment on no impact for red tide blooms is not reliable. HW-21

An analysis of this issue should be obtained from qualified experts, due to the close proximity of significant harbor side business in Harbor Island and the known financial disasters that are endured by local business when red tide blooms occur. This analysis should be founded on the most current research techniques to evaluate the seasonal variations of light, turbidity, water temperature and nutrient levels, etc. Consider that a red tide bloom occurred on May 4. 2012 in the MCRD estuary. There was no storm runoff proximate to the time frame of the MCRD red tide bloom.

SOIL SAMPLING - HEAVY METALS

Soil sampling was performed in the area of the new pier showing exact locations where samples were taken. However, soil studies cited in the EA that were specific to the west basin indicated that presence of copper 600 feet away from the proposed new location. Most notable is the fact that the EA fails to identify that soil samples were taken that were within healthy limits to the mammals in areas closer than 600 feet to the proposed new location. Considering that the proposed new location is a boat dock where recreational boats have been dock for decades such tests should be specific to this location. Consider that laws directed at bottom cleaning procedures to reduce the dispersion of metals that are still currently allowed in bottom paint have been implemented only recently. Additionally, many boaters have historically taken their boats to Mexico in order to circumvent pollution control laws directed at bottom paints. The least the EA could have done is shown that current soil testing in the area of the boat docks had determined there would be no concern that the new location would present a hazard to the mammals in the marine mammal program. HW-22

SEASONAL STORM ACTIVITY

The EA states on page 119 line 3, "*The marine environment at the proposed temporary Navy marine mammal enclosure relocation site is similar to that of their current location*", The EA's determination of sameness that the marine environment at the new location is the same as the current location for the mammal pens failed to consider winter storm wind patterns. HW-23

Winter storms can produce strong winds coming from 120s degrees ESE. As the storms pass the wind direction rotates to the south and then west. These winds will produce troughs at both the current location of the pens and NMAWC. The wind will stop effecting the current location of the pens at 180 degrees S due to Ballast Point and the westerly shore blocking troughs. However, at NMAWC the wind continues to cause troughs until the wind direction swings around to 220 degrees SSW.

The entire opportunity for troughs at NMAWC is the difference between 120 degrees SSE and 220 degrees SSW or a total of 100 degrees. For troughs to impact the current location of the pens the window of opportunity is from 120 degrees SSE to 180 degrees S, for a total of 60 degrees. Due to the fact that the wind duration from any particular direction is a variable that changes from storm to storm the difference between the 100 degree impact zone and the 60 degree impact zone would still remain a constant when taking into account an average of all winter storms. Thus, the duration at NMAWC is over 60% greater than NMAWC. 1.6 X 60 = 96.

There is a slightly longer fetch for all wind from 120 degrees SSE to 180 degrees S at NMAWC than the current location of the pens. There is a very small window of opportunity for a long fetch at the current location of the pens at 160 degrees SSE. However, this very long fetch also occurs at NMAWC at 120 degrees SSE. For the purpose of a comparative analysis it can be said that these very long fetches with a small window of opportunity cancel each other. The main difference between the two locations involves the slightly larger fetch from 120 degree to 180 degrees at NMAWC and most significantly the 40 degree window of opportunity with a one mile fetch that hits NMAWC between 180 degrees S and 220 degrees SSW that does not impact the current location of the pens. This difference could result in the mammals experiencing troughs at NMAWC that are created by a fetch that is twice as long as the fetch from 120 degrees SSE to 180 degrees S at the current location of the pens for a period of time 60 percent longer. If it were a simple math problem this would result in a potential impact of 60% longer duration and 2 times the fetch for a total impact more than double what the mammals experience at the current location of the pens from each winter storm. The possibility that this could be an unusual stressor is real depending on the depth of the mammal pens. HW-23 cont.

The EA only states that the mammal pens will be towed from the present location to NMAWC. The EA does not identify how deep the pens are. The failure to specifically identify the known depth of the pens prevents any party interested in rebutting the interpretations of the data being advanced by the EA from having access to relevant criteria. It should be noted that while drift fishing in the area of NMAWC on Nov. 2, 2012 at dusk, a boat owner was seen on a sailboat. When queried if he knew the depth under his boat, he went inside to look at his meter then said it was 7.2 feet. A check of the charts indicated that the lowest tide that evening was + 0.4. The average monthly low tide for San Diego is -1.283 (see tides pg, 16) .This would result in the pens in the area of the sailboat being no more than 6 feet deep from time to time. The EA states that the depth is shallower at NMAWC than the current location of the pens. Considering the potential for larger troughs with increased duration, a stressor for the mammals could result. A review of the literature indicates that it is unknown where dolphins go during storms. Unless the EA identifies specific knowledge that this added storm activity will not present a stressor, moving the mammals to NMAWC is experimentation with no potential to produce useful knowledge and should be forbidden. This issue could easily result in legal actions from the animal rights organizations. The EA does not even address the issue of the increased fetch as not being a potential problem, raising the possibility that the planners did not consider this issue. An understanding of the problems presented by winter storms must be investigated in advance of moving the mammal otherwise an uninformed plan to move the mammals would be experimentation.

SEASONAL CHARACTERISTICS OF THE WEST BASIN / PETRO CHEMICAL POLLUTION.

A complete understanding of the petro chemical presence at NMAWC is needed. According to NOAA, dolphins in the Gulf coast have beached themselves at a rate as high as eight times the pre gulf oil spill rates. (http://www.gulfspillrestoration.noaa.gov/2012/03/gulf-dolphins-answers/). HW-24

Thequestion arises as to why are the gulf dolphins beaching themselves. According to NOAA absorption of petro chemicals through the mammal's skin is a suspected cause. Whether or not the beaching in the Gulf are related to petro chemicals, a complete understanding of the petro chemical presence at NMAWC is needed. NOAA's concern establishes that the issue of absorption through the skin is real.

The potential reverse impact on the health of the mammals in the Navy's Marine Mammal Program should be fully addressed early in the process to avoid long delays and added expense as was the case in Bangor Washington. Due to the close proximity and volume of the vessel traffic and vocalized complaints of petro chemical pollution effecting shell fish (addressed later in this response to the EA), in the area of NMAWC a full understanding of the petro chemical pollution in the area of NMAWC including seasonal peak levels must be identified. Testing for petro chemicals should be performed at NMAWC for one full year in advance of moving the mammals. Peak periods would include the Memorial Day to Labor Day season. Additionally, the five day period before and after the fourth of July should be fully investigated. The City of San Diego has a huge fireworks show. Many boaters spend an entire week on their boats. Once the levels are identified they need to be evaluated using the most current research for the purpose of determining if there is any laboratory or environmental studies that will be able to assess the risk level associated with the identified level of petro chemicals present in the area of NMAWC. A minimum understanding of the new site should show clear factual evidence that the ongoing petro chemical pollution at the proposed new location is fully understood. HW-24 cont.

Considering the mammals will be required to live 24/7 for as many as five years in the waters of the new location, a plan to move the mammals to a location where it cannot clearly be demonstrated in advance that the conditions would pose no hazard or unusual stressor to the mammals well being would be experimentation with no potential to produce useful knowledge and should be forbidden.

Credible lay observations and complaints of petro chemically tainted shell fish in the West basin of San Diego Bay need to be investigated scientifically to determine the levels of petro chemical pollution. Multiple individuals have complained that shell fish they are calling "oysters" taken from the pilings at the proposed new location for the mammal pens looked polluted and even tasted like gasoline. According to the Louisiana Department of Health there are sufficient instances in which the appearance and taste of petro chemicals in oysters were confirmed by scientific investigation to determine that there is no doubt a lay complaint of petro chemical appearance and taste justifies continued scientific investigation of vocalized complaints identifying the presence of petro chemicals.

Petro chemical pollution in the basin where the Navy plans to move the mammals has been ongoing and inadequately tested. No safe criterion for levels of petro chemical pollution in the area of the proposed new location for the mammals was identified in the EA. Even though the mammals in the marine mammal program can obtain drinking water from the food supplied by the trainers, the mammals will be exposed to the waters of the new location 24/7 for up to five years. The average and peak levels of all petro chemical contaminants listed on the EPA's National Primary **Drinking Water** Regulations should be identified and the impact on the mammals should be fully understood using current technology.

The entire volume of boats operating in the West basin will be required to operate closer to the mammal pens than any previous location. The mouth of the Shelter Island harbor (current location of some of the mammal pens) provides opportunities for boaters to steer away from the mammal pens to a distant three times greater than what will be available in the Harbor Island channel (site of the proposed new location). The direction of the boat traffic at the current location of the mammal pens is dominantly parallel to the pens. The proposed new location for the pens is adjacent to a busy marine fuel dock. As many as five or six boats at a time can be seen loitering in the area in front of the fuel dock waiting their turn to pull in and get fuel. Large (approximately 90 feet) U.S. Coast Guard vessels and numerous commercial fishing vessels (60 to 90 feet) and occasional private vessels (100 feet) HW-25

are required to turn and maneuver in such a manner that their prop wash will propel water from the heavily used narrow channel right in the direction of the mammal pens. The literature and laws do not identify any regulation that parallels smog laws as to the amount of petro chemical pollution coming from these large diesels or numerous smaller gasoline motors.

There are significant differences between petro chemical pollution caused by high volumes of motor vessel operation and occasional fuel spills. Fuel spills are visible, float, evaporate and can be contained. To the contrary motor vessels discharge exhaust contains small amounts of petro chemicals which are thoroughly mixed with the engines cooling water within the exhaust pipe. The mixture is again agitated by prop wash from the vessel and continued mixing occurs due to the continued high volume of motor vessel traffic in the narrow channel. Petro chemicals will attach to small organic and inorganic particles suspended in the water column resulting in longer periods of time that the chemicals are present. There are very high levels of visible particles in the area of NMAWC. HW-25 cont.

The 100 foot restricted distance from the pens may not be sufficient to keep the combined effect of prop wash and current from pushing petro chemical pollution into the mammal pens. Keep in mind that the prevailing winds will be pushing the boats waiting in line toward the fuel dock. This requires that the boats continually circle to maintain a distance from boats already at the fuel dock. Typically the boats will back up as close to the pens as they can to limit the amount of correction needed to keep from hitting the boats already at the fuel dock. No evidence was provide in the EA that would establish that there has ever been such a significant amount of boating activity at such a close distance to the pens at any prior location. HW-26

It should be noted that there are fueling activities in the general area of the current location of the mammal pens associated with the refueling of Navy vessels. This fueling activity involves the operation of tug boats in the area of the current fuel dock at least daily. The EA makes no attempt to make a comparison between the activities of these tugs to both the average and peak seasonal petro chemical discharge that occur at the Harbor Island fuel dock. It should be noted that the tug boats routinely operate at the current location of the mammals pens at twice the 100 foot distance of the restricted area at NMAWC and in water twice as deep.

ADMINISTRATIVE CONSIDERATIONS

There are federal laws governing the quality of care for captive mammals. These laws were cited by the Progressive Animal Welfare Society (PAWS) in a case in Bangor Washington that has similarities to the Navy's current plan to move the mammals. In the Bangor case 9 CFR 3.103 required that the water temperature be maintained as to not harm the captive mammals. The law did not specifically identify temperature ranges. The Navy attempted to move bottlenose dolphins to the cold water of the northwest coast without any verifiable knowledge of how the water temperature in the northwest would affect the dolphins. PAWS was successful in stopping the move until such time studies were performed addressing the health effects of water temperature on the dolphins. HW-27

When considering the issue of petro chemical pollution, 9 CFR 3.106 and 9 CFR 3.107 addresses contaminants contained in the water for captive mammals. However, like the Bangor Washington case these laws are vague in as much as the laws discussing contaminants are not specific. Section "A' of 9 CFR is a general rule stating that the water cannot be detrimental to the health of the mammals. Section B allows an exemption from testing for chemicals in "natural seawater". By no means is water that is polluted to the point that shell fish taste like petro chemicals "natural seawater". The Navy states they comply with all relevant laws and they belong to several oversight organizations. Where were these organizations and how much reliable knowledge did they have readily available to stop the court from intervening in Bangor Washington? Has anybody tested the

shell fish in the West basin of the San Diego Bay for petro chemicals on a year round basis? If yes, why were these test results not identified? Considering that shell fish are considered "bio monitors" for petro chemical pollution and used in the NOAA NS&T program the EA should not be silent for testing of shell fish at the proposed new location for the mammals.

HW-27 cont.

If someone were to collect a container of water from the area where the EA states the pens will be moved and tells me it has been desalinated and is safe to drink and there is a requirement to drink this water for three days, they would soon find this water flying back into their face. It is very likely that the organizations that have advanced court action in the past will consider the plan to move the mammals as flawed. These organizations will view the plan as going from not so good to even worse. They will consider the plan to require that the mammals reside in the area of the proposed new location of the mammal pens 24/7 for several years an experiment that is unjustified. They might feel that a court action can be advanced at any time they believe the health of the mammals is at risk. It is just a question if they can find a judge who will agree with them, as they have done in the past.

HW-28

Compared to any other location with better protection, the longer fetch and increased duration of winter storms will result in increased risk of injury to employees feeding and transporting the mammals due to the large wind waves that batter the docks at NMAWC. The fuel dock ceases operations during winter storms. From my experience working with disability claims I can assure one knee injury or back injury can cost a self insured employer up to $100,000.00 per incident.

Respectfully,

Howard Weiss

November 16, 2012

Attachments; 4 pages of charts from the Luke Dudek 1983 report showing the source as the Navy Hydrographic Office,



PADDLE BOARDS GOING TOWARDS POINT LOMA. THE TIP OF THE NAVY DOCK AT NMAWC IS SHOWN. THEY TOLD ME THEY LAUNCHED FROM MCRD.

THE PICTURE WAS TAKEN FROM MY BOAT WHILE DRIFT FISHING FOR CORBINA IN THE AREA OF THE BOAT DOCKS AT NMAWC.



PADDLE BOARDERS GOING TOWARD THE MCRD ESTUARY. THE GIRL IN WHITE TOLD ME SHE WAS SITTING BECAUSE SHE KEPT FALLING INTO THE WATER.

(REC – 1 WATER CONTACT ACTIVITY)

IT SHOULD ALSO BE NOTED THAT EMPLOYEES OF KAYAK RENTAL COMPANY TOLD ME THAT KAYAKERS DO FALL OF THE KAYAKS AND SOMETIMES EVEN LOSE THE KEYS TO THEIR CARS.

HW-29

http://www.americantides.com/tide-predictions/san-diego-california

San Diego, California 2012 Lowest Tides by Month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lowest	Sat 1/21	Tue 2/7	Tue 3/6	Sun 4/8	Sun 5/6	Mon 6/4	Tue 7/3	Wed 8/1	Sat 9/1	Tue 10/16	Wed 11/14	Thu 12/13
	-1.50	-1.20	-0.80	-1.30	-1.70	-1.80	-1.60	-1.20	0.00	-0.90	-1.50	-1.90

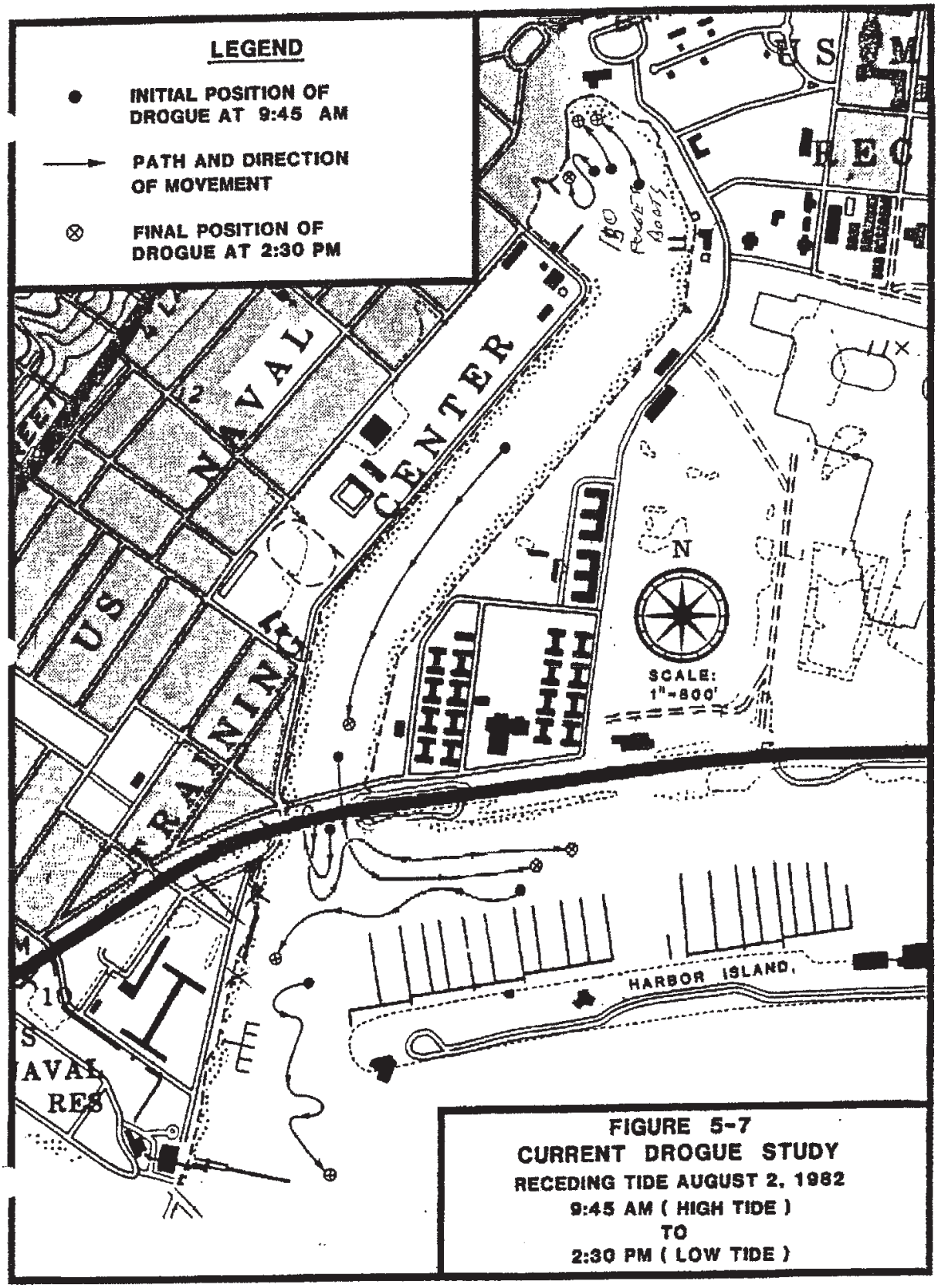
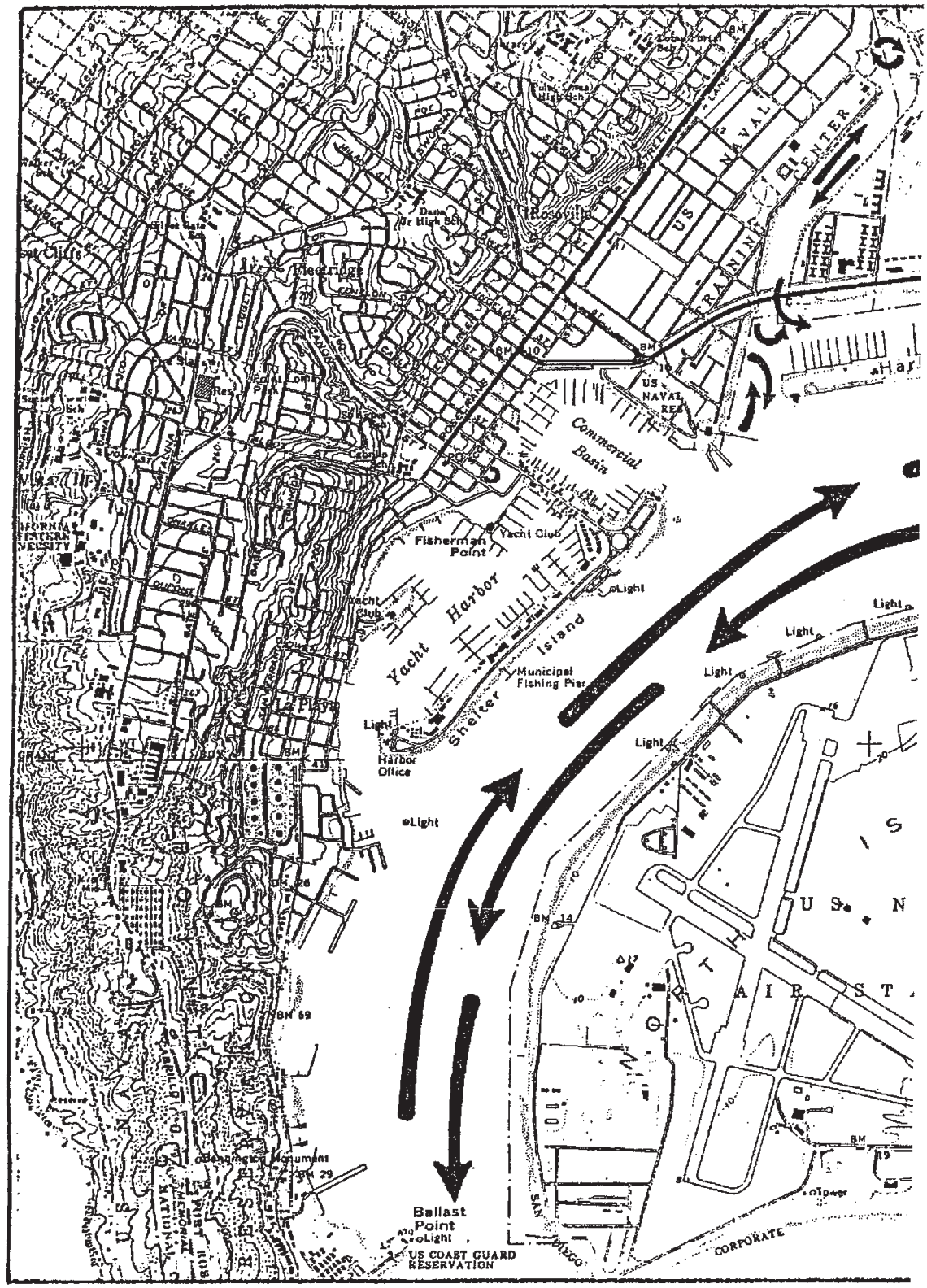


FIGURE 5-7
CURRENT DROGUE STUDY
RECEDING TIDE AUGUST 2, 1982
9:45 AM (HIGH TIDE)
TO
2:30 PM (LOW TIDE)

HW-29
cont.


Commercial Basin
Fisherman Point
Yacht Club
Harbor Office
Municipal Fishing Pier
Yacht Harbor
Shelter Island
Light
Ballast Point
US COAST GUARD RESERVATION
US NAVAL TRAINING CENTER
CORPORATE

HW-29
cont.

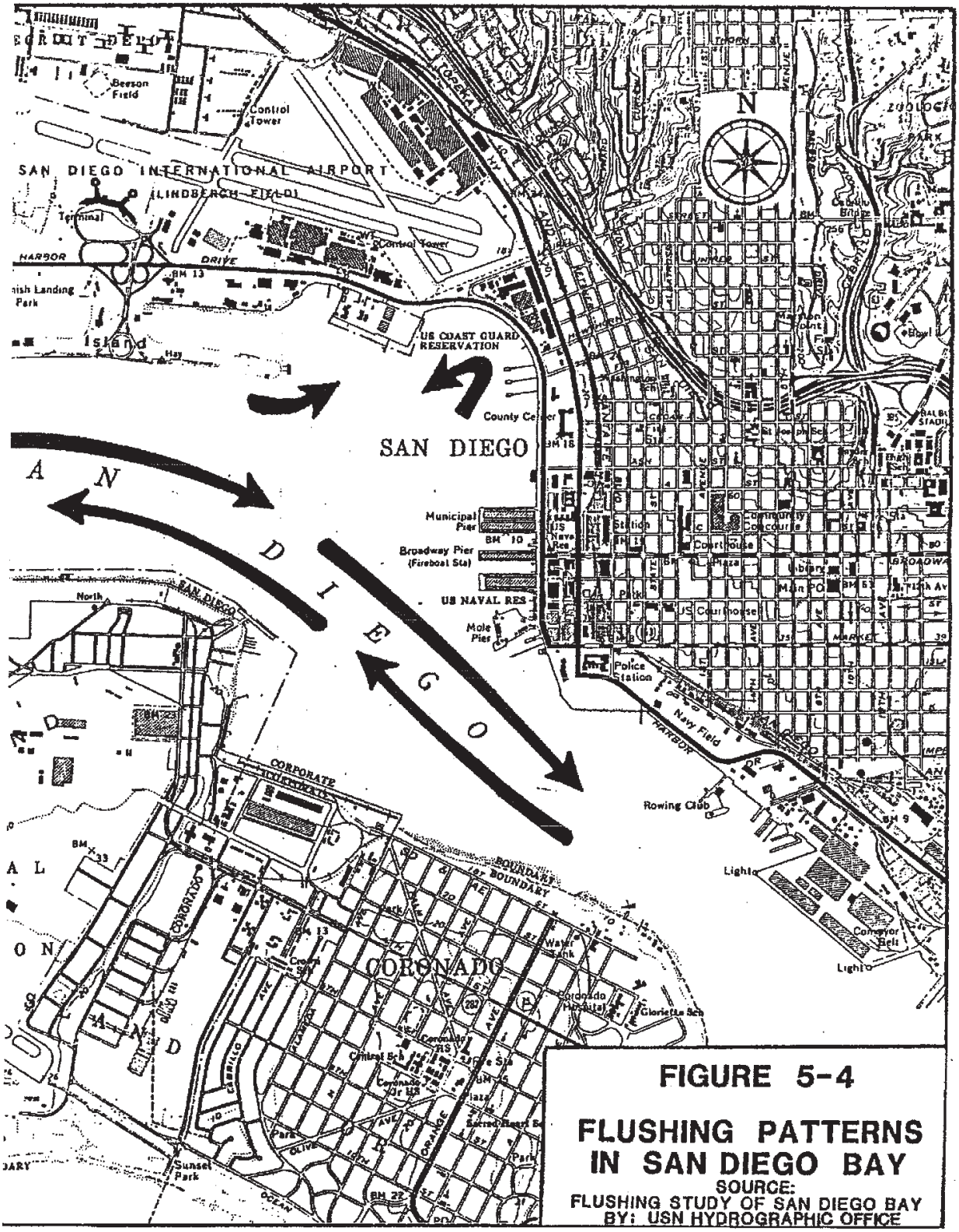


FIGURE 5-4

FLUSHING PATTERNS IN SAN DIEGO BAY

SOURCE:
FLUSHING STUDY OF SAN DIEGO BAY
BY: USN HYDROGRAPHIC OFFICE

HW-29
cont.

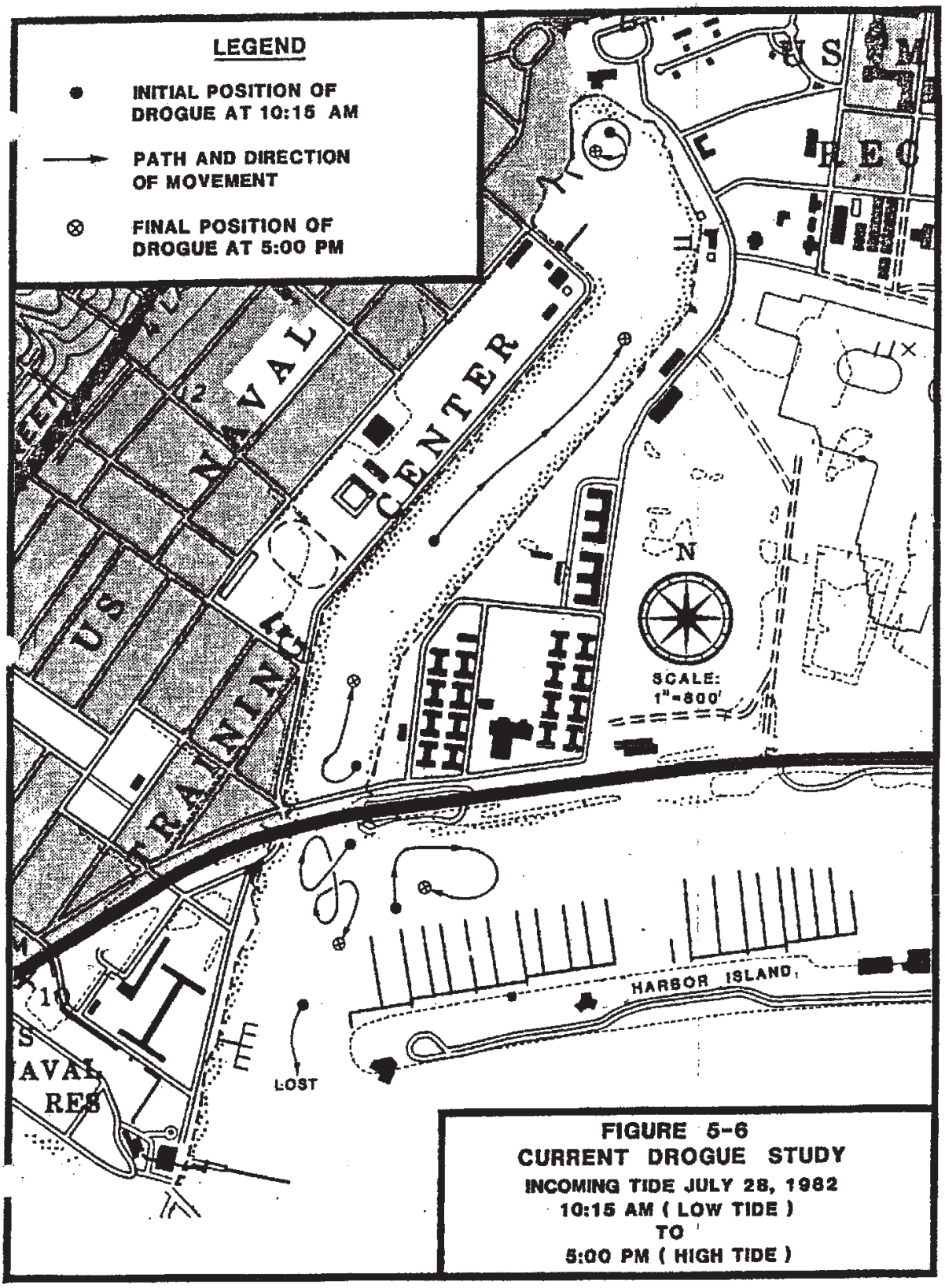


FIGURE 5-6
CURRENT DROGUE STUDY
INCOMING TIDE JULY 28, 1982
10:15 AM (LOW TIDE)
TO
5:00 PM (HIGH TIDE)

HW-29
cont.

619.758.7743
619.224.4638
2825 DEWEY ROAD, SUITE. # 200
SAN DIEGO, CALIFORNIA 92106
www.sdcoastkeeper.org
ONE ORGANIZATION PROTECTING 100% OF THE COAST

November 1, 2012

P-151 NEPA Project Manager
Naval Facilities Engineering Command Southwest
Attn: (OPUE2.LS)
2730 McKean Street, Bldg 291
San Diego, CA 92136-5198

Re: Request for Public Comment Period Extension for the NBPL Fuel Pier Replacement Environmental Assessment (P-150/DESC1306)

Dear Project Manager:

San Diego Coastkeeper® protects fishable, swimmable and drinkable waters in San Diego County. We would like to submit comments on the environmental assessment for the NBPL Fuel Pier Replacement, released October 18, 2012, but the sheer size of the document, at close to 700 pages, stands as an obstacle to a thorough, timely review of it.

Council on Environmental Quality (CEQ) guidance suggests that environmental assessments (EA) should be 10-15 pages, and states, "[i]n most cases, however, a lengthy EA indicates that an EIS is needed." "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 Fed. Reg. 18026 (1981), Questions 36a and 36b. Regulations for the Army Corps of Engineer cap an EA at 15 pages and note: "[t]he document is to be *concise* for meaningful review and decision." 33 C.F.R. § 230.10(c) (emphasis added). Moreover, CEQ regulations provide that an environmental impact statement (EIS) be less than 150 pages, or 300 pages in exceptional circumstances. 40 C.F.R. 1502.7. CK-1

Chapter 3 of the NBPL Fuel Pier Replacement EA -- *one chapter alone* -- is 193 pages, exceeding the length suggested for a fully-developed EIS. So while 30 days might be appropriate to review a "concise" environmental assessment, this voluminous document absolutely requires additional time for the public to digest it. Moreover, as suggested by the CEQ "Forty Most Asked Questions," the length of this EA may indicate an EIS is needed, further underscoring the need for ample time to review it. Therefore, we request an extension of the public comment period from 30 days, ending November 19, to 90 days, ending January 18, 2012.

Additionally, we request that an email address be made available for submitting comments. The present web form is inadequate because it fails to allow the submission of formatted documents, which is especially problematic where citations or footnotes are concerned. Moreover, the web form fails to allow for attachment of relevant or background materials, like studies or appendices, and more fundamentally, basic .doc or .pdf files.

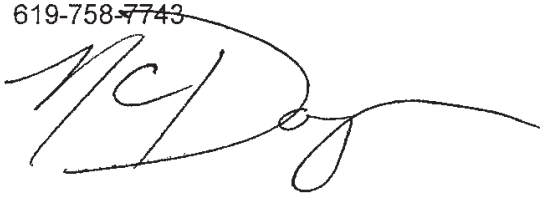
Thank you for the opportunity to provide comments on this project, and we look forward to your announcement of the extended comment period and email address where comments can be submitted.

CK-1 cont.

Sincerely,

Megan Baehrens, Executive Director
San Diego Coastkeeper
619-758-7743 x103

Nick Doenges, Student Attorney
San Diego Coastkeeper
619-758-~~7743~~



November 28, 2012
P-151 NEPA Project Manager
Naval Facilities Engineering Command Southwest
Attn: (OPUE2.LS)
2730 McKean Street, Bldg. 291
San Diego, CA 92136-5198

Re: San Diego Coastkeeper Comments on the Environmental Assessment for the Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151/DESC1306).

[redacted]

San Diego Coastkeeper submits the following comments on the Environmental Assessment for the Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151/DESC1306) ("the Report"). The Report fails to adequately analyze major elements of the fuel pier replacement and dredging project ("the Project"), which may have significant environmental impacts. The Report's main problems include: (1) identifying significant traffic impacts but arbitrarily concluding the impacts are less than significant, (2) failing to analyze the extent of water quality and aquatic life impacts for various dredging methods, (3) failing to analyze boat traffic impacts and hazardous substance impacts, (4) failing to adequately assess alternative locations for the Marine Mammal Program enclosures, as well as the impacts of each alternative on water quality and endangered species, (5) and failing to base the Project's cumulative impacts conclusions on substantial evidence in the record. San Diego Coastkeeper respectfully submits these comments to assist the Navy in planning the best, least impactful project, and looks forward to the Navy taking the necessary actions to meet the shared goal of environmental excellence. San Diego Coastkeeper reserves the right to rely on all comments submitted and requests formal notice of any and all action taken in relation to this Project. CK-2

Background

The existing fuel pier is located on San Diego Bay at Naval Base Point Loma. The fuel pier currently serves a number of vital functions including service as a fuel depot for loading and unloading tankers and refueling American ships at sea.

Segments of the pier are over 100 years old, constructed in 1908 as the La Playa Coaling Wharf, with the south segment of the pier constructed in 1942. The Navy suggests that the pier is "significantly past its designed service life." Further, the pier does not meet current California State Lands Commission - Marine Oil Terminal Engineering and Maintenance Standards Level 1 (operational) and Level 2 (spill prevention) seismic criteria. According to the structural evaluation and seismic analysis conducted for this project, the existing fuel pier is not structurally sufficient to comply with multiple Level 2 seismic performance requirements.

The Project site is located on the west side of San Diego Bay, near the mouth of the bay directly opposite Naval Air Station North Island. The Navy is proposing the Project to allow it to fuel newer and larger ships. However, many Project details remain unclear at this point. Because of that, the law requires a more thorough investigation in the form of an environmental impact statement, before the Project can go forward.

SAN DIEGO COASTKEEPER
TEL. 619.758.7743
FAX 619.224.4638
ADDRESS 2825 DEWEY ROAD, SUITE. # 200
SAN DIEGO, CALIFORNIA 92106
www.sdcoastkeeper.org
IMPACT

I. An Environmental Impact Statement is Required for Projects that May Have Significant Impacts.

A. The Law Requires an Environmental Impact Statement for all Projects Significantly Affecting the Quality of the Human Environment.

NEPA "is a procedural statute that . . . does not command the agency to favor an environmentally preferable course of action, only that it makes its decision to proceed with the action after taking a 'hard look at environmental consequences.'" *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). While other statutes may impose substantive requirements on an agency, "NEPA merely prohibits uninformed -- rather than unwise -- agency action." *Sabine River Auth. v. United States Dep't of Interior*, 951 F.2d 669, 676 (5th Cir. 1992).

An environmental impact statement must contain "a detailed statement of the expected adverse environmental consequences of an action, the resource commitments involved in it, and the Alternatives to it." *Kleppe v. Sierra Club*, 427 U.S. 390, 401-02, 49 (1976). An environmental assessment, on the other hand, is prepared in order to determine whether an environmental impact statement is required. *See Sabine*, 951 F.2d at 677. An environmental assessment is a "rough-cut, low-budget environmental impact statement" intended to determine whether environmental effects are significant enough to warrant preparation of an environmental impact statement. *Id.* An environmental assessment must "include brief discussions of the need for the proposal, of Alternatives . . . of the environmental impacts of the proposed action and Alternatives, and a listing of agencies and persons consulted." 40 C.F.R. 1508.9(b). CK-3

The Report fails to set forth any baseline conditions. "NEPA clearly requires that consideration of environmental impacts of proposed projects take place before" [a final decision] is made." *LaFlamme v. FERC*, 852 F.2d 389 (9th Cir. 1988). Once a project begins, the "pre-project environment" becomes a thing of the past, thereby making evaluation of the project's effect on pre-project resources impossible. *Id*. Without establishing the baseline conditions, there is simply no way to determine what effect the proposed actions will have on the environment and, consequently, no way to comply with NEPA.

A project proponent must prepare an environmental impact statement if the Project may significantly impact the human or natural environment. Generally speaking, if an environmental assessment reveals that a project will not significantly impact the environment, the project proponent must prepare a Finding of No Significant Impact (FONSI). If it is found that a proposed action has the potential for significant impacts but that those impacts may be mitigated, the project proponent may adopt a so-called “mitigated FONSI”. Mitigated FONSIs must include “a commitment to carry out the mitigation.” CEQ Draft Mitigation Guidance at 3 n.2. CK-4

B. The Draft Report Reveals that Navy must prepare an Environmental Impact Statement.

The Report discusses many areas where discussions regarding the environmental impact of the Project either cannot be ruled out as not significant or requires more substantial examination.

The NEPA process involves the public and gathers the best available information in a single place to inform before decision makers before they make their choices. The Report reveals that

the Project may significantly influence the quality of the human environment, triggering an environmental impact statement. The Report fails to address mitigation procedures in numerous areas. Further, the mitigation steps listed fail to demonstrate that they will mitigate all potential impacts to a level below significance so the Navy could issue a mitigated FONSI.

II. The Navy must prepare an EIS because the Report revealed a Significant Environmental Impact.

A. The Navy Found the Project will have a Significant Environmental Impact on Traffic Conditions and Fails to Address it.

The Navy's conclusion that there are no significant impacts resulting from the Project is incorrect because the analysis found evidence of a significant impact to transportation. The City of San Diego establishes level of service (LOS) ratings for traffic conditions. LOS A is the best traffic condition and LOS F is the worst traffic condition. *See* EA at Table 3.10-1. Several street segments on Rosecrans Street and Canon Street are currently rated at LOS D, described as "traffic speed begins to be reduced, and freedom to maneuver is seriously limited due to a high concentration of traffic." EA at Table 3.10-1, and Table 3.10-2. The Report states that "the proposed project would cause significant impacts to transportation and circulation if they would exceed City of San Diego significance criteria on segments characterized by LOS E or LOS F conditions." EA at 3-164. A LOS E rating is present during "unpredictable traffic flow, with virtually no usable gaps in the traffic stream to accommodate vehicle maneuvers." EA at Table 3.10-1. The Report states "estimated future traffic growth would cause two segments of Rosecrans Street and one segment of Canon Street to deteriorate from LOS D to LOS E" which by definition would cause a significant impact. EA at 3-166. CK-4 cont.

With no basis in the record, the Navy concludes "Alternative 1 would not have a significant impact to transportation and circulation." EA at 3-167. The conclusion that there are no impacts directly conflicts with the evidence, violating NEPA. *See Sierra Club v. Babbitt,* 15 F. Supp. 2d 1274, 1283 (S.D. Ala. 1998) (holding that the agency in question must examine the relevant data and provide a satisfactory explanation for its action including a "rational connection between the facts found the choice made" and that NEPA requires preparation of an EIS on all major federal actions that "significantly affect" the environment. *See* 42 U.S.C. 4332(C)). NEPA requires the preparation of an EIS when significant impacts are discovered during the environmental assessment process. *Id.* The Navy also fails to provide mitigation measures for traffic, precluding the Navy from issuing a mitigated FONSI.

C. The Navy does not Compare Traffic Impacts with a Baseline Traffic Level.

When the Navy discusses the construction traffic impacts related with this Project, it fails to use baseline traffic conditions. For a proper NEPA analysis, NEPA requires a comparison between baseline conditions and proposed future conditions. *See Half Moon Bay Fishermans' Marketing Assoc. v. Carlucci*, 857 F.2d 505, 510, (9th Cir. Cal. 1988) (articulating that NEPA requires a consideration of environmental impacts of all proposed projects to take place before a final decision is made). Instead, it compares this Project with another construction project, the P-401 Project. The Navy reasons that because the fuel pier Project will supposedly have less traffic impacts than the P-401 Project, there will be no adverse traffic related impacts. EA at 3-164-165. The law requires the Navy to analyze the Project's impacts compared to the baseline – not CK-5

compared to another project. *Carlucci,* 857 F.2d at 510. Moreover, the Navy failed to examine the cumulative impacts of both the Project and the P-401 project if they happen to overlap. CK-5 cont.

III. The Navy fails to take a "Hard Look" at Dredging Impacts.

The Navy concluded that the proposed dredging would not cause any significant impacts without actually taking a "hard look" at any of the impacts from either dredger proposed. When significant impacts to the environment may occur, "the agency must take a 'hard look' at the impacts of its action by providing 'a reasonably thorough discussion of the significant aspects of the probable environmental consequences.' " *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1194 (9th Cir. 2008) (internal citations omitted). CK-6

A. The Report Failed to Take a Hard Look at the Impacts of the proposed Dredgers.

By failing to investigate which dredger the Navy plans to use, the Navy does not have enough information about dredger impacts to make an informed decision. The Navy states that it will choose either a hopper dredge or a clamshell dredge, depending only on availability at the time of the Project. EA at 2-33. The Report then goes on to discuss only the amount of sediment to be dredged and where it will be taken. *Id*.

1. The Navy Fails to Investigate Effects from Entrainment

The Navy fails to examine each dredger's impacts on aquatic organisms. For example, dredging causes entrainment, which is when aquatic organisms are caught in the uptake caused by the suctioning field of the dredger. *See* Reine, K. and Clarke, D. (1998) "Entrainment by Hydraulic Dredges – A Review of Potential Impacts." Technical Note DOER-E1. U.S. Army Engineer Research and Development Center, http://el.erdc.usace.army.mil/elpubs/pdf/doere1.pdf, (attached hereto as Attachment A). Hopper dredges are much more likely than clamshell dredgers to cause harmful impacts and higher mortality rates for aquatic organisms during dredging. *Id*. However, the Report fails to discuss any dredger impacts at all. NEPA requires agencies to discuss direct and indirect effects of environmental actions. *See* 40 C.F.R. 1508.8. Without this discussion, the Navy cannot know whether dredging's impact on the aquatic environment may be significant, nor can the Navy make an informed decision as to which dredger to use. Therefore, without further analysis, the Navy cannot issue a FONSI. CK-7

2. The Navy Fails to Investigate Effects from Sediment and Turbidity

The Navy failed to investigate the types of effects each of the dredger it may use will have on sediment dispersion and turbidity in the San Diego Bay. Appendix D at D-3. Studies have shown that increased turbidity during dredging can reduce light and impact seagrass and other oceanic organisms. Nichols, M and Diaz, R. (1990) "*Effects of Hopper Dredging and Sediment Dispersion, Chesapeake Bay*." Environmental Geology and Water Sciences. Volume 15 (1990) http://link.springer.com/article/10.1007%2FBF01704879?LI=true, (attached hereto as Attachment B). Hopper dredging generally has greater impacts than clamshell dredging. Without examining the impacts each dredging type has on water quality, the Navy cannot conclude that those impacts will not be significant. CK-8

Further, without detailing impacts, the Navy cannot determine which best management practices and monitoring combinations will mitigate those impacts to less than significant. Because of potential issues with sediment dispersal, the Navy should describe monitoring activities consistent with accepted standards, and monitor for changes in water quality, including decreased dissolved oxygen, changes in turbidity, and possible contaminants that could endanger underwater ecosystems. Without these safeguards, the Navy cannot fully analyze and then provide mitigating measures for detrimental environmental effects, precluding the Navy from issuing a mitigated FONSI. CK-8 cont.

D. **The Navy's Chemical Testing Methods are Misleading and Fail to Address the Full Scope of the Project.**

When agencies perform scientific analysis of a project area, NEPA requires the agency to "insure the professional integrity, including scientific integrity, of the discussions and analyses." 40 C.F.R. 1502.24. The Navy's scientific analysis of the proposed dredging sediment area is misleading and uses questionable sampling protocol, and therefore fails to allow the public and the Navy to make an informed decision about the Project. The Navy claims to follow the USEPA's "Evaluation of Dredged Material Proposed for Ocean Disposal" Testing Manual ("Green Book"), however, the sampling analysis indicate otherwise.

The proposed dredging footprint is adjacent to a fuel pier that has been in existence since 1908, with an area of approximately 463,000 square feet/10.6 acres. Appendix E.1 at 8. The Navy only took *ten* samples across the 10.6 acres of the proposed dredging footprint to determine whether sediment is contaminated or if it is appropriate for ocean disposal. Appendix D at D-3. The Green Book indicates that when composite sampling the ultimate goal is "obtaining an accurate representation and definition of the dredging area." Green Book at 55. The Navy misleads the public by referencing the ten sampling locations, but in actuality it analyzed only two composite samples for contaminants. *Id*. The Navy bases its entire conclusion that the sediment is not contaminated on those two composite samples. *See* Appendix D at D-31. CK-9

Additionally, the Green Book requires samples at the bottom of the excavation area, unless sediments are known to be uncontaminated. Green Book at 56. However, the Navy does not "know" if the area is uncontaminated, and should therefore take samples at this area. Further, the proximity to the fuel pier supports the presumption that the bottom sediment may be contaminated. The Navy failed to take and separately analyze samples down to the bottom of the excavation area to determine whether those sediments are contaminated, and if so, what environmental impact exposing those sediments would have. *See Holy Cross v. U.S. Army Corps of Engineers*, 455 F.Supp.2d 532, 540 (E.D. La. 2006) (finding the Corps failed to take a hard look at environmental impacts and consequences of dredging and disposing contaminated sediments). Therefore, the Navy failed to meet the standards of scientific integrity in its sampling report and may not issue a FONSI.

The Green Book also states that sampling analysis shall be compared to appropriate method detection limits (MDLs) to ensure the sampling results are properly interpreted. Green Book at 64. Instead of properly identifying MDLs, the Navy listed most sampling results as non-detects – which is essentially a useless comparison without knowing the MDLs nor the actual number claiming to be a non-detect. Appendix D at Table 3. The Navy does not even include the actual

laboratory data listing the sampling results or MDLs. Thus, the Navy failed to comply with the Green Book sampling protocols. CK-9 cont.

E. **The Navy used an Incorrect Baseline to Compare its Chemical Analysis.**

The Navy failed to clearly explain why it has analyzed sediment for ocean disposal site LA – 5, but actually plans to dispose sediment into Imperial Beach. The Navy claims that the chemical analysis was prepared to determine whether sediment disposal is appropriate for LA-5. Appendix D at D-3. The Navy even compares its chemical analysis results to sediment disposal requirements for ocean disposal site LA-5. Appendix D at Table D-3. The Navy rests its conclusion that ocean disposal is appropriate because it "appears to support" that analysis. Appendix D at D-4. But then the Navy inexplicably concludes that sediment disposal is proper for Imperial Beach disposal. EA at 2-33. The Navy may not base its conclusions on false assumptions or conclusions not based on evidence. *See Sierra Club v. Babbitt,* 15 F.Supp. at 1283. The Navy must look at impacts for disposal at Imperial Beach and conduct its own analysis to determine whether disposal at Imperial Beach is proper. The Navy should engage local communities in Imperial Beach to determine disposal effects on the local human environment. CK-10

F. **The Navy Fails to Analyze Dredging Impacts on Geology and Topography.**

The Report states that geology and topography were not analyzed because there would be no changes in the terrain as a result of the project. EA at 3-1. However, the Navy is removing 80,000 cubic yards of sediment from the Project location and moving it to Imperial Beach. The Navy simply failed to take a "hard look" or even any kind of look at the geological and topographical impacts from moving so much sediment. The Navy also failed to take a "hard look" at impacts to its disposal site on Imperial Beach. The Navy is adding approximately 80,000 cubic yards of sediment to a new location, and the Navy does not an appropriate analysis of impacts to the drop off location. Therefore, the Navy failed to take a "hard look" at changes to geology and topography and may not issue a FONSI. CK-11

IV. <u>The Navy Fails to Adequately Support its Statements and Conclusions.</u>

The Report states many times that no significant impacts would occur from the chemicals stored on or near the pier during pier demolition. NEPA requires decisions to be supported by "facts based on evidence," not simply assumptions and bare bone conclusions. *Sierra Club v. Babbitt*, 15 F.Supp. at 1283. The Navy's conclusions are not supported by the evidence.

A. **The Navy Fails to Sufficiently Consider Potential Impacts from Hazardous Substances.** CK-12

The Report makes statements that are just not true. The Report states that "no hazardous materials are stored *on* the fuel pier," but in the very next paragraph states the fuel pier has "several 90-day storage sites *on* the pier for oiled boom, rags, and absorbent materials" and then identifies itself as a large quantity hazardous waste generator that is permitted by USEPA. EA at 3-125 (emphasis added). The Report also states that pipelines *on* the pier contain approximately 26,010 gallons of fuel, oil and contaminated petroleum product. EA at 3-125 (emphasis added). The Report lists no contingency plan if any of the hazardous materials are

released into San Diego Bay during construction or demolition. The Navy must consider all direct and reasonably foreseeable indirect effects that could impact the natural environment. *See* 40 C.F.R. § 1508.8. Therefore, the Navy fails to comply with NEPA with respect to its discussion on hazardous substances and may not issue a FONSI or mitigated FONSI. CK-12 cont.

B. **The Navy Fails to Fully Analyze Discarded Munitions Impacts Prior to Beginning Pier Demolition and Construction.**

The Report states that the Navy is investigating whether or not discarded military munitions are located in San Diego Bay. *See* EA at 3-130. The Navy does not state that it will wait until the Project area has been investigated before it begins demolition, nor does it give a contingency plan for what to do if munitions are found in the project area. This presents a potentially unsafe working area for demolition crews and potentially the entire San Diego Bay. The Navy must investigate any reasonably likely effect on the environment, or the Report will fail to comply with NEPA. *See* 40 C.F.R. 1508.8 CK-13

V. <u>The Navy fails to Fully Investigate Environmental Consequences from Pier Demolition.</u>

The Report mentions that many hazardous wastes would be exposed or recovered during pier demolition including but not limited to mercury containing lights and associated equipment, coal tar, lead based paint, potential for asbestos containing materials, fuel, and fuel byproducts. *See* EA at 3-131-133. However, the Navy does not address the possibility of a release into the San Diego Bay. By not including any mitigation measures to remediate a possible release of hazardous substances into the San Diego Bay, the Navy fails to comply with NEPA. The Navy must not avoid carefully investigated mitigation measures to avoid preparing an EIS. *See Nat'l Audubon Soc. v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997) (holding that failing to adequately consider and analyze mitigation measures alone is sufficient to find the agency failed to take a "hard look" at the proposed action's impact on the environment.) Because the Navy failed to provide reasonable mitigation measures for potentially significant impacts to the natural environment, the Navy cannot issue a mitigated FONSI. 40 C.F.R. § 1502.14 CK-14

A. **The Navy Fails to Fully Investigate Effects from Coal Tar, Mercury Containing Lights, and Treated Wood Waste.**

The Navy reports that coal tar, mercury containing lights and associated equipment, and treated wood containing polycyclic aromatic hydrocarbons (PAHs) were detected on the current pier. *See* EA at 3-121. The Navy expects to encounter these hazardous items during pier demolition. The Navy states generally it will follow proper procedures, but it does not specify what those procedures are. *See* EA at 3-126. The Navy must describe in detail what measures it will take if the hazardous items are released into San Diego Bay because a release would cause significant environmental impacts. When significant impacts are likely to occur, the Navy must suggest mitigation measures to remedy the impacts, otherwise the Navy fails to comply with NEPA. *Nat'l Audubon Soc.,* 132 F.3d at 17. CK-15

In addition, even though the Navy plans to remove a fuel pier that has been in place since 1908, it failed to take a chemical analysis near the current removal activities. The activities have the potential to degrade water quality, increase turbidity, and resurface contaminants that may be CK-16

located below the initial top sediment layer. The Navy failed to detail what would happen if contaminated sediment was encountered during demolition. The Navy must analyze all feasible environmental impacts or else it fails to comply with NEPA and may not issue a FONSI. 40 C.F.R. 1508.8. CK-16 cont.

B. **The Navy Fails to Outline Proper Procedures for Lead Based Paint Removal.**

The Report states that lead based paint was encountered on the pier itself and will be "blasted" off of the pier. *See* EA at 3-132. While the Navy states it will conduct air monitoring, the Navy fails to set standards for lead exceedances in the air for its construction workers and the natural environment. The Navy fails to specify the measures it will take to remediate the problem if an exceedance occurs, precluding a mitigated FONSI. CK-17

The Navy also states that "lead based paint chips, flakes or dust *would not be permitted* to enter San Diego Bay." *Id.* (emphasis added). The Navy fails to describe which best management practices it will employ in an attempt to prevent lead based paint from entering the San Diego Bay, and what mitigation measures it will take if lead based paint does fall into San Diego Bay. Therefore, this precludes the Navy from issuing a mitigated FONSI.

VI. <u>The Navy Fails To Analyze Mitigation Measures With Respect To Potential Releases From Lead Based Paint, Petroleum Products, Hazardous Substances And Asbestos.</u>

A. **The Report Fails to Identify Reasonably Foreseeable Environmental Consequences.**

After writing fourteen pages of possible hazards at the site, the Navy concludes that there would not be significant hazardous materials impacts or waste impacts. *See* EA from 3-122 - 136 NEPA requires analysis of all reasonably foreseeable environmental consequences to accurately conclude whether there will be a significant environmental impact. *See* 40 C.F.R. 1502.22(a). A fuel spill into the San Diego Bay is a very real possibility during the demolition of an existing fuel pier and construction of a new fuel pier, along with the expansion of fuel pipe lines with increased fuel holding capacities. The Report does not mention nor propose any mitigation measures for a potential release. EA at 3-137. Unless the Report explains and justifies that the cost of investigating low probability worst case scenarios would be "exorbitant" then the Report must include it in its analysis. *See* 40 C.F.R. 1502.22(b). Thus, the Report fails to comply with NEPA in its lack of identification of reasonably foreseeable environmental consequences. CK-18

The Navy concludes that "no increase in human health risk or environmental exposure to hazardous materials would result" from Alternative 1. EA at 3-135. But this is unlikely considering in just a few paragraphs above the Navy states there will be a substantial increase in pipeline capacity. EA at 3-135. The Navy cannot reasonably expect boat traffic to continue at the same pace when the fuel pier's capacity has been increased by 88%. The dredging will allow bigger ships to use the fuel pier, and the increased fueling capacity is likely to lead to more traffic at the fuel pier. The Navy fails to discuss how many fuel releases have occurred in the past, and fails to account for the potential of future spills. Without baseline information, the Navy cannot sufficiently analyze and dismiss the possibility of environmental consequences,

which is required by NEPA. *See* 40 C.F.R. 1502.16. If the Navy does not incorporate mitigation measures for the Project, then the Navy may not issue a mitigated FONSI. CK-18 cont.

B. **The Navy Inappropriately Incorporates by Reference its Contingency Response Plan.**

By not including its Contingency Response Plan and Spill Prevention Plan in an Appendix in the Report, the Navy fails to comply with NEPA. When a Report incorporates by reference important material, it must be "reasonably available for inspection by potentially interested persons within the time allowed for comment." 40 C.F.R. 1502.21. The Report mentions a "NAVFAC 2009" plan that supposedly address spills, spill containment, and spill cleanup. EA at 3-128. However, the plan is not included as an Appendix in the Report, and the Report does not summarize the specifics of the plan. This information is vital to interested parties to enable them to make an informed decision on the impacts of the Project. There is also not enough time within the limited thirty day comment period to track down the spill plan and review that also. Therefore, the lack of summary and lack of inclusion of the cleanup plan fails to comply with NEPA precluding the Navy from issuing a FONSI or mitigated FONSI. CK-19

VII. <u>The Navy Fails to Adequately Analyze Impacts Caused by Increased Fueling and Boating Traffic within the Bay.</u>

A. **The Navy Failed to Analyze Air Impacts caused by Increased Boating Traffic within the San Diego Bay.**

The Navy failed to analyze impacts on greenhouse gases and climate change associated with increased boating traffic within the San Diego Bay. The Navy is required to take a "hard look" at environmental consequences when significant impacts are likely to occur. *See Ctr. for Biological Diversity,* 538 F.3d at 1194. The Report does not analyze or even mention increased fossil fuel emissions that will be caused by increased fuel capacity of the fuel pier, or propose mitigation measures from possible released emissions during fueling. *See* EA at 3-156. CK-20

The Report inaccurately concludes that the Project "would not result in increases in mobile source emissions." EA at 3-157. However, the Navy estimates that fuel capacity on the pier will increase by 88% after construction is complete. EA at 2-28. A major aspect of the Project is the dredging of approximately 80,000 cubic yards of sediment to allow for increased capacity of larger vessels. The Navy may not conclude that no adverse air quality impacts will occur until it takes a hard look at the impacts caused by increased fuel capacity and accommodations for larger vessels. *Ctr. For Biological Diversity* 538 F.3d at 1194.

B. **The Navy Fails to Fully Analyze Transportation Impacts Related to Increased Boating Construction Traffic in the San Diego Bay.**

The Navy fails to discuss increased boating traffic that will occur during the four years of construction in the San Diego Bay. *See* EA at 3-166. The Report simply concludes "no significant impact" because they will be using navigation channel, but it fails to evaluate how much increased boating traffic will be caused by dredging vessels and barges. *Id.* Therefore, the Navy may not issue a FONSI until it actually looks at the impacts of increased boating traffic in the San Diego Bay. CK-21

VIII. The Report Fails to Adequately Analyze the Environmental Impact of the Marine Mammal Program "Temporary" Relocation.

A. The Navy Must Adequately Examine Alternative Locations for the Marine Mammal Program Enclosures.

1. The Law Requires the Navy to Examine Alternatives.

The Report fails to adequately analyze potential alternative sites for the temporary relocation of the Marine Mammal Program enclosures. EA at 2-6. Table 2-1 features a column entitled "Additional Rationale for Elimination," which offers just a few bullet points explaining why the Navy rejected each site. But bullet points fail to satisfy the Navy's obligation to take a hard look at the project's environmental impacts and examine alternatives. *See* 40 C.F.R. 1502.14(a). The law requires the Navy to "rigorously explore and objectively evaluate all reasonable alternatives." *Id*. The law further requires the Navy to "devote substantial treatment to each alternative considered in detail . . . so that reviewers may evaluate their comparative merits." 40 C.F.R. 1502.14(b). Additionally, the Navy must identify the environmentally preferable alternative. 40 C.F.R. 1505.2(b). It has failed to do so with respect to the marine mammal enclosures. CK-22

Moreover, given that the "temporary" relocation will persist for four years, decisions to eliminate possible sites from consideration because the "[s]ite lacks existing infrastructure" or there are "[n]o existing waterside improvements" are arbitrary. *See* EA at Table 2-1. Perhaps it might be unreasonable to build new infrastructure for a temporary relocation lasting, e.g., six to eighteen months. But given a four year period, the costs of new infrastructure would be defrayed over a significant time period, thereby mitigating the upfront cost. Thus, it seems unreasonable to eliminate sites that might otherwise be better suited for the marine mammal enclosures because more work will initially need to be done.

2. The Navy Must Analyze How Similar Bacterial Levels Impact Different Locations.

The Report erroneously assumes similar bacteria levels will have similar effects at the proposed marine mammal relocation site as at its current site. But this assumption discounts the differences in tidal flushing and human usage. As the drogue study suggests (*see infra* section VIII.B.1), water circulation may be poor in the area around Harbor Island. The Navy must appropriately analyze how the circulation patterns around the Harbor Island basin site will impact bacterial concentrations. The Navy should conduct its own drogue test[1] or chemical/isotopic tracer analysis to determine if relocating the marine mammal enclosures to the basin site is appropriate in light of water circulation and tidal flushing. CK-23

3. The Navy Must Thoroughly Analyze Impacts for Aspects of the Project That Are Not Permanent. CK-24

[1] Drogues are objects dropped in the water and tracked to study water circulation, including tides and currents. Drogues can be something as simple as a fruit, or be equipped with tracking instruments. *See* Stephen A. Hughes, Army Corps of Engineers, "Estimating Surface Currents Using Dyes and Drogues" (2002), *available at* http://chl.erdc.usace.army.mil/library/publications/chetn/pdf/chetn-vi-37.pdf (last accessed Nov. 28, 2012).

The law requires the Navy to consider the intensity of an action within the Project. *See* 40 C.F.R. 1508.27. The regulations outline factors to consider when analyzing intensity, and note, "[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary . . . ." 40 C.F.R. 1508.27(b)(7).

The Navy improperly depends upon the temporariness of the marine mammal relocation in its Report to conclude the impacts are insignificant. For example, when discussing bathymetry and circulation, the Report suggests, "[t]he guide piles would be removed when the temporary relocation period is over, so any changes to circulation patterns would be short-term. Therefore, the proposed temporary relocation . . . would not have a significant impact." EA at 3-114. This argument assumes, with no support in the record, that impacts from four years of work would likewise be short-term. What if the changes to bathymetry and circulation are long-term? How would the analysis change? Calling the relocation temporary does not necessarily make the impacts temporary, and more importantly, even if temporary, impacts can be significant. The Navy must, therefore, fully analyze the significance of the impacts of moving the marine mammal enclosures on circulation and bathymetry. CK-24 cont.

B. **The Navy Fails to Adequately Analyze the Proposed Harbor Island Marine Mammal Program Enclosures Relocation Site.**

The area near the proposed marine mammal enclosures relocation site is frequently used by boaters, anglers, and even swimmers. For example, the San Diego International Triathlon swim course extends almost to the current boat docks at the Naval Mine and Anti-Submarine Warfare Command. *See* http://maps.onemillionrevolutions.org/map.jsp?mapID=1646 (attached hereto as Attachment C). The San Diego Classic Olympic Triathlon swim course also begins not far away, in the channel beyond the North Harbor Drive bridge. *See* http://www.sandiegotriathlonclassic.com/course/olympic-course/ (attached hereto as Attachment D). CK-25

These types of events bring in participants from all across the country, and contribute to the local economy. The four year relocation of the MMP enclosures must be appropriately analyzed to determine if it will adversely impact the water quality around Harbor Island, and thus adversely impact recreational tourism to San Diego and local recreational opportunities in San Diego.

1. **Circulation Studies Suggest the Site May Be Ill-Suited for the MMP Because of Poor Tidal Flushing and Circulation.**

Drogue studies[2] conducted in the Harbor Island area strongly suggest the location is ill-suited for the marine mammal enclosures because of poor tidal flushing and water circulation conditions. *See* drogue study maps attached hereto as Attachments F, G. Drogues placed near the North Harbor Drive Bridge either swirled around with negligible change in location, travelled CK-26

[2] Luke-Dudek Civil Engineers, "Bacteriological Source Investigation: Marine Corp Recruit Depot/Naval training Center Estuary," (January 27, 1983) (attached hereto as Attachment E).

into the Harbor Island basin, or travelled deeper into the channel beyond the North Harbor Drive Bridge. The two latter findings are problematic because it is in these very waters that triathlon swimmers compete and where the boating community docks its boats. CK-26 cont.

2. Marine Mammal Excrement May Have a Significant Impact on Water Quality and Adversely Impact Human Use of Waters Around Harbor Island.

Marine mammals impact water quality. For example, the San Diego County Department of Environmental Health lists a beach advisory for Children's Pool in La Jolla because of "[o]n-going contamination by harbor seals." *See* "Beach and Bay Current Status" at http://www.sdcounty.ca.gov/deh/water/beach_bay.html (last visited Nov. 19, 2012). The Navy plans to move about one hundred marine mammals to the waters near Harbor Island, and claims there will be no significant impact. *See* EA at 3-118. Yet, the contamination issue at Children's Pool and the drogue study demonstrating the poor water circulation in the Harbor Island basin raise concerns about bacterial levels. Even though the Navy conducts weekly tests of the water near the current site of the marine mammal enclosures, these tests are only done weekly. EA at 3-118. If the Harbor Island basin site is finally chosen for relocation, testing must be more frequent, ideally daily, given the high potential for significant adverse impacts to human recreational uses in the area. CK-27

3. The Report Fails to Adequately Analyze the Cumulative Impacts of Moving the Marine Mammal Program Near a Storm Drain.

A storm drain empties into the basin between the docks and the North Harbor Island bridge where the Navy is proposing to relocate the marine mammal enclosures. *See* photos attached hereto as Attachments H, I. The San Diego County Department of Environmental Health issues a blanket advisory against water contact recreation San Diego for 72 hours after a storm event, especially within 400 yards of a storm drain. *See, e.g.*, http://www.sdcounty.ca.gov/deh/water/beach_bay.html (last accessed Nov. 28, 2012).

The Navy must analyze the cumulative impacts to water quality from storm drain runoff and marine mammal waste. The law requires the Navy to assess of cumulative impacts; even those from "individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. 1508.7. If runoff and marine mammal waste can each alone adversely impact water quality, then the combination of two major sources of contamination at the Harbor Island basin site may have a significant cumulative impact on Harbor Island basin water quality. Without more analysis, the Navy cannot issue a FONSI. CK-28

The Report acknowledges the current enclosure site has elevated bacteria levels, but then arbitrarily concludes, "[b]ecause bacteria levels associated with Navy marine mammal enclosures at NMASWC would be similar to those at their existing location, they would not exceed standards established by the California Department of Health Services. . . ." EA at 3-118. The Navy also asserts, "[w]ater quality at private marinas located about 500 ft to the east across San Diego Bay and Spanish Landing Beach . . . would not likely be affected due to the intervening distance and tidal flushing. . . ." EA at 3-118. The Report concludes, therefore, no significant impact will occur. But the drogue studies and the Navy's own admission of elevated

bacterial levels relative to background undermine this finding. And a persistently elevated background bacterial level in the Harbor Island basin area for four years is an unacceptable, significant impact on the health of boaters and swimmers recreating in the area. The Navy must adequately analyze, and support with evidence in the record, impacts on water quality. CK-28 cont.

IX. The Report Fails to Adequately Analyze Project Impact on the California Least Tern.

The California least tern is an endangered species that nests, breeds, and forages in the proposed project area. It is protected under the California Endangered Species Act of 1984, the federal Endangered Species Act, and the Migratory Bird Treaty Act. The Report fails to adequately analyze the project's impact on the endangered California least tern.

Under section 7(a)(2) of the Endangered Species Act, the Navy must ensure its project will not jeopardize the continued existence of the California least tern. *See* 16 U.S.C. 1536(a)(2). Procedurally, the Navy must confer with the U.S. Fish and Wildlife Service (USFWS) before commencing its project. *See Pyramid Lake Paiute Tribe of Indians v. U.S. Dept. of Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990). The Report notes that the Navy is "consulting informally" with the U.S. Fish and Wildlife Service. EA at 3-104. Therefore, the Navy cannot reasonably conclude in its EA that there "would be no significant impact on the California least tern" until it receives a concurring biological opinion from the U.S. Fish and Wildlife Service. CK-29

In analyzing the project's impact on the California least tern (as well as on the green sea turtle, EA at 3-104) the Navy must be mindful that the Endangered Species Act forbids the taking of endangered species. *See* 16 U.S.C. 1532(13), 1538(a)(1)(B). The Navy must fully analyze whether the project may kill or injure the California least tern, and must be mindful that "impairing essential behavioral patterns, including breeding, feeding or sheltering" can amount to a taking. 50 C.F.R. 17.3 (defining "harm" in the definition of "take"). The Navy must take a hard look at the project's impact on the California least tern, especially at the project's impact to the birds' feeding patterns.

A. The Marine Mammal Program Relocation Site May Impact the Least Tern.

The Navy proposes to move its marine mammal enclosures into the California least tern's foraging grounds. Figure 3.5-1 of the Report, at page 3-101 presents an aerial photograph of San Diego Bay with overlays showing project elements. Least tern foraging sites are indicated by parallel yellow lines. The foraging sites include areas extending from the Pier Replacement Area down to Ballast Point, and from Zuniga Jetty southward toward Coronado. But critically, the third key foraging area overlaps the proposed marine mammal program relocation site. Therefore, if the water quality around the relocation site is impaired, the California least tern's foraging grounds will be impaired. CK-30

Relocating the marine mammal program to the proposed Harbor Island basin site will introduce about a hundred marine mammals to the waters around Harbor Island that comprise a foraging area for the California least tern. These marine mammals will produce nutrient-rich -- especially phosphorous -- waste; e.g., urea. In light of the concerns about poor water circulation in the area,[3] this additional nutrient load could accumulate in the area and promote the growth of

[3] *See* section VIII.B.1 above.

algae. Algae can be problematic for fish and aquatic species because it impacts water oxygen levels.

But more importantly, harmful algae blooms, including red tide events, may be more likely. If an harmful algae bloom were to occur, it is possible seabirds, including the California least tern, could be killed. *See* http://www.whoi.edu/redtide/page.do?pid=18103&tid=542&cid=47892&c=3 (attached hereto as Attachment J). Moreover, phytoplankton may produce toxins that can accumulate in shellfish and other organisms. If this were to occur, both the California least tern and human anglers who eat from the Harbor Island basin would be adversely impacted by the relocation of the Marine Mammal Program enclosures. The Navy must adequately analyze the potential impacts to the California least tern's foraging area, and especially take a hard look at the direct risk of harmful algae blooms to the California least tern and the indirect risk of harmful algae blooms to the California least tern's prey. CK-30 cont.

B. The Report Fails to Adequately Safeguard the California Least Tern from Project Impacts.

1. The Report Should Provide Least Tern Spotters/Nest Monitors.

The Report provides for marine mammal spotters: "observers utilized for avoidance and minimization activities will be experienced biologists with training in marine mammal detection and behavior." EA at 3-77. However, the Report fails to provide for bird spotters. CK-31
The Report does prohibit project work during the least tern breeding season, April 1 - September 15. But as a designated endangered species, the project should provide for bird spotters during at least a one-month buffer period before (March) and after (late September - October) the designated season. Known nesting sites should be monitored to ensure no project work occurs during the breeding season. The influence of climate change has been shown to influence the behavior patterns of wildlife, and this buffer period would account for it. *See, e.g.*, http://www.livescience.com/19248-penguin-breeding-global-warming.html.

2. The Report Fails to Adequately Analyze the Impact of Noise on Least Tern Eggs and Nestlings.

The Report fails to analyze the impact of noise on least terns, their eggs, and their young. The U.S. Fish and Wildlife Service reports: "[c]onflicts between human beach use and habitat protection continues. Examples of human disturbance include: . . . c) noise or pollution from nearby construction or other human activities." Carlsbad Fish and Wildlife Office, "5-Year Review: Summary and Evaluation" at 14 (September 2006), *available at* http://www.fws.gov/cno/es/California%20least%20tern%205-year%20review.FINAL.pdf (attached hereto as Attachment K). As suggested above, providing bird spotters and nest monitors will help to ensure no least terns are adversely impacted by the Project. CK-32

Further, the Report notes in passing how noise impacts animals differently, depending on size and maturity. Are eggs and nestling birds more vulnerable to noise impacts? Will vibratory pile driving disturb nested eggs? These questions need to be fully investigated before this Project proceeds.

X. The Project May Cause Significant Cumulative Impacts.

Federal law (42 U.S.C. 4321 *et seq*.) and state law (32 C.F.R. 775) requires the Navy to assess the Project's cumulative impacts. Cumulative impacts are "past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." 40 C.F.R. 1507. The Report identifies several areas where the Project may have significant cumulative impacts.

1. The Report Must Further Analyze the Impact on the Habitats and Communities.

CK-33

The Report paints an indefinite picture of the severity of the impact on habitats and communities. EA at 4-8. The Report states that with implementation of Alternative 1 or Alternative 2, the effects on habitats and communities "would largely consist of *temporary* underwater noise and sediment disturbance to open water and benthic communities during construction and demolition." EA at 4-8 (emphasis added). The Report asserts that "the Scripps Pier replacement project would overlap with the Project and would add incrementally by a small amount to areas of marine water column and habitat affected by the [action], but the combined impacts would still be small in the context of the bay, *temporary*, and not significant in a cumulative sense." EA at 4-8 (emphasis added). The Report fails to support its conclusion with evidence in the record.

2. The Report Fails to Cumulatively Assess the Impact on Fish.

The Report's cumulative impact analysis on fish concludes that the Project would impact fish, but impacts would be "temporary underwater noise and sediment disturbance during construction and demolition." EA at 4-8. The report adds that "mortality to fish is unlikely because potential Zones of Influence (ZOIs) for fish injury are confined to the immediate area around the pile being driven, and fish would most likely move away during the ramp-up procedure." EA at 4-8. Again, the Report relies on the liberal use of terms such as "temporary" and "not significant" to describe a swath of the spectrum of possibilities without basing their conclusions on substantial evidence. EA at 4-8-9.

CK-34

3. The Project Will Significantly Affect the Bird Population.

The Report concludes that affected birds will simply 'move out of the way' and find new migratory patterns and settlements during the period of the Project and perhaps thereafter. EA at 4-11. The Project would cause direct and indirect impacts on birds, including "temporary noise and sediment disturbance during construction and demolition, as well as minor permanent changes in structural habitats which birds perch on and which may affect the distribution of forage fish." EA at 4-11. The Navy arbitrarily concludes, without support of evidence in the record, that such a disturbance will result in no permanent negative effects, seeming to rely only on their own intuition for the analysis. EA at 4-11. ("Overall, localized effects on foraging and resting habitats would occur, but no effects on migratory bird populations are anticipated as a result of the Proposed Action.") The Navy may not base its conclusions on assumptions or conclusions not based on evidence. *Sierra Club v. Babbitt,* 15 F. Supp. 2d at 1283.

CK-35

4. The Project will Significantly Impact Air Quality.

The Report admits that the potential effects of greenhouse gasses (GHG) emissions "are by nature global and cumulative and it is impractical to attribute climate change to individual activities." EA at 4-14-17. The Report then concludes that "an appreciable impact on global climate change would only occur when GHG emissions associated with the Project are combined cumulatively with GHG emissions from other man-made activities on a global scale." EA at 4-14-17. The Navy fails to examine local GHG emission sources, local plans and policies for reducing GHG, and whether the Project's cumulative impact significantly harms air quality. Furthermore, the Navy could elect to use alternative fuel tags and construction equipment to mitigate these significant impacts. CK-36

Conclusion

San Diego Coastkeeper requests that the Navy prepare an environmental impact statement to determine the true impacts of the Project. CK-37

Sincerely,

Substantially Prepared By:

Jill M. Witkowski
Waterkeeper
San Diego Coastkeeper-

David Vincent
Sara Rogers
Nick Doenges

Responses to Public Comments on the Draft EA

(This page intentionally left blank)

COMMENT No. KE-1

Thank you for your comment. A lease agreement for the bait barge temporary relocation site will be negotiated between the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) after the NEPA process has been completed by the Navy and the California Environmental Quality Act (CEQA) process has been completed by the CSLC.

COMMENT No. PD-1

Thank you for your comment. A lease agreement for the bait barge temporary relocation site will be negotiated between the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) after the NEPA process has been completed by the Navy and the California Environmental Quality Act (CEQA) process has been completed by the CSLC.

COMMENT No. JS-1

Thank you for your comment. A lease agreement for the bait barge temporary relocation site will be negotiated between the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) after the NEPA process has been completed by the Navy and the California Environmental Quality Act (CEQA) process has been completed by the CSLC.

COMMENT No. TF-1

Thank you for your comment. Figures 3-1 and 3-2 were added the EA to show the size of the proposed new fuel pier relative to the existing pier and surrounding landscape in San Diego Bay.

COMMENT No. AF-1

Thank you for your comment. A lease agreement for the bait barge temporary relocation site will be negotiated between the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) after the NEPA process has been completed by the Navy and the California Environmental Quality Act (CEQA) process has been completed by the CSLC.

COMMENT No. JG-1

Thank you for your comment. Please see response to following comment JG-2.

COMMENT No. JG-2

Construction of the project includes underwater inspection for quality control of work including such things as pile alignment and coatings, cathodic protection, and concrete form placement. Hydrographic surveys are performed to measure the dredge area and conformance with project documents. The contract documents would contain language as to the safe and proper handling of waste products, contaminants, and working site conditions. Permit conditions from the regulatory agencies are provided to the Contractor for implementation that addresses air and water quality. Geotechnical reports have been prepared to document investigations with soil sampling and categorization that were collected prior to design of the project. This information was incorporated into the design for excavation, pile driving, and dredging.

COMMENT No. HW-1

In response to this comment and other water quality related comments, the Navy conducted a water and sediment quality investigation and revised the Water Quality section (Section 3.6) of the EA to answer the water quality concerns that were expressed. The study that provides the details of the investigation is *Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation San Diego Bay, San Diego California* (herein Naval Facilities Engineering Command [NAVFAC] Southwest 2013) and is included as Appendix I of this EA. The information is set out here to help insure that all concerns have been answered.

COMMENT No. HW-2

The Navy conducted a water and sediment quality investigation. The study that provides the details of that investigation is presented in Appendix I of this EA.

COMMENT No. HW-3

There is no proposal associated with the proposed project to retire marine mammals.

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-4

An investigation was conducted to evaluate potential bacterial impacts to water quality associated with the temporary relocation of the Navy SSC Pacific marine mammal program to Naval Mine and Anti-submarine Warfare Command (NMAWC). The results of the investigation are presented in *NAVFAC Southwest 2013* and are included as Appendix I of this EA.

The findings of the investigation concluded that once the SSC Pacific marine mammals are moved to the proposed relocation area (RA) at NMAWC:

1) Fecal and total coliform bacteria concentration values contributed by the marine mammals are not expected to result in increased frequency of exceedances of regulatory water quality objectives for indicator bacteria in waters designated for contact recreation (REC-1) beneficial uses, and
2) Relocation of the SSC Pacific marine mammals is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. These conclusions are based on conservative hydrodynamic modeling that did not consider natural degradation of the bacteria and physical and biological processes that would be expected to lower nutrient concentrations. Hydrodynamic modeling was conducted using a Curvilinear Hydrodynamics in Three Dimensions (CH3D) model that was developed for San Diego Bay. The CH3D model was used to identify comparative tidal flushing values between the existing enclosures and proposed RA, and to provide average fecal coliform and nutrient concentrations throughout the RA site based on projected loading from the marine mammals. The model's predicted fecal coliform concentrations provided a relevant value to estimate fecal coliform concentrations at the RA. Based on a cumulative sum of the fecal

coliform load contributed by the proposed SSC marine mammal relocation and fecal coliform concentration existing conditions at the proposed NMAWC RA (34 months of weekly data), no additional exceedances of the REC-1 standards would have occurred over the nearly three years of measurements at the RA site between 2009 and 2012. Two sampling events were conducted in January 2013 to measure total and fecal coliform bacteria concentrations in San Diego Bay. The sampling events were conducted 100 feet away from the existing enclosures to simulate the 100 foot security zone that would be in place at the RA and to attempt to quantify the effects of dispersion and degradation on the bacteria concentration levels.

No bacteria were detected in any of the water samples collected 100 ft away from the existing SSC marine mammal enclosures in the January 2013 sampling event. This contrasts with historical results for water samples collected immediately adjacent to the enclosures where bacteria concentrations were usually at detectable levels. The difference between the measurements is likely at least partially attributable to dispersion and degradation effects as the marine mammals' waste moves away from the enclosures. Considering natural degradation is not addressed in the model, the modeling estimates are probably conservative.

Though the hydrodynamic modeling did not specifically address predicted total coliform concentration levels it is appropriate to assume the fecal coliform concentration estimates are an accurate surrogate for total coliform concentrations based on specific marine mammals as the source. Nutrient source loading examined by the hydrodynamic modeling using individual marine mammal species contributions and proposed animal relocation numbers reported that concentrations of both nitrogen and phosphorus would not cause exceedances to regulatory standards. Constraints on the results from physical and biological processes not accounted for during the modeling effort (plant uptake and nutrient recycling) place the reported values in the conservative context and are not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. Therefore, based on this combined modeling and sampling data, and taking into account historical conditions, it is not anticipated that moving the marine mammals to the proposed RA would have significant water quality impacts at the 100 foot security barrier or beyond.

COMMENT No. HW-5

The cited study cannot be generalized to the NMAWC site. It involved releasing drogues from various locations, most of which were inside the West Basin or further up the MRCD channel on two occasions. One drogue released near the NMAWC site during an outgoing tide was reported as lost, but this likely was because it was swept out into the bay. Limited movement of drogues also occurred because they were released during periods of incoming and otherwise low amplitude tides and only for brief periods. As such, the data were bound to show limited circulation and are not a basis for generalizations about the NMAWC site. The Navy has conducted a study *(NAVFAC Southwest 2013),* included as Appendix I of this EA, to better address circulation and the potential for water quality impacts at this site. The Curvilinear Hydrodynamics in Three Dimensions (CH3D) model is a boundary-fitted finite difference, Z-coordinate model developed at the U.S. Army Corps of Engineers Waterways Experiment

Station (Johnson et al. 1991) to simulate physical processes in bays, rivers, lakes and estuaries. The model simulates hydrodynamic currents in four dimensions (x, y, z and time) and allows for the prediction of the fate and/or transport of metals, fecal coliforms and other contaminants in estuaries and coastal environments under the forcing of tides, wind and freshwater inflows (Sheng et al. 1991; Wang and Richter 1999). The model includes the back-channel areas adjacent to NMAWC, including the West Basin and up the NTC channel. These areas are fully open to tidal exchange but have reduced mixing and water circulation relative to the open bay because they are closed-ended.

COMMENT No. HW-6

The near shore area at NMAWC is shallow but it is not cut off from tidal exchange. The shallow inshore area of the NMAWC site is in close proximity (< 100 m) to the MCRD navigation channel to the east and the Main (federal) channel (~300 m) to the south. The results of the modeling study display that tidal flushing occurs throughout the proposed NMAWC site.

COMMENT No. HW-7

The results of the modeling study (*NAVFAC Southwest 2013* in Appendix I) show that tidal flushing occurs throughout the NMAWC site.

COMMENT No. HW-8

The existing marine mammal pens at SSC Pacific are configured as three separate clusters of enclosures within a 2,800-ft-long distance. One location is configured as 3 to 5 pens deep and 3-4 pens across in close to the shoreline or bulkheads. At the proposed temporary NMAWC RA the enclosures would be placed in a linear orientation and as close to the deep water portions of the channel as possible. Realignment of the enclosures to narrower footprint at NMAWC increases the total surface area of the enclosures, designed to facilitate circulation and dissolution of waste matter.

The results of *NAVFAC Southwest 2013* show that tidal flushing occurs throughout the NMAWC site. Water flows in from the bay at high tide and out to the bay at low tide, and tidal amplitude is the same as in the bay. The configuration of the proposed NMAWC site takes in to account shallow water areas and implements design considerations to improve flow in an around constructed pens.

The depth and tidal circulation of the NMAWC site was considered sufficient to allow waste to be dispersed, without impacting water quality based on hydrodynamic modeling performed *in NAVFAC Southwest 2013.*

NAVFAC Southwest 2013 utilized a well-accepted tidal flushing model of San Diego Bay to examine dispersion at both the existing and proposed locations.

The results of *NAVFAC Southwest 2013* show that tidal flushing occurs throughout the proposed NMAWC site. The model does in fact measure tidal excursion, and it shows that the dispersal of material in the water column is diminished with distance away from the main channel opening to the bay.

COMMENT No. HW-9

Bathymetric data indicate that depth range at the relocation site of approximately 6 to 12 feet. *NAVFAC Southwest 2013* results indicate water circulation is sufficient to disperse waste. Currently the proposed pen configuration places the majority of pens on the outboard edge of the present dock structures closest to the deeper water portions of the MCRD navigational channel.

COMMENT No. HW-10

NAVFAC Southwest 2013 examined bacteria concentrations from three separate sources, performed field water collections for the proposed and existing sites, and conducted modeling based on waste loading from the marine mammals to examine San Diego Regional Water Quality Control Board (SDRWQCB) Basin Plan (SDWRCB 2008) water quality objective level exceedance frequency and evaluate potential cumulative effects the introduction of marine mammal waste. In addition, please see response to comment No. HW-4.

COMMENT No. HW-11

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-12

The distance has been corrected to 0.3 mile. In addition, please see response to Comment No. HW-4.

COMMENT No. HW-13

A 100 ft security barrier would be installed at NMAWC.

There would be four 16-inch diameter piles approximately 3 ft east (bayward) of the marine mammal enclosures, with signs advising the public to stay away.

COMMENT No. HW-14

The SDRWQCB utilizes the indicator bacteria objective level criteria stipulated in the Basin Plan (SDWRCB 2008) to evaluate exceedance levels. The 30-day log average as well as a single sample maximum is used as objective levels for REC-1 beneficial use. Conservative hydrodynamic modeling and 34 months of weekly data from the RA site were used to evaluate expected exceedances of the REC-1 objectives. Based on this information it is not expected that relocation of the marine mammals will result in an increased frequency of exceedances of the Basin Plan REC-1 objectives. This is based on conservative modeling that does not account for natural degradation of the bacteria.

COMMENT No. HW-15

The cited testing (water quality measurements) was done by the Navy, not SWRCB, and these measurements were taken immediately adjacent to the marine mammal enclosures.

COMMENT No. HW-16

SDWRCB Basin Plan objective levels were utilized to evaluate potential impacts related to indicator bacteria concentrations. These levels are set to protect beneficial uses of waters of the state, and to determine when those uses become impaired. 9 CFR 3.106 is outside of the scope of the EA, because it relates to standards for captive marine mammals, rather than waters of the state. In addition it is inapplicable to the Navy marine mammal program.

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-17

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-18

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-19

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-20

Tributyltin is non-soluble and so it tends to accumulate in the sediments near the source. In the bay, the primary tributyltin source is antifouling paints that were used on boats. Storm drains are not a major source.

Tributyltin was not detected in sediment samples from the proposed marine mammal relocation site.

COMMENT No. HW-21

Nutrient source loading examined by the hydrodynamic modeling (in NAVFAC Southwest 2013) using individual marine mammal species contributions and proposed animal relocation numbers reported that concentrations of both nitrogen and phosphorus would not cause exceedances to regulatory standards. Constraints on the results from physical and biological processes not accounted for during the modeling effort (plant uptake and nutrient recycling) place the reported values in the conservative context and are not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

COMMENT No. HW-22

Levels of copper in sediment samples from the proposed marine mammal relocation site did not exceed National Oceanographic and Atmospheric Administration (NOAA) screening levels for toxicity and bioaccumulation in benthic organisms.

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-23

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-24

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-25

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-26

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-27

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-28

Conditions and standards for marine mammals under the care and custody of the U.S. Navy are outside of the scope of the EA.

COMMENT No. HW-29

(Attachments: scanned photographs of paddle boarders near the NMAWC marina; four figures excerpted from Bacteriological Source Investigation Marine Corps Recruit Depot/Naval Training Center Estuary San Diego California Project No. S-81-04 For Department of the Navy Western Division Naval Facilities Engineering Command San Bruno, California By Luke-Dudek Civil Engineers, 575 Second Street, Encinitas, California. January 27 1983.)

Comment noted.

COMMENT No. CK-1

Thank you for stopping by the public meeting last Wednesday, November 12, 2012, for the environmental review of the Navy's proposed fuel pier project. Thanks also for bringing a copy of your November 1, 2012 comment letter. As was discussed at the meeting, the Navy had never received your letter.

With regard to your request to extend the comment period, we decline to publish a new notice to formally extend the comment period. The NEPA process has phases and milestones. In order to be fair to all, published time limits must be observed. While we appreciate that the document is lengthy, we believe that the time frame offered is fair, and it is in line with other projects of similar complexity and scale.

Having said that, we are still mindful of some points that you brought up when we talked last Wednesday. You referred to potential information relating directly to the underlying science of

the EA's analysis. Such information is a major reason for soliciting public comment. Therefore we would like you to submit what you have. To assist you in this, we will allow you an additional 15 days to submit the comments you referred to. If you submit those comments prior to 12:01 a.m. on 5 Dec. 2012, they will be considered by the Navy in exactly the same way as if they were received on or before 19 Nov 2012, the end of the comment period.

Note that this is not a general extension of the comment period. It is granted only to your organization. It is granted because you made very specific representations as to the kind of substantive scientific information that you had. We also believe that, as Coastkeeper, you are reasonably likely to have access to the kind of relevant scientific information that you mentioned. And, it is also significant that you contacted the Navy about this well before the end of the comment period.

In addition to the comment period extension issue, your letter commented on the length of the draft EA as it relates to the likeliness of an EIS being necessary. Of course, an EIS may turn out to be necessary; or a Finding of No Significant Impact (FONSI), may be supportable. There will be no conclusion on that until after a final EA has been issued. In the meantime, we would note that your references to the CEQ regulations and the "40 Questions" are correctly quoted, but they do not reflect the entirety of current reality.

Since NEPA was enacted in 1969, executive orders have accumulated, laws have been passed, certain issues have become more critical, and litigation has added a great deal of baggage to NEPA. There is simply more to consider than there was in the 1970s. As a result, many times documents have to be long to be sure that there is enough detail and reasoned analysis to fully inform Navy decision makers and the public about potential environmental impacts of a proposed action. In addition, the Navy uses the EA or EIS as a means of ensuring compliance with other environmental laws. In other words, those legal processes end up as part of the NEPA process, and often end up increasing the document length.

COMMENT No. CK-2

Thank you for your comment. Please see responses to comments CK-3 through CK-36.

COMMENT No. CK-3

There is discussion of baseline (existing) conditions for every resource analyzed in Chapter 3 of the EA; for example, see Sections 3.1.2.1, 3.6.2.1, and 3.10.2.1. Each resource-specific baseline discussion is then followed by a resource-specific analysis. The baseline (existing) condition equates to the No-Action Alternative (see Section 2.2.3).

COMMENT No. CK-4

The Draft EA did not find that the project would result in a significant impact to any of the resources analyzed.

As indicated in Section 3.10.3.1, the significance of the project's traffic impact was determined using City of San Diego procedures for segments characterized by congested LOS E or F conditions. According to Table 5 of the City's Traffic Impact Study Manual, the allowable

increase in the volume-to-capacity (V/C) ratio for LOS E or F segments is 0.02. Therefore, a V/C increase of more than 0.02 would constitute a significant traffic impact.

As stated in the comment, several street segments in the study area would decline from LOS D to LOS E. However, this change in LOS is due to projected background traffic growth from local and regional development and is not attributable to the proposed Point Loma Fuel Pier project. The proposed project's traffic impacts were determined by comparing the V/C and LOS of Baseline conditions to Baseline Plus Project conditions. As shown in Table 3.10 of the EA, the project would result in a negligible V/C increase (i.e., less than 0.001) on segments experiencing LOS E. This V/C change is less than the significance threshold of 0.02 and, therefore, the proposed project's traffic impact would be less than significant.

COMMENT No. CK-5

As discussed in Section 3.10.3.2, *Baseline and Baseline Plus Traffic Conditions*, a Baseline condition was developed to reflect future traffic conditions at the time project construction begins. As shown in Table 3.10-3, the impacts of the proposed project were identified by comparing V/C and LOS with project traffic to the Baseline condition. Conclusions regarding the significance of the project's traffic impacts are based solely upon this analysis. The text has been revised to remove discussion of P-401 minimization measures, since such measures are not required to offset any significant project traffic effect. The cumulative traffic impacts associated with the P-401 project and other appropriate cumulative projects are addressed in Section 4.2.10.

COMMENT No. CK-6

The EA analyzes the potential water quality impacts of two dredging methods as well as potential entrainment of benthic organisms into dredge material.

EA Section 2.2.1.5, *Dredging and Sediment Disposal*, describes the proposed project components. Potential impacts of the proposed project are discussed in Chapter 3.

The Navy cannot hire a construction contractor for the project until after the National Environmental Policy Act process has been completed and all resulting environmental analysis thoroughly considered. Sufficiently experienced and qualified construction contractors all own and have access to different suites of construction equipment, the availability of which is further determined by the selected company's ongoing projects in the Western United States. Given the large size of the equipment and the significant cost to relocate it from region to region or across the country, the advance staging locations and the location of most recent equipment usage will largely determine which exact pieces of equipment would be used on the project site. For these reasons, the P-151 analysis and equipment mix assumptions are based on experience with other large and otherwise similar projects. The exact mix of equipment that would be used for P-151 is unknowable at this point in time.

COMMENT No. CK-7

Section 3.1.3.3 recognized the displacement and mortality of invertebrates due to dredging. Text has been added identifying entrainment as one of the causes of mortality and citing the reference provided by the Coastkeeper as an example. This does not alter the conclusion that

the impacts would be localized to the area of the dredging footprint, temporary because the organisms would recolonize the area, and overall less than significant. Text was also added to Section 3.2.3.3 recognizing that there would likely be some mortality of fishes due to entrainment, citing the reference provided and identifying the species most susceptible to entrainment. These species (rays and flatfishes) are not unique to San Diego Bay and their populations are not declining. Managed EFH species (groundfish and coastal pelagics) are unlikely to be entrained. As pointed out in the added text, the area affected by dredging amounts to only about 0.25% of the deep subtidal habitat in San Diego Bay, indicating a small effect in terms of habitat and fish populations within the bay. The conclusion remains that the impact would be localized (i.e. small in magnitude), temporary, and less than significant.

COMMENT No. CK-8

Effects from increased turbidity due to sediment resuspension during dredging are found in Chapter 3, Section 3.6.3.2, under the subheading *Turning Basin*. The use of either type of dredging equipment would generate short-term turbidity. The EA lists three reasons why the impacts to water quality from dredging would not be significant:

a) The dredge material is mostly sand that settles quickly out of the water column.
b) In general, the vast majority of dredged sediments settle out of the water column near the dredge within one hour.
c) Analytical testing of the proposed dredge sediments did not indicate elevated levels of contaminants.

Text was revised in Section 3.6.3.2 of the EA, under the subheading *Turning Basin*, to include the following two paragraphs:

1. Typical industry practices in dredging can be used to reduce turbidity, ranging from the type of clamshell dredge bucket used (open or closed), removing material by scooping it horizontally or vertically relative to the seabed, the speed of the bucket's ascent, and the amount of dredge material in each load. If there is a need for special measures, any of these variables can be modified. If there are no restrictions, the typical bucket for new (hard bottom) dredging would be a heavier bucket that takes vertical scoops out of the bottom and would be as full as the dredge operator could make it, which depends in part on the amount of cut.

2. Closed clamshell buckets (also known as environmental buckets) minimize impacts to water quality by preventing water and sediment from leaking out of the bottom of the bucket as it is raised to the surface; water can only escape through the top of the bucket. Normal clamshell buckets with teeth are usually needed for new (hard bottom) dredging; the closed buckets, however, have no teeth and are not effective for hard bottom dredging. Environmental buckets work best in maintenance dredging projects to dredge soft material. The proposed dredge footprint has not been previously dredged, so hard bottom conditions are likely to be encountered there.

COMMENT No. CK-9

The Navy undertook a thorough and scientifically acceptable approach to assessing dredge sediment for open water disposal that met with all relevant regulatory protocols. At the outset, the Navy prepared a project-specific Sampling and Analysis Plan (SAP) pursuant to the national technical guidelines provided in the document entitled "Valuation of Dredged Material Proposed for Ocean Disposal – Testing Manual," also known as the "Green Book" (EPA/USACE 1991). The Navy submitted a draft SAP to the EPA, Region 9 and to the Regulatory Carlsbad Field Branch of the USACE for review and approval. The EPA and the USACE approved the SAP in November 2010 for use in collecting and testing sediment within the proposed dredging footprint of the Point Loma Pier 180 Replacement Project to determine suitability for open water disposal.

The Green Book recommends a tiered approach to sediment sampling and testing. Tier I is the assessment of existing information to evaluate the likelihood of contaminates of concern within the proposed dredged sediment. The proposed dredging footprint for this project is located in the outer edge of the turning basin, approximately 1000 feet from the existing Pier 180, immediately adjacent to the Federal navigation channel of San Diego Bay. Following Tier 1, and in support of selecting the number and location of the sampling sites, the November 2010 SAP provides evidence from past investigations of the likely composition and quality of sediment within the proposed dredging footprint as follows:

1. Maintenance dredging in the Pier 180 vicinity (both pier and turning basin areas) last occurred in 1999. Previous geotechnical investigations in the vicinity of the proposed dredging project indicate that the sediment within the proposed dredge footprint consists of bay/beach deposits and the Pleistocene age Bay Point Formation. Bay deposits generally consist of loose, fine sands with silt and silty sands. Bay/beach deposits are underlain by terrace deposits of the Bay Point Formation. The Bay Point Formation generally consists of medium dense and dense, poorly graded clays sands with some layers of sandy clay (Woodward-Clyde 1995).
2. In addition, the USACE undertook sediment sampling and testing before the recent maintenance dredging of the San Diego Harbor Navigation Channel. Vibracore samples were taken in the federal navigation channel in the vicinity of the proposed dredging portion of the turning basin for Pier 180. The grain size and chemical analyses of samples revealed sediment that was mostly sand with low concentrations of any contaminants. This sediment was deemed suitable for beach nourishment (USACE, March 2009).

The EPA and USACE approved the 10 sample locations and compositing plan for testing and analysis. Visual inspection of each collected sample revealed similar composition of mostly sand with some shell hash, confirming the historic research undertaken in Tier I. Therefore, sediment for five sample locations, as per the SAP, was combined into Area Composite #1 while the other five sample locations were combined into Area Composite #2. Together the two composite samples represent the ten locations that cover the entire dredging footprint. Given the clear evidence of similar sediments at each sampling location, the decision to composite

samples, as approved by EPA and USACE, is consistent with national technical protocols to represent proposed dredging areas.

The "Greenbook" Tier II evaluation consisted of testing the composite samples for physical and chemical properties. Results of the physical tests showed the sediment in both composite samples consisted of greater than 86 percent sand. Project sediments were tested for the presence of trace metals, mercury, polycyclic, aromatic hydrocarbons (PAH), phenols, phthalates, organochlorine pesticides, polychlorinated biphenyl (PCB) congeners, organotins, total recoverable petroleum hydrocarbons (TRPH), total solids, total sulfide, dissolved sulfide, ammonia, and total organic carbon. Test results, as reported in Table 3, *Summary of Sediment Chemistry Analysis* in Appendix D of the Draft EA, showed minimal to no evidence of chemical contamination in the sediment.

Tier III evaluation was undertaken for both the project site and the reference site near LA-5 (the ocean disposal site). Bioassay tests showed greater than 90 percent survival rates, well above the survival threshold level needed for open water disposal of dredged sediment. Results of bioaccumulation tests revealed no to very low levels of chemical constituents.

Sampling and laboratory test results were presented to the EPA and the USACE in March 2011 ("Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging", presented as Appendix D of the EA). The EPA and the USACE reviewed all protocols used as well as the test results and concluded in email communication with the Navy (April 20, 2011) that "all 87,000 cubic yards (cy) of proposed dredged material is suitable for unconfined aquatic disposal". The dredge volume was later reduced to 80,000 cy when the project dredge depth was reduced from -41 feet mean lower low water level (MLLW) to -40 MLLW.

The complete SAR, including sampling and laboratory test results, as well as the method detection limits (MDLs) for the sediment analyses, are available for review at the NBPL Public Affairs Office.

References cited in Response to Comment No. CK-9:

SAP. 2010. Final Sampling and Analysis Plan Naval Base Point Loma Pier 180 (Navy MILCON Project P-151). Prepared by Naval Facilities and Engineering Command, Southwest. November.

U.S. Army Corps of Engineers (USACE). 2009. Final Environmental Assessment for the San Diego Harbor Maintenance Dredging Project, San Diego, California. March.

Woodward-Clyde. 1995. Geotechnical Investigation Structural Repairs/Construction and Maintenance Dredging at the Fueling Pier, Fleet and Industrial Supply Center, Point Loma, CA. Prepared for Blaylock Engineering Company. November.

COMMENT No. CK-10

The Navy followed all pertinent environmental regulations and protocols to assess proposed dredge sediment characteristics and disposal options. Sediment sampling and testing was done pursuant to Section 404 and 401 of the Clean Water Act and Section 103 of the Marine

Protection, Research and Sanctuaries Act. The results of the sampling and testing indicate that the sediment of the proposed dredging project comprises greater than 86 percent sand and is sufficiently free of contaminates of concerns that the USACE and EPA have deemed the project sediment suitable of open water disposal. Section 103 regulates disposal at approved dredge material ocean disposal sites, such as LA-5. In addition to accepting only suitable dredge material for unconfined ocean disposal, Section 103 also requires applicants to seek alternative disposal options to ocean disposal and to use such alternative disposal options if prudent and feasible. In essence, ocean disposal is an option of last resort and applicants should seek to beneficially use the dredge sediment when feasible.

After review of sediment test results, the USACE and USEPA indicated to the Navy that the dredge sediment is a good candidate for beneficial use in on-going regional beach nourishment programs and that this beneficial use is preferable to ocean disposal. In a collaborative effort with the regional regulatory agencies, the Navy initially investigated the beneficial use of placing the dredge sediment nearshore of Imperial Beach. Dredge sediment disposal into the nearshore zone for beach nourishment is the preferred option for this project. Beach nourishment provides shoreline protection, erosion control, recreational benefits, and habitat enhancement.

The Draft EA evaluated the nearshore zone at Imperial Beach as the proposed location for beneficial reuse of dredged sediments from the Proposed Action. In the interval between the Draft and the Final EA, the decision was made to reuse dredged sediments instead in the nearshore zone at Silver Strand Training Complex-North (STCC- North) at NAB Coronado (Figure 2-10 in the EA.) Similar to Imperial Beach, the STCC beach has become eroded due loss of sand from natural sources. The STCC beach is one of four coastal segments recommended and approved for sediment replenishment. The U.S. Army Corps of Engineers brought dredge sediments from its San Diego Harbor Maintenance Dredging Project to an adjacent section of the STCC nearshore zone. The proposed sediment beneficial reuse area is approximately 1,200 ft offshore, contained within Naval Amphibious Base Coronado SSTC Boat Lanes 8 and 9. The SSTC-North site for receiving sediment from dredging projects is approved for such use by the USACE, EPA and California Coastal Commission.

The Navy will indicate that the dredge sediment placement in the nearshore area of the monitored STCC-North site is the preferred disposal alternative in its Section 404/401 permit applications. The Navy will adhere to all permit conditions that are in place at this approved beach nourishment site at Silver Strand Training Complex-North.

Text has been added to Section 2.2.1.5, *Dredging and Sediment Disposal*, Paragraph 6 to clarify that dredge sediments from the proposed project would be used for beach replenishment in the nearshore zone at Silver Strand Training Complex-North, a site that is approved and has been previously used for dredge sediment disposal.

Section 3.6.3.2, under the subheading *Bathymetry and Circulation – Silver Strand Training Complex Sediment Beneficial Reuse Site,* addresses disposing dredge sediments from the proposed project in the nearshore zone at STCC-North and concludes that there would be a beneficial impact.

Section 3.6.3.2, under the subheading, *Bathymetry and Circulation – Silver Strand Training Complex Sediment Beneficial Reuse Site* addresses water quality impacts of disposing the dredge sediments and concludes no significant impact would occur.

COMMENT No. CK-11

The NEPA resource topic "geology and topography" pertains to on-shore changes in unique, rare, or valuable geographic features or geological resources. Projects with potential to have impacts (significant or insignificant) are those with major grading, mining, and/or land use conversion. As described in Section 1.5, *Scope of the Analysis*, surficial modifications associated with the proposed project would be minimal. Chapter 3, Page 3-1 provides additional discussion about the limited on-shore geological and topographic components of the proposed project.

The project proposes dredging and sediment placement that would occur on the ocean bottom, i.e., below sea level. The ocean bottom is generally described in terms of bathymetry rather than geology and topography. Accordingly, the EA discusses potential impacts to the ocean bottom as a result of proposed project dredging and sediment placement under "Bathymetry and Circulation." As stated in Section 3.6.3.2, under the subheading *Turning Basin,* and as shown on Figure 2-6 (see Section 2.2.1.3, *Phased Construction of Replacement Fuel Pier*), most of the area surrounding the proposed dredge footprint lies below the proposed dredge depth of -40 ft MLLW and much of the dredge footprint itself lies near the proposed dredge depth. As such, deepening the entire dredge footprint to an even -40 ft MLLW will bring the dredge footprint to the level of the surrounding bay floor and so will not be a significant impact. The Navy will provide new bathymetric data for the dredge footprint to the U.S. Army Corps of Engineers after the project is complete.

In Section 3.6.3.2, under the subheading *Bathymetry and Circulation – Silver Strand Training Complex Sediment Beneficial Reuse Site* the impact of sediment disposal to bathymetry in the STCC beach nearshore zone is discussed as a beneficial impact.

COMMENT No. CK-12

No chemicals are stored on the fuel pier (see Section 3.7.2.5 of the EA). Hazardous waste in the form of oily rags and absorbent materials are properly managed according to state and federal hazardous waste management regulations.

Section 3.7.2.4, *Bulk Fuel Pipelines*, was added to separate discussion of bulk fuel lines from temporary storage of oily rags and absorbent materials under hazardous waste.

The listed items (oiled boom, rags, and absorbent materials) are classified as hazardous waste rather than hazardous materials. A new paragraph sub header in Section 3.7.2.5 was added to distinguish hazardous materials from wastes and clarify this for the reader. In addition, the definition of a large quantity generator (more than one kilogram [2.2 pounds] or more per month of acutely hazardous waste) was added.

Text in Section 3.7.3.2, *Environmental Consequences - Alternative 1 Pier Replacement and Associated Dredging - Other Hazardous Material and Hazardous Wastes*, was revised to differentiate between the fuel pipelines and the hazardous waste storage.

The pipelines on the fuel pier are not storage facilities; they are a transfer system for moving petroleum product to and from the onshore storage tanks. The bulk fuel pipelines and fuel transfer operations are extensively regulated by multiple federal and state agencies. These regulations address construction, inspection, and maintenance of the pipelines, and training personnel for operations and emergency response. Some of the regulations are listed in Section 3.7.2.4 of the EA. This same section describes the emergency shutdown switches on the fuel lines, secondary containment features that capture releases, and spill containment equipment kept on the fuel pier.

The purpose of the proposed project is to improve safety with respect to fuel transfer operations by constructing a new modern facility that is consistent with seismic safety standards.

Text was revised to add a new subheading *Bulk Fuel Pipelines* in Section 3.7.3.2 to clarify for the reader the measures built-in to the project to minimize the risk of accidental release of petroleum product from the pipelines during demolition/ construction. Text was also added from the NBPL Emergency Response Action Plan that would be followed in the event of a spill.

COMMENT No. CK-13

Text in Section 3.7.2.9, under subsection *Discarded Military Munitions (DMM)*, was updated to include information about historical ammunitions handling at the fuel pier and the Navy's magnetometer survey for the proposed fuel pier demolition and construction footprint.

Text has been added to Section 3.7.3.2, under subsection *Discarded Military Munitions (DMM)* stating that a Navy Explosives Safety Submission Determination Request (ESS DR) would be prepared for review by the Navy's explosive safety division and Naval Ordnance Safety and Security Activity (NOSSA) for approval before construction activities begin. An ESS DR is a document that details how explosives safety is evaluated to ensure protection of personnel and Navy assets in the event of unintentional detonation from potential discarded military munitions. Dredged sediments would be screened with a 12-in square grid to remove potential DMM; and Navy Explosive Ordnance Disposal would conduct emergency response as needed.

COMMENT No. CK-14

Section 3.7.3.2, under the subheading *Pier Replacement and Associated Dredging - Fuel Pier Demolition and Construction*, a paragraph was added describing minimization measures for preventing releases of demolition debris. Additional text was added and revised to include hazardous waste spill emergency response procedures from the Navy Region Southwest Waste Management Plan San Diego Metro Area.

Specific measures to minimize potential contact of lead-based paint and asbestos-containing material waste (ACM if revealed during demolition; note that none were identified during a hazardous waste survey of the existing fuel pier) with San Diego Bay are discussed under the subheadings for those individual topics.

COMMENT No. CK-15

Please see response to Comment No. CK-14: Text was added Section 3.7.3.2, under the subheading *Pier Replacement and Associated Dredging - Fuel Pier Demolition and Construction*, to include hazardous waste spill emergency response procedures from the Navy Region Southwest Waste Management Plan San Diego Metro Area.

COMMENT No. CK-16

Text was added in Section 3.6.3.2, under the subheading Marine Water Quality – Sediment Quality, stating that sediment samples were collected for analysis at the fuel pier and proposed NMAWC site. Text also summarized the test results, which indicated that elevated levels of contaminants were not detected above National Oceanic and Atmospheric Administration Screening guidelines (effects range-median). The full sampling report and analytical results are available from the NBPL Public Affairs Officer.

COMMENT No. CK-17

Section 3.7.3.2 of the EA includes a detailed description of the procedures that would be used to remove the lead-based paint. Section 3.6.3.2, under the subheading *Marine Water Quality - Pier Demolition*, states that the Navy would require the contractor to prepare and implement a comprehensive debris management plan that would address the types of construction and demolition debris, expected separation and retrieval methods, and disposal methods. The contractor would be required to use catch devices and sheeting to capture and contain debris and materials that may be produced by project activities.

COMMENT No. CK-18

1) Section 3.7.3.2, under the subheading *Fuel Pier Demolition and Construction*, describes the procedures that would be followed to properly characterize, label, store, and recycle/dispose of lead based paint, asbestos containing materials (if found), universal waste, and coal-tar coatings on steel debris. All procedures are in compliance with state and federal hazardous waste management regulations. These procedures are incorporated into the project to prevent and minimize the release of hazardous materials and waste during the demolition and construction activities. Implementation of such procedures would reduce any impacts to below the level of significance, so mitigation measures (measures implemented to offset impacts resulting from the project) are not recommended in the EA.

2) With respect to fuel spills, the following excerpt from the NBPL Emergency Response Action Plan was added to Section 3.7.3.2, under the *Bulk Fuel Pipelines* subsection:

   In the event of a spill of oil or hazardous substance at Naval Base Point Loma, the Emergency Response Action Plan, and in particular the Red Plan (these two plans comprise the first 26 pages of the Integrated Contingency Plan [ICP]) would be followed for immediate action:

   1) Stop the product flow – Stop transfers, secure pumps, and close valves;

2) Warn personnel – Sound alarms, enforce safety and security actions;

3) Shut off ignition sources – Motors, electric circuits, and open flames;

4) Contain the spill – Secure valves, block drains, and deploy boom; and

5) Notify authorities – Ensure the Command Duty Officer is called and the (federal) fire department is advised if the situation warrants.

The actions described above are emergency response procedures in the event of an accident and are not project mitigation measures. An accidental fuel spill during demolition/construction would be just that - an accident - not a planned component of the proposed project that would cause an impact that would need to be offset through mitigation measures. The emergency response procedures would minimize impacts of potential accidental spills.

No EA can speculate on different scenarios beyond work that has been correctly and thoroughly done to determine if existing emergency response plans are thorough and updated.

No mitigation measures are proposed in Section 3.7.3.4, *Mitigation Measures,* because no significant hazardous materials/hazardous waste impacts would occur due to the use of built-in protective measures. Text in Section 3.7.3.2, under the *Bulk Fuel Pipelines* subheading, describes the minimization and protective measures that would take place during demolition and construction to prevent accidental releases of petroleum products or oily waste water so that no significant impacts would occur. Section 3.7.3.2, under the *Other Hazardous Materials and Hazardous Wastes* subheading, presents the following statement that summarizes the potential impacts and what would be done to reduce the impacts to a less than significant level:

> Through the use of the preventive measures described above (proper management of hazardous materials and waste during construction and operation of the new fuel pier; compliance with regulations for pipeline construction and operational safety; use of the spill control and minimization procedures described in the Emergency Action Response Plan in the event of an accidental release), no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would result from implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes.

The fuel storage capacity at DFSP Point Loma is related to the fuel tanks on shore, not to the pipelines on the fuel pier. Military construction Project P-401, currently underway to upgrade the onshore facilities, will not increase the tank storage capacity. No expanded ship operations or traffic to the new fuel pier are proposed in association with this project. Please refer to EA Section 1.1, last paragraph.

The Navy is proposing construction of a new fuel pier because the existing fuel pier is significantly past its design service life (refer to EA Section 1.1, paragraphs 3 through 7). It would be inappropriate not to properly design and size the replacement fuel pier to meet anticipated future needs and standards as well as current seismic and marine oil terminal

requirements. This EA addresses the potential impacts of the construction and operation of the replacement fuel pier under existing levels of vessel traffic only. Increases in ship traffic are not proposed in this EA, and will be addressed in future NEPA documents as ship operations in San Diego Bay actually evolve (refer to EA Section 1.1, last paragraph).

3) A major spill would be less likely after implementation of the project. The new double-deck fuel pier would provide more spill prevention and containment features than the existing fuel pier. For example, on the new double-deck pier, the lower deck would provide complete containment beneath the pipelines in the event of a spill. The fuel pipelines would be hung beneath the upper deck where they would be physically separated from vehicle operations and other activities taking place on the main deck.

COMMENT No. CK-19

The following excerpt from the NBPL Emergency Action Plan was added to the *Bulk Fuel Pipelines* subsection in Section 3.7.3.2:

> In the event of an accidental spill of oil or hazardous substance at Naval Base Point Loma, the Emergency Response Action Plan, and in particular the Red Plan (these two plans comprise the first 26 pages of the Integrated Contingency Plan [ICP]) would be followed for immediate action:
>
> 1. Stop the product flow – Stop transfers, secure pumps, and close valves;
> 2. Warn personnel – Sound alarms, enforce safety and security actions;
> 3. Shut off ignition sources – Motors, electric circuits, and open flames;
> 4. Contain the spill – Secure valves, block drains, and deploy boom; and
> 5. Notify authorities – Ensure the Command Duty Officer is called and the (federal) fire department is advised if the situation warrants.
>
> The NBPL Emergency Response Plan specifically calls out two external agencies that must be notified of reportable spills: the National Response Center and California Emergency Management Agency (CALEMA). The emergency response procedures would minimize potential effects of accidental spills. Reportable spills are publicly available on the CALEMA website at http://w3.calema.ca.gov/operational/malhaz.nsf/$defaultview.

COMMENT No. CK-20

Please see the addition to Section 1.1 of the EA, last paragraph, last sentence:

"There is no element of the Proposed Action that would add vessel traffic (public or federal)."

COMMENT No. CK-21

The EA states that project construction vessels would be working outside the federal channel (Figure 2-5 and Section 3.10.3.2, under the *Amendments to Existing Navigation Zones* subsection). All construction vessels except the dredge vessel and the barge(s) for the dredged sediment would be working inside restricted navigation zones that are off-limits to civilian vessels, so

there would be no impact to civilian navigation from the construction vessels. With respect to the dredge and the dredge barge(s), these vessels would be working outside the federal channel but within waters where civilian vessels normally navigate. Text in Section 3.10.3.2, under the *Sediment Dredging and Disposal* subsection, has been revised to state that it is anticipated that one dredge vessel and one or two barges, plus assisting tugs for each vessel (i.e., up to six vessels associated with the dredging activities) would be present in this space for a period of no more than three months. The Navy would coordinate with the Coast Guard to issue a Notice to Mariners to advise civilian vessels of the presence of the dredging vessels. There would be open space to the east of the federal channel for small civilian vessels. Therefore no significant impact to vessel traffic would occur.

COMMENT No. CK-22

1) Table 2-1 in Section 2.2.1.1 lists the 12 potential Navy marine mammal relocation sites that the Navy investigated in addition to the NMAWC site. Text has been added to Section 2.2.1.1, paragraphs 3-5, describing why the two best alternative sites were not selected.
2) "Rough Order Magnitude (ROM) Cost-Mammal Pier Relocation Five Alternates plus Optional Sites" report, by Moffatt, Nichol Blaylock, 25 March 2011, examined the multiple potential relocation sites in detail. This document is available for public review at the NBPL Public Affairs Office.

COMMENT No. CK-23

Please refer to response to Comment No. HW-4 above.

COMMENT No. CK-24

Text in Section 3.6.3.2 under subheadings *Bathymetry and Circulation - Temporary Relocation of the Navy MMP* was revised to state that there would be no dredging or filling at the NMAWC site and temporary guide piles would be removed leaving no high spots on the bay bottom, thus there would be no impacts to bathymetry. Text also revised to state that there would be minor, localized increases to circulation caused by vessel movement and in-water construction and demolition; these increases would cease when each particular activity ends; also, in-water structures to be installed would not form a barrier to water movement and in –water activities to take place at the temporary relocation site would not generate wakes or turbulence sufficient to the natural tidal-controlled flow of water in San Diego Bay. Therefore, there would be no significant impact to bathymetry or circulation.

COMMENT No. CK-25

Please refer to response to Comment No. HW-4 above.

COMMENT No. CK-26

Please refer to responses to Comment No. HW-2 and HW-5 above.

COMMENT No. CK-27

Please refer to response to Comment No. HW-4 above.

COMMENT No. CK-28

The EA was revised to include a summary of the findings of *NAVFAC Southwest 2013* (Appendix I). This summary is found in the EA in Section 3.6.3.2 under the subheadings Marine Water Quality-Temporary Relocation of the Navy MMP- Water and Sediment Quality Investigation. The two paragraphs below excerpted from the EA addresses this comment's concern regarding bacteria from storm drain runoff and marine mammal waste.

To evaluate potential bacterial impacts to water quality associated with the temporary relocation of the MMP to NMAWC, available water quality data was reviewed, additional field surveys were performed, and hydrodynamic modeling was conducted. The findings of the investigation concluded that once the marine mammals are moved to the proposed RA site indicator bacteria, fecal and total coliform, concentration values contributed by the marine mammals are not expected to result in increased frequency of exceedances of regulatory water quality objectives for indicator bacteria in waters designated for contact recreation (REC-1) beneficial uses. The frequency of exceedances is expected to primarily be dependent on external sources related to storm water runoff and not the marine mammal inputs. In addition, the relocation of the marine mammals is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

Existing water quality data were reviewed and compared to the REC-1 fecal and total coliform bacteria water quality objectives provided in the San Diego Regional Water Quality Control Board, San Diego Region Basin Plan (herein Basin Plan). The Basin Plan objectives for fecal coliform are: 1) shall not exceed 200 most probable number [MPN] per 100 milliliter [ml] for any 30 day logarithmic average (at least 5 samples), and 2) shall not exceed 400 MPN per 100 ml for more than 10% of samples during any 30 day period. The Basin Plan objectives for total coliform are: 1) no more than 20% samples at any sampling station, in a 30 day period, may exceed 1,000 organisms per 100 ml, and 2) no single sample, when verified by a repeat sample taken within 48 hours, shall exceed 10,000 organisms per 100 ml. Indicator bacteria data sets were obtained from the City of San Diego for outfalls discharging to the Naval Training Center (NTC) Channel and from the County of San Diego Environmental Health Department (SDCDEH) for receiving water data during dry season months near Spanish Landing. Data from the City (2008 to 2012) displayed elevated fecal and total coliform levels, whereas data from SDCDEH (2009 to 2012) rarely exceeded the REC-1 objectives, only one fecal and one total coliform sample during the period, and the logarithmic averages for fecal coliform were all below the 200 MPN/100ml objective. The City of San Diego data do not represent existing receiving water conditions, but rather provides information on a potential source of bacteria loading, urban runoff. SDCDEH data represent the existing receiving water conditions at Spanish Landing during dry season months.

For additional information regarding this topic please refer to the response to Comment Nos. HW-4 and HW-5 above, and *Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation San Diego Bay, San Diego California* (NAVFAC Southwest 2013) presented in Appendix I.

COMMENT No. CK-29

The Navy and the U.S. Fish and Wildlife Service agreed upon the annual critical breeding season for the California least tern (April 1 through September 15) and memorialized it in the Memorandum of Understanding (MOU) Between the U.S. Fish and Wildlife Service and U.S. Navy Concerning Conservation of the Endangered California Least tern in San Diego Bay, California. In accordance with the MOU, there would be no in-water construction work during the critical breeding season. Thus, there would be no significant impact to the California least tern.

COMMENT No. CK-30

Please see response to comment CK-29. In accordance with the Navy least tern MOU, there would be no in-water construction during the least tern breeding season from April 1 1through September 15. Recent water sample analytical data for the NMAWC area and the Navy marine mammals' existing location do not show a significant increase in the levels of phosphates or bacteria.

COMMENT No. CK-31

The Navy and the U.S. Fish and Wildlife Service agreed upon the annual critical breeding season for the California least tern (April 1 through September 15) and memorialized it in the Memorandum of Understanding (MOU) Between the U.S. Fish and Wildlife Service and U.S. Navy Concerning Conservation of the Endangered California Least tern in San Diego Bay, California. In accordance with the MOU, there would be no in-water construction work during the critical breeding season. Thus, there would be no significant impact to the California least tern.

COMMENT No. CK-32

See response to Comment No. CK-31. Airborne noise levels associated with existing fuel pier operations do not negatively impact least tern eggs or hatchlings; operational noise levels for the proposed new fuel pier would be similar to those of the existing pier. No in-water construction work (vibratory or impact pile driving) would be done during the least tern breeding season (April1 through September 15). Out-of-water work would not generate loud noise that would affect small birds. When construction is complete, operations at the new fuel pier would generate the same type and levels of airborne noise as the existing fuel pier operations do. Noise generated by in-air construction activities during the least tern breeding season is expected to be similar to that which normally occurs in the busy, industrial San Diego Bay to which the terns are accustomed. As such, project-related noise generated during the least tern breeding season would not adversely affect the California least tern and there would be no disturbance to nested eggs or nestlings.

COMMENT No. CK-33

The cumulative analysis has been revised to identify projects and associated resources to be analyzed quantitatively.

Impacts have been fully analyzed individually (Chapter 3) and cumulatively (Chapter 4), and project-specific special conservation measures have been developed and incorporated into the project and analysis to prevent a significant impact in an iterative process. Given the special conservation measures and the background level of activity within the industrialized San Diego Bay, the project would not have a significant impact on biological resources, even in the worst-case scenario in which piles at the proposed project and piles at the Scripps Marine Facility Replacement Pier project are struck simultaneously.

Proposed pile driving would cease upon project completion, and pile driving would not occur every day. All in-water activity would cease during the least tern breeding season (1 April – 15 September), and pile driving necessarily must be completed before the deck and other above-water infrastructure could be completed. Therefore, impacts from the proposed construction would be temporary and less than significant.

COMMENT No. CK-34

Impacts from the project on the local marine environment would be temporary for the reasons described above under Comment No. CK-33.

As described in Chapter 3 of the EA, the significance of an impact must be considered in the context of the surrounding environment (also provided in Chapter 3) and is based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species. Thus, as analyzed in the Draft EA, while some fish within the immediate vicinity of the proposed project may be injured or killed during pile driving activities, the majority are expected to leave the area to avoid the noise during the ramp-up procedure. Furthermore, the area affected is relatively small compared to the available habitat within San Diego Bay. Therefore, impacts from the Proposed Action would not be significant individually or cumulatively.

COMMENT No. CK-35

As described above under Comment No. CK-34, the significance of an impact must be considered in context of the surrounding environment (see Chapter 3). Section 3.3 of the EA reviewed existing data on bird occurrence in the project area and carefully considered potential project effects. As described in Section 3.3.3.3, bird responses to the proposed project activities are expected to consist of minor physiological and behavioral responses, such as being startled and/or fleeing the area prior to or just after the initial pile strike. Furthermore, it is understood that seabirds are highly mobile organisms and generally do not rely on any one localized area, including the proposed project area, for resources such as food and shelter. The comment accurately conveys the biologists' reasoning in the EA that the project's impacts are for the most part temporary and localized, and that permanent alterations to structural and open water habitat would be so small as to be inconsequential. The same reasoning leads to the conclusion in Section 4.3 that cumulative impacts would not be significant.

COMMENT No. CK-36

GHG emissions associated with the Proposed Action are temporary and would occur over a four-year timeframe. It is not possible to calculate GHG emissions from all activities on a global scale. The Navy has provided a list of cumulative projects that, combined with the Proposed Action, were considered in the evaluation of whether the Proposed Action's impacts would be cumulatively considerable. The Navy has developed its own programs to reduce GHG emissions. These programs are discussed on Page 4-17 of the Draft EA.

It should be noted that the emissions attributable to the Proposed Action are below the U.S. Council on Environmental Quality's annual threshold of 25,000 metric tons of CO2e emissions below which an analysis may not be required. According to the CEQ:

> CEQ proposes to advise Federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect GHG emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO2-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public.[1]

Given that the emissions associated with the Proposed Action are below the annual threshold of 25,000 metric tons of CO2e, and given that they are temporary, no further analysis is required beyond the analysis provided in the Draft EA.

COMMENT No. CK-37

Please see the response to Comment No. CK-1.

[1] Council on Environmental Quality. 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. February 18.

[This Page Intentionally Left Blank]

Appendix C

Unified Facilities Criteria (UFC)

[This Page Intentionally Left Blank]

APPENDIX C: APPLICABLE UNIFIED FACILITIES CRITERIA

New Fuel Pier Facility design would be in accordance with the following applicable Unified Facilities Criteria (UFC):

- UFC 2-000-05N (P-80) Facility Planning Criteria for DoN and Marine Corps Shore Installations
- UFC 3-300-10N Structural Engineering
- UFC 3-460-01 Petroleum Fuel Facilities
- UFC 3-600-01 Fire Protection Engineering for Facilities
- UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- UFC 4-150-02 Dockside Utilities for Ship Service
- UFC 4-150-06 Military Harbors and Coastal Facilities
- UFC 4-151-10 General Criteria for Waterfront Structures
- UFC 4-152-01 Design: Piers and Wharves
- UFC 4-159-03 Design: Moorings

Appendix D

Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging (MILCON Project P-151)

[This Page Intentionally Left Blank]

SAMPLING AND ANALYSIS REPORT
for
NAVAL BASE POINT LOMA
FUEL PIER REPLACEMENT AND DREDGING

(Navy MILCON Project P-151)



Prepared by:
TEC Inc.
1819 Cliff Drive, Suite F
Santa Barbara, CA 93109

Prepared for:
U.S. Navy
Naval Facilities Engineering Command, Southwest
Coastal IPT
Naval Base San Diego
2730 McKean Street, Building 291
San Diego, California 92136

March 2011



Figure ES-1
Sample Locations - Pier 180
Naval Base Point Loma

EXECUTIVE SUMMARY

The Navy has undertaken physical, chemical, and biological testing of sediment within a proposed dredged footprint associated with the proposed Fuel Pier (Pier 180) replacement project located at Naval Base Point Loma (NBPL) in San Diego, California. The intent of this sediment testing is to determine suitability of the proposed dredged material for disposal in the approved regional ocean disposal site LA-5. Sediment collection and testing was done pursuant to the approved P-151 Sampling and Analysis Plan (November 2010).

The following summarizes the results of analytical tests performed on sediment samples collected within a proposed dredging area and ocean disposal reference site.

Field Sediment Collection

- Field sampling activities were conducted from November 10 through November 13, 2010:
  - Ocean Disposal Site (LA-5) reference site sample collected.
  - 10 sites in proposed turning basin (TB) dredge area collected (Figure ES-1).
- Sediment samples were received by the laboratories (CalScience Environmental Laboratories and Nautilus Environmental LLC) on November 15, 2010.
- The control sediment for bioassay toxicity testing was collected by the contracted laboratory on November 18, 2010.

Composites

- Sediments from sample stations TB-1 to TB-5 were combined into Composite Sample #1 representing approximately 40 percent of proposed dredge material.
- Sediments from sample station TB-6 to TB-10 were combined into Composite Sample #2 representing approximately 60 percent of proposed dredge material.

Grain Size

- Field observation and laboratory analysis of the collected sediment from the two composite samples from within the proposed dredging footprint indicates that the dredge material would be comprised largely of sand and shell hash.
- Results of the physical tests show sediment from both composite samples consist of more than 86 percent sand, 10 percent silt and 2 percent clay, with trace amounts (less than 1 percent) of gravel.

Bulk Chemistry

- The following bulk chemistry tests were conducted by the contracted laboratory: trace metals, mercury, polycyclic aromatic hydrocarbons (PAHs), phenols, phthalates, organochlorine pesticides, polychlorinated biphenyl (PCB) congeners, organotins, total recoverable petroleum hydrocarbons (TRPH), total solids, total sulfide, dissolved sulfide, ammonia and total organic carbon.
- A total of 128 constituents were analyzed and more than 100 constituents were not detected above the laboratory reporting limits in sediments from each composite sample.
- A majority of the chemicals that were detected in all three samples (including the LA-5 reference sample) were metals and phthalates.

- No organotins, PAHs, phenols and PCBs were detected above the laboratory reporting limits.
- No pesticides were detected in samples from Area 1 composite or Area 2 composite.
- Three pesticides were detected in sediment from the reference site, two of which (4,4'-DDE and DDTs) were detected at concentrations greater than the Effects Range Low (ERL) levels (NOAA National Sediment Quality Guidelines)
- No constituents were detected greater than any of the ERLs or Effects Range Median (ERM) concentrations in the Project Sediment Samples.
- For toxicity characteristic leaching procedure (TCLP), barium and zinc were detected in sediment from both project composite samples at concentrations less than 1 milligram per liter. Additionally, trace amounts of arsenic were detected just above the laboratory reporting limit in sediment from Area 2 composite.
- No TCLP metals were detected greater than any of the respective Resource Conservation and Recovery Act (RCRA) standards for hazardous waste. TCLP testing is not required for ocean disposal. Characterization with respect to hazardous waste disposal criteria would be useful should upland disposal be considered.

Bioassay

- Solid phase testing showed greater than 90 percent survival in all exposures to amphipod shrimp (*Eohaustorius*) and worms (*Neanthes*).
- Suspended particulate phase testing showed greater than 90 percent survival in the lab control and all levels of exposure to fish (*Menidia*) and shrimp (*Mysidopsis*). For the bivalve larval development test, observed effects were of low magnitude: for both composite samples, the percent normal survival rate of the 100 percent exposure sample yielded a value within 20 percent of the laboratory control. Furthermore, none of the results were less than the median effect level and the limiting permissible concentration (LPC) criterion is therefore substantially met for ocean disposal.
- Bioaccumulation phase testing has yielded sufficient organism survival and tissue recovery for chemical analysis.

Chemistry Tests of Bioaccumulation Tissues

- Tests results of tissues from clams and worms for metals indicate low bioavailability of several metals. Bioavailability of metals detected by the laboratory in project samples is not believed to be ecologically significant.
- Most organic contaminants were not detected with the exception of phthalate compounds that were detected in both the project composites and reference-sediment exposed tissues.

Overall

The project sediment from the proposed dredging consists mostly of sand. Test results indicate low concentrations or the absence of contaminants in the sediments. All test results appear to support a regulatory conclusion that the project sediment is suitable for ocean disposal. However, the regulatory determination needs to be made by the US Army Corps of Engineers (USACE) and US Environmental Protection Agency (USEPA).

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **ii**
1.0 INTRODUCTION **1**
2.0 PURPOSE OF THE SAMPLING **1**
3.0 DESCRIPTION OF THE SAMPLING AREA **3**
4.0 PAST RELEVANT SEDIMENT CHARACTERIZATIONS **3**
5.0 FIELD ACTIVITIES **3**
5.1 Test Sediment Collection 3
5.2 Test Sediment Compositing 4
5.3 Reference Sediment Collection 5
5.4 Control Sediment Collection 5
5.5 Field Observations 6
6.0 ANALYTICAL RESULTS **7**
6.1 Results of Physical Tests 8
6.2 Results of Chemical Tests 9
6.3 Results of Bioassay Tests 15
6.3.1 Solid Phase Toxicity Tests 15
6.3.2 Suspended Particulate Phase Toxicity Tests 16
6.3.3 Bioaccumulation Test 17
7.0 SUMMARY OF FINDINGS **23**
8.0 REFERENCES **25**

LIST OF TABLES

Table Page
Table 1. Sample Collection Locations and Core Depths 6
Table 2. Results of Grain Size Analysis 8
Table 3. Summary of Sediment Chemistry Analysis 11
Table 4. Summary of TCLP Results 15
Table 5. Summary of Solid-Phase Toxicity Test Results 16
Table 6. Summary of Suspended Particulate-Phase Toxicity Test Results 17
Table 7. Mean Percent Survival in Bioaccumulation Tests 18
Table 8. Summary of Clam Tissue Metal Concentrations 20
Table 9. Summary of Worm Tissue Metal Concentrations 21
Table 10. Summary of Tissue Organic Concentrations 22

LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
±	Plus or Minus
BP	Bioaccumulation Phase
CFR	Code of Federal Regulations
CY	Cubic Yards
DFSP	Defense Fuel Support Point
DGPS	Differential Global Positioning System
ERL	Effects Range Low
ERM	Effects Range Median
FISC	Fleet and Industrial Supply Center
ft	Foot/Feet
LPC	Limiting Permissible Concentrations
mL	Milliliters
MLLW	Mean Lower Low Water
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
N	North
Navy	Naval Facilities Engineering Command, Southwest Division
NBPL	Naval Base Point Loma
NOAA	National Oceanic and Atmospheric Administration
ODMDS	Ocean Dredged Material Disposal Site
oz.	Ounce
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SP	Solid Phase
SQG	Sediment Quality Guidelines

SSP	Suspended Solid Phase
TB	Turning Basin
TCLP	Toxicity Characteristic Leaching Procedure
TEC	TEC Inc.
TEG	TEG Oceanographic Services
TRPH	Total Recoverable Petroleum Hydrocarbons
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USEPA	US Environmental Protection Agency
W	west

LIST OF APPENDICES

Appendix A Figures
Appendix B Field Photos
Appendix C Sediment Core Logs
Appendix D Chain-of-Custody Forms
Appendix E Physical and Chemical Laboratory Analytical Results
Appendix F Toxicity and Bioaccumulation Testing Laboratory Report
Appendix G Analytical Results of Tissue Samples (CD)

LIST OF FIGURES

Figure Page
Figure ES-1. Sample Locations, Pier 180, Naval Base Point Loma, CA i
Figure 1. Regional Location, Pier 180 Replacement, Naval Base Point Loma, CA 1
Figure 2. Vicinity Map, Naval Base Point Loma, CA 2
Figure 3. Proposed 1100' x 50' Double Deck Fuel Pier, Naval Base Point Loma, CA 3
Figure 4. Sample Locations, Pier 180, Naval Base Point Loma, CA 4
Figure 5. LA-5 Ocean Disposal Site and Reference Sediment Location, Naval Base Point Loma, CA 5

This page is intentionally left blank.

1.0 INTRODUCTION

This document serves as the Sampling and Analysis Report for a dredged material characterization study associated with the proposed Fuel Pier (Pier 180) replacement project located at Naval Base Point Loma (NBPL) in San Diego, California (Appendix A, Figures 1 and 2).

NBPL Pier 180 is an active fuel pier that has been in operation for many decades and currently serves approximately 40 ship fueling operations per month. Naval Facilities Engineering Command, Southwest (Navy) is proposing to demolish the existing Pier 180 and replace it with a modern structurally sound marine fuel pier. This proposed project would replace the approximately 100 year old and seismically deficient Pier 180 at NBPL and would provide a new pier that will meet current California State Lands Commission - Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS). An environmentally safe and improved fuel receipt and delivery capability at the Defense Fuel Support Point (DFSP), Fleet and Industrial Supply Center (FISC), San Diego would be provided. This proposed project would replace the existing deficient Fuel Pier with a new concrete pile supported T-shaped fueling pier, located in deeper water outboard of the existing structure.

Sediment samples were collected within a proposed dredge footprint in the outer turning basin for the fuel pier, as well as in a designated reference sample site located near the US Environmental Protection Agency (USEPA) - approved LA-5 Ocean Dredged Material Disposal Site (ODMDS). The collected sediment samples were subject to physical, chemical and biological testing to determine suitability for ocean disposal of the proposed dredged material. Field sample collection and laboratory testing were conducted in accordance with the Sampling and Analysis Plan (SAP) for this project (NAVFAC Southwest, 2010), that was approved in November 2010 by the United States Army Corps of Engineers (USACE) and the USEPA. Field and laboratory activities were also consistent with USACE dredge material engineering and regulatory practice along with guidance provided by the USEPA's "Evaluation of Dredged Materials Proposed for Ocean Disposal" (commonly known as the "Green Book Testing Manual").

This Sampling and Analysis Report documents the sediment sample collection procedures and analytical test results that were done to evaluate proposed dredged materials from the outer portion of the turning basin for Pier 180 for suitability for ocean disposal. Tests were conducted according to the regulations contained in Title 40 Code of Federal Regulations (CFR) Parts 220-228.

2.0 PURPOSE OF THE SAMPLING

The Fuel Pier NBPL is critical to the mission of the Navy and is the only active Navy fueling facility in the vicinity. More than 42 million gallons of fuel are stored at DFSP Point Loma and more than 11 million gallons of fuel is issued and received every month to more than 42 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier

strike groups, National Oceanographic and Atmospheric Administration (NOAA), Homeland Security (USCG), foreign and small craft.

The proposed pier replacement project would provide a new Double Deck Fuel Pier, 1,100 feet (ft) long and 50 ft wide. The proposed pier replacement would extend the outboard berthing length to 1500 ft by the addition of two 30 ft square mooring dolphins on each end of the pier. The total area, including the 700 ft long Access Pier, would be 91,150 square ft (Appendix A, Figure 3). No dredging would be needed alongside the replacement pier, as sufficient water depths currently exist.

The proposed new pier layout would include a minimum 1,200 ft wide turning basin between the outboard (eastern) side of the pier and the navigation channel, to provide safety for the berthing operations of the large vessels being serviced at the facility (Figure 4). The design depth for the turning basin would be 41 ft below mean lower low water (MLLW) (38 ft vessel draft plus 3 ft under keel) with an additional 2 ft for overdredge allowance. The majority of the existing bathymetry of the turning basin is deep enough to accommodate safe vessel operation. However, there is a wedge-shaped high spot along the western edge of the navigation channel where bottom depths rise from -40 to -36 ft MLLW. This wedge-shaped area would need to be excavated to bring it to a minimum of -41 ft MLLW (plus 2 ft overdredge allowance). The proposed dredge footprint would be limited to the location adjacent, to the west, of the navigation channel, as illustrated and shown in green in Figure 4. The estimated volume of proposed dredging is presented in the table below.

Proposed Dredging Volume (Cubic Yards [CY])			
SITE	DESIGN DEPTH (-41 ft MLLW)	OVERDREDGE (2 ft)	TOTAL
Turning Basin	53,000 CY	34,000 CY	87,000 CY

Physical, chemical and biological tests were conducted on two composite sediment core samples collected within the dredge footprint, and one reference sample from near the proposed ODMDS site. The intent of the sediment physical and chemical tests is to characterize and describe the type of dredged material that will be excavated from the proposed dredging area. Bioassay testing assesses the impact of contaminants in the dredged material on appropriate sensitive organisms to determine if there is potential for the dredged material to have an unacceptable impact.

The ocean disposal of dredged materials at the LA-5 ODMDS is regulated under Section 103 of the Marine Protection, Research and Sanctuaries Act, and disposal operations must comply with permitting and dredging regulations published in 33 CFR Parts 320-330 and 335-338.

3.0 DESCRIPTION OF THE SAMPLING AREA

The proposed dredge footprint is located in the outer portion of the turning basin for NBPL Pier 180. The extent of the footprint is illustrated in Figure ES-1 and Appendix A, Figure 4. The dredging footprint is comprised of areas in the outer portion of the turning basin with water depths of less than -41 ft MLLW.

Sediment samples were collected from 10 representative sites within the proposed dredging footprint in the turning basin. The intent was to place sampling stations in 10 sites equidistant from one another from one end of the footprint to the other. Sites in the equidistance locations were placed in a zigzag fashion to obtain sediment cores from the west, central and east sides of the footprint. This resulted in sediment collection from representative locations within the proposed dredging envelope.

4.0 PAST RELEVANT SEDIMENT CHARACTERIZATIONS

Sediment within the proposed dredge footprint consists of bay/beach deposits and the Pleistocene age Bay Point Formation. Bay deposits generally consist of loose, fine sands with silt and silty sands. Bay/beach deposits are underlain by terrace deposits of the Bay Point Formation. The Bay Point Formation generally consists of medium dense and dense, poorly graded and clays sands with some layers of sandy clay (Woodward-Clyde, 1995).

In addition, the USACE undertook recent sediment sampling and testing before proposed maintenance dredging of the San Diego Harbor Navigation Channel. Vibracore samples were taken in the federal navigation channel in the vicinity of the proposed dredging portion of the turning basin for Pier 180. The grain size and chemical analyses of samples revealed sediment that was mostly sand with low concentrations of any contaminants. This sediment was deemed suitable for beach nourishment (USACE, 2009).

5.0 FIELD ACTIVITIES

Field activities were conducted from November 10 through November 13, 2010. TEC Inc. (TEC) was project manager for sediment sample collection effort. The following subcontractors carried out the field collection activities:

- AMEC Earth & Environmental, Inc. – field work coordination.
- Seaventures – boat (*Early Bird II)* and boat crew.
- TEG Oceanographic Services (TEG) - operated vibracore equipment for sediment collection.

5.1 TEST SEDIMENT COLLECTION

Sample sediments were collected from the 10 sites (Figure ES-1 and Appendix A, Figure 4) and the sediment was pooled into two (TB sites 1-5 and TB sites 6-10) composite samples for physical, chemical and biological testing for ocean disposal suitability determination. A reference sediment sample was also collected from the designated reference site (Appendix A, Figure 5) for the same physical, chemical, and biological tests as the two composite samples from within the proposed dredging footprint.

Extra sediment was collected from the 10 dredging footprint sites and archived for backup testing if needed. The cores were visually inspected and split into a top and bottom strata per physical characteristics or per depth when no physical differences were observed. Subsamples were taken from both strata for archiving and then homogenized separately, as top and bottom samples for later testing for physical, chemical and bioaccumulation analyses, if needed.

A differential global positioning system (DGPS) was used to navigate to the target sampling locations. The target navigational accuracy was plus or minus three meters. The *Early Bird II* deployed a three-point anchor to maintain its position. Once secured, the position was recorded in the field log and the water depth was measured with a weighed fiberglass tape. The water depth was corrected for the MLLW (using the NOAA tide tables).

TEG personnel deployed the vibracore used for sediment sample collection. The vibracore uses a 4-inch diameter aluminum tube connected to a stainless steel cutter. The aluminum encased vibrating unit uses 240-volt, three-phase, and 26-amp electricity to drive two counter rotating concentric vibrators. The vibracore and tube were lowered by a hydraulic winch and vibrated until penetration to project depth was achieved. Core penetration depth was calculated with a tape measure attached to the vibracore head. After the vibracore was turned off, the sediment core was returned to the boat's deck for processing.

Once onboard, core samples were carefully extruded into clean, polyethylene-lined trays, photographed, and inspected for unique strata, color, odor, etc. The processing involved extruding each sample from the plastic-enclosed core tube into a polyvinylchloride (PVC) tray. The extruded cores were subsampled after being logged and photographed. All of the core logs and sediment sample photographs are included in Appendix C. Subsampled sediments were deposited into stainless steel mixing pots and thoroughly homogenized with a mixer attached to an electrically-powered hand-held drill. This process was repeated at each of the 10 collection sites.

No solvents were used on deck of the vessel. Decontamination used only biodegradable soap rather than hazardous substances. Between coring stations, sampling equipment and the work area on board the collection vessel was cleaned. The decontamination process for equipment coming into direct contact with sediment samples included thorough cleaning with site seawater, scrubbing with Alconox (or similar) detergent, and rinsing with site seawater. Similarly, between cores, the deck of the collection vessel was cleaned using site seawater. Site seawater was obtained from approximately 1 ft beneath the bay surface using an onboard pump which supplies water to the deck at approximately household pressure.

5.2 TEST SEDIMENT COMPOSITING

Sediment samples collected at the 10 sample locations within the proposed dredging footprint were pooled into two composite samples. Sediments from sample stations TB-1 to TB-5 were combined into Composite Sample #1 (referred to as Area 1). Sediments from sample stations TB-6 to TB-10 were combined into Composite Sample #2 (referred to as Area 2). It is estimated that of the total volume of proposed dredging, that approximate 40 percent is represented by Composite Sample #1 and 60 percent by Composite Sample #2.

On the survey vessel, each of the 10 individual core samples, (plus additional cores necessary to make up sufficient testing volume – required additional testing volume was accomplished by moving vertically not by moving to adjacent locations at the same depth) were homogenized separately in a clean, non-contaminating stainless steel mixing vessel, and then subsampled for archiving purpose. The sediment from the five individual cores within each composite group were then combined, homogenized, and subsampled for physical, chemical and biological analyses as well as for archiving purposed. Samples for physical and chemical analyses were forwarded to Calscience in labeled 16 ounce (oz.) glass jars and plastic bags, respectively. Samples were transported in accordance with chain-of-custody procedures and were received by the laboratory on November 15, 2010 (Appendix D).

For the toxicity and bioaccumulation testing, the two test site composite samples and sediment collected from the reference site were delivered to Nautilus Environmental laboratory in food-grade plastic bags in iced coolers or buckets. The samples were held in a 4 degrees Celsius (˚C) cold room until toxicity tests were initiated.

The integrity of each sample was maintained throughout the study. Proper record-keeping and chain-of-custody procedures were implemented to allow samples to be traced from collection to their final disposition. After collection of sediment, documentation on various logs and forms were completed to adequately identify and catalog station and sample information. Archived samples will be retained by the laboratories for a period of one year from collection (or until suitability determination has been made). Completed chain-of-custody forms are located in Appendix D and core log documentation is located in Appendix C.

5.3 REFERENCE SEDIMENT COLLECTION

Reference sediment was collected at a designated site (lat 32˚46.00'N, long 117˚22.75'W) that has been used for numerous dredged material bioassays and has a sediment quality that is acceptable to USEPA and USACE (Appendix A, Figure 5).

5.4 CONTROL SEDIMENT COLLECTION

Control sediments were used for both the solid phase (SP) and bioaccumulation phase (BP) biological tests. The control or "home" sediments were collected at the same location and at the same time as the test organisms. Control sediment exposures are used to determine the health of the test organisms during the laboratory exposure period. These tests must meet specific control criteria (greater than 90 percent survival in the SP tests and greater than 70 percent in the BP tests) for the tests to be considered valid. Survival at these levels attests to the suitability of the organisms for testing purposes. Home control sediments were collected from Tomales Bay in northern California and fine-grained control sediments were collected from Sail Bay in San Diego on November 18, 2010. Control sediment was collected by the test organism supplier using the methods used to collect test organisms. Then, the sediment was sent to the Nautilus Environmental laboratory along with each batch of test organisms. Control sediment was stored at 4˚C until test initiation.

5.5 FIELD OBSERVATIONS

At many sample locations, the sediment was composed of fine to medium grain sand with an underlying layer of coarse sand mixed with shell hash (see Photos in Appendix B). Additionally, the photo on page 7 illustrates a core sample of sandy sediment taken at station TB-10. Sands have a tendency to dampen the frequency of the vibracore's vibration, while the shell hash has a tendency to clog the vibracore's catcher/cutter head causing a plug in the core cutter. As a result, multiple attempts were made at the sediment sample locations that experienced poor core recoveries. At some locations, the collection boat had to be slightly re-positioned so that sufficient core recoveries could be achieved.

Table 1 provides the actual locations within the proposed dredging footprint of the sample stations, the water depth and the penetration length of the sample cores.

Table 1. Sample Collection Locations and Core Depths

Station ID	*Sample Type*	*Collection Coordinates*		*Sample Collection Type*	*Sample Collection*			
		Latitude North WGS84 (dd° mm ss.sss')	*Longitude West WGS84 (ddd° mm ss.sss')*		*Mudline[1] (ft MLLW)*	*Dredge Depth (ft MLLW)*	*Penetration Depth (ft)*	
							Target	*Actual*
Turning Basin								
TB1	Core	32° 42'9.300"	117° 13'52.560"	Vibracore	-38.3	-43	4.7	4.7
TB2	Core	32° 42'8.460"	117° 13'51.840"	Vibracore	-40.0	-43	3.0	3.0
TB3	Core	32° 42'6.300"	117° 13'53.580"	Vibracore	-37.4	-43	5.6	5.6
TB4	Core	32° 42'3.540"	117° 13'54.720"	Vibracore	-36.6	-43	6.4	6.0
TB5	Core	32° 42'0.480"	117° 13'55.680"	Vibracore	-38.8	-43	4.2	4.7
TB6	Core	32° 41'56.340"	117° 13'57.720"	Vibracore	-39.5	-43	3.5	4.0
TB7	Core	32° 41'53.220"	117° 14'1.200"	Vibracore	-39.1	-43	3.9	4.0
TB8	Core	32° 41'51.360"	117° 13'58.860"	Vibracore	-36.4	-43	6.6	6.6
TB9	Core	32° 41'49.320"	117° 14'3.420"	Vibracore	-37.0	-43	6.0	6.0
TB10	Core	32° 41'46.320"	117° 14'0.900"	Vibracore	-35.0	-43	8.0	8.0
Reference								
REF	Grab	32° 46' 00"	117° 22'45.0"	Pipe Dredge	Approx. -600	NA	Surface	

Legend:
NA – not applicable
Ref – reference

Vibracore penetration accuracy is ±0.5 ft. Target penetration to project design depth was corrected for the tidal elevation at each coring location. The penetration depth was determined using a measuring tape attached to the vibracore head. The distance from where the tape is attached to the vibracore head was added to the length from this point to the core cutter. Following the collection of each core, the length of the sediment in the tube was determined to assess the amount of compaction that occurred during collection. In the case of TB4, refusal was met at 6 ft, 0.4 ft short of the target penetration depth (see Table 1).



Above: Photo from TB-10 station showing a core sample consisting largely of sand.

6.0 ANALYTICAL RESULTS

The results of the analytical tests presented below are required for ocean disposal consideration as per "Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual), 1991 (also known as the "Green Book").

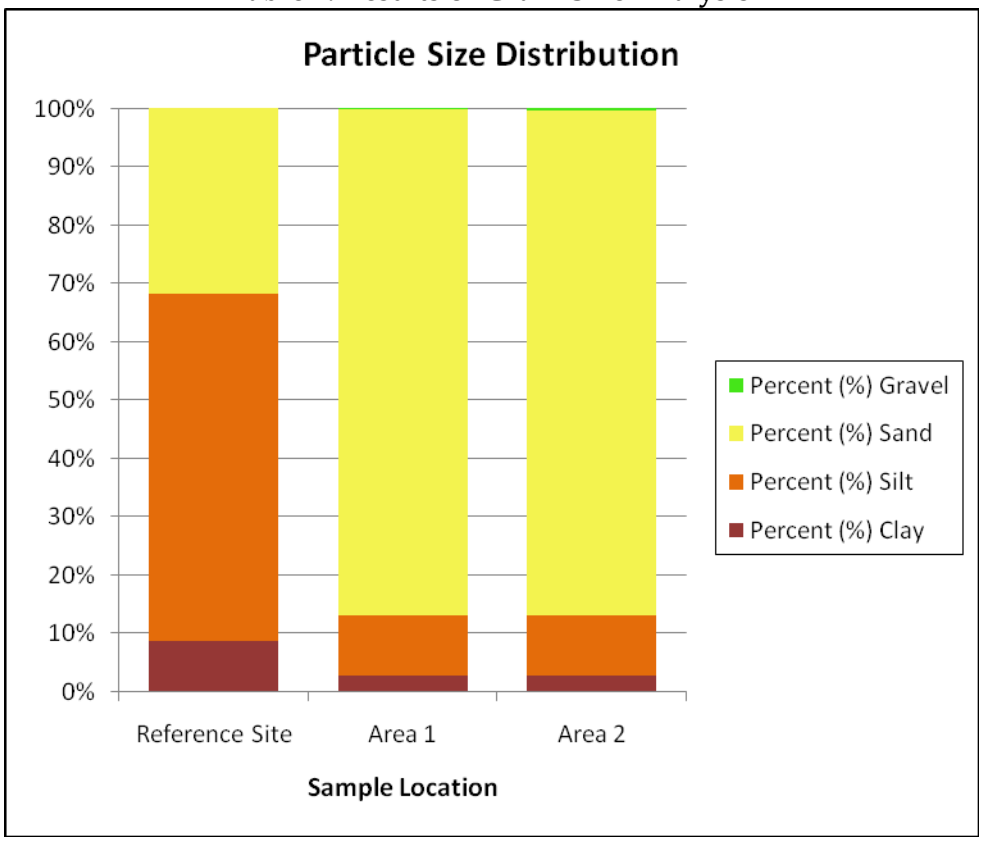
Testing protocols contained in this USEPA reference manual suggests a tiered approach for analysis of dredge sediment quality. Tier I relies on historical evidence. Tier II involves sediment sampling and physical and chemical analysis of the sediment. Tier III includes biological assessments of the sediment for suitability for ocean disposal. The objective of this sediment sampling and testing program was to complete Tiers I, II and III of the USEPA referenced protocol. Complete laboratory analytical reports for physical and chemical tests, including Quality Assurance/Quality Control (QA/QC) statistics, are provided in Appendix E.

Upon receipt from the laboratory that performed the analysis, all data were forwarded to Laboratory Data Consultants, Inc. for third party validation.

6.1 RESULTS OF PHYSICAL TESTS

Physical analyses were performed on the two composite samples and the reference sample. The analyses were performed at Core Laboratories in Bakersfield, California (under subcontract to Calscience) following the sieve and hydrometer method (ASTM 1967). Percent gravel, sand, silt and clay were reported to 0.1 percent, along with the corresponding millimeter and phi sizes, and a cumulative grain-size distribution diagram. The results of the grain size analysis are illustrated in Table 2.

Table 2. Results of Grain Size Analysis



The general size classes of gravel, sand, silt and clay are the most useful in describing the size distribution of particles in dredged material samples. Grain size analysis is used to describe the distribution of particle sizes in samples of sediment. Based on the results of the grain size analysis, sediments from the samples collected within the proposed dredge footprint (i.e., Area 1 and Area 2) have similar particle size distributions. Sediment samples collected from Area 1 and Area 2 consist of more than 86 percent sand, 10 percent silt and 2 percent clay, with trace amounts (less than 1 percent) of gravel. Sediment from the reference sample location consists of 31.76 percent sand, 59.47 percent silt and 8.77 percent clay.

6.2 RESULTS OF CHEMICAL TESTS

Bulk chemistry tests are a primary method of characterizing sediment quality for proposed dredged material. Chemical analysis of the sediment provides information about constituents present in the dredged material that, if biologically available, could cause toxicity and/or be bioaccumulated. This information is valuable for exposure assessment and for selecting constituents to measure in tissue samples for Tier III analysis.

Calscience Environmental Laboratories (Calscience), a California accredited laboratory, conducted all analytical chemical analyses on sediment. The sediment samples submitted to Calscience were analyzed according to USEPA- and USACE-approved methods. Total solids/water content was also analyzed and reported to 0.1 percent solids. Results of the bulk chemistry tests are summarized in Table 3.

NOAA sediment quality guidelines (SQGs) were developed as part of the National Status and Trends Program to be used as informal, interpretive tools to estimate the possible toxicological significance of chemical concentrations in sediments. The guidelines are commonly used to rank and prioritize sites and chemicals of concern. NOAA SQGs are reported as two values: the Effects Range Low (ERL) and the Effects Range Median (ERM). The ERL values represent the concentration below which adverse effects rarely occur and the ERM value represents the concentration above which adverse effects frequently occur.

As shown in Table 3, analyses were conducted on 128 constituents. In each of the three samples (two samples from the proposed dredge footprint and one sample from the reference site) more than 100 of the analyzed constituents were not detected above the reporting limits in sediment from each sample. For the Area 1 composite sample, 107 of the 128 analyzed constituents were not detected above the laboratory reporting limits. For the Area 2 composite sample, 105 constituents were not detected and for the reference site sample, 101 constituents were not detected above the laboratory reporting limits. For all samples, no constituents were detected in the following chemical categories: organotins, polycyclic aromatic hydrocarbons (PAHs), phenols and polychlorinated biphenyls (PCBs). No pesticides were detected above the reporting limits in the sediment samples from Area 1 and Area 2. In the sample from the reference site, 4,4'-DDE and DDTs were detected above the reporting limits and above the designated ERLs. In general, most chemical detections for all sample areas were concentrated in the following chemical categories: conventionals, metals and phthalates. In addition, total sulfide was detected above the laboratory reporting limits in all three samples analyzed, but dissolved sulfide was not.

Sediment for the two composite samples from within the proposed dredge footprint did not exhibit detected chemical concentrations greater than any of the ERLs or ERMs. In sample sediment from the reference site, no constituents were detected above any of the ERMs. Other than the two pesticide constituents (i.e., 4,4'-DDE and DDTs) detected in the sediment sample from the reference site, no other constituents were detected at concentrations greater than any of the ERLs.

Sediment from the sample composites was also subjected to Toxicity Characteristic Leaching Procedure (TCLP) testing. TCLP results are summarized in Table 4. Of the 12 TCLP metals that

were analyzed, only trace levels of barium and zinc were detected above the laboratory reporting limits in sediment from sample composites. Arsenic was also detected in trace amounts, but only in the sediment from Area 2. Results of TCLP tests are typically used to determine whether a substance meets the criteria for hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). None of the TCLP metals were detected above the RCRA concentrations for hazardous waste. These tests are not related to ocean disposal requirements but would be useful should upland disposal of the proposed dredging project be considered.

Table 3. Summary of Sediment Chemistry Analysis

Sample ID		***Area 1***	***Area 2***	***Reference***	***ERL***	***ERM***
Sample Components		***TB-1 - TB-5***	***TB-6 - TB-10***	***LA-5***		
Sample Date		***11/13/10***	***11/12/10***	***11/10/10***		
	Units	***Result***	***Result***	***Result***		
Conventionals						
Ammonia	mg/kg	1.4	3.1	2.3	NA	NA
Carbon, Total Organic	%	0.2	0.71	3.4	NA	NA
Moisture	%	28.4	18.2	39.7	NA	NA
Total Solids	%	71.6	81.8	60.3	NA	NA
TRPH	mg/kg	38	34	40	NA	NA
Metals						
Arsenic	mg/kg	1.94	2.67	2.48	8.2	70
Cadmium	mg/kg	ND	ND	0.293	1.2	9.6
Chromium	mg/kg	8.91	6.56	22.3	81	370
Copper	mg/kg	7.51	5.27	10.8	34	270
Lead	mg/kg	3.57	2.66	7.06	46.7	218
Mercury	mg/kg	0.0613	0.0498	0.0559	0.15	0.71
Nickel	mg/kg	2.63	3.94	11.9	20.9	51.6
Selenium	mg/kg	ND	0.133	0.542	NA	NA
Silver	mg/kg	ND	ND	ND	1	3.7
Zinc	mg/kg	33.5	16.2	40.9	150	410
Sulfides						
Dissolved Sulfide	mg/kg	ND	ND	ND	NA	NA
Total Sulfide	mg/kg	18	0.98	2.2	NA	NA
Organotins						
Dibutyltin	ug/kg	ND	ND	ND	NA	NA
Monobutyltin	ug/kg	ND	ND	ND	NA	NA
Tetrabutyltin	ug/kg	ND	ND	ND	NA	NA
Tributyltin	ug/kg	ND	ND	ND	NA	NA
PAHs						
1-Methylnapthalene	ug/kg	ND	ND	ND	NA	NA
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	NA	NA
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	NA	NA
2,4-Dichlorophenol	ug/kg	ND	ND	ND	NA	NA
2,4-Dimethylphenol	ug/kg	ND	ND	ND	NA	NA
2,4-Dinitrophenol	ug/kg	ND	ND	ND	NA	NA
2-Chlorophenol	ug/kg	ND	ND	ND	NA	NA
2-Methylnapthalene	ug/kg	ND	ND	ND	70	670
Acenaphthene	ug/kg	ND	ND	ND	16	500

Sample ID ***Sample Components*** ***Sample Date***		***Area 1*** ***TB-1 - TB-5*** ***11/13/10***	***Area 2*** ***TB-6 - TB-10*** ***11/12/10***	***Reference*** ***LA-5*** ***11/10/10***	***ERL***	***ERM***
	Units	***Result***	***Result***	***Result***		
Acenaphthylene	ug/kg	ND	ND	ND	44	640
Anthracene	ug/kg	ND	ND	ND	85.3	1100
Benzo(a)anthracene	ug/kg	ND	ND	ND	261	1600
Benzo(a)pyrene	ug/kg	ND	ND	ND	430	1600
Benzo (b) Fluoranthene	ug/kg	ND	ND	ND	NA	NA
Benzo (g,h,i) Perylene	ug/kg	ND	ND	ND	NA	NA
Benzo (k) Fluoranthene	ug/kg	ND	ND	ND	NA	NA
Chrysene	ug/kg	ND	ND	ND	384	2800
Dibenz (a,h) Anthracene	ug/kg	ND	ND	ND	63.4	260
Fluoranthene	ug/kg	ND	ND	ND	600	5100
Fluorene	ug/kg	ND	ND	ND	19	540
Indeno (1,2,3-c,d) Pyrene	ug/kg	ND	ND	ND	NA	NA
Naphthalene	ug/kg	ND	ND	ND	160	2100
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	NA	NA
Pentachlorophenol	ug/kg	ND	ND	ND	NA	NA
Phenanthrene	ug/kg	ND	ND	ND	240	1500
Phenols	ug/kg	ND	ND	ND	NA	NA
Pyrene	ug/kg	ND	ND	ND	665	2600
PAHs	ug/kg	ND	ND	ND	4022	44792
Phthalates						
Bis(2-Ethylhexyl) Phthalate	ug/kg	51	50	110	NA	NA
Butylbenzyl Phthalate	ug/kg	150	120	180	NA	NA
Diethyl Phthalate	ug/kg	200	190	300	NA	NA
Dimethyl Phthalate	ug/kg	ND	13	20	NA	NA
Di-n-butyl Phthalate	ug/kg	23	16	25	NA	NA
Di-n-octyl Phthalate	ug/kg	ND	ND	ND	NA	NA
Phenols						
2-Methylphenol	ug/kg	ND	ND	ND	NA	NA
2-Nitrophenol	ug/kg	ND	ND	ND	NA	NA
3,4-Methylphenol	ug/kg	ND	ND	ND	NA	NA
4,6-Dinitro-2-Methylphenol	ug/kg	ND	ND	ND	NA	NA
4-Chloro-3-Methylphenol	ug/kg	ND	ND	ND	NA	NA
PCBs						
Congener 8	ug/kg	ND	ND	ND	NA	NA
Congener 18	ug/kg	ND	ND	ND	NA	NA
Congener 28	ug/kg	ND	ND	ND	NA	NA

Sample ID ***Sample Components*** ***Sample Date***		***Area 1*** ***TB-1 - TB-5*** ***11/13/10***	***Area 2*** ***TB-6 - TB-10*** ***11/12/10***	***Reference*** ***LA-5*** ***11/10/10***	***ERL***	***ERM***
	Units	***Result***	***Result***	***Result***		
Congener 44	ug/kg	ND	ND	ND	NA	NA
Congener 49	ug/kg	ND	ND	ND	NA	NA
Congener 52	ug/kg	ND	ND	ND	NA	NA
Congener 66	ug/kg	ND	ND	ND	NA	NA
Congener 70	ug/kg	ND	ND	ND	NA	NA
Congener 74	ug/kg	ND	ND	ND	NA	NA
Congener 77	ug/kg	ND	ND	ND	NA	NA
Congener 81	ug/kg	ND	ND	ND	NA	NA
Congener 87	ug/kg	ND	ND	ND	NA	NA
Congener 101	ug/kg	ND	ND	ND	NA	NA
Congener 105	ug/kg	ND	ND	ND	NA	NA
Congener 114	ug/kg	ND	ND	ND	NA	NA
Congener 118	ug/kg	ND	ND	ND	NA	NA
Congener 119	ug/kg	ND	ND	ND	NA	NA
Congener 123	ug/kg	ND	ND	ND	NA	NA
Congener 126	ug/kg	ND	ND	ND	NA	NA
Congener 128	ug/kg	ND	ND	ND	NA	NA
Congener 138	ug/kg	ND	ND	ND	NA	NA
Congener 151	ug/kg	ND	ND	ND	NA	NA
Congener 153	ug/kg	ND	ND	ND	NA	NA
Congener 156	ug/kg	ND	ND	ND	NA	NA
Congener 157	ug/kg	ND	ND	ND	NA	NA
Congener 158	ug/kg	ND	ND	ND	NA	NA
Congener 167	ug/kg	ND	ND	ND	NA	NA
Congener 168	ug/kg	ND	ND	ND	NA	NA
Congener 169	ug/kg	ND	ND	ND	NA	NA
Congener 170	ug/kg	ND	ND	ND	NA	NA
Congener 180	ug/kg	ND	ND	ND	NA	NA
Congener 183	ug/kg	ND	ND	ND	NA	NA
Congener 184	ug/kg	ND	ND	ND	NA	NA
Congener 187	ug/kg	ND	ND	ND	NA	NA
Congener 189	ug/kg	ND	ND	ND	NA	NA
Congener 195	ug/kg	ND	ND	ND	NA	NA
Congener 201	ug/kg	ND	ND	ND	NA	NA
Congener 206	ug/kg	ND	ND	ND	NA	NA
Congener 209	ug/kg	ND	ND	ND	NA	NA

Sample ID ***Sample Components*** ***Sample Date***		***Area 1*** ***TB-1 - TB-5*** ***11/13/10***	***Area 2*** ***TB-6 - TB-10*** ***11/12/10***	***Reference*** ***LA-5*** ***11/10/10***	***ERL***	***ERM***
	Units	***Result***	***Result***	***Result***		
Total PCB Congeners	ug/kg	ND	ND	ND	22.7	180
Pesticides						
2,4'-DDD	ug/kg	ND	ND	ND	NA	NA
2,4'-DDE	ug/kg	ND	ND	ND	NA	NA
2,4'-DDT	ug/kg	ND	ND	ND	NA	NA
4,4'-DDD	ug/kg	ND	ND	ND	NA	NA
4,4'-DDE	ug/kg	ND	ND	5	2.2	27
4,4-DDT	ug/kg	ND	ND	4	NA	NA
DDTs	ug/kg	ND	ND	9	1.58	46.1
Aldrin	ug/kg	ND	ND	ND	NA	NA
Alpha-BHC	ug/kg	ND	ND	ND	NA	NA
Beta-BHC	ug/kg	ND	ND	ND	NA	NA
Chlordane	ug/kg	ND	ND	ND	NA	NA
Delta-BHC	ug/kg	ND	ND	ND	NA	NA
Dieldrin	ug/kg	ND	ND	ND	NA	NA
Endosulfan I	ug/kg	ND	ND	ND	NA	NA
Endosulfan II	ug/kg	ND	ND	ND	NA	NA
Endosulfan Sulfate	ug/kg	ND	ND	ND	NA	NA
Endrin	ug/kg	ND	ND	ND	NA	NA
Endrin Aldehyde	ug/kg	ND	ND	ND	NA	NA
Endrin Ketone	ug/kg	ND	ND	ND	NA	NA
Gamma-BHC	ug/kg	ND	ND	ND	NA	NA
Heptachlor	ug/kg	ND	ND	ND	NA	NA
Heptachlor Epoxide	ug/kg	ND	ND	ND	NA	NA
Methoxychlor	ug/kg	ND	ND	ND	NA	NA
Toxaphene	ug/kg	ND	ND	ND	NA	NA

Legend:
ERL – Effects Range-Low
ERM – Effects Range-Median
NA – not applicable
ND – indicates that the analyte was not detected above the reporting limit
mg/kg – milligrams per kilogram
ug/kg – micrograms per kilogram
% – percent
5 – result exceeded the ERL

Table 4. Summary of TCLP Results

Sample ID ***Sample Components*** ***Sample Date***		***Area 1*** ***TB1 - TB5*** ***11/13/10***	***Area 2*** ***TB6 - TB10*** ***11/12/10***	***RCRA***
TCLP Metals	***Units***	***Result***	***Result***	
Arsenic	mg/L	ND	0.175	5
Barium	mg/L	0.563	0.425	100
Cadmium	mg/L	ND	ND	1
Chromium	mg/L	ND	ND	5
Copper	mg/L	ND	ND	NA
Lead	mg/L	ND	ND	5
Mercury	mg/L	ND	ND	0.2
Nickel	mg/L	ND	ND	NA
Selenium	mg/L	ND	ND	1
Silver	mg/L	ND	ND	5
Zinc	mg/L	0.889	0.908	NA

Legend:
NA – not applicable
RCRA – Resource Conservation and Recovery Act Standards for TCLP
ND – indicates the analyte was not detected above the reporting limit
mg/L – milligrams per liter

6.3 RESULTS OF BIOASSAY TESTS

Bioassay testing assesses the impact of contaminants in the dredged material on appropriate sensitive organisms to determine if there is potential for the dredged material to have an unacceptable impact. Bioassays use lethality as the endpoint because lethality is easily interpreted and quantified. The bioassays are acute tests using organisms that are representative of the water-column and benthic environments at the disposal site. Bioaccumulation also has to be considered to fully evaluate potential benthic impact. The results of bioaccumulation tests are used to predict the potential for uptake of dredged-material contaminants by organisms.

Bioassay and bioaccumulation testing was conducted by Nautilus Environmental Laboratory, LLC, San Diego, California (Nautilus). The complete report by Nautilus *Pier 180 Sediment Characterization Study, Naval Base San Diego Toxicity & Bioaccumulation Report March 2011* is presented as Appendix F to this report. Portions of the Nautilus report are excerpted/ summarized below.

6.3.1 SOLID PHASE TOXICITY TESTS

Ten-day amphipod and polychaete tests were conducted according to USEPA/USACE 1998 and ASTM 1990 protocols. The five replicate solid phase (SP) test chambers contained a 2-centimeter layer of control, reference, or test sediment, along with 950 milliliters (mL) of clean

seawater. Test chambers were permitted to equilibrate for 24 hours before adding test organisms. Test chambers were aerated for the duration of the test period.

Twenty amphipods were distributed randomly to each chamber. The polychaete test was conducted with five individuals per replicate container. Test and reference sediment toxicity tests were run in concurrence with control toxicant tests to ensure the test organisms were in adequate health. Water quality parameters were measured prior to test initiation, then daily during the 10-day test period.

SP toxicity test results are summarized in Table 5. Sediment exposures to amphipods (*Eohaustorius estuarius*) and polychaete (*Neanthes arenaceodentata*) from Area 1 and Area 2 composite samples exhibited high mean survival rates (96 and 92 percent, respectively). Mean survival of *Eohaustorius* ranged from 91 percent to 97 percent in the three controls, exceeding the USEPA criteria of 90 percent. Mean survival of *Neanthes* was slightly less than the USEPA criteria in Lab Control 1 at 88 percent. However, the other two controls exceeded the criteria at 92 percent and 96 percent. Based on the lab data, the absence of toxicological effects correlates well with the amphipod results (Nautilus, 2011). High mean survival rates for *Eohaustorius* and *Neanthes* were also observed in the LA-5 reference sediment.

Table 5. Summary of Solid-Phase Toxicity Test Results

Sediment Treatment	***Eohaustorius estuarius Mean Survival (percent)***	***Neanthes arenaceodentata Mean Survival (percent)***
Lab Control 1	91	88
Lab Control 2	97	92
Sail Bay Control	94	96
LA-5 Reference	92	100
Area 1 Comp	96	96
Area 2 Comp	92	92
Source: Nautilus, 2011		

6.3.2 SUSPENDED PARTICULATE PHASE TOXICITY TESTS

The test solution used in the suspended solid phase (SSP) toxicity tests was prepared by mixing seawater and test sediment to yield a volumetric water:sediment ratio of 4:1. Mechanical mixing, using a stainless steel impeller, was applied to vigorously agitate the mixture for 30 minutes. A one-hour settling time followed (or longer if insufficient settling has occurred), after which the supernatant was drained from the top of the mixing chamber. The supernatant was the 100 percent SSP liquid. The 100 percent liquid was then mixed with clean seawater (from Scripps Institution of Oceanography) to prepare the 50, 10 and 1 percent exposure concentrations. Clean seawater was also used as the control.

Control and test liquids were distributed to individual test chambers, and water quality parameters were measured. Water quality was monitored daily for the duration of the test period to ensure that acceptable test conditions were met. Tests were initiated by adding 10

mysid shrimp and 10 silversides to separate test chambers. Bivalve larvae test vials were initially stocked with approximately 20 fertilized embryos per mL. Silversides and bivalve larvae were not fed during the test period; however, mysid shrimp must be fed once daily to prevent cannibalism. The test duration was 96 hours for the mysid shrimp and silverside, and 48 hours for the bivalve larvae.

Results of the SPP toxicity tests are summarized in Table 6. In the mysid shrimp [*Americamysis bahia (Mysidopsis bahia*)] and silverside (*Menidia beryllina*) tests no toxicity was observed and mean percent survival was at or exceeding 98 percent in all 100 percent exposures. In laboratory controls, *Mysidopsis* and *Menidia* exhibited mean survival rates of 94 to 100 percent and 96 percent, respectively.

Suspended particulate-phase elutriates obtained from test sediments were not toxic to mysid shrimp or inland silverside minnow at any concentration tested. Toxicity was observed in the bivalve larvae test in the 100 percent concentrations from both sites and in the 50 percent elutriate of Area 2 composite sediment exposure. However, toxicity was of insufficient magnitude to calculate a median lethal concentration (Nautilus, 2011). Per Green Book guidance, LPC compliance was undertaken using the USACE's Short-Term Fate model (STFATE) (Version 5.01, windows version, USACE 2007). The STFATE model output results indicated that water column LPC requirements were met (Nautilus, 2011).

Table 6. Summary of Suspended Particulate-Phase Toxicity Test Results

Treatment	***Elutriate Concentration (Percent)***	***M. galloprovincialis (Mean Percent Normal Alive)***	***A. bahia (Mean Percent Survival)***	***M. beryllina (Mean Percent Survival)***
Laboratory Control	0	77 – 82	94 - 100	96
Area 1 Comp	1	79	94	96
	10	73	88	94
	50	78	94	94
	100	***66***	100	98
Area 2 Comp	1	74	100	96
	10	76	94	98
	50	***66***	92	98
	100	***61***	98	98

Note: Bold values indicate significant differences when compared to control.
Source: Nautilus, 2011

6.3.3 BIOACCUMULATION TEST

Bioaccumulation testing used the polychaete worm (*Nereis virens*) and the bent-nose clam (*Macoma nasuta*) with a 28-day test period under flow-through conditions. Testing was initiated using reference and test sediments in the same manner as described for other 10-day testing, except that tests were carried out in 10-gallon glass aquaria designed to accommodate the 10

polychaetes and 35 mollusks per replicate necessary to yield the biomass required to achieve the specified detection limits. The chambers were maintained under flow-through conditions, and daily water quality measurements were taken on each chamber.

Mean percent survival of the clams and worms (summarized in Table 7) were within acceptable parameters (i.e. percent survival to supply enough tissue for follow-on tests) for the test method. The bent-nose clams (*Macoma nasuta*) exhibited 98 percent survival in the Area 1 composite, 95 percent in the Area 2 composite and the LA-5 reference sample, and 97 percent survival in the laboratory control. Polychaete worms (*Nereis virens*) showed a 98 percent survival rate in the Area 1 composite, 88 percent in the Area 2 composite, 94 percent survival in the LA-5 reference, and 98 percent in the laboratory control sediment. The same suite of chemical analyses used to test sediments was applied to the bioaccumulation tissue samples.

Table 7. Mean Percent Survival in Bioaccumulation Tests

Treatment	*Macoma nasuta*	*Nereis virens*
Laboratory Control	97	98
LA 5 Reference	98	94
Area 1 Comp	98	98
Area 2 Comp	95	88
Source: Nautilus, 2011		

Tissue from Nautilus Laboratory was shipped to Physis Environmental Laboratory for analysis. The analysis included all of the same chemical parameters tested for in the sediment analysis as per the SAP. The full suite of test results of tissue of clams and worms is included in a CD appended to this report. These tissue chemistry results are summarized as follows.

Laboratory Analysis of Metals Bioaccumulation Data

Mean metals concentrations in test sediment exposed tissues were compared with respective reference sediment exposed tissues for both clam and worm tissues; data is summarized in Tables 8 and 9. For clam tissues, exposed to Area 1 composite sediments, several metals were found at concentrations greater than those in tissues exposed to reference sediments, but only lead, mercury, and zinc were found to be elevated at levels which were statistically significant, and none were found at levels more than 34 percent higher than those in reference tissues. Tissue burdens were also examined in terms of the ratio of metals in tissues compared with those in sediments (on a dry-weight basis), and were not found to be present in ratios greater than 2.9 (for zinc) (Note: comparable ratio for reference tissues was 2.0). Lead and mercury concentration ratios did not exceed 1.0, and thus, while bioavailable, appeared not to biomagnify. It appears that zinc was the only metal to biomagnify, albeit at a similar rate to that of zinc in reference sediment and to tissue concentrations only slightly greater than that of comparable reference sediment exposed tissues (only 15 percent greater, Table 8). Tissues of clams exposed to Area 2 composite sediments did not exhibit any metals which were statistically elevated over those of reference sediment exposed tissues. (Nautilus, 2011)

For worm tissues exposed to test sediments, patterns differed from those of clam tissues. Copper was the only metal to be statistically elevated in worm tissues, and was elevated for

both Area 1 composite and Area 2 composite exposures. The magnitude of the bioaccumulation was similar (respectively 19 and 27 percent higher values in Area 1 composite and Area 2 composite sediment exposed tissues). Bioconcentration of copper was also similar between the test sites (approximately 1.7 times, Table 9). (Nautilus, 2011)

Table 8. Summary of Clam Tissue Metal Concentrations

Parameter	*Reference*	*Area 1 Comp*				*Area 2 Comp*			
	Mean ± SD	*Mean ± SD*	*Magnitude of Exceedance vs. Reference*	*Statistically Elevated? (p-value)*	*Bioconcen-tration Factor (Tissue: Sediments)*	*Mean ± SD*	*Magnitude of Exceedance vs. Reference*	*Statistically Elevated? (p-value)*	*Bioconcen-tration Factor (Tissue: Sediments)*
Arsenic (As)	2.48 ± 0.16	2.42 ± 0.30	-			2.15 ± 0.11	-		
Cadmium (Cd)	0.050 ± 0.015	0.046 ± 0.005	-			0.037 ± 0.008	-		
Chromium (Cr)	0.37 ± 0.04	0.55 ± 0.55	1.49	No		0.24 ± 0.07	-		
Copper (Cu)	2.33 ± 0.17	2.91 ± 0.90	1.26	No		2.28 ± 0.48	-		
Lead (Pb)	0.27 ± 0.02	0.37 ± 0.06	1.34	Yes (0.005)	0.7	0.26 ± 0.04	-		
Mercury (Hg)	0.006 ± 0.001	0.008 ± 0.002	1.29	Yes (0.034)	1.0	0.007 ± 0.001	1.12	No	NA
Nickel (Ni)	0.46 ± 0.04	0.35 ± 0.05	-			0.30 ± 0.04	-		
Selenium (Se)	0.24 ± 0.02	0.23 ± 0.03	-			0.21 ± 0.01	-		
Silver (Ag)	0.07 ± 0.01	0.07 ± 0.03	1.02	No		0.05± 0.01	-		
Zinc (Zn)	11.0 ± 1.3	12.7 ± 1.2	1.15	Yes (0.032)	2.9[1]	10.1 ± 1.2	-		

All data presented in milligrams per kilogram wet weight, with the exception of the Bioconcentration Factors (see text), which are presented on a dry weight/dry weight basis.
[1] Bioconcentration Factor for Reference Tissue Zinc loading = 2.1.
SD – standard deviation of the mean
Statistical differences were assessed using a one-tailed *t*-test, (α =0.05, n=5)

Table 9. Summary of Worm Tissue Metal Concentrations

Parameter	*Reference*	*Area 1 Comp*				*Area 2 Comp*			
	Mean ± SD	*Mean ± SD*	*Magnitude of Exceedance vs. Reference*	*Statistically Elevated? (p-value)*	*Bioconcen-tration Factor (Tissue: Sediments)*	*Mean ± SD*	*Magnitude of Exceedance vs. Reference*	*Statistically Elevated? (p-value)*	*Bioconcen-tration Factor (Tissue: Sediments)*
Arsenic (As)	2.28 ± 0.12	2.39 ± 0.27	1.05	No		2.40 ± 0.12	1.05	No	
Cadmium (Cd)	0.048 ± 0.004	0.040 ± 0.006	-			0.039 ± 0.003	-		
Chromium (Cr)	0.12 ± 0.13	0.09 ± 0.06	-			0.14 ± 0.04	1.22	No	
Copper (Cu)	0.93 ± 0.14	1.10 ± 0.13	1.19	Yes (0.039)	1.6	1.18 ± 0.11	1.27	Yes (0.006)	1.7
Lead (Pb)	0.25 ± 0.03	0.27 ± 0.09	1.05	No		0.21 ± 0.05	-		
Mercury (Hg)	0.007 ± 0.002	0.006 ± 0.001	-			0.005 ± 0.001	-		
Nickel (Ni)	0.13 ± 0.06	0.11 ± 0.01	-			0.14 ± 0.01	1.07	No	
Selenium (Se)	0.17 ± 0.02	0.17 ± 0.02	1.00	No		0.17 ± 0.01	1.04	No	
Silver (Ag)	0.033 ± 0.008	ND<0.0 5	-			ND<0.05	-		
Zinc (Zn)	27.2 ± 15.1	15.7 ± 8.0	0.58	No		24.9 ± 24.1	-		

All data presented in milligrams per kilogram wet weight, with the exception of the Bioconcentration Factors (see text), which are presented on a dry weight/dry weight basis.
SD – standard deviation of the mean
Statistical differences were assessed using a one-tailed *t*-test, (α =0.05, n=5)

Laboratory Analysis of Organics Bioaccumulation Data

Organic contaminants were largely absent from the tissues tested with the exception of phthalate compounds. Phthalates were observed in all tissue replicates, and were observed to be statistically higher in clam tissues from both Area 1 composite and Area 2 composite exposure treatments when compared to the reference sediment exposed tissues (Table 10). Phthalates were also elevated in worm tissues exposed to test sediments, but not at levels statistically distinguishable from reference-sediment exposed tissues.

Table 10. Summary of Tissue Organic Concentrations

Analyte Class	***Reference Mean ± SD***	***Area 1 Comp Mean ± SD***	***Area 2 Comp Mean ± SD***
Clam Tissues			
Pesticides	ND	ND	ND
PCBs	ND	ND	ND
Phenols	ND	ND	ND
Phthalates	902 ± 253	***2071 ± 368***	***2632 ± 1412***
PAHs	ND	ND	ND
Organotins	ND	ND	ND
Worm Tissues			
Pesticides	ND	ND	ND
PCBs	ND	ND	ND
Phenols	ND	ND	ND
Phthalates	208 ± 190	230 ± 114	343 ± 108
PAHs	ND	ND	ND
Organotins	ND	ND	ND

All units: micrograms per wet kilogram.
SD – standard deviation of the mean
Statistical differences were assessed using a one-tailed *t*-test, (α =0.05, n=5)
Bold Italicized values are statistically elevated compared to the mean Reference concentration.
Pesticides include the sum of Aldrin, 2,4- and 4,4- isomers of DDD, DDE, and DDT; α-, ß-, δ- and γ-BHC; chlordane (includes α - and γ - chlordane); dieldrin; endosulfan I and II; endosulfan sulfate; endrin, endrin aldehyde and ketone; heptachlor and heptachlor epoxide; methoxychlor; cis- and trans-nonachlor; and toxaphene.
PAHs includet the sum of both Low Molecular Weight PAHs (acenaphthylene; acenaphthene; anthracence; fluorene; 1- and 2-methylnaphthalene; naphthalene; and phenanthrene) and High Molecular Weight PAHs (fluoranthene; pyrene, benzo(a)anthracene; chrysene, benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; indeno(1,2,3-c,d)pyrene; dibenz(a,h)anthracene; and benzo(g,h,i)perylene).
Phthalates include the sum of bis(2-ethylhexyl) phthalate; butyl benzyl phthalate; di-n-butyl phthalate; di-n-octylphthalate; diethyl phthalate; and dimethyl phthalate.
Phenols include the sum of 2,4-dimethylphenol; 2,4,6-trichlorophenol; 2- and 2,4-dichlorophenol, 2- and 4-nitrophenol, 3/4-methylphenol; 4,6-dinitro-2-methylphenol; 2,4-dinitrophenol; and pentachlorophenol.
Organotins includes the sum of mono-, di-, tri- and tetra-butyltin.

As noted in the detailed tables included in Appendix F, the phthalate compound bis (2-ethylhexyl) phthalate was present in concentrations over an order of magnitude higher than any other phthalate compound in clam tissue samples from Areas 1 and 2 and concentrations of this compound in all Area 1 and 2 were higher than in the reference area. The mean bis (2-

ethylhexyl) phthalate concentration in the clam tissue samples were 1,964 and 2,569 ug/kg for Areas 1 and 2 and 696 ug/kg for the reference area. However, these results differ from those for phthalate concentrations in sediment where the mean sediment concentrations in Areas 1 and 2 for all phthalate compounds were lower than those detected in the reference sediments (See Table 3).

7.0 SUMMARY OF FINDINGS

The following summarizes the results of the sediment sampling and testing for the characterization of dredged material associated with the proposed Pier 180 replacement project.

Grain Size

- Field observation and laboratory analysis of the collected sediment from the two composite samples from within the proposed dredging footprint indicates that the dredge material would be comprised largely of sand and shell hash.
- Results of the physical tests show sediment from both composite samples consist of more than 86 percent sand, 10 percent silt and 2 percent clay, with trace amounts (less than 1 percent) of gravel.

Bulk Chemistry

- The following bulk chemistry tests were conducted by the contracted laboratory: trace metals, mercury, PAHs, phenols, phthalates, organochlorine pesticides, PCB congeners, organotins, TRPH, total solids, total sulfide, dissolved sulfide, ammonia and total organic carbon.
- A total of 128 constituents were analyzed and more than 100 constituents were not detected above the laboratory reporting limits in sediments from each composite sample.
- A majority of the chemicals that were detected in all three samples (including the LA-5 reference sample) were metals and phthalates.
- No organotins, PAHs, phenols and PCBs were detected above the laboratory reporting limits.
- No pesticides were detected in samples from Area 1 composite or Area 2 composite.
- Three pesticides were detected in sediment from the reference site, two of which (4,4'-DDE and DDTs) were detected at concentrations greater than the ERL levels (NOAA National Sediment Quality Guidelines)
- No other constituents were detected greater than any of the ERLs or ERM concentrations in the project sediment samples.
- For TCLP, barium and zinc were detected in sediment from the two samples at concentrations less than 1 milligram per liter. Additionally, trace amounts of arsenic were detected just above the laboratory reporting limit in sediment from Area 2 composite.
- No TCLP metals were detected greater than any of the respective RCRA standards for hazardous waste. TCLP testing is not required for ocean disposal. Characterization with respect to hazardous waste disposal criteria would be useful should upland disposal be considered.

Bioassay

- Solid phase testing showed greater than 90 percent survival in all exposures to amphipod shrimp (*Eohaustorius*) and worms (*Neanthes*).
- Suspended particulate phase testing showed greater than 90 percent survival in the lab control and all levels of exposure to fish (*Menidia*) and shrimp (*Mysidopsis*). For the bivalve larval development test, observed effects were of low magnitude: for both composite samples, the percent normal survival rate of the 100 percent exposure sample yielded a value within 20 percent of the laboratory control. Furthermore, none of the results were less than the median effect level and the limiting permissible concentration (LPC) criterion is therefore substantially met for ocean disposal.
- Bioaccumulation phase testing has yielded sufficient organism survival and tissue recovery for chemical analysis.

Chemistry Tests of Bioaccumulation Tissues

- Several metals were detected in the bioaccumulation results for the two project composite samples as well as in the reference sample. All of these detection levels were low and the project composite sample results were approximately the same as those found in the reference sample.
- Most organic contaminants were not detected with the exception of phthalate compounds that were detected in both the project composites and reference-sediment exposed tissues.

Overall

The project sediment from the proposed dredging area consists mostly of sand. Test results indicate low concentrations or the absence of contaminants in the sediments. All test results appear to suggest a regulatory conclusion that the project sediment is suitable for ocean disposal. However, the regulatory determination needs to be made by the USACE and USEPA.

8.0 REFERENCES

American Society for Testing and Materials (ASTM), 1990. Conducting 10-day Static Sediment Toxicity Tests with Marine and Estuarine Amphipods. ASTM Designation E 1367-90.

ASTM, 1967. Standard Methods for Grain-Size Analysis of Soils. American Society for Testing and Materials Designation D422-63, Part II

Environmental Protection Agency/ U.S. Army Corps of Engineers (EPA/USACE), 1991. Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual (Green Book). EPA-503/8-91/001. February.

EPA/USACE. 1998. Evaluation of Material Proposed for Discharge to Waters of the U.S. – Testing Manual (inland testing manual). EPA/823/B-98/004. Washington, D.C.: USEPA.

Nautilus Environmental, LLC (Nautilus). 2011. Pier 180 Sediment Characterization Study, Naval Base San Diego Toxicity & Bioaccumulation Testing Report. Prepared for: TEC Inc. 2496 Old Ivy Road, Suite 330 Charlottesville, VA 22905. March.

U.S. Navy, Southwest Division Naval Facilities Engineering Command (NAVFAC Southwest). 2010. Final Sampling and Analysis Plan Naval Base Point Loma Pier 180 (Navy MILCON Project P-151). Naval Base San Diego, San Diego, California. November 11.

USACE. 2007. Short-Term Fate of Dredged Material from Split Hull Barge or Hopper Dredge Model. (STFATE). Microsoft Windows Version 5.01. Access via the internet from: http://el.erdc.usace.army.mil/products.cfm?topic=model&Type=drgmat. Cited in Nautilus 2011.

USACE. 2009. Final Environmental Assessment for the San Diego Harbor Maintenance Dredging Project, San Diego, California, March

Woodward-Clyde, 1995. Geotechnical Investigation Structural Repairs/Construction and Maintenance Dredging at the Fueling Pier, Fleet and Industrial Supply Center, Point Loma, CA. Prepared for Blaylock Engineering Company. November

This page is intentionally left bank.

APPENDIX A
FIGURES

This page is intentionally left bank.

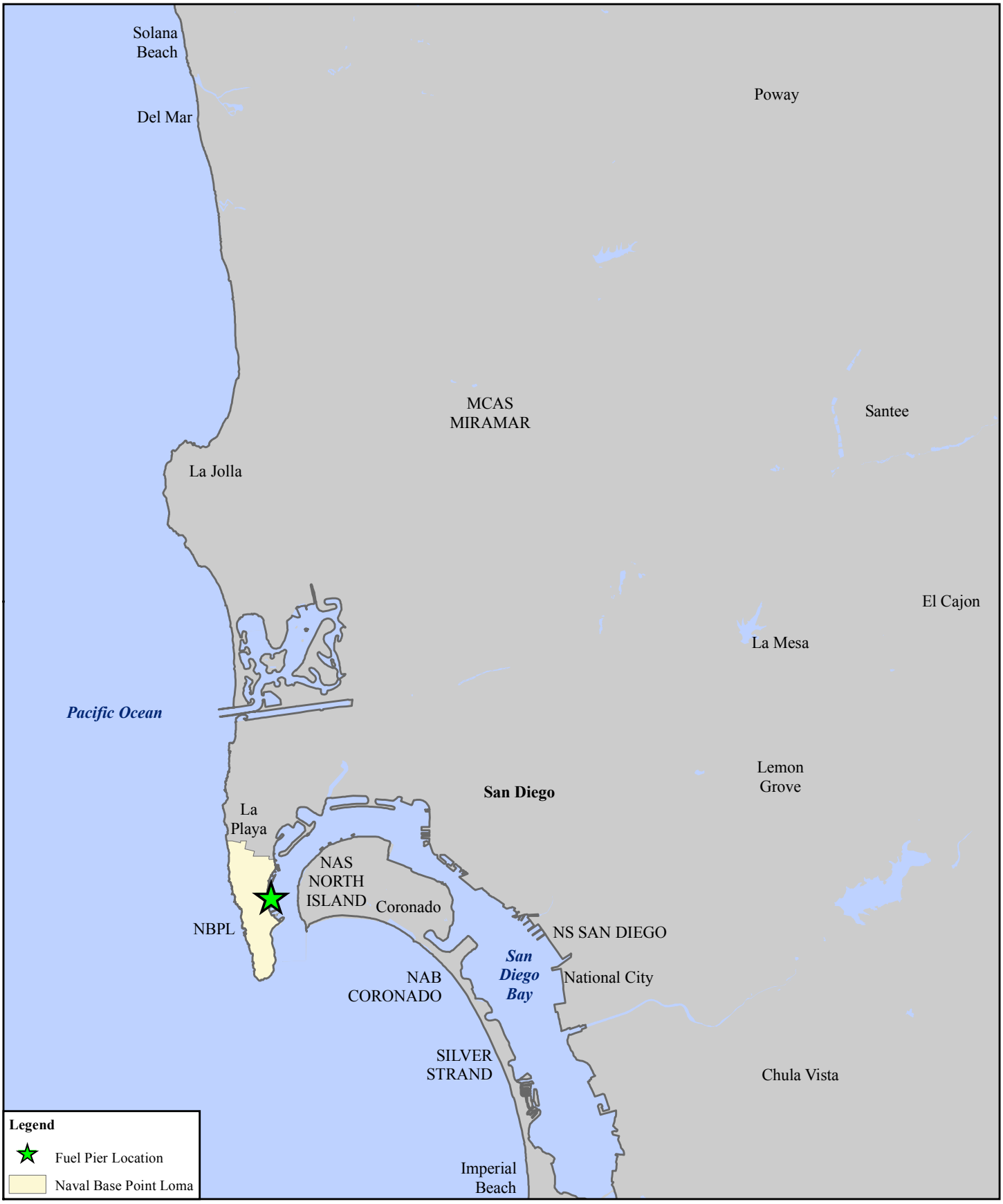
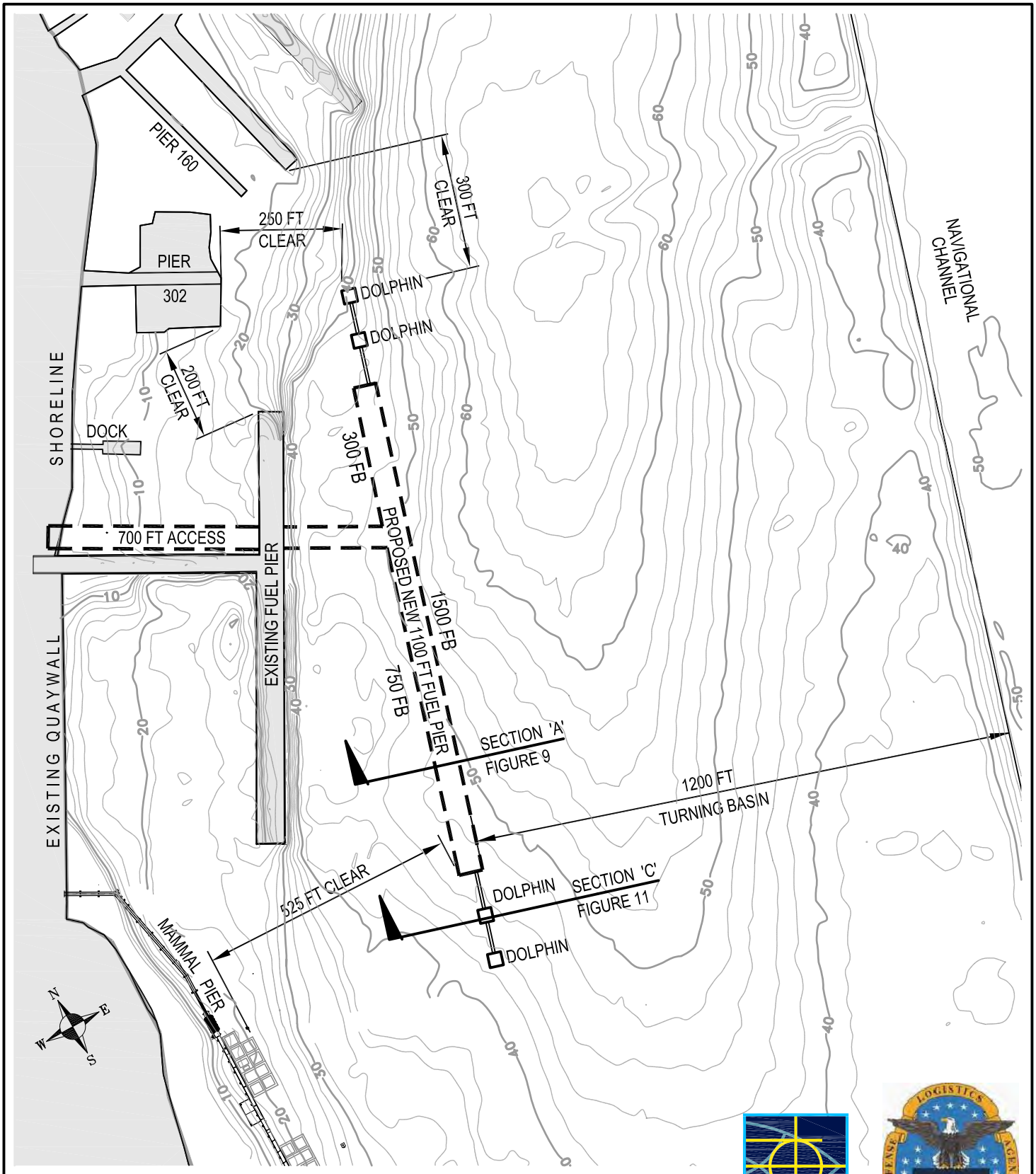


Figure 1
Regional Location - Pier 180 Replacement
Naval Base Point Loma



Figure 2
Vicinity Map
Naval Base Point Loma



ALTERNATIVE 3 - 1100 FT LONG x 50 FT WIDE PIER

2,550 FB 95,150 SF

GRAPHIC SCALE		NAVAL SUPPLY SYSTEMS COMMAND FLEET INDUSTRIAL SUPPLY CENTER SAN DIEGO, CA	
0 150 300 600 FT 1"=300'	Source: NAVFAC Southwest 2010 D-39	NAVAL BASE POINT LOMA, CA ALTERNATIVE 3 - 1100 FT x 50 FT DOUBLE DECK FUEL PIER	FIG. NO. 3



Figure 4
Sample Locations - Pier 180
Naval Base Point Loma

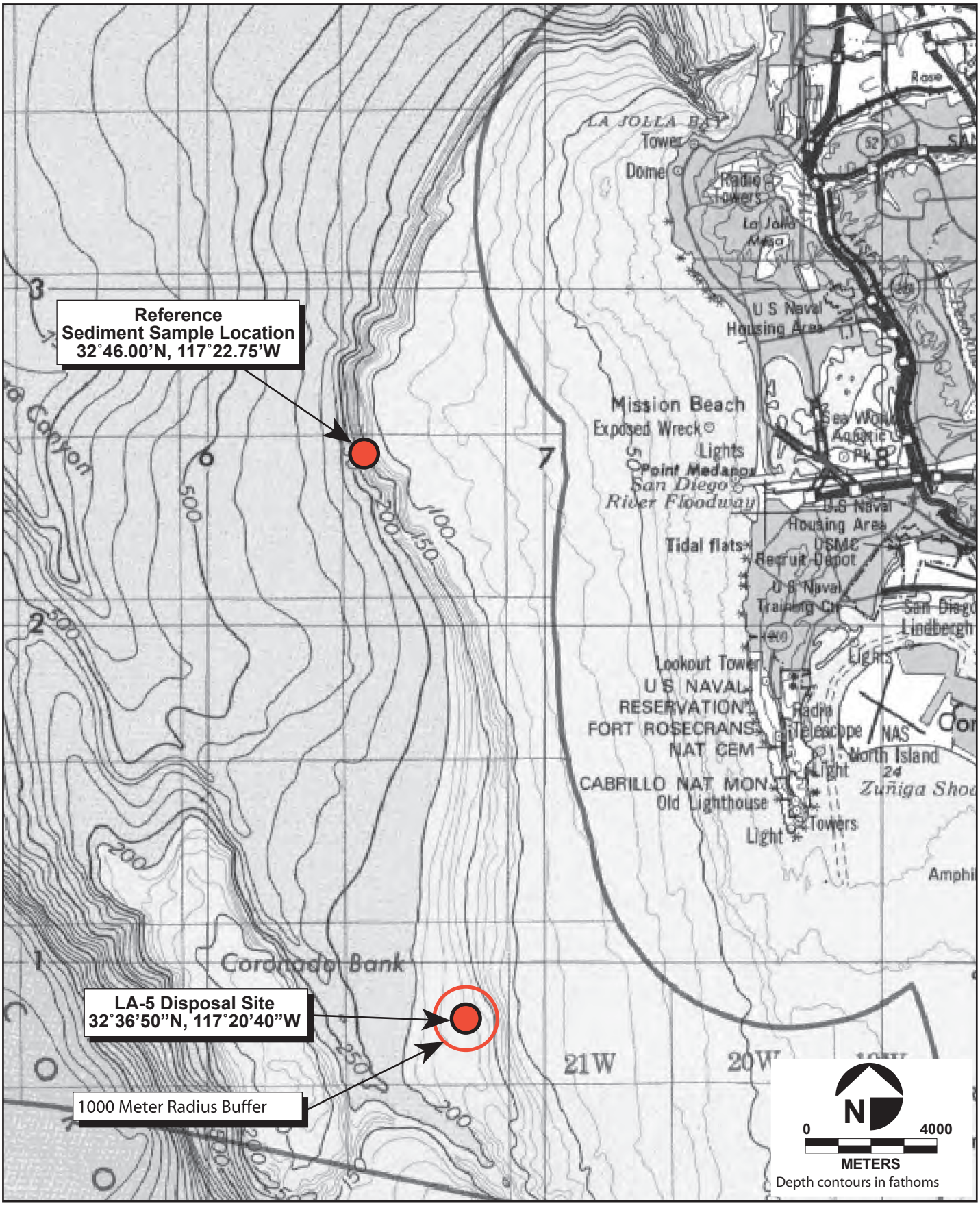


Figure 5
LA-5 Ocean Disposal Site and Reference Sediment Location
Naval Base Point Loma

Source: NAVFAC Southwest 2009

This page is intentionally left bank.

Appendix E

Marine Biological Resources

[This Page Intentionally Left Blank]

Appendix E.1

Essential Fish Habitat Assessment for NBPL Fuel Pier Replacement and Dredging (MILCON P-151)

[This Page Intentionally Left Blank]

FINAL ESSENTIAL FISH HABITAT ASSESSMENT FOR THE NAVY'S FUEL PIER REPLACEMENT PROJECT AT NAVAL BASE POINT LOMA



Prepared by:

Naval Facilities Engineering Command

For:

Naval Base Point Loma

December 2012

ACRONYMS AND ABBREVIATIONS

°ac	acre/acres
C	degree Celsius
°F	degree Fahrenheit
µPa	micro pascal
ac	acre
CFR	Code of Federal Regulations
CPS	Coastal Pelagic Species
CSLC	California State Lands Commission
dB	decibel
DFM	diesel fuel marine
DFSP	Defense Fuel Support Point
DMM	discarded military munitions
EFH	Essential Fish Habitat
FMP	Fishery Management Plan
ft	feet/foot
HAPC	Habitat Area of Particular Concern
in	inch
INRMP	Integrated Natural Resources Management Plan
km	kilometer
lf	linear feet
m	meter
mg O^2/l	milligrams oxygen per liter
MHHW	Mean Higher High Water
mi	mile
MLLW	Mean Lower Low Water
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MWR	Morale, Welfare and Recreation
NAS	Naval Air Station
NAVFACSW	Naval Facilities Engineering Command Southwest
NBPL	Naval Base Point Loma
NEPA	National Environmental Policy Act
NMAWC	Naval Mine Antisubmarine Warfare
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ODMDS	ocean dredged material disposal site
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PFMC	Pacific Fishery Management Council
POSD	Port of San Diego
ppt	parts per trillion
PSU	practical salinity unit
rms	root mean square
RWQCB	Regional Water Quality Control Board
SELcum	accumulated sound exposure level
SPAWAR	Space and Naval Warfare Systems Command
SPLpeak	peak sound pressure level
sq	square
sf	square feet
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
ZOI	zone of influence

TABLE OF CONTENTS

1 INTRODUCTION 1

2 PROPOSED ACTION 2

2.1 Introduction 2
2.2 Proposed Action 2
2.2.1 Background 2
2.3 Description of Pile Installation and Other Construction Activities 6
2.3.1 Phased Demolition and Removal of the Existing Fuel Pier 11
2.3.2 Demolition/Construction Equipment and Phasing 17
2.3.3 Phased Construction of Replacement Fuel Pier 20
2.3.4 Regulated Navigation Zones 25
2.3.5 Dredging and Sediment Disposal 25
2.4 Dates of Construction 28
2.5 Duration of Activities 28
2.5.1 Year 1 28
2.5.2 Year 2 29
2.5.3 Year 3 29

3 ESSENTIAL FISH HABITAT 30

3.1 Essential Fish Habitat Designations 30
3.1.1 San Diego Bay 30
3.1.2 Imperial Beach Nearshore Disposal Area 38
3.2 Habitat Areas of Particular Concern (HAPC) Designations 39
3.3 Descriptions of Habitats in San Diego Bay 39
3.3.1 Water Column Habitat 41
3.3.2 Sediments 43
3.3.3 Artificial Hard Substrate habitat and its Use by Fishes 48
3.3.4 Vegetated Substrate: Eelgrass habitat and Its Use 49
3.3.5 Vessel Traffic and Ambient Underwater Soundscape 54
3.4 Description of Habitats at Nearshore Disposal Area 55

4 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES 58

4.1 Impacts to Essential Fish Habitat – San Diego Bay 58
4.1.1 Underwater Acoustic Analysis 58
4.1.2 Water Column 70
4.1.3 Benthic Habitats and Communities 70
4.1.4 Marine Vegetation: eelgrass beds 72
4.2 Impacts to Essential Fish Habitat – Imperial Beach Nearshore Disposal Area 73
4.2.1 Underwater Noise from Disposal 73
4.2.2 Water Column 73
4.2.3 Benthic Habitats and Communities 73
4.3 Proposed Conservation Measures and Guidelines for EFH Protection 74

5 CONCLUSIONS 75

6 LITERATURE CITED 76

LIST OF FIGURES

2-1 Regional Location – Pier 180 Replacement, Naval Base Point Loma – Point Loma Complex 3
2-2 Project Site Map 4
2-3 Views of Existing Fuel Pier 180....5
2-4 Navy Marine Mammal Program Current and Proposed Temporary Relocation Sites .7
2-5 Limit of Potential Underwater Noise Disturbance and Proposed Temporary Relocation Sites for Navy Marine Mammal Program and Bait Barges....9
2-6 Imperial Beach Sediment Beneficial Reuse Receiver Site 10
2-7 Demolition and Construction Phasing Plan 12
2-8 Contractors' Laydown Area....16
2-9 Navigation/Construction Zone....18
2-10 Proposed New Fuel Pier and Turning Basin Dredge Footprint....21
2-11 Regulated Navigation Zones....26
3-1 Cumulative History of Dredge and Fill Activity in San Diego Bay. 44
3-2 Sediment Composition in San Diego Bay 45
3-3 Shoreline Habitats 46
3-4 Biomass, Abundance, and Species Richness at small and large piers....48
3-5 Eelgrass Beds in the Project Area 51
3-6 Eelgrass in the Vicinity of the Fuel Pier....52
3-7 Eelgrass in the Vicinity of the Proposed Temporary Marine Mammal Enclosure Relocation Site 53
4-1 Underwater Sound from Impact Pile Driving, 36-48" Steel Piles (Source = 195 dB rms) 62
4-2 Underwater Sound from Vibratory Pile Driving, 36-48" Steel Piles (Source = 180 dB rms) 63
4-3 Underwater Sound from Impact Pile Driving, 24" Concrete Piles (Source = 176 dB rms) 64
4-4 Underwater Sound from Impact Pile Driving, 16" Fiberglass-Concrete Piles (Source = 173 dB rms)....65
4-5 Underwater Sound from Impact Pile Driving at Marine Mammal Relocation Site, 18" Concrete Piles (Source = 173 dB rms)....66
4-6 Underwater Sound from Vibratory Steel Pile Extraction (Source = 172 dB rms).....67
4-7 Underwater Sound from Vibratory Non-Steel Pile Extraction (Source = 160 dB rms)68

LIST OF TABLES

2-1 Construction Phase Summary 11
2-2 Existing Fuel Pier (Pier 180) Information....13
2-3 Existing Fuel Pier (Pier 180) Piles and Caissons 14
2-4 Replacement Fuel Pier Pilings to Be Installed....22
2-5 New Pier Fueling Stations....23
2-6 Proposed Dredging Volume....27
3-1 Summary of Federally Managed Fishes Observed in Habitats of the Northern Half of San Diego Bay (from NAVFACSW 2010) 31
3-2 Federally Managed Groundfish with EFH in the Nearshore Disposal Area 38
3-3 Port of San Diego Average Annual Vessel Traffic....55
3-4 Sediment Characteristics of the Disposal Site vs. Dredging Area 56
4-1 Interim Criteria for Fish Injury and Disturbance by Underwater Sound from Pile Driving 59
4-2 Calculated ZOIs Corresponding to Interim Criteria for Fish....61

1 INTRODUCTION

As required by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), the purpose of this document is to present the findings of the Essential Fish Habitat (EFH) Assessment conducted for the United States Department of the Navy's proposed demolition and replacement of Naval Base Point Loma Pier 180 and dredging of the turning basin. The objective of this EFH Assessment is to evaluate how the actions proposed may affect EFH designated by the Pacific Fishery Management Council (PFMC) and implemented by the National Marine Fisheries Service (NMFS) within its area of influence.

The coastal waters of southern California, including San Diego Bay where the project is located, are designated as EFH for two Fishery Management Plans (FMPs): Pacific Coast Groundfish (PFMC 2011) and Coastal Pelagic Species (PFMC 1998a). For any Federal action that may adversely affect EFH, Federal agencies must provide NMFS with a written assessment of the effects of that action on EFH. An adverse effect to EFH is "any impact that reduces the quality and/or quantity of EFH" (see 50 Code of Federal Regulations [CFR] § 600.910 (a) for further clarification). The level of detail required in the assessment is commensurate with the magnitude of potential adverse effects, so an action that may only result in minor effects would only require a brief assessment. Mandatory contents of the assessment are outlined in 50 CFR 600.920.e.3. Because this project may adversely affect EFH, the U.S. Navy is required to consult with NMFS.

This assessment of EFH is being provided in conformance with the 1996 amendments to the Magnuson-Stevens Act as well as the Navy Policy Regarding Essential Fish Habitat Assessments and Consultations (Navy 2011). Species that are managed by the West Coast Groundfish and Coastal Pelagic Species FMPs and are likely to occur in the project site are considered in this assessment.

This EFH Assessment will include a description of the Proposed Action, an overview of the EFH designated within the activity area, an analysis of the direct and cumulative effects on EFH for the managed fish species and their food resources, the Navy's views regarding the effects of the proposed activity, and proposed mitigation measures selected to minimize any potential adverse effects resulting from the proposed activity.

The Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151/DESC1306) Environmental Assessment contains additional detail regarding the project's proposed activities, the affected environment, and the potential environmental effects that would result from project implementation. The San Diego Bay Integrated Natural Resources Management Plan (INRMP) (Naval Facilities Engineering Command Southwest [NAVFACSW] and Port of San Diego [POSD] 2011) also contains comprehensive descriptions of the marine environment including climate; marine geology; physical, chemical, and biological oceanography; marine habitats; and protected species in the project site.

2 PROPOSED ACTION

2.1 Introduction

Naval Base Point Loma (NBPL), California, is located on the peninsula of Point Loma near the mouth and along the northern edge of San Diego Bay (Figure 2-1). NBPL provides berthing and support services to United States (U.S.) Navy submarines and other fleet assets. The entirety of NBPL is restricted from general public access, although the adjacent waters of San Diego Bay are heavily used by the public as well as the Navy. The Proposed Action (Figure 2-2) would involve demolition of the aging and seismically deficient fuel pier (Pier 180) at NBPL; construction of a new enhanced fuel pier with optimum capability to support current and projected fueling needs of the Navy and Department of Homeland Security (DHS); performance of associated dredging, and the beneficial reuse of dredged sediments; the temporary relocation of the Navy's Marine Mammal Program to avoid potential effects of construction noise on the Navy's trained marine mammals; and the relocation of commercial bait barges to reduce potential construction noise effects on California sea lions (which are attracted to the bait barges) and on the bait fish, which are an important resource for the local fishing community. Project demolition, construction, and dredging would occur simultaneously, and would commence in 2013 and be completed in 2017. Sections 2.2 and 2.3 describe the proposed activities to be conducted in detail and impacts on federally managed fisheries and EFH.

2.2 Proposed Action

The Proposed Action has two alternatives that differ only with respect to when dredging would occur. Both alternatives would have the same impacts on EFH and hence they are not separated in this assessment.

2.2.1 Background

The existing fuel pier (Figure 2-3) serves as a fuel depot for loading and unloading tankers, U.S. Navy underway replenishment vessels that refuel ships at sea ("oilers") fueling Navy, DHS, Department of Defense (DoD), and foreign Navy vessels, as well as transferring fuel to the local replenishment vessels and other small craft operating in San Diego Bay. The fuel pier at NBPL Defense Fuel Support Point (DFSP) is critical to the mission of the Navy and is the largest active Navy fueling facility in the vicinity. More than 42 million gallons of fuel are stored at NBPL DFSP and more than 11 million gallons of fuel are issued and received every month to an average of 43 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier strike groups, National Oceanic & Atmospheric Administration (NOAA), DHS, foreign and small craft. The approach (portion that connects to shore) and north segments are over 100 years old (constructed in 1908 as La Playa Coaling Wharf). The south segment was constructed in 1942. The average design service life of this kind of structure in a marine environment is typically considered to be about 50 years (Navy 2010a). The pier, as such, is significantly past its design service life. Further, the pier does not meet current California State Lands Commission (CSLC) - Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) Level 1 (operational) and Level 2 (survival) seismic criteria (Navy 2010a, b). Because of the structural deficiencies, significant damage in a moderate earthquake is considered to be likely, with potential failure of the pile foundations occurring in a major seismic event.

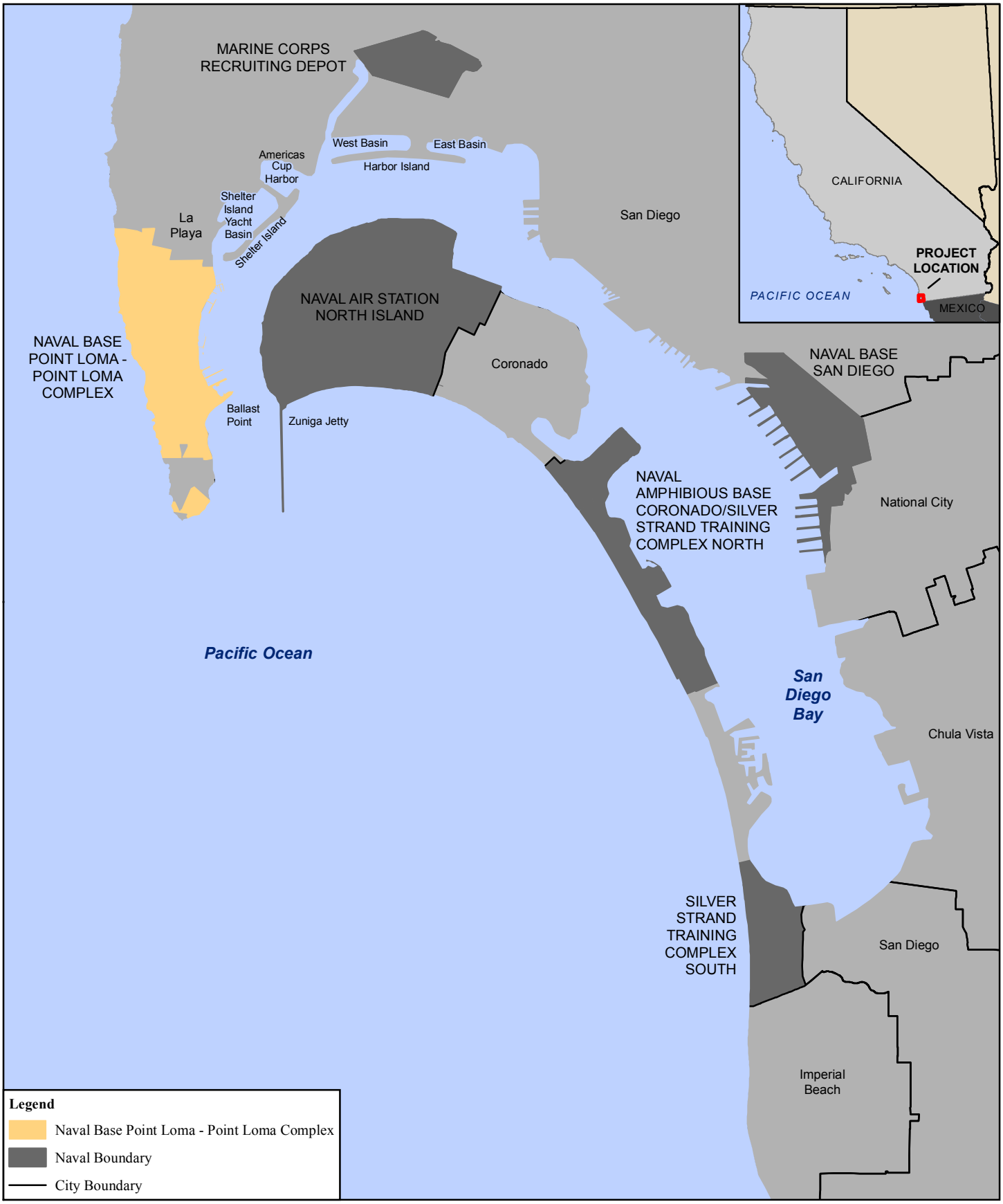
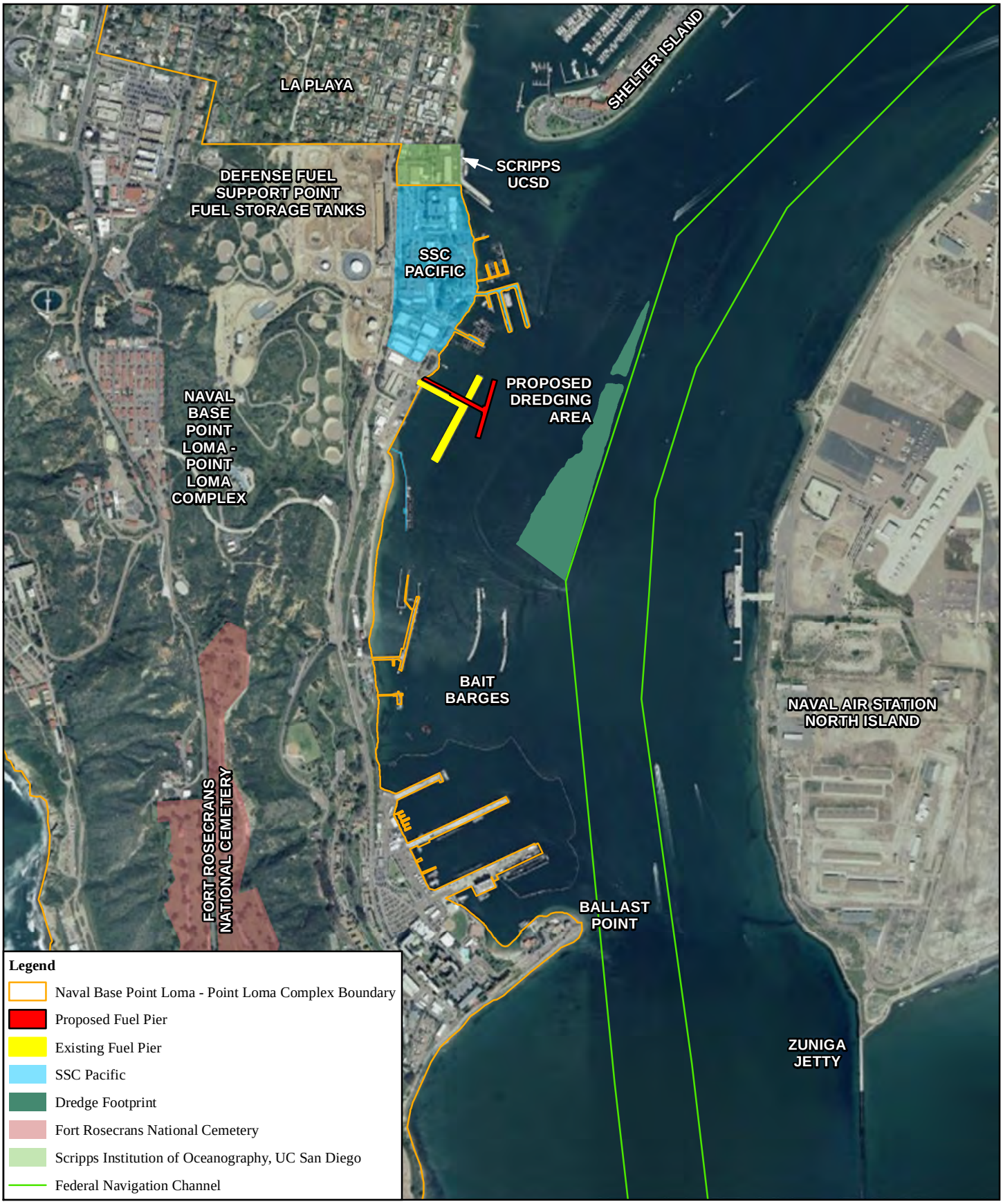


Figure 2-1
Regional Location - Pier 180 Replacement
Naval Base Point Loma - Point Loma Complex

Source: Navy, NAVFAC Southwest, and Port of San Diego 2010



Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a

Figure 2-2
Project Site Map



a) Aerial View of Existing Fuel Pier 180



b) View of Existing Fuel Pier 180 to the northeast

Figure 2-3 Views of Existing Fuel Pier 180

The State of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria. The Navy has agreed to comply with the California MOTEMS requirements for the fuel pier. However, the existing fuel pier is not consistent with the MOTEMS seismic criteria. The poor condition of the existing fuel pier has also been noted in the Navy Region Southwest (NRSW), Port Operations Shore Infrastructure Plan, dated April 2009 (Navy 2010a). Per the Defense Readiness Reporting System an overall rating of "F4" has been assigned to the existing fuel pier facility. This translates into: "Facility has deficiencies that prohibit or severely restrict use of its designated functions." The Port Operations Shore Infrastructure Plan has listed P-151 "Replace Pier 180" as a planned project affecting Port Operations for NRSW. Additionally, the existing fuel pier is situated in waters where the natural bottom depth is between 30 to 40 feet (ft) thus requiring maintenance dredging because San Diego Bay has an open hydrologic circulation system that causes infill around piers and infrastructure. Dredging occurred most recently in 1999 to keep the pier accessible for larger vessels.

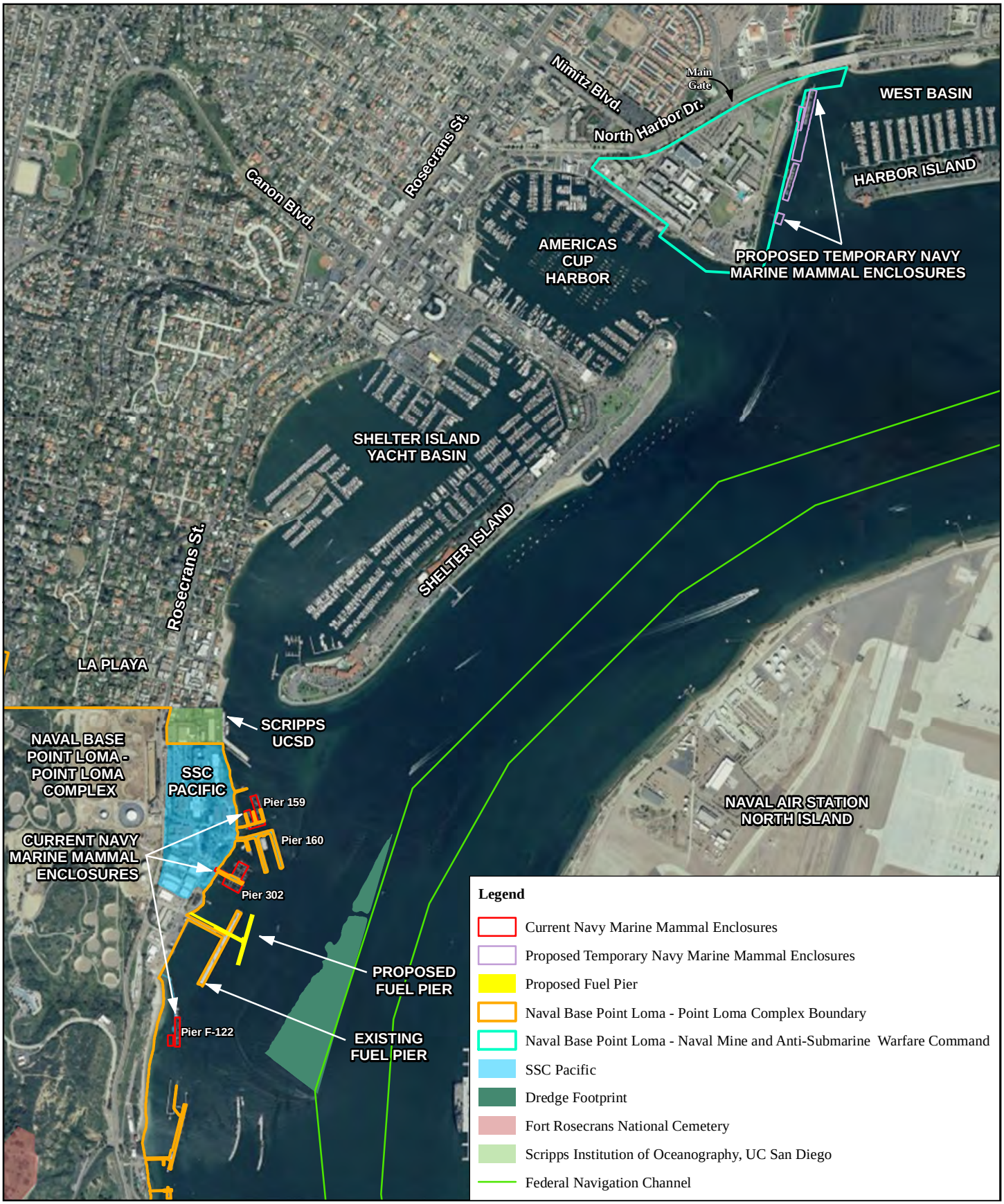
To support the fueling needs of the Navy and DHS, the NBPL DFSP must be able to provide adequate services, i.e., receive and issue fuel, to multiple ships at a time. To meet this requirement, ships and barges are received on both the inboard and outboard sides of the existing pier. The inboard south side of the pier is primarily used for fuel issues to small cutters, mine sweepers, and barges. The inboard north side is used for fueling small craft. The outboard side of the pier is currently used to issue and receive fuel from large ships, i.e., tankers, oilers, transport ships, dock landing ships, ocean going barges, and various other Navy and DHS vessels. When included with scheduling requirements, the demand of the existing pier has exceeded the facility capacity. In addition, the existing fuel pier has reached a maximum capacity for the deeper outer berth, resulting in the need to turn vessels away due to lack of available docking and mooring space.

It is anticipated that future classes of ships would generally be more multi-purpose, require more frequent fueling, and further increase the fuel capacity loading requirement for the new replacement fuel pier (Navy 2010a). The existing fuel pier lacks deep water berthing capability and is therefore limited in the range of vessels that can be accommodated (Navy 2010a).

2.3 Description of Pile Installation and Other Construction Activities

In addition to demolition and construction, which are described in more detail below, the Proposed Action would include the following key elements.

- ***Temporary Relocation of the Marine Mammal Program.*** Before the pier replacement activities begin, the Navy Marine Mammal Program, which is administered by Space and Naval Warfare Systems Command (SPAWAR) Systems Center (SSC), would be moved to the Naval Mine and Anti-submarine Warfare Command (NMAWC), (Figure 2-4). SSC's working mammals are being relocated so that they will not be affected by noise and vibrations associated with demolition/construction-related activities. The only suitable location available is at the Naval Mine and Antisubmarine Warfare Center (NMAWC), approximately 3 kilometers (km) away. In addition, NMAWC is acoustically shadowed from the piling noise. Per 10 U.S. Code (USC) 645 Section 7524, the Navy's authorization to hold marine mammals applies without regard to the provisions of the MMPA.



0 0.2 0.4 Kilometers

0 0.2 0.4 Miles

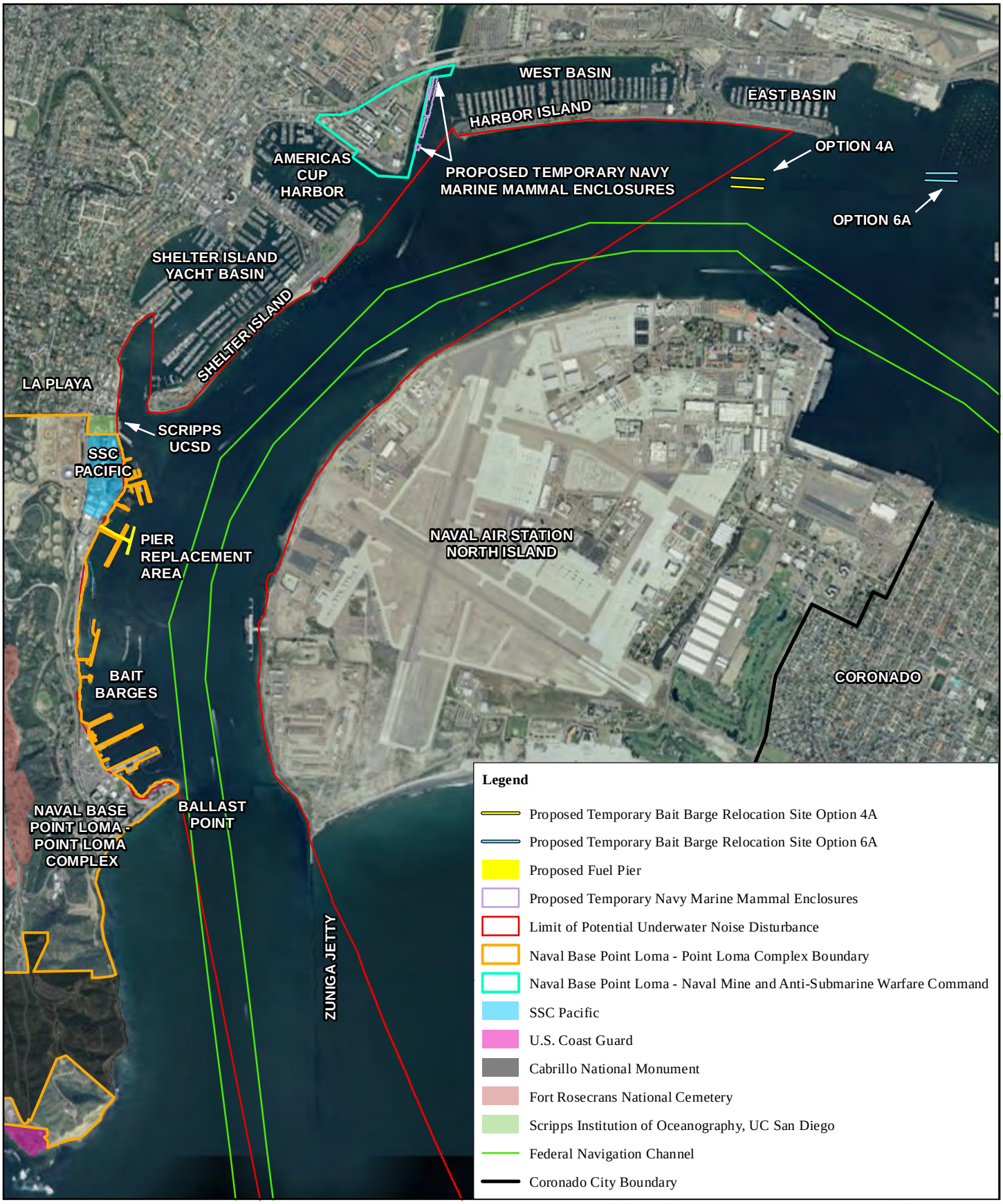
Source: NAVFAC Southwest 2011a

Figure 2-4
Navy Marine Mammal Program Current and Proposed Temporary Relocation Sites

N

Construction of the temporary facility would include driving 50 18-in square concrete piles; this component of the action is analyzed herein for potential effects on wild marine mammals. After completion of the new fuel pier the Marine Mammal Program would move back to its original location adjacent to the fuel pier, and the temporary facilities at NMAWC would be removed.

- ***Temporary Relocation of Everingham Brothers Bait Company Bait Barges.*** The Everingham Brothers Bait Company bait barges currently anchored in Navy waters approximately 600 meters (m) south of the existing fuel pier would be moved to a location to be determined along the southwest side of Harbor Island, approximately 5 kilometers (km) from the project site (Figure 2-5). The two barges attract large numbers of sea lions, and their relocation would reduce the number of sea lions that would be exposed to noise levels constituting harassment under the MMPA. Barge relocation would also avoid construction underwater noise disturbance to the bait fish, which might otherwise affect their viability. The bait barges would be moved prior to the initiation of in-water construction. There would be no in-water demolition and construction during the least tern foraging season (April 1 to September 15). It is anticipated that it would be possible for the Everingham Brothers Bait Company to move the two bait barges back to their current position south of the fuel pier on approximately April 1 and return to the selected temporary relocation site by September 15 while project activities are ongoing. The current plan is for the Everingham Brothers Bait Company to return the barges to their existing site after the proposed new pier is constructed.
- ***Regulated Navigation Zones***. The existing U.S. Coast Guard (USCG) Security Zone would be amended as needed to provide adequate security standoff distance to the east for the proposed new fuel pier alignment. A temporary Security Zone would be established to a distance of 100 ft offshore from the proposed temporary Navy marine mammal relocation site at NMAWC for the period that the Navy marine mammals are present.
- ***Dredging and Sediment Disposal***. Dredging and sediment disposal are needed to deepen a high spot in an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities. An estimated 80,000 cubic yards of sediment would be dredged. The proposed dredge footprint would be approximately 463,000 square feet/10.6 acres. Laboratory testing of the sediments confirmed the lack of contamination and they were approved for ocean disposal by the U.S. Environmental Protection Agency (USEPA) and USACE. However, the sediments also have sufficient content of sand for beneficial reuse in nearshore replenishment. Accordingly, the sediments would be transported by barge and deposited in the nearshore zone of the sediment beneficial reuse receiver site south of the Imperial Beach Pier (Figure 2-6).
- ***Notice to Mariners.*** To ensure safety of all vessels using the San Diego Bay and nearshore waters, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including temporary relocation of the Navy marine mammal enclosures and the bait barges, dredging, and sediment disposal at the receiver site at Imperial Beach.
- ***Construction Monitoring.*** Sound propagation data will be collected through hydroacoustic monitoring during pile installation and removal. The presence of marine mammals will also be monitored during pile installation and removal. The results from acoustic and marine mammal monitoring will be used to validate or refine estimates of acoustic effects as part of the Navy's compliance with the MMPA.



0 0.2 0.4
Kilometers
Miles
0 0.2 0.4

Source: NAVFAC Southwest 2011a; Navy 2007

Figure 2-5
Proposed Temporary Relocation Sites for Bait Barges

N



0 100 200
Meters
Feet
0 200 400

Source: NAVFAC Southwest 2012

Figure 2-6
Imperial Beach Sediment
Beneficial Reuse Receiver Site

N

2.3.1 Phased Demolition and Removal of the Existing Fuel Pier

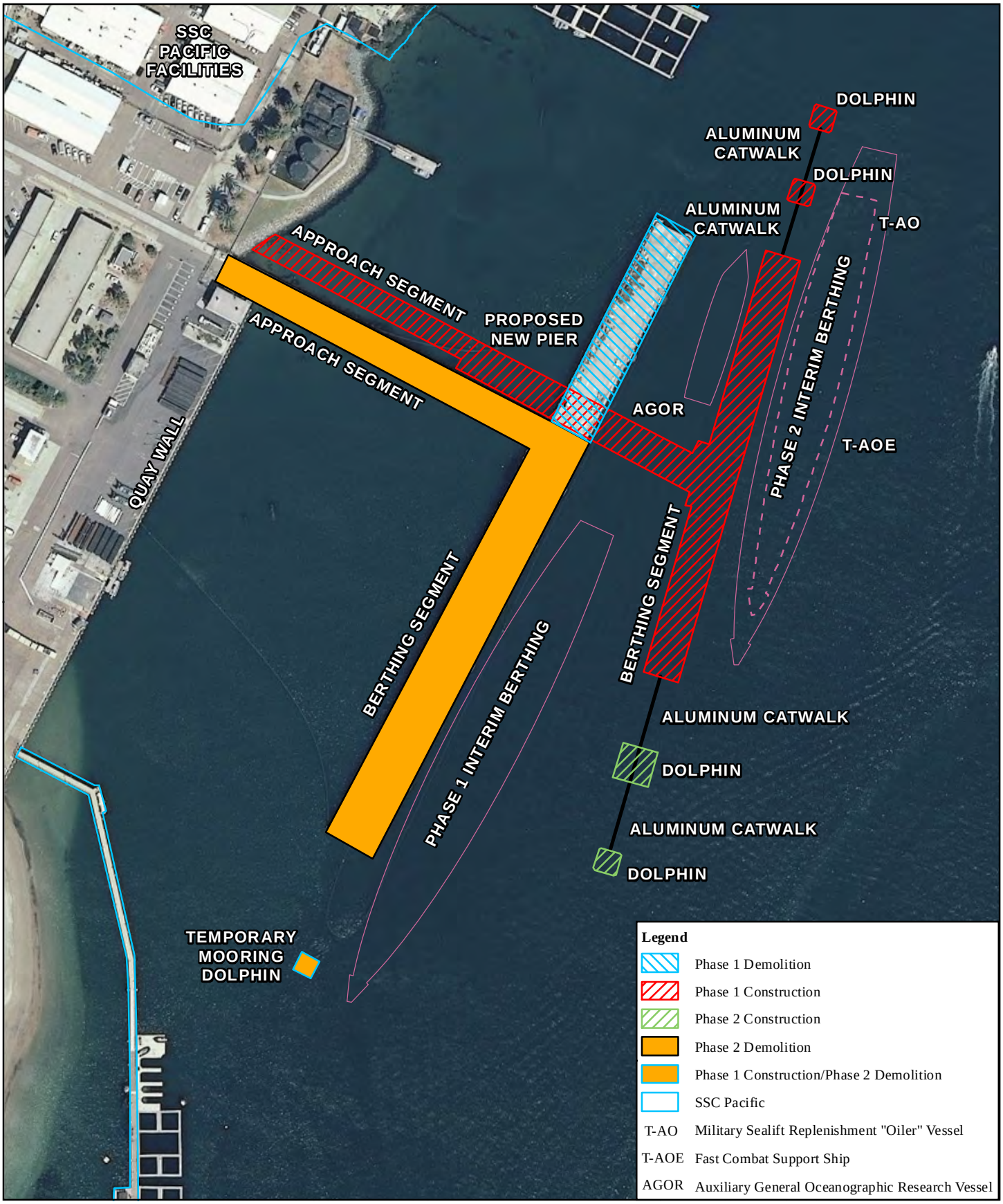
Demolition and construction would occur in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. Each of the utilities, systems and pier features would be demolished as described in this section, but on a segment-by-pier segment basis to allow for continuous fueling operations during demolition and construction. Table 2-1 below summarizes the work that would be done in each phase (refer also to Figure 2-7), and the durations of each phase. The total duration of demolition/construction is estimated to be approximately four years.

Table 2-1. Construction Phase Summary

PHASE ONE (approximately three years)	
1	Initial mobilization of equipment to the site, set up temporary office space.
2	Temporary relocation of Navy marine mammals to NMAWC.
3	Relocation of Everingham Brothers Bait Company bait barges
4	Indicator Pile Program- Drive approximately 12 piles (several of them will be 'driven' twice: once to the tip elevation and again after 48 hours to check the 'set-up' strength).
5	Construct temporary mooring dolphin south of existing fuel pier.
6	Demolish north segment of the existing fuel pier.
7	Construct abutments at landside end of approach segment for the new fuel pier.
8	Construct portions of landside utilities and relocations.
9	Construct the new pier: ramped approach pier (lower and upper deck) two northern mooring dolphins, and double deck fueling pier.
10	Connect/construct fueling lines to new pier and begin fueling at the new fuel pier.
PHASE TWO (approximately one year)	
1	Construct southern berthing dolphin and mooring dolphin.
2	Demolish remainder of existing fueling pier (approach and south segments).
3	Complete abutment construction.
4	Remove temporary mooring dolphin.
5	Complete grading, paving, and landside utility work.
6	Demobilize equipment from site, remove temporary offices

More detail is provided below only on those aspects of the project that involve in-water activity or otherwise might have the potential to result in impacts on federally managed fisheries or EFH. Other aspects of the project are considered in more detail in the Navy's Environmental Assessment. It should be noted that the NBPL DFSP bulk fuel storage tanks, pipelines, and supporting infrastructure are currently being replaced under the military construction project P-401 (Navy 2010a).

In addition to fueling vessels, NBPL DFSP supplies JP-5 (jet fuel) to Naval Air Station (NAS) North Island across San Diego Bay to the east via two underwater pipelines (Naval Facilities Engineering Command [NAVFAC] 2009). The NAS North Island pipelines are not included in the fuel pier replacement project, (Navy 2010a). However the NAS North Island pipelines are in the fuel pier replacement project area, both onshore and offshore. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the demolition and



0 25 50
Meters
Feet
0 100 200

Source: MNB 2012b

Figure 2-7
Demolition and Construction Phasing Plan

N

construction work zone footprint and would ensure that all contractors' equipment and vessels remain outside the buffer zone during demolition and construction.

The majority of the fuel pier replacement work would be conducted over water and would include removal of the pier, pilings, plastic camels and fenders. All utility infrastructure would be removed, including water and sewer pipelines, lighting systems, and wiring. The fueling systems, including piping and pipe supports would also be removed. Facility information for the existing fuel pier is included in Table 2-2.

Table 2-2. Existing Fuel Pier (Pier 180) Information

Existing Pier 180	***Pier Specifications***
Installation	Naval Base Point Loma (NBPL), San Diego, California
Activity	Defense Fuel Support Point (DFSP) NBPL
Facility Name	Fuel Pier (Pier 180)
Pier Area	71,180 square feet (sf)
Description	T-shaped fuel pier, consisting of 3 sections with concrete deck
Approach Segment	Built in 1908, Size: 34 feet (ft) x 500 ft, timber support piles, steel caissons and superstructure, plastic fender piles
North Segment	Built in 1908, Size: 50 ft x 349 ft, timber support piles, steel caissons and superstructure, plastic fender piles
South Segment	Built in 1942, Size: 60 ft x 598 ft, concrete support piles and superstructure, plastic fender piles
Function	Loading and off-loading of fuels and contaminated petroleum products
Current Ship Loading	Average: 43 ships/month
Condition of Facility	Facility is aging, is in poor condition, and is seismically deficient
Major Structural Repairs	Repairs to four undermined caissons on the Approach Pier in 1957 and two additional undermined caissons in 1987. The 1987 repairs included the installation of a submerged steel sheet pile bulkhead to prevent further undermining of the caissons.

Source: Navy 2010a.

Demolition Process

Hazardous Material Abatement. Hazardous lead paint removal and asbestos containing material abatement would be completed by licensed contractors before demolition.

Mechanical and Electrical Utilities. Shoreside, all water and sewer laterals connected to the fuel pier would be cut and capped at the mains to prevent the formation of dead-end pipes in the water and sewer systems. Underground utilities would be located before performing any drilling or excavation work at the site. All electrical and mechanical utilities would be properly terminated before demolition. Demolition of utilities under the pier would either occur with a hydraulic crane from the pier topside, or a barge mounted crane. Salvageable piping and electrical materials would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

Fueling System and Pipelines. All liquids, solids, or sludges would be evacuated from the fuel and contaminated petroleum product systems, and the systems and pipelines would be cleaned. The same procedure would be applied to the potable water and sewer lines that supply Building 140 on the fuel pier. All pipelines would then be properly terminated at the shoreline and

dismantled topside. Salvageable metal would be would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

Cleat and Bollard Bases. This work would be performed with a mini excavator with a concrete breaker. All bollards and cleats would be hauled away for recycling. This operation would occur concurrently with the removal of the pier deck.

Plastic Fendering System. This work would be performed from a barge-mounted crane. Salvageable materials from this demolition process would be loaded onto flatbed trucks and hauled away for recycling. All other materials removed from the fendering system would be sized and hauled away to an approved disposal facility. This work would occur concurrently with the hazardous material abatement.

Concrete Deck and Pier Pilings. Typical pier demolition takes place bayward to landward and from the top down. Table 2-3 below lists the types and numbers of piles to be removed. First, the fender piles and exterior appurtenances (such as utilities and the fuel piping systems) would be demolished above and below the pier deck. Then, the deck would be demolished using concrete saws and a barge-mounted excavator equipped with a hydraulic breaker. Next, structural and fender piles would be demolished.

Table 2-3. Existing Fuel Pier (Pier 180) Piles and Caissons

Pile Type or Structure	***Number***
16-inch concrete structural piles	518
14- and 24-inch concrete fender piles	105
13-inch plastic fender piles	34
16-inch steel pipe filled with concrete	24
12-inch timber piles	739
66-inch diameter concrete-filled steel caissons – approach	26
84-inch diameter concrete-filled steel caissons – north section	25
Total	**1,471**

Typically piles would be cut off at the mudline; however, the full length of the piles would be pulled at the area where the new approach segment would be constructed. An attempt would first be made to dry-pull the piles with a barge-mounted crane. A vibratory hammer or a pneumatic chipper may be used to loosen the piles. Jetting (the application of a focused stream of water under high pressure) would be another option to loosen piles that could not be removed through the previous procedures. The removal of the caissons (six ft diameter steel with 13 wood piles each [25 caissons and 325 12-in diameter wood piles total] and concrete topping) would take place outside the least tern nesting season. The caisson elements could be removed with a barge-mounted derrick crane. The crane can be used to grasp and lift large components such as caissons and piles with attachments such as wire slings or clamshell buckets (i.e., dredge buckets). When a wooden pile cannot be completely pulled out, the pile may be cut at the mudline using crane-attached hydraulic jaws and/or a diver-operated underwater chainsaw.

Once extracted, the piles would be loaded on to a support barge where they would be floated over to the quaywall. Once on shore, the debris would be crushed onsite or hauled to a concrete recycling facility. 100% of the concrete material would be recycled.

Figure 2-8 shows the location of the contractors' laydown area for materials, equipment, and concrete recycling. The contractor may also stage some equipment and materials on barges. During demolition, floating slick bar booms would be used to provide a complete barrier to floating debris. Any floating debris would be gathered in work boats and would be disposed of or recycled as appropriate.

To minimized impacts to eelgrass and minimize sediment disturbance, steel sheet pile bulkheads along the south side of the approach segment and the outboard side of the north segment would not be removed. The bulkheads protrude about 10 ft above the mudline, and preserve a remnant soil mound that lies beneath the approach pier and main pier structure (Terra Costa Consulting Group 2010). This remnant soil mound was created by dredging the bay floor adjacent to the pier (Terra Costa Consulting Group 2010). Original engineering plans for the sheet pile bulkhead indicate that it was covered in rock rip-rip (Terra Costa Consulting Group 2010).

Discarded Military Munitions (DMM)

DMM are unfired military munitions that have been abandoned, discarded, or improperly disposed of and are still capable of functioning (e.g., items found with their cartridges). DMM could be present due to historical military activities involving munitions within the San Diego Bay. However, the area to be dredged is in an area of high energy and contains course grain sand due to scouring. The dredge location is adjacent to the main channel and 250 meters from any pier or structure so the potential for any DMM is very low. .Other areas subject to new construction or dredging have been or will be assessed for DMM as necessary prior to construction to minimize risks. In the unlikely event that DMM are detected, established procedures for removal would be followed. Refer to the EA for additional discussion of this topic.

Demolition Debris

Four major types of debris would result from the demolition of the fuel pier: concrete; wood; steel; and plastic. The Proposed Action would be in accordance with the DoD Low-Impact Development Initiative requiring all demolition projects that take place after 2011 to recycle and divert materials from local landfills to the maximum extent practicable. Materials would be reused or recycled as appropriate. 100% of the concrete material would be recycled. Materials that cannot be reused or recycled would be transported to a permitted landfill. No special permits would be required for disposal of non-hazardous solid waste. Debris would not be allowed to fall into the San Diego Bay.

- Concrete debris would comprise the largest volume of demolition material, approximately 4,280 cubic yards (Navy 2010c). Concrete debris not crushed for onsite reuse would be hauled to an offsite concrete recycling facility and processed for reuse as bulk construction material such as roadway fill.
- Wood debris, comprising approximately 739 creosote-treated timber support piles would be disposed at Miramar landfill in accordance with the NRSW special waste management policy (NRSW 2007)



0 25 50
Meters
Feet
0 100 200

Source: NAVFAC Southwest 2011a

Figure 2-8
Contractors' Laydown Area

N

- Approximately 680 tons of steel debris and 4 tons of wiring (e.g., utility wires 34,000 linear feet [lf] estimated 4 ft per pound [Navy 2010c]) would also be recycled or appropriately disposed as a requirement of the demolition contract. Steel debris that could not be recycled would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill.
- Approximately 3,100 lf of plastic fender material would be removed from the fuel pier (Navy 2010c). Reuse or recycling of the plastic fenders would be determined as appropriate. Any material not suitable for reuse or recycling would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill.

2.3.2 Demolition/Construction Equipment and Phasing

There would be no in-water demolition, construction, and dredging during the least tern season (April 1 through September 15). Demolition and construction work (including pile driving) would occur between the hours of 7:00 A.M. and 4:00 P.M., Monday through Friday. Contract specifications would provide work day and hour restrictions that are consistent with City of San Diego noise ordinances.

The new fuel pier would be constructed concurrently with demolition of the existing pier. The north segment of the existing pier would be demolished first while the existing approach and south segment would remain operational. Fueling capabilities would be provided by the south segment. During the estimated construction period of approximately four years, fuel pier operations would continue with no more than 45 days total downtime. As described below, the two phases are designed with some overlap to maintain operational capability and make full use of the available construction timeframe.

To maintain continuous fueling capability, access to the existing south pier would be required as construction gets underway. Access to the new north pier would be required during later phases for both construction and fueling activities. According to engineering estimates there would be approximately 500 to 700 ft of open water between the pier construction activity and the dredging activity. Figure 2-9 shows the construction and navigation zones. In the event that construction and dredging take place concurrently, there would be sufficient space to accommodate both operations and normal nonmilitary boat traffic.

Construction and dredging activities would take place outside the San Diego Harbor navigation channel. The new fuel pier construction zone is approximately 1,200 ft from the channel. The dredge footprint, where the dredge vessels would operate, lies outside the channel. Most of the vessels involved with the project would transit the channel intermittently, with the exception of the sediment transport barges that may make more frequent trips to the nearshore dredged material beneficial reuse site.

Phase 1 – Fuel Pier Construction: Project Indicator Pile Program, Temporary Mooring Dolphin, North Segment Demolition (350 lf). A temporary mooring dolphin would be constructed to allow vessels to berth and load/unload fuel while the north segment of the existing pier is under demolition. The same pile driving equipment and barges used to construct the temporary mooring dolphin would later be used to construct the new fuel pier. Approximately 12 steel pipe indicator piles (36-inch and 48-inch diameter, exact mix to be determined later) would be driven in the new pier alignment. The purpose of the indicator piles is to verify the driving



Sources: NAVFAC Southwest 2011a; NOAA 2012

Figure 2-9
Navigation/Construction Zone

conditions and establish the final driving lengths prior to fabrication of the final production piles that would be used to construct the new pier.

The north segment would be demolished by water access using barges to provide a working area for the crane and equipment. The demolition waste would be placed on two barges and hauled offsite for processing, recycling, and disposal. Water access is preferable for the heavy equipment and demolition waste to keep the existing pier operational during the demolition phase. Access to the existing pier is necessary for laborers, trucks, and removal of pier appurtenances. Some equipment used for demolition may include: hydraulic hammers mounted to back-hoes for breaking concrete, front-end loaders, fork-lifts, concrete saws, steel cutting torches, and excavators with hydraulic thumb shears. The floating barges would be supported by tug boats and small work boats. While demolition of the north segment of the existing fuel pier is underway, the steel piles for the new pier approach segment would be fabricated offsite and transported to NBPL. Other construction equipment needed for Phase 2 would be mobilized to NBPL within this time.

Phase 1 - Approach Pier (Connection to Shore) Construction (700 lf). It is not necessary to wait for the complete demolition of the north segment to begin construction. The approach pier construction would begin after the piles have been fabricated offsite and delivered. The piles would likely be delivered by barge. The approach pier construction would require two barge-mounted cranes, one with a pile driving rig and one for constructing the pier. Two additional barges would be used to store the piles, concrete formwork, steel reinforcement, and precast concrete deck sections. The floating barges would be supported by tug boats and small work boats. Construction from shore and/or the remaining fuel pier approach segment is a possibility for a small percentage of the work. Additional equipment would include front-end loaders, fork-lifts, steel welding and cutting equipment, concrete placement and finishing equipment, concrete saws and drills, and carpentry tools for building formwork. Materials delivered by truck may include concrete, reinforcing steel, utility pipes, and other miscellaneous construction materials.

Phase 1 - North Pier Construction (600 lf) & Mooring Dolphins). The north pier would be constructed concurrently with the approach pier. The pile driving for the north pier would begin after the pile driving for the approach pier is complete, most likely using the same pile driving rig. The north pier construction would require a second barge mounted crane for the pier construction. Two additional barges and equipment would also be required as described in Phase 2. Two 14-ft MLLW mooring dolphins and connecting catwalks would also be constructed at this time.

Phase 2 – South Pier Construction (1,100 lf). The south berthing dolphin (13 ft MLLW) and mooring dolphin (14 ft MLLW) construction would begin after the approach pier, north pier, and mooring dolphins are operational. This segment would be constructed using a pile driving rig, and two barge mounted cranes. Additional barges and equipment would also be required as described in Phase 1. When the new south berthing and mooring dolphins are completed, the new pier section would be connected via walkways.

Phase 2 - South Pier and Approach Pier Demolition. The old south pier and old approach pier demolition would begin after the new south pier is operational. The temporary mooring dolphin near the north pier would also be demolished at this time, and the debris would be recycled along with the south pier demolition debris. This phase would require two barge mounted cranes to expedite the demolition of the existing pier. The other equipment used would be the same as Phase 1.

Turning Basin Dredging. Dredging for the turning basin could occur any time before, during, or shortly after the construction process. There would be no dredging during the least tern foraging season, April 1 to September 15. There is no specific intent for the Navy MMP to remain at its existing location during the dredging phase. However, under Alternative 1, should dredging take place separately from the pier replacement effort (i.e., either before or after construction and demolition), the Navy MMP could occupy its current location if the assumptions listed in Section 2.2.2 are met.

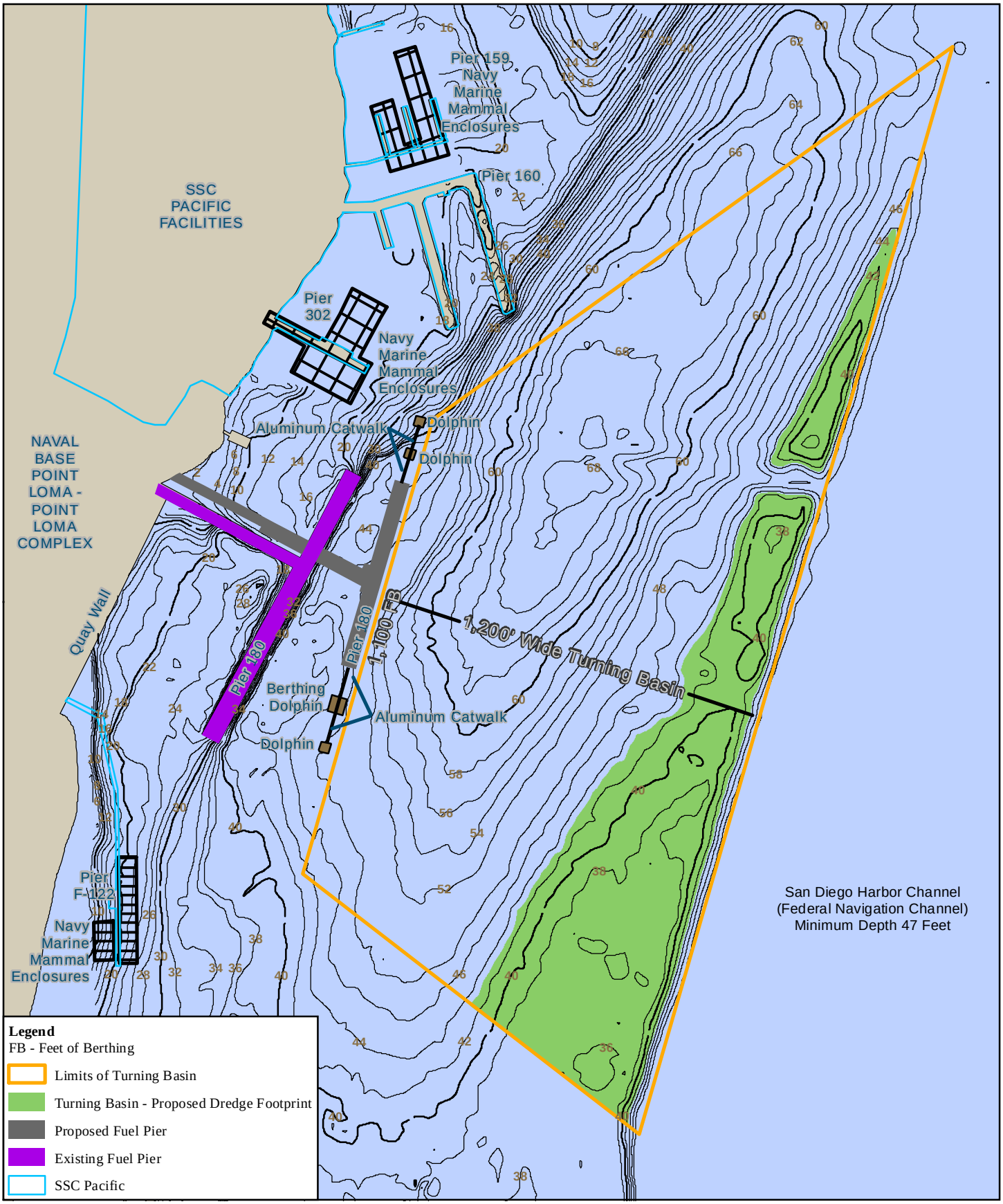
2.3.3 Phased Construction of Replacement Fuel Pier

During development of the new pier design several measures were adopted to minimize impacts to eelgrass. These measures include: pier alignment positioned to minimize eelgrass disturbance; pier extended into deeper water to minimize dredging; existing sheet piling left in place to minimize sediment and eelgrass disturbance; and use of mooring dolphins to reduce the size of new pier footprint and minimize bay shading.

Either alternative would involve construction of a new double deck fuel pier. The approach segment would be 700 ft long by 50 ft wide. The new pier approach segment would connect to shore as a single deck with a ramp leading to the upper deck of the double deck berthing segment. The berthing segment would be 605 ft long by 50 ft wide, supplemented with three mooring dolphins and one berthing dolphin to extend berthing length to 1,100 ft. The approach segment would be constructed approximately 5 ft north of the existing pier to minimize disturbance to eelgrass and to facilitate connecting the pier with pipelines to onshore Fleet Logistics Center NBPL fuel storage facilities. The new pier approach segment would be 200 ft longer than the existing pier approach segment, so the berthing segment of the new pier would stand in a deeper, previously dredged location where most of the area to be used by vessels approaching the pier already meets the minimum depth requirement of 40 ft. This placement would accommodate a wider variety of ships than is currently possible at the existing fuel pier where depths are 30 to 40 ft (Figure 2-10). No dredging would be needed alongside the pier during construction, and the need for future maintenance dredging along the pier would be reduced or eliminated. The top of the lower deck would be set at 13 ft MLLW, approximately 5 ft above extreme high tide. The new pier upper deck elevation would be 28 ft above mean lower low water (MLLW) and 20 ft above extreme high tide. The upper deck would have sufficient height needed for the pier fuel load arms to safely reach fuel transfer points on the majority of larger ships (Navy 2010a).

The 1,100 ft berthing length was chosen to provide flexibility in fueling multiple types of vessels at the proposed new fuel pier, including the TAKR (large, medium speed roll-on/roll-off ship, 951 ft long), which requires the 1,100 ft berthing length. The inner berths provide two additional berthing areas, the south and north inner berths. The south inner berth accommodates vessels up to 500 ft long and the north inner berth provides a small craft berthing area for vessels up to 400 ft long. The existing fuel pier total area is 71,180 square feet/1.63 acres (sf/ac). The total area of the new pier (including the 700 ft long approach segment and dolphins) would be 65,865 sf/1.51 ac. This would be a decrease of 5,315 sf/0.12ac of bay shading compared to the area of the existing fuel pier.

The replacement pier structure, including the mooring dolphins, would consist of steel pipe piles, supporting concrete pile caps and cast-in-place concrete deck slabs. Concrete material may be delivered from either trucks or barges. The upper 10 ft of the steel wall pipe piles would be filled



Sources: NAVFAC Southwest 2011a; NOAA 2012

Figure 2-10
Proposed New Fuel Pier and
Turning Basin Dredge Footprint

with concrete as part of the connection between the piles and the pier deck. Approximately 554 total piles would be installed. Concrete pilings are not suitable to support the double-deck pier due to the structural seismic forces, so steel structural pilings would be used. Design of the fuel pier takes into account seismic loading, vessel loading, gravity loads and functionality of the overall system. The state of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria, and the Navy has agreed to comply with the California marine oil terminal requirements for this facility. The design of the piles is governed by loading conditions that include seismic loads.

The structural analysis performed has determined that concrete piles of sizes available in southern California cannot develop sufficient strength and stiffness to withstand the design loads considering the water depth at the site, the geotechnical conditions, and with the deflection limitations needed for the fuel operations. The sizes of the steel piles are dependent on water depth, subsurface soil conditions, and the mass of the deck structure. In most areas, a 36 inch diameter steel pile is adequate to meet the criteria. In other areas, a 48 inch diameter pile is necessary.

The new steel piles would be protected from seawater corrosion with a combination of coating and cathodic protection systems with anodes (aluminum) that would require replacement approximately every 20 years. The existing sheet pile system would continue to be protected from corrosion with its existing (protected/reconnected) impressed current cathodic protection system. The service life of the entire pier structure would be 75 years.

Table 2-4 below lists the types and numbers of pilings to be installed. The project construction schedule calls for pile driving during four "windows" of opportunity that would occur in Phase 1 and Phase 2 episodes of pile driving. There would be no pile driving or other in-water construction or demolition during the least tern foraging season, from April 1 through September 15 of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to three years to complete. Pile driving would occur during normal working hours (7:00 A.M. to 4:00 P.M.). The impact pile driver would be used for all three types of piles (steel, concrete and fiberglass) The steel wall pipe piles would first be driven with a vibratory hammer for the majority of the embedment, after which each steel pile takes 30 to 120 minutes for the final driving element at a rate between 25 and 150 blows per foot for the last 10-15 ft. The concrete piles would first be jetted, and then driven the last few feet with the impact hammer. The fiberglass piles do not need to be embedded very deeply into the subsurface, so they would be driven for the entire length. Use of steel wall pipe, concrete, and fiberglass rather than creosote wood pilings would be consistent with Navy policy and is preferred by the Regional Water Quality Control Board (RWQCB) because, unlike creosote pilings, these materials are not a potential source for polycyclic aromatic hydrocarbons (PAHs) to the bay. The fender system for the pier would include foam-filled fenders at the berths and plastic log camels.

Table 2-4. Replacement Fuel Pier Pilings to Be Installed

Pile Type	***Number***
48-in diameter x 1-in steel wall pipe piles	77
36-in diameter x 1-in steel wall pipe piles	228
24-in diameter x 1-in prestressed concrete piles	165
16-in diameter concrete-filled fiberglass piles	84
Total	**554**

Source: Moffatt & Nichol – Blaylock 2012

Concrete catwalks would connect the berthing and mooring dolphins to the main pier (refer to Figure 2-10). The approach segment would be of similar construction to the berthing pier. The main pier decks would be designed for a 50 ton mobile crane, 20 ton truck load and 10 ton forklifts (5 ton forklift on the lower deck); heavy equipment would not be operated on the berthing or mooring dolphins.

There would be fueling stations on the upper and lower decks of the new fuel pier berthing segment. Each fueling station would have the capability to supply diesel fuel marine (DFM) and JP-5 turbine (jet) fuel to vessels. The upper deck would be used for offloading fuel from tankers to the tank farm and for supplying fuel to higher profile vessels. The lower deck would be used for fueling smaller profile vessels. Table 2-5 below lists the fueling stations on the two decks of the berthing segment of the new fuel pier.

Table 2-5. New Pier Fueling Stations

Deck	*Side*	*Product*	*Number of Stations*
Upper	Outboard	Fuel	4
Upper	Outboard	Lube Oil	2
Upper	Inboard	Fuel	4
Upper	Inboard	Lube Oil	1
Lower	Outboard	Fuel	4
Lower	Outboard	Lube Oil	1
Lower	Inboard	Fuel	3
Lower	Inboard	Lube Oil	0

The upper deck would also have six piping connections to receive ballast water from fleet tankers and other larger ships. An 8-inch diameter oily water pipe would be used to transfer the ballast water to the NBPL Fuel Oil Reclamation (FOR) facility. The ships could either pump directly to the oily water receipt tank at the treatment system or transfer to the smaller collection tank located on the pier. A pump at the collection tank would then transfer the oily water to the receipt tank at the treatment system.

Pier deck design is such that all rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be collected on the pier and sent to the FOR receipt tank for treatment. . The upper deck would be equipped with underflow scuppers that would permit a portion of the runoff from large storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay and also allow the "first flush" to be sent to the FOR Receipt Tank.

The pier operations would be supported by two pipelines for each fuel product and two for lube oil. There would be a 16-inch and an 8 inch pipeline for loading/unloading JP-5. For loading and unloading DFM, there would be a 16 inch and a 10 inch pipeline. There would be two 6-inch pipelines for loading lube oil. The 16 inch pipes would support the fueling stations on the outboard side while the 8 inch JP-5 and 10 inch DFM pipes would support the fueling stations on the inboard side.

The 50 ft top-of-deck width is the minimum requirement for a fuel pier per DoD Unified Facilities Criteria (UFC). The new fuel pier would provide adequate deck space on the berthing

segment by using a double deck structure to separate the fuel lines from operations on the berthing segment and provide containment for fuel pipelines and utilities. On the berthing segment the pipelines and utilities would be hung beneath the upper deck. Utilities would be in a dedicated vault separate from the pipelines. On the approach segment, fuel lines would be stacked in pipe racks running along one side of the lower deck. At the "T" juncture of the approach and berthing segments, the fuel lines' orientation would transition from horizontal along the lower deck to vertical to reach the upper deck, then horizontal again beneath the upper deck.

Concrete containment curbs would be incorporated into the pier deck design surrounding all fueling arms, fueling risers, and fuel pipes. There would be sumps in curbed containment areas in both pier decks to capture spilled fuel as well as rain water. Sumps located in the upper deck would be fitted with drains that would be piped to a collection tank on the lower deck. Sumps in the lower deck would connect to the FOR. There would be a 1.25 ft high concrete curb around the perimeter of the lower deck and 3.75 ft high concrete curb around the upper deck.

The total fuel volume of the new pier pipelines would be 49,000 gallons, an increase of 22,960 gallons (approximately 88 percent) from the existing pipeline capacity of 26,040. The dual piping configuration would allow fueling operations to take place on both sides of the pier simultaneously, and include a cross-over capability so that fuel could be transferred from one side of the pier to the other should one side shut down temporarily.

The following would all be upland work. An existing underground trench containing piping from the onshore fuel storage facilities would be extended to the pipelines on the new pier. The connection for the new pipelines would be located between 35 and 65 ft from the existing pier abutment. With the exception of some electrical duct bank work would be located in proximity to the existing pier abutment and the new pier abutment. In addition to the fuel pipelines, an 8-inch diameter fire suppression water line would be installed on the new pier and connected to the onshore potable water supply system (Navy 2010c).

The total disturbed area on shore would be less than one acre, comprising previously disturbed areas that are paved and unpaved. The paved area northwest of the existing fuel pier would be excavated (an area approximately 20 ft long, 6 ft wide, to a depth of about 5 ft) to extend the underground pipeline trench to the new pier and to install underground utilities and subsequently re-paved. The existing 12-in diameter storm water outfall located immediately north of the existing fuel pier abutment would be relocated to the north side of the new pier abutment. A portion of the landscaped area between the existing fuel pier and lube oil storage tanks would be paved as part of the new pier landside abutment. Three palm trees would be removed from the landscaped area. A new security fence with a motorized gate would be constructed at the entrance to the new pier.

After the new pier is completed, the quaywall at the entrance to the old fuel pier would be rebuilt. This work would include the placement of approximately 100 cubic yards of concrete to repair the quay wall. There would also be some grading and asphalt repairs in this area. Repairs to the quaywall would also include removal of two closed underground storage tanks (Tanks 115A and 115B).

The connection between the new and old pier abutments would be constructed by placing closely-spaced 48 inch diameter steel-pipe piles along the base of the new and existing bulkhead. The gaps between the piles would be closed by welding steel "wings" between the piles. A

concrete cap would be placed at the top of the piles to support the new pier approach and provide a continuous surface. All the work would be performed above mean higher high water. All the work would be performed above mean higher high water.

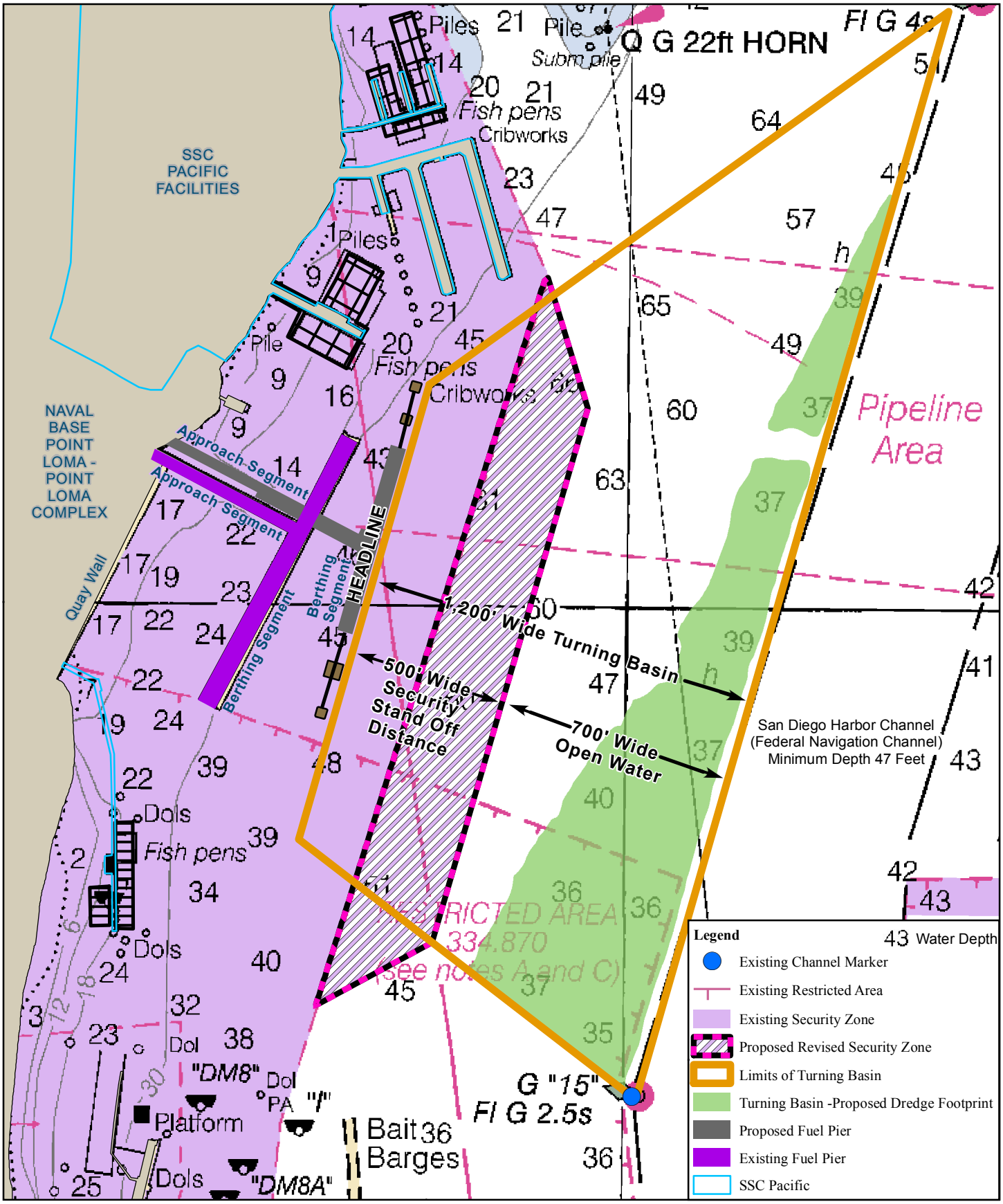
2.3.4 Regulated Navigation Zones

The approach segment of the new fuel pier from shore bayward (east) would be 700 ft long as compared with 500 ft for the existing fuel pier. The new pier berthing segment north end would be about 100 ft further east into San Diego Bay than the existing fuel pier, and the south end would be about 300 ft feet further bayward. While the new pier would not extend beyond the existing Security Zone east of the pier, there would not be sufficient security standoff distance between the new pier headline and the Security Zone boundary. The Navy Anti-Terrorism/Force Protection required standoff distance for the fuel pier is 500 ft. The Navy has coordinated with the USCG to amend the Security Zone east of the pier by 250 ft (200 ft for the additional approach length and 50 ft for the berthing pier width) to provide adequate security standoff distance of 500 ft for the proposed new fuel pier alignment. The new pier would also extend beyond Navy waters into waters that are under the jurisdiction of the California State Lands Commission (CSLC). Following completion of the National Environmental Policy Act (NEPA) process, Navy counsel would provide written notification to CSLC of the extension of Navy facilities into state waters, (NAVFAC Southwest 2010).

The Navy would also coordinate with the USCG to establish a temporary Security Zone that would extend 150 ft bayward from the temporary Navy marine mammal facilities to ensure civilian craft to do not interfere with restricted maneuverability of Navy small boats operating within immediate vicinity of Navy marine mammal enclosures (SSC Pacific 2012). . There would be approximately 320- ft of open water for civilian boat traffic to navigate between the proposed temporary Security Zone and west Harbor Island. Signs would be posted alerting vessels that entry into the temporary Security Zone is prohibited without permission of the Captain of the Port. The temporary Security Zone would be removed when the Navy marine mammal program has returned to its existing location. Regulated Navigation Zones are shown in Figure 2-11.

2.3.5 Dredging and Sediment Disposal

Vessel traffic moves in and out of San Diego Bay via the San Diego Harbor Channel (navigation channel) that is maintained at a depth of 47 ft MLLW by the USACE (Figures 2-8 and 2-9) (NOAA 2012). Large vessels approaching the fuel pier in the channel from the south (inbound) require an area of open water with sufficient depth, known as a turning basin, to safely align at the pier. The proposed new pier layout would include a minimum 1,200 ft wide turning basin between the outboard (eastern) side of the pier and the navigation channel, to provide safety for the berthing operations of the large vessels being serviced at the facility. The north and south limits of the turning basin would be bounded by the existing channel markers located to the northeast and southeast of the fuel pier (Figure 2-11). The design depth for the turning basin would be 40 ft below MLLW (38 ft vessel draft plus 2 ft under keel). An additional 2 ft of dredge depth would be included as overdredge allowance, or tolerance that could vary depending on the precision of the dredging contractors' equipment and methods. Thus, the maximum project dredge depth would be 42 ft MLLW, but the entire overdredge volume might not be recovered if the contractor is able to excavate to 40 ft with less than 2 ft of tolerance.



0 50 100
Meters
Feet
0 250 500

Figure 2-11
Regulated Navigation Zones

Sources: NAVFAC Southwest 2011a; Navy 2012b; NOAA Chart 18773 San Diego (NOAA 2012)

The majority of the existing bathymetry is deep enough to accommodate safe vessel operation. However, there is a wedge-shaped high spot adjacent to the western edge of the navigation channel where bottom depths rise from -40 to -36 ft MLLW (refer to Figure 2-10). This wedge-shaped area (approximately 463,000 sf/10.6 ac) would need to be excavated to bring it to a minimum of 40 ft MLLW. The proposed dredge footprint would be located approximately 700 ft east of the new fuel pier, as illustrated in Figure 1-8. The dredge footprint would be limited to the area shown in green on Figure 2-5. The estimated volume of dredging required is shown in Table 2-6.

Table 2-6. Proposed Dredging Volume

Site	*Design Depth (-40 ft MLLW)*	*Overdredge (2 ft)*	*Total*
Turning Basin	40,000 CY	40,000 CY	80,000 CY

Note: CY = Cubic Yards

As stated above in Section 2.3.3, underwater pipelines that supply JP-5 to NAS North Island are in the project area. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the dredge footprint and would ensure that all contractors' vessels and equipment remain outside the buffer zone during dredging operations. Sediment samples from the dredge footprint were collected in November 2010 and tested in accordance with regulations contained in Title 40 Code of Federal Regulations (CFR) Parts 220-228. The sediment characterization report is included as Appendix D of the EA. The sediment characterization report was provided to USEPA and USACE for review and comment on potential sediment disposal options. The agencies determined that the dredged material is suitable for unconfined aquatic disposal (USEPA 2011).

Depending on availability, a hopper (hydraulic) dredge or a medium size, 8-12 cy bucket, barge-mounted clamshell dredge would be used (Navy 2010d). If a clamshell dredge is used, the specific make and model of the bucket would be determined by the selected contractor and permit conditions. If a hopper dredge is used, the Navy would plan to coordinate dredging to occur after the MMP has been moved to the temporary relocation site at NMAWC. However, if availability does not permit this, the hopper dredge would be operated to minimize turbidity and maintain water quality necessary for the health and wellbeing of the Navy marine mammals.

Dredge material would be loaded into a 5,000-10,000 cy capacity barge and transported to the beneficial reuse site south of the Imperial Beach pier where it would be placed in the nearshore zone (Figure 2-6). Daily dredge production, including transport and placement at the beneficial reuse site can be assumed to be 2,000 cy. Maintaining this as an average production rate would enable up to 80,000 cy of material dredged from the turning basin to be dredged and placed at the beneficial reuse site in approximately three months (Navy 2010d). Dredging and beneficial reuse for nearshore replenishment of dredged materials would comply with USACE requirements for dredging and sediment disposal. The sediment in the proposed dredging area is classified as fine sand; as such it is similar to sediments at the beneficial reuse site (Tierra Data, Inc. 2012).

2.4 Dates of Construction

Assuming timely completion of the regulatory and NEPA processes, in-water activities would begin in September 2013, and proceed to completion in early 2017.. Pile driving, dredging, and in-water demolition that requires jetting and vibratory pile extraction would only occur between September 16 and March 31, inclusive, whereas all other construction and demolition activities could occur throughout the year.

2.5 Duration of Activities

To facilitate understanding of the project and its potential effects, a year-by-year breakdown is provided below. Year 1 starts with the first in-water construction activities on 30 September 2013; subsequent years also begin on 30 September.

2.5.1 Year 1

No work will begin on the Proposed Action until all required permits and approvals are in place. Under the Proposed Action, 604 piles will be installed, including 554 for the new pier (see Table 2-4) and 50 18-inch concrete piles to support the temporary facilities for the Navy Marine Mammal Program at NMAWC. Pile driving would occur only during daylight hours, nominally 0700-1600.

It is assumed that the contractor will drive approximately 2 steel piles per day, and 5 concrete or fiberglass piles per day. Each pile is assumed to require up to 2 hours of driving. Steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile driver. Working assumptions are 1-1.5 hours of vibratory pile driving and up to 0.5 hour of impact pile driving for each steel pile. Concrete and fiberglass piles would be jetted then driven with an impact pile driver only; sound levels are much lower for these types of piles.

The currently proposed construction schedule includes the following non-overlapping, consecutive episodes of pile driving within the first year:

- Installation of 50 18-inch square concrete piles to support the relocated facilities of the Navy Marine Mammal Program to NMAWC. Pile driving is estimated to occur on 16 days.
- Installation of steel indicator piles to occur over 17 days.
- Installation of steel temporary dolphin piles to occur over 5 days.
- Installation of 24 steel abutment piles to occur over 13 days.
- Installation of approximately 26 steel structural piles over 15 days.

Steel piles are assumed to be a mix of 36- and 48-inch diameter. As noted above, pile driving would likely occur on only a few hours of each day.

Demolition of the existing pier would occur at the rate of approximately 5 piles per day. Demolition of the north segment of the existing pier is scheduled to occur within the period of this IHA. There are no steel piles in the north segment; only 12-inch timber piles, 18- and 24-inch square concrete piles, and 13-inch diameter plastic piles. Demolition of the north segment of the pier is scheduled to occur during year 1. That activity is estimated to require 84 days, with approximately one fourth of the effort involving pile removal, a portion of which may involve the use of a vibratory extractor. During the first year, it is assumed that vibratory pile extraction could occur on up to 21 days.

2.5.2 Year 2

During the second year of construction there would be several non-overlapping episodes of pile driving, including:

- Steel structural piles for the access pier, 45 days
- Fiberglass-concrete secondary fender piles for the access pier, 10 days. Since this would occur in the same timeframe as concrete pile driving (below) – which generates louder sound – this source does not need to be modeled.
- Steel structural piles, 45 days
- Steel mooring dolphin piles, 12 days
- Concrete primary fender piles, 15 days

No in-water demolition activities are scheduled during year 2.

2.5.3 Year 3

During the third year of construction there would be several episodes of pile driving, including:

- Concrete primary fender piles, 15 days
- Fiberglass-concrete secondary fender piles, 12 days
- Steel mooring dolphin piles, 12 days
- Steel abutment piles, 10 days

The abutment piles and mooring dolphin piles would be driven within the same timeframe, over a combined 12-day period.

Demolition of the remaining structure is estimated to require 154 days, with vibratory extraction occurring on approximately ¼ of those days (39 days). It is assumed that removal of the 24 concrete-filled steel piles would require vibratory extraction on 6 of the 39 days.

3 ESSENTIAL FISH HABITAT

EFH is described as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (see 50 CFR § 600.10 for further clarification). Regional Fishery Management Councils are required to identify EFH in Fishery Management Plans pursuant by the MSFCMA [16 United States Code [USC] §180l-189ld].

The PFMC is responsible for designating EFH for all federally managed species occurring in the coastal and marine waters off the coasts of Washington, Oregon, and California, including the Puget Sound. The PFMC has designated EFH for species within the FMPs for each of the four primary fisheries that they manage: Pacific Coast Groundfish, Pacific Coast Salmon, Coastal Pelagic Species, and West Coast Fisheries for Highly Migratory Species (PFMC 1998, 2003, 2007, 2008).

In addition to designating EFH, the PMFC is also responsible for identifying Habitat Areas of Particular Concern (HAPC) for federally managed species. EFH that is considered to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, also may be identified by NMFS HAPC. For types or areas of EFH to be considered HAPC, at least one of the following must be demonstrated:

- The importance of the ecological function provided by the habitat
- The extent to which the habitat is sensitive to human-induced environmental degradation
- Whether, and to what extent, development activities are, or would be, negatively impacting the habitat type
- The rarity of the habitat

The proposed project area is within EFH and includes eelgrass habitat which has been designated HAPC by PFMC. The coastal waters of southern California, which includes San Diego Bay, are designated as EFH for two Fishery Management Plans (FMPs): Pacific Coast Groundfish (PFMC 2008) and Coastal Pelagic Species (PFMC 1998a). The PFMC has only designated HAPC for groundfish. The HAPC are seagrass, canopy kelp, rocky reef, and estuarine habitats along the Pacific coast, including Puget Sound (PFMC 2008). Two HAPC, estuarine habitats and eelgrass, a species of seagrass, are in San Diego Bay (NAVFACSW 2010).

3.1 Essential Fish Habitat Designations

3.1.1 San Diego Bay

Of the approximately 90 species of fish previously identified in San Diego Bay (Bay), nine are managed by the NMFS under two Fishery Management Plans (FMPs) - the Coastal Pelagics and Pacific Groundfish Management Plans (PFMC 1998a, 1998b, 2011). Four are managed under the Coastal Pelagics FMP: northern anchovy, pacific sardine, pacific mackerel, and jack mackerel. Five species are covered under the Pacific Groundfish FMP and occur, although not in abundance, in San Diego Bay: California scorpionfish, grass rockfish, English sole, curlfin sole, and leopard shark (NAVFACSW 2010; NAVFACSW and POSD 2011). The fish species are discussed in detail in the next subsection. Sections 3.2 and 3.3 provide detailed descriptions of the local-scale habitats utilized by the managed fish species. Ecosystem function and productivity of the habitats are summarized.

Table 3-1 is a summary of the local-scale habitats that the eight managed fishes are expected to utilize in the northern half of San Diego Bay. The data is excerpted from NAVFACSW (2010) which provides characterizations of the potential community of fishes, including the managed species, and other marine organisms at each habitat. Three natural habitats, bare mud, bare sand, and eelgrass (a designated HAPC for groundfish) are in the proposed project areas. Six habitats are man-made: riprap, marina, wharf, artificial reef, bulkhead wall, and launch ramp. Riprap, wharf, and bulkhead wall habitats are in the proposed project areas.

Highly mobile, mixed schools of pelagic finfish frequently occur under and around the fuel pier in the proposed project area. Northern anchovy and Pacific sardine move through and feed in the water column of all natural and manmade habitats within the proposed project area (Table 3-1, NAVFACSW 2010). Pacific mackerel and jack mackerel occur infrequently in the northern bay, but would be expected to occur in the water column of all habitats with the likely exception of waters along the armored shoreline (riprap and bulkhead wall).

Table 3-1. Summary of Federally Managed Fishes Observed in Habitats of the Northern Half of San Diego Bay (from NAVFACSW 2010)

Common name	*Bare sand**	*Bare mud**	*Eelgrass**	*Riprap**	*Marina*	*Wharf**	*Artificial Reef*	*Bulkhead wall**	*Launch ramp*
Coastal Pelagic Species:									
northern anchovy	x	x	x	x	x	x	x	x	x
Pacific sardine	x	x	x	x	x	x	x	x	x
Pacific mackerel	x	x	x		x	x	x	x	x
jack mackerel	x	x	x***		x	x			
Groundfish:									
curlfin sole	x	x							
English sole	x	x							
California scorpionfish			x	x	x	x	x	x	
grass rockfish			x						
leopard shark			x**						

Notes: * habitat present in the proposed project area based on maps from NAVFACSW 2010
** leopard shark observed by Hoffman 1986 referenced by Robbins 2006.
***observed in an eelgrass transplantation bed (Pondella et al.2006)

The managed groundfish species are expected to be uncommon if not rare under the fuel pier and in the other areas of project-related activities: the NMAWC marine mammal temporary relocation site, bait barge relocation site, and turning basin to be dredged. California scorpionfish is a rocky reef residing species known to occur under wharfs and other man-made hard structured habitats in north San Diego Bay (Table 3-1, NAVFACSW 2010). Similarly, grass rockfish reside in shallow rocky reef habitat in coastal waters; however, the species has not been observed around wharfs and other artificial hard structures in the north bay. Wharf habitat offer little or no crevices and ledges that rocky reef residing groundfish use as shelter. Curlfin sole and English sole, both uncommon in the bay, would be expected to utilize unvegetated soft bottom habitat (i.e., bare sand and bare mud) but have not been observed under wharves in the northern

half of the bay. Leopard shark has not been observed in the various man-made hard structured habitats in north San Diego Bay (Table 3-1, NAVFACSW 2010).

California scorpionfish, grass rockfish, and leopard shark, all uncommon in the San Diego Bay, will utilize eelgrass beds as juvenile nursery habitat and a resource for prey. The three species have been observed in the north bay. Curlfin sole and English sole are not known to occur in eelgrass beds of the north bay (Table 3-1, NAVFACSW 2010).

Coastal Pelagic Species (CPS)

The CPS fishery includes four finfish (Pacific sardine, Pacific (chub) mackerel, northern anchovy, and jack mackerel) and the invertebrate, market squid (PFMC 1998). CPS finfish are pelagic in the water column near the surface and are not associated with substrate. These fishes generally occur above the thermocline in the upper mixed layer. For the purposes of EFH, the four CPS finfish are treated as a single species complex, because of similarities in their life histories and similarities in their habitat requirements. Market squid are also treated in this same complex because they are similarly fished above spawning aggregations.

All except for market squid are likely to occur in San Diego Bay. The CPS finfish are highly transient and two, northern anchovy and Pacific sardine, can be found throughout San Diego Bay. Jack mackerel are typically only found in the north bay, in the vicinity of the project area, and Pacific mackerel are found throughout much of the bay excluding its southern portion (Allen et al. 2002).

Essential fish habitat for the CPS finfish is defined both through geographic boundaries and by sea-surface temperature ranges (PFMC 1998a). Specific EFH boundaries (i.e., the habitat necessary to provide sufficient fishery production) are based on best available scientific information and described in the Coastal Pelagics Fishery Management Plan (PFMC 1998b). The east-west geographic boundary of EFH for each individual Coastal Pelagic Species finfish and market squid is defined to be all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone (200 miles) and above the thermocline where sea surface temperatures range between 10 degrees Celsius (°C) and 26°C. The southern extend of EFH for CPS finfish is the U.S.-Mexico maritime boundary. The northern boundary of the range of CPS finfish is more dynamic and variable due to the seasonal cooling of the sea surface temperature. The northern EFH boundary is, therefore, the position of the 10°C isotherm which varies both seasonally and annually. San Diego Bay is entirely within the boundary of EFH for CPS finfish.

Aside from their value to commercial Pacific fisheries, CPS finfish species are also recognized for their importance as food for other fish, marine mammals, and birds (63 FR 13833). Marine mammals and birds regularly are seen foraging in the intertidal, shallow, and deep water habitats of San Diego Bay. Two marine mammal species, California sea lion (*Zalophus californianus californianus*) and coastal bottlenose dolphin (*Tursiops truncatus*) are known to move in and out of the north bay in search of fish prey (NAVFACSW and POSD 2011). About 40 species of migratory and resident birds have been seen in the various shallow and deep water habitats of the bay at one time or another foraging on schooling pelagic fish. CPS are considered sensitive to overfishing, the loss of habitat, reduction in water and sediment quality, and changes in marine hydrology, including entrainment through water intakes (PFMC 1998).

Following are descriptions of CPS finfish that occur in San Diego Bay which is designated EFH:

Northern anchovy (*Engraulis mordax*) are small, short-lived fish that are typically found in schools near the water's surface and are pelagic at all life stages. They are found from British Columbia to Baja California and have recently appeared in the Gulf of California. Northern anchovies are divided into northern, central, and southern sub-populations. The central subpopulation is located in the Southern California Bight, between Point Conception, California and Point Descanso, Mexico (PFMC 1998).

Anchovy grow to approximately eight inches and rarely live beyond four years. The central subpopulation is all sexually mature at age two. Anchovy spawn during every month of the year, but spawning increases in late winter and early spring (peaking from February to April). Natural mortality is thought to be M = 0.6 to 0.8 year^{-1}, which means that 45% to 55% of the total stock would die each year of natural causes if no fishing occurred (PFMC 1998).

Northern anchovy in the central subpopulation are typically found in waters that range from 12°C to 21.5°C. Anchovy eggs are most abundant at about 14°C. Spawning adults, planktonic eggs, and larvae are found near the surface, generally in waters about 14^{o}C at depths of less than 50 meters (PFMC 1998). Anchovy juveniles school near the surface over soft and hard-bottom areas, and in eelgrass, bays and estuaries (Robbins 2006).

In San Diego Bay, highly mobile schools of northern anchovy spend the majority of their time and feed in the water column in all the natural and man-made habitats of the north bay including those within the proposed project area (Table 3-1). The bay serves as a nursery area for this species; 100% of northern anchovy collected in quarterly surveys throughout the bay over a course of five years (1994-1999) were juveniles (Allen et al. 2002). Spawning primarily occurs outside of the bay, and the pelagic eggs and larvae are advected into the bay. Young-of-year northern anchovy recruit to the midwater of nearshore habitats and the channel, and abundances peak in late spring and early summer (Allen et al. 2002; Allen 1999 referenced by Robbins 2006). During this time, northern anchovy can numerically dominate the fish assemblage in the northern quadrant of the bay where the proposed project area is situated (Allen et al 2002; Pondella and Williams 2009a and 2009b).

Northern anchovy eat phytoplankton and zooplankton by either filter feeding or biting, depending on the size of the food. Northern anchovy are subject to natural predation throughout all life stages and are important forage for other species. Eggs and larvae fall prey to an assortment of invertebrate and vertebrate planktivores. As juveniles, anchovy are vulnerable to a wide variety of predators, including many recreationally and commercially important species of fish. Adult anchovy are fed upon by numerous fishes (some of which have recreational and commercial value), mammals, and birds including the endangered least tern (*Sterna albifrons browni*) which nests in the vicinity of the project area (PFMC 1998a; NAVFACSW 2010).

Pacific sardine (*Sardinops sagax*) are small schooling fish that typically grow to approximately 12 inches and may live as long as 13 years, but they are usually younger than five years old. When the population of Pacific sardine is large, it is abundant from the tip of Baja California to southeastern Alaska, and throughout the Gulf of California. Pacific sardine are highly mobile and move seasonally along the coast. Older adults may move from spawning grounds in southern California and northern Baja California to feeding grounds off the Pacific northwest and Canada. Pacific sardine is typically distributed more offshore than northern anchovy. Pacific sardine occur in estuaries, but the fish are most common in the nearshore and offshore domains along the

coast (PFMC 1998). Spawning occurs year-round peaking April through August. Eggs and larvae occur nearly everywhere adults are found and eggs are most abundant between 14°C and 15°C. Sardine spawn in loosely aggregated schools in the upper 164 ft (50 meters [m]) of the water column. The main spawning area for the historical population off the U.S. was between Point Conception and San Diego, CA, out to approximately 100 mi (160 km).

In the proposed project area, Pacific sardine, like northern anchovy, occur in highly mobile schools and feed in the water column in all the natural and man-made habitats (Table 3-1). The species is among the numerically dominant taxa during the summer and fall in the northern quadrant of the bay (Allen et al 2002; Pondella and Williams 2009a and 2009b). The bay serves as a nursery area for this species; 96% of Pacific sardine collected in quarterly surveys throughout the bay over a course of five years (1994-1999) were juveniles (Allen et al. 2002).

Pacific sardines feed on phytoplankton and zooplankton. The fish are heavily preyed upon at all life stages. Sardine eggs and larvae are consumed by an assortment of invertebrate and vertebrate planktivores including northern anchovy. Juvenile and adult sardines are consumed by a variety of predators, including commercially important fish (e.g., yellowtail, barracuda, bonito, tuna, marlin, mackerel, hake, salmon, and sharks), seabirds (pelicans, gulls, and cormorants) and marine mammals (sea lions, seals, porpoises, and whales). In all probability, sardines are forage for the same predators that prey on northern anchovy (PFMC 1998).

Pacific (chub) mackerel (*S. japonicus*) range from Mexico to southeastern Alaska. Pacific (chub) mackerel can grow to 25 in (63 centimeters [cm]) and reach 11 years old; commercially fished Pacific (chub) mackerel rarely exceed 16 in (40 cm) and are under four years old. Adults are midwater pelagic fish and migrate inshore from July to November. They are most abundant south of Point Conception, California and usually appear within 20 mi (30 km) offshore. Pacific stock spawns from Eureka, California, south to Cabo San Lucas in Baja California between 2 and 199 mi (3 to 320 km) from shore. In general, juvenile Pacific mackerel are found along open coast sandy beaches, in kelp beds, bays, and estuaries (PFMC 1998a).

In San Diego Bay, Pacific mackerel has been observed in all major natural and man-made habitats except the shallow waters over riprap (Table 3-1). This highly summer-seasonal species is far less abundant than northern anchovy or Pacific sardine in the bay, and like these two species, is most likely to occur in the northern quadrant (Allen et al. 2002). The species is likely to occur in the proposed project area.

Like sardines and anchovies, Pacific mackerel are schooling fish, and they may school with other pelagic species such as jack mackerel and sardines. Pacific mackerel feed on copepods, squid, euphausiids, and small fishes including their own larvae (Robbins 2006). They are also heavily preyed upon by a variety of fish, mammals, and sea birds.

Jack mackerel (*T. symmetricus*) are a schooling fish that range widely throughout the northeastern Pacific. They grow to about 24 in (60 cm) and can live 35 years or longer. Much of their range lies far offshore outside the 200-mile U.S. Exclusive Economic Zone.

Jack mackerel in southern California are more likely to appear on offshore banks in late spring, summer, and early fall. The spawning season for jack mackerel off California extends from February to October, with peak activity from March to July. Little is known about the maturity cycle of large fish offshore, but peak spawning appears to occur later in more northerly waters.

Small jack mackerel (up to six years of age) are most abundant in the Southern California Bight, where they are often found near the mainland coast and islands and over shallow rocky banks.

Young juvenile fish sometimes form small schools beneath floating kelp and debris in the open sea. In southern California waters, jack mackerel schools are often found over rocky banks, artificial reefs, and shallow rocky coastal areas including kelp beds. They remain near the bottom or under kelp canopies during daylight and venture into deeper surrounding areas at night.

Jack mackerel is least common among the managed pelagic finfish species in the bay (Allen et al. 2002). Jack mackerel has been observed over bare sand, bare mud, and eelgrass, in marinas and under wharves in northern San Diego Bay (Table 3-1). Jack mackerel have been observed over eelgrass only in an experimental transplanted bed located across the channel from the proposed project area (Pondella et al. 2006). The species is likely to occur in the proposed project area.

Small jack mackerel taken off southern California and northern Baja California eat large zooplankton, juvenile squid, and juvenile northern anchovy. Larvae feed almost entirely on plankton. They provide forage for a variety of fish, mammals, and sea birds. In the north bay, sea lions and coastal bottlenose dolphin opportunistically prey on this species.

Groundfish Species

The Pacific Coast Groundfish FMP manages 82 species over a large ecologically diverse area covering the entire west coast of the continental United States. Although groundfish are those fish considered demersal (fish that live on or near the seabed), they occupy diverse habitats at all stages in their life histories. EFH areas may be large because a species' pelagic eggs and larvae are widely dispersed, for example, or comparatively small as is the case with the adults of many nearshore rockfishes which show strong affinities to a particular location or type of substrate (PFMC 2008). Two marine mammal species, California sea lion (*Zalophus californianus californianus)* and coastal bottlenose dolphin (*Tursiops truncatus*) are commonly seen in the north bay and are known to opportunistically prey on groundfish (NAVFACSW and POSD 2011).

The following are descriptions of the five groundfish species that occur in San Diego Bay, although uncommon, and have designated EFH in the bay:

English sole (*Pleuronectes vetulus*) are found in water less than 985 ft (300 m) along the open coast from Baja California to the Gulf of Alaska (PFMC 1998c). English sole use nearshore coastal and estuarine waters as nursery areas. Adults and juveniles prefer soft bottoms composed of fine sands and mud, but may also occur in eelgrass habitats.

This species may reach ages in excess of 20 years. Females generally reach maturity after four years. Spawning occurs offshore in waters shallower than 330 ft (100 m), primarily during the autumn and winter, depending on the stock. Pelagic eggs and larvae are uncommon south of Point Conception (Robbins 2006). Juveniles and adults are carnivorous, feeding on polychaetes, small bivalves, clam (*Tagelus californianus*) siphons, brittlestars, and other benthic invertebrates. Both forage in intertidal areas of shallow bays and estuaries (Robbins 2006).

English sole is uncommon in the San Diego Bay, and few have been collected infrequently over bare mud and sand habitat in the northern quadrant of the bay. The species has not been observed

in eelgrass habitat in San Diego Bay (Allen et al. 2002; NAVFACSW 2010, Table 3-1).English sole is unlikely to occur in the proposed project area.

Curlfin sole (*Pleuronichthys decurrens*), also known as curlfin turbot, are found along the Pacific Coast of North America from the Bering Sea south to San Quintin, Baja California (NMFS 2007). Adults are demersal (bottom dwellers) and are associated with soft bottoms, occurring all along the west coast at depths from 125 to 1,150 ft (38 to 350 m). This species spawns from April to August and grows to a maximum size of 15 inches (37 cm). Eggs and larvae are pelagic. Curlfin sole feed primarily on polychaete worms, crustacean eggs, and brittle star fragments.

Curlfin sole is documented to occur in bare sand and bare mud habitat in northern San Diego Bay (Table 3-1, NAVFACSW 2010). However, the species is very uncommon in San Diego Bay; no specimens were collected during quarterly surveys from 1994-1999 or surveys in 2008 (Allen et al. 2002; Pondella and Williams 2009a and 2009b). Kramer (1991) conducted extensive trawl and seine surveys in San Diego County and found that curlfin sole were very uncommon nearshore along the open coast and absent from catches in San Diego Bay. The flatfish has not been found in eelgrass beds of San Diego Bay. Thus, curlfin sole is unlikely to occur in the proposed project area.

California scorpionfish (*Scorpaena guttata*) is a benthic species found from central California to the Gulf of California in depths between the inter-tidal and 555 ft (170 m). California scorpionfish is a valuable commercial fish with most of the catch taken in traps or by hook and line in shallow habitat for the live fish fishery (Leet et al. 2001). Fish are reproductively mature in 2-4 years, grow to 17 inches, and live as long as 21 years. Preferring warmer water, the species is common as far north as Santa Barbara with abundances highest off San Diego. While they are most abundant on hard bottom (such as rocky reefs, sewer pipes and wrecks), they are also found on sand (Leet et al. 2001). California scorpionfish do not appear to be territorial or have restricted home ranges. This species is active at night and feeds nocturnally on a wide variety of foods, including crabs, fishes, octopi, isopods and shrimp (Love et al. 1998).

California scorpionfish make extensive spawning migrations in late spring and early summer, when most adults move from shallow nearshore areas to 12 to 360 foot depths. Spawning occurs from April to August, peaking in June and July. Individuals likely return to the same spawning ground year after year (Love et al. 1998). Large aggregations rise up off the bottom when spawning, sometimes approaching the surface. Scorpionfish are oviparous, have external fertilization, and females produce minute eggs imbedded in the gelatinous walls of hollow, pear-shaped "egg-balloons." These paired structures, each 5 to 10 in long, are joined at their small ends. The egg masses float near the surface and the eggs hatch within five days. Very young fish live in shallow water, hidden away in habitats with dense algae and bottom-encrusting organisms (Leet et al. 2001).

California scorpionfish occur somewhat frequently in very low numbers in San Diego Bay. From 1994-1999, 37 California scorpionfish were collected in quarterly surveys in the north bay comprising less than 0.01% of the total catch throughout the bay (Allen et al. 2002). NAVFACSW (2010) indicates that California scorpionfish occurs in all manmade habitats comprised of hard structure (Table 3-1). Juvenile and adult California scorpionfish has been collected in eelgrass (a designated HAPC) and channel habitats of north and north-central San Diego Bay (Allen et al. 2002; Pondella and Williams 2009a and 2009b). Pondella et al. (2006)

reports the species was observed in an established natural eelgrass bed near Shelter Island and in experimental artificial reefs set in the north bay across the channel from the proposed project area. Thus, California scorpionfish may occur in the proposed project area in eelgrass habitat, under the pier, and on the sandy soft bottom in the turning basin.

Grass Rockfish (*Sebastes rastrelliger*) is a common, shallow-water rockfish found from Playa Maria Bay, Baja California to Yaquina Bay, Oregon, although they are most common south of southern Oregon. Among rockfishes, they have one of the shallowest and narrowest depth ranges. They are found from the intertidal zone to 184 ft, frequently less than 49 ft, and are commonly found from the intertidal to 20 ft. The species is common in nearshore rocky areas, along jetties, and in kelp. Around reef structures, adults may be found hiding in crevices (PFMC 2005). Grass rockfish have become an important component of the live-fish fishery.

Both sexes of grass rockfish begin to mature at 9 inches and are fully mature at 11 inches; these lengths correspond to ages 2 to 5 years for males and 3 to 5 years for females. Larvae are released from January to March (PFMC 2005). Grass rockfish habitat generally is restricted to rocky areas (Leet et al. 2001).

Grass rockfish are documented to occur in eelgrass beds, a designated HAPC, but not in any other habitat in the north bay (Table 3-1). Juveniles of shallow dwelling rockfish species will inhabit eelgrass habitat as shelter and resource for prey for months; however, no life history stage of this or other rockfish species is dependent on eelgrass beds. Grass rockfish is very uncommon in San Diego Bay; no specimens of this species or other rockfishes (*Sebastes* spp.) were collected in more than five years of fish surveys in eelgrass, unvegetated nearshore and channel habitats in the bay (Allen et al. 2002; Pondella et al. 2006; Pondella and Williams 2009a and 2009b). Thus, grass rockfish are unlikely to occur in the project area.

Leopard shark (*Triakis semifasciata*) are found from southern Oregon to Baja California, Mexico including the Gulf of California. The recreational leopard shark catch appears to be greater than the commercial catch, and the species does not appear to be at risk with current conservation measures managing fishing exploitation (Leet et al. 2001). They are most common in northern California bays and estuaries and along southern California beaches. They are also common in enclosed, muddy bays, and also reside in flat, sandy areas, mud flats, sandy and muddy bottoms, strewn with rocks near rocky reefs, and kelp beds (PFMC 2005). Leopard sharks are most common on or near the bottom in waters less than 13 ft deep, but have been caught as deep as 300 ft.

The maximum recorded length of a leopard shark is six ft, but most do not exceed five ft in length. Females may take 10 to 15 years to reach maturity, while males may only take 7 to 13 years. Maximum age is reported to be 30 years. Female leopard sharks give birth annually to a litter of 7 to 36 live "pups" along sandy beaches and in protected bays from about March through July (Leet et al. 2001). Leopard shark, most active at night, is a nomadic, opportunistic benthic predator that feeds on a variety of prey including worms, crabs, clams, octopus, pelagic forage fishes, and soft-bottom and reef dwelling fishes. Leopard shark can be a key predator in sandy subtidal habitat (Leet et al. 2001; NAVFACSW 2010). California sea lion, regularly seen hauled out on the bait barges near the proposed project area, will prey on leopard shark opportunistically (NAVFACSW and POSD 2011).

Leopard shark have been documented to utilize intertidal sandy beach and subtidal soft–bottom sediments (mud, sand, and silty sand), two habitat components of San Diego Bay (Hoffmann

1986 referenced by Robbins 2006). These habitats can be influenced by seasonal freshwater input, and thus are designated estuarine HAPC for this managed groundfish species (Table 3-1). The species has been collected in eelgrass beds in Richardson Bay within San Francisco Bay (http://www.tiburonaudubon.org/conserve_bay.php). In Humboldt and San Francisco Bay, females have been observed releasing their young in beds of eelgrass, while in southern California females are thought to release their pups along more open coastal areas (Carlisle and Smith 2009). No specimens were collected over six years of surveys by Allen et al. (2002) and Pondella and Williams (2009a and 2009b). Thus, leopard shark is expected to be very uncommon in San Diego Bay.

3.1.2 Imperial Beach Nearshore Disposal Area

The Imperial Beach nearshore disposal area consists of sandy bottom and loose cobble substrate, with a highly variable occurrence of kelp offshore in depths greater than about 30 ft. The waters off Imperial Beach provide EFH for the same CPS species as were discussed above for San Diego Bay. Groundfish species for which EFH is designated and which are likely to occur in the vicinity of the disposal area are listed in Table 3-2. Life history information on these species is provided in PFMC 2005.

Table 3-2. Federally Managed Groundfish with EFH in the Nearshore Disposal Area

Scientific Name	Common Name	Life Stages[1]
Squalus acanthias	spiny dogfish	A
Galeorhinus galeus	soupfin shark	J
Triakis semifasciata	leopard shark	A, J
Raja binoculata	big skate	A
Raja inornata	California skate	A, J, E
Raja rhina	longnose skate	A
Ophiodon elongates	lingcod	L
Sebastes chrysomelas	black and yellow rockfish	L
Sebastes mystinus	blue rockfish	L
Sebastes paucispinis	bocaccio	J, L
Sebastes dallii	calico rockfish	J
Sebastes pinniger	canary rockfish	J
Sebastes goodei	chilipepper	J
Sebastes carnatus	gopher rockfish	L
Sebastes rastrelliger	grass rockfish	A, J
Sebastes chlorostictus	greenspotted rockfish	J
Sebastes umbrosus	honeycomb rockfish	J
Sebastes atrovirens	kelp rockfish	A
Sebastes diploproa	splitnose rockfish	J
Sebastes saxicola	stripetail rockfish	J
Sebastes serriceps	treefish	A, J
Pleuronichthys decurrens	curlfin sole	A
Citharichthys sordidus	Pacific sanddab	A
Scorpaena guttata	California scorpionfish	A, J, L

1. *A= adult, = J = juvenile, L = larvae, E = eggs.*

Sources: Navy 2011, PFMC 2005.

3.2 Habitat Areas of Particular Concern (HAPC) Designations

Out of the four primary fisheries managed by the PFMC, HAPC has only been identified for groundfish. The four HAPC designated for these species include seagrass, canopy kelp, rocky reef, and estuarine habitats along the Pacific coast, including Puget Sound (PFMC 2008). Two of these HAPC, estuarine habitats and eelgrass, a species of seagrass, are designated in San Diego Bay (NAVFACSW 2010). In addition, canopy kelp occurs just offshore of the Imperial Beach nearshore disposal area.

Estuaries are protected nearshore areas such as bays, sounds, inlets, and river mouths, influenced by ocean and freshwater. Because of tidal cycles and freshwater runoff, salinity varies within estuaries and results in great diversity, offering freshwater, brackish and marine habitats within close proximity. Estuaries tend to be shallow, protected, nutrient rich, and are biologically productive, providing important habitat for marine organisms, including groundfish (PFMC 2005).

The inland extent of the estuary HAPC is defined as Mean High Higher Water (MHHW), or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 parts per trillion (ppt) during the period of average annual low flow. The seaward extent is an imaginary line closing the mouth of a river, bay, or sound; and to the seaward limit of wetland emergents, shrubs, or trees occurring beyond the lines closing rivers, bays, or sounds. This HAPC also includes those estuary-influenced offshore areas of continuously diluted seawater (PFMC 2011).

Southern California estuaries can be considered distinct from the more classically defined estuaries of northern California. This is due to the relatively low rainfall and reduced influence of rivers in southern estuaries. Southern estuaries, including San Diego Bay, have been termed "intermittent estuaries" because they less frequently exhibit the salt-wedge hydrologic model (Allen et al. 2006).

The seagrass HAPC includes those waters, substrate, and other biogenic features associated with eelgrass species (*Zostera* spp.), widgeongrass (*Ruppia maritima*), or surfgrass (*Phyllospadix* spp.) (PFMC 2011). The eelgrass beds are the only vegetated habitat within the proposed project area in San Diego Bay. A description of the habitat and its use by fishes is in section 3.3.4.

The canopy kelp HAPC includes those waters, substrates, and other biogenic habitats associated with canopy forming kelp species (*Macrocystis* and *Nereocystis*). Canopy kelp provides nurseries, feeding grounds, and shelter to a variety of groundfish species and their prey (PFMC 2011). Canopy kelp occurs in the waters just offshore of the Imperial Beach nearshore disposal area, but is highly variable in space and time (North and MBC Applied Environmental Sciences 2001; U.S. Army Corps of Engineers 2012).

3.3 Descriptions of Habitats in San Diego Bay

The Fuel Pier is located at the NBPL Defense Fuel Support Point, San Diego California. NBPL is located on the west side of northern San Diego Bay, directly opposite NAS North Island, and about 2 km from the mouth of the bay. The marine mammal program temporary relocation site at NMAWC is approximately 2 mi (3 km) northwest (Figure 2-4). The existing bait barge location is about ¼ mile (400 m) from the fuel pier at its closest point, whereas the temporary relocation sites are roughly 3 mi (5 km) northwest (Figure 2-5). The turning basin to be dredged is about ¼ mi (400 m) offshore of the Fuel Pier (Figure 2-2).

For management purposes, San Diego Bay is divided into four hydrodynamic-based quadrants: North Bay, the Marine Region; North-Central Bay, the Thermal Region, South-Central Bay, the Seasonally Hypersaline Region; and South Bay, the Seasonally Estuarine Region (Allen et al. 2002; Navy, 2010). The proposed project area is within the northern part of the bay (north bay).

San Diego Bay is a naturally formed embayment and is the largest estuary between San Francisco Bay and Baja California. The bay is long and narrow with a crescent shape extending in a northwest to southeast direction. The north bay is connected to the Pacific Ocean through a mouth approximately 1 km wide. The south bay is closed and without substantial tributaries. The San Diego River has been diverted from the Bay, and two small channels, the Otay River and Sweetwater River provide intermittent seasonal flows. The Otay River enters San Diego Bay at its southernmost extent and the Sweetwater River channel enters approximately 7 km to the north on the eastern shore. Freshwater input to the Bay is limited for the most part to surface runoff from urban areas (e.g., from the over 200 storm drains). For about nine months of the year, the bay receives no significant amount of fresh water. The absence of significant fresh water inflow for much of the year means that normal estuarine circulation in the bay is weak (NAVFACSW 2010). Given its proximity to the mouth of the bay and little freshwater input through much of the year; the proposed project area in the north bay is strongly influenced by the coastal marine environment outside of the bay.

San Diego Bay presently has 8,779 ac of shallow and deep water habitat. The Bay is characterized by a wide range of marine habitats including the water column, soft-bottom which predominates in the bay, eelgrass, and artificial hard substrates primarily associated with piers and jetties (NAVFACSW and POSD 2011). These habitats, discussed in sections herein, represent important breeding, nursery, and feeding areas for hundreds of fish species and their prey (NAVFACSW and POSD 2011).

San Diego Bay has experienced substantial historical degradation and loss in quantity and quality of intertidal and subtidal habitat as a result of human development. Losses of intertidal habitat have been severe; up to 90 percent of intertidal areas in the north and central San Diego Bay have been lost, partially due to the diversion of the San Diego River (NAVFACSW and POSD 2011). Intertidal areas have historically been filled with dredged material. The intertidal zone is also threatened by shoreline alteration and development such as the building of piers, docks and seabreaks, as well as the placing of riprap to slow erosion of the crumbling sandstone cliffs, which can often lead to unintended but devastating changes in sedimentation along the shoreline. Less than 16 miles of "soft" shoreline remain (NAVFACSW and POSD 2011). The entire shoreline inshore of the proposed project area is armored with riprap and a bulkhead wall.

Marine mammals and birds regularly are seen foraging in the intertidal, shallow, and deep water habitats of San Diego Bay. There are two marine mammal species, California sea lion (*Zalophus californianus californianus*) and coastal bottlenose dolphin (*Tursiops truncatus*) that are known to occur in proximity to the project site (NAVFACSW and POSD 2011). Pacific harbor seal (Phoca vitulina richardsi) are seen on only an occasional basis. These highly mobile marine mammals are opportunistic predators preying on pelagic and benthic fishes. None of the three marine mammals are listed as threatened or endangered under the Endangered Species Act. More than 300 bird species have been documented to use the bay, and about 40 of these species forage on fish in shallow and deep waters. Among these is the California least tern (*Sterna antilarium browni*), a federal and state endangered species that has been listed since 1970. Many, like the

least tern, are migratory species that seasonally utilize the resources provided by the various habitats in San Diego Bay.

This EFH assessment refers to habitat specific information in NAVFACSW (2010) to evaluate how the actions proposed may affect managed fish species and EFH designated by the PFMC. NAVFACSW (2010) provides a broad-scale, qualitative assessment of habitat classifications within San Diego Bay with a map and description of those habitats. The habitat characterization provides information on the use of dominant habitat in San Diego Bay by managed fish species and on ecosystem function and productivity generally within these habitats present in the bay. Habitats found in the project area are bare mud, bare sand, eelgrass, riprap, wharf, and bulkhead wall. Additional information about habitat use by fishes was from field surveys reported in Allen et al. (2002) and Pondella and Williams (2009a and 2009b).

3.3.1 Water Column Habitat

Stratification, Salinity, and Temperature

Southern California estuaries can be considered distinct from the more classically defined estuaries of northern California. This is due to the relatively low rainfall and reduced influence of rivers in southern estuaries. Southern estuaries have been termed "intermittent estuaries" because they less frequently exhibit the salt-wedge hydrologic model (Allen et al., 2006). Stratification, salinity, and temperature and the spatial and temporal variability of these properties in the bay have been markedly altered by water diversion, shoreline development, and dredging.

In San Diego Bay, freshwater input is now limited to surface runoff from urban areas (e.g., the over 200 storm drains and intermittent flows from several rivers and creeks after storms). For about nine months of the year, the bay receives no significant amount of fresh water. Evaporation approximately balances the freshwater input from all sources over the course of the entire year. Salinities near the bay entrance approach those of the nearby open ocean (31.2 to 31.4 practical salinity units [psu]). In contrast, south bay evaporation of 62.7 in/year and poor flushing produce salinities as high as 37 psu in late summer, decreasing to lows of 22 psu following heavy rain. The summer occurrence of hypersalinity in south bay may lead to stratified, density-driven flushing in the fall. This process moderates the build-up of hypersaline conditions in south bay (NAVFACSW and POSD 2011).

Temperature and density gradients, both with depth and along a longitudinal cross-section of the bay, drive tidal exchange of bay and ocean water beginning in the spring and continuing into fall. In the winter, thermal gradients are absent, with cooler air temperatures and higher winds causing the bay to be nearly isothermal. The average surface temperature is estimated to be 63.3 degrees Fahrenheit (°F) (17.4°C). Over the length of the bay, the maximum vertical temperature gradient is about 0.3° F/ft (0.5°C/m) during the summer. The typical longitudinal temperature range is about 45 to 50°F (7 to 10°C) (about 0.3 to 0.5°C/km) over the length of the bay during the summer (NAVFACSW and POSD 2011).

Colder, denser water moves into the bay as a front at greater depths. As described above, the importance of this stratification depends on the state of the tide, the strength of the wind, and time of year. Estimates of the tidal exchange ratio at the bay entrance (the proportion of water coming in the bay with the flood tide that is new oceanic water versus recycled bay water) range from 0.5 to 0.7 (NAVFACSW and POSD 2011).

Tidal exchange in the bay exerts control over the flushing of contaminants, transport of aquatic larvae, salt and heat balance, and residence time of water. Tidal current velocities range from 0.6 to 2.7 ft/second (0.2 to 0.8 m/second) at the mouth to much lower in central and south bay. During an average tidal cycle, the volume of water leaving the bay is about 13%. This bay water mixes with ocean water. During the next flood tide, this mix gets pulled back into the bay.

The residence time of water in the north bay where the proposed project area is located is short except for side basins where commercial and marina activities are located. In contrast, it can take from 10 to 100 days for water in the bay as a whole to be exchanged, depending on the tidal amplitude. Residence times in south bay may be months, ranging from 20 to 300 days (NAVFACSW and POSD 2011).

Ocean temperatures in the Imperial Beach area are typical of the Silver Strand coastal region and vary seasonally with minimum temperatures of approximately 57^{o}F in winter and maximum temperatures of 71^{o}F in summer. A thermocline, or rapid change in temperature with depth, occurs within water depths of 30 to 65 feet. The City of San Diego (1996) reported temperatures of 57 to 71^{o}F and 51 to 57^{o}F in surface and bottom waters, respectively, offshore from Imperial Beach during July 1995 through June 1996. (U.S. Army Corps of Engineers 2012).

Salinity in nearshore waters is generally uniform, ranging from around 33 to 34 parts-per-thousand. Seasonal decreases in salinities within nearshore, surface waters adjacent to the mouth of the Tijuana River may occur following storm-related discharges (U.S. Army Corps of Engineers 2012).

Dissolved Oxygen

Dissolved oxygen concentrations in surface waters of San Diego Bay in April and July 2008 and June 2009 ranged between about 4.5 and 6.6 milligrams oxygen per liter (mg O^2/l) (Pondella and Williams 2009a, 2009b). Dissolved oxygen concentrations in the north bay are most similar to that in coastal waters outside of the bay. Dissolved oxygen generally decreases from north to south with most of the decrease observed between the North and North-Central quadrants of the bay.

Turbidity

Natural, or ambient, turbidity comprised of both organic and inorganic suspended particles is distinguished here from turbidity caused by dredging or other human activities. Ambient turbidity varies spatially and over time, with waters of San Diego Bay becoming more turbid, or less transparent, as distance increases from the entrance. Wind and wave action cause a marked increase in turbidity during the winter and early spring in the bay. Shallow areas are more affected than deep waters. The wind is able to scour up the finer sediments of this region at that time of year. Turbidity also varies through the day with both wind and tides.

Estuarine organisms tend to be adapted to higher turbidity levels than those of the open coast. For example, the well-known paucity of suspension feeders such as tunicates, hydroids, and sponges in many estuaries may be due to clogging of the feeding apparatus with silt. The more turbid estuaries are known to have very few suspension feeding species, whereas less turbid estuaries are covered by bryozoans, tunicates, and sponges (in rocky subtidal areas) (NAVFACSW and POSD 2011).

Use of Water Column habitat by fishes

The kind of substrate in the vicinity will influence the species assemblage in the water column habitat. Furthermore, the water column properties of temperature, salinity, stratification, turbidity, dissolved oxygen, and turbidity also influences what species are likely to occur.

In San Diego Bay, the water column habitat extends over subtidal depths ranging from -2.2 (-0.7 m) to >-20 ft (-6m) MLLW. The substrates in the water column habitat differ with depth and location in the bay, and include mud, sand, and man-made hard structure. In general, coastal pelagic fishes numerically dominated the catches of surveys conducted over 5 years in San Diego Bay (Allen et al. 2002). Together, northern anchovy and Pacific sardine (two managed species) and topsmelt (*Atherinops affinis*), slough anchovy (*Anchoa delicateissima*) and California grunion (*Leuresthes tenuis*) across all habitats comprised 95% of the total fish collected in the northern quadrant of San Diego Bay. In contrast, the slough anchovy, an indigenous estuarine species that utilizes the bay throughout its life history, was most abundant in the southernmost quadrant and decreased in abundance further north toward the mouth of the bay.

In the vicinity of the Imperial Beach Receiver Site, the open-coast habitat includes the high energy surf zone and shallow nearshore areas dominated by sand and low lying (< 6.0 feet) rocky reef and cobble (Navy 2011). Small kelp beds are generally restricted to the rocky areas within the photic zone (depths of 20 to 60 feet) (North and MBC 2001, USIBWC 1998).

The water column habitat is an important nursery area for coastal pelagic fishes: juvenile represented 100% of the northern anchovy catch in San Diego Bay, 96% of the Pacific sardine, 73% of topsmelt, 66% of California grunion, and 43% of slough anchovy (Allen et al. 2002). These pelagic fish species are forage for other fishes, marine mammals, and birds. Two marine mammal species, California sea lion and coastal bottlenose dolphin, regularly occur in the north bay. California least terns forage in waters less than 60 feet deep.

3.3.2 Sediments

Physical and Chemical Properties of Sediments

Historically, the bay floor and margins were characterized by sand, silt, clay, mud (silt and clay less than 62 microns in diameter), and mudstone. Sands were most common at the mouth and along the western margins, while finer mud deposits characterized the eastern margins and southern extremity of the bay. The mud sits upon layers of sand and sandy-silt, then on older semi-consolidated sediments. Dredging exposes these sandier layers. Only 17 to 18% of the original bay floor remains undisturbed by dredge or fill. Figure 3-1 shows the cumulative history of dredge and fill activity. The diversion of the San Diego River and the damming of the Sweetwater and Otay Rivers has significantly reduced natural sedimentation sources into the bay. Present contribution of sediment from all potential sources is minimal (NAVFACSW and POSD 2011).

As a result, the bay's sediment composition and distribution is highly altered. Figure 3-2 shows the present pattern of fine sediments (as represented by percent silt and clay) on the bay floor (compiled by Space and Naval Warfare Systems Command [SPAWAR] from several sources). Such characteristics of the bay's sediment can help explain the distribution and abundance of organisms that are closely tied to substrate. Reflecting the present hydrodynamic regimes, grain



0 0.25 0.5
Kilometers
Miles
0 0.25 0.5

Source: NAVFAC Southwest and POSD 2011

Figure 3-1
Cumulative History of Dredge and Fill Activity in San Diego Bay

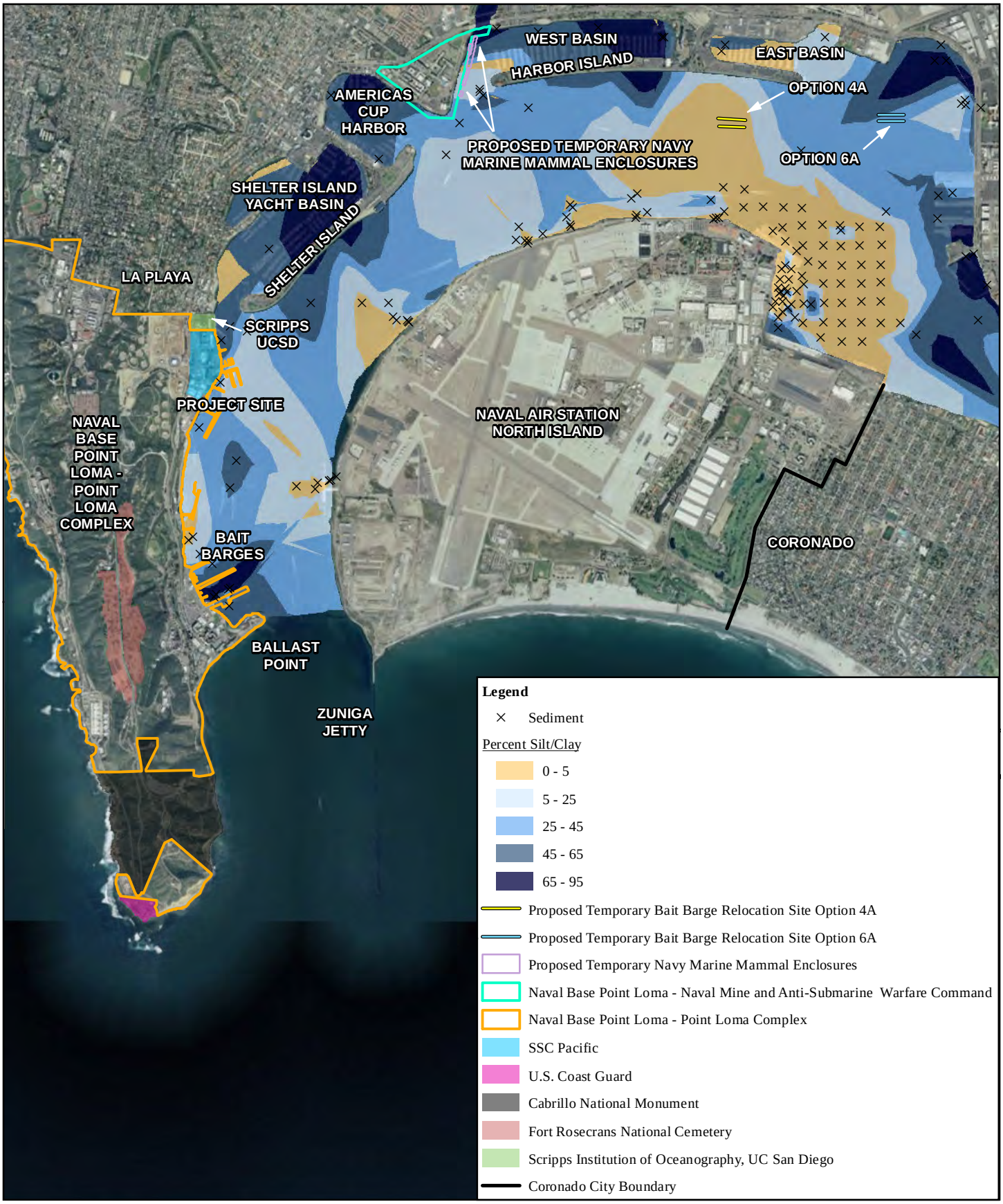


Figure 3-2
Sediment Composition in San Diego Bay

Source: NAVFAC Southwest and POSD 2011

size can also explain the fate and loading of sediment contamination (NAVFACSW and POSD 2011).

More than half of the shoreline of San Diego Bay is protected by piers, docks, bulkheads, revetments, and riprap (Figure 3-3). The remaining unprotected shoreline is predominantly on the leeside of prevailing winds (the western shoreline). As a result, only about 18 to 20% of the unprotected shoreline and 7% of the overall bay shoreline appears subject to significant erosion; therefore, unprotected shoreline is a minimal potential contributor of sediment to the bay (NAVFACSW and POSD 2011).

Metals and Organic Contaminants

As part of California's ongoing Bay Protection and Toxic Cleanup Program, San Diego Bay's sediment was evaluated for chemical and biological conditions between October 1992 and May 1994 (Fairey et al. 1996 and Addendum Fairey et al. 1998). Results indicated chemical pollution based on established sediment quality indicators, developed by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida and used as a substitute for absent USEPA and California guidelines. The study used a weight-of-evidence approach. Sediment quality indicators were exceeded at all San Diego Bay stations and the number of exceedences was high at most stations. Chlordane, PAHs and polychlorinated biphenyls (PCBs) were the pollutants most often found at elevated concentrations. Copper, lead, mercury and zinc were often found at elevated levels in the Naval Shipyard areas, although the data indicate the probability of metal toxicity is low. This is consistent with previous results demonstrating elevated chemical concentrations at several of these stations (NAVFACSW and POSD 2011).

Use of Unvegetated Soft Substrate Habitat by Fishes

Estuarine sediments are the sites of key ecological functions such as decomposition, nutrient cycling, and nutrient production (NAVFACSW 2010). Infaunal invertebrates in these sediments increase percolation of water and oxygen levels through bioturbation and suspension feeding. Shredders such as gastropod mollusks break up large pieces of organic matter, while deposit feeders both transform and bury or bring up organic matter. Dominant suspension feeders are often bivalve mollusks, but some polychaetes, crustaceans, and sponges also perform this function. These animals can increase water clarity and light levels, and reduce pollutants. Infaunal and epifaunal invertebrates serve as the major food base for many species of fish and larger invertebrates including shrimp, crabs, lobster, halibut and croaker which transfer this production across habitats.

Based on the abundances and distribution of 40 top ranking fishes by total biomass or abundance in surveys from 1994 through 1999 of intertidal, unvegetated nearshore, eelgrass (vegetated nearshore), and channel habitats within San Diego Bay, Allen et al (2006) reported that at least 8 fish species were associated with soft substrate habitats in the nearshore and channel habitats in the north bay. The area that Allen et al (2006) surveyed in the north bay is located off NAS North Island about 3 km toward the interior of the bay from the proposed project area. Large, predatory benthic species, spotted sand bass (*Paralabrax maculatofasciatus*), barred sand bass (*Paralabrax nebulifer*), round stingray (*Urolophus halleri*), and black croaker (*Cheilotrema saturnum*) are residents in the nearshore areas and channels of the north bay and throughout the interior of the bay to its southernmost area. Four resident, benthic flatfishes occur primarily in channel habitat:



0 0.25 0.5
Kilometers
Miles
0 0.25 0.5

Source: NAVFAC Southwest and POSD 2011

Figure 3-3
Shoreline Habitats

N

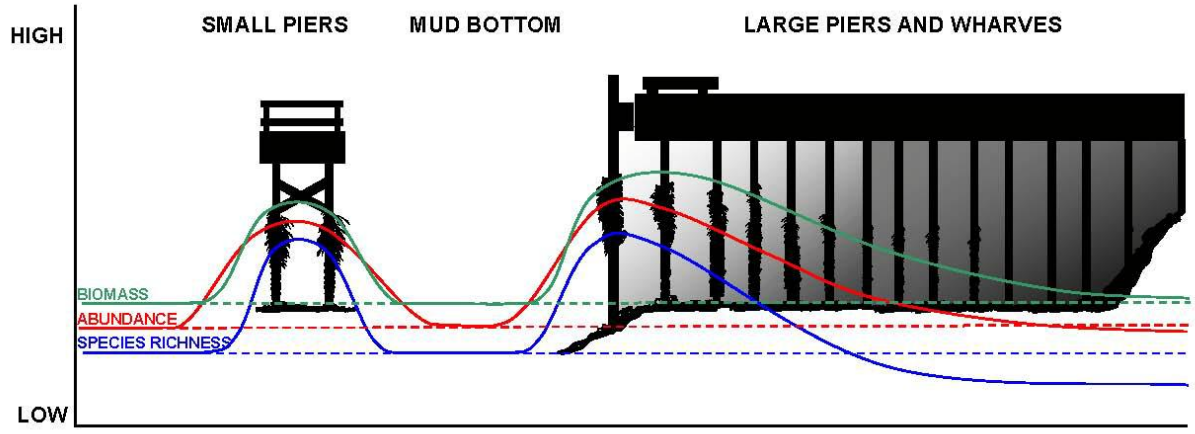
juveniles and adults of California halibut (*Paralichthys californicus*) and diamond turbot (*Hypsopsetta guttulata*) occur throughout the bay in both channel and nearshore sand and mud habitat; and spotted turbot (*Pleuronichthys ritteri*) and California tonguefish (*Symphurus atricata*) are primarily found in channel habitat of the north bay. None are EFH groundfish species.

3.3.3 Artificial Hard Substrate habitat and its Use by Fishes

The shoreline surrounding both the fuel pier and the NMAWC site has been modified and is now predominantly comprised of manmade structures (quay wall, piers and riprap) (Figure 3-3).

Large piers, such as the existing and proposed new construction of the fuel pier, provide a high concentration of piles, and impose a high degree of shading on the water column (NAVFACSW 2010). These structures are generally concrete decks with pre-stressed concrete piles. Associated fender systems are constructed from a variety of materials including foam filled or pneumatic rubber, recycled plastic piles, fiberglass piles filled with concrete, and untreated timber. In contrast to small piers, water movement and illumination can be significantly affected around and under large pier structures (Figure 3-4).

Figure 3-4. Biomass, Abundance, and Species Richness at small and large piers



At more exposed portions of larger piers, similar elevation of biomass, abundance and richness of fish communities is seen as with smaller piers (NAVFACSW 2010). Microalgae and drift kelp are within the upper portions of the pier at elevations that would be low intertidal and shallow subtidal zones. Below the algal communities, encrusting growth of sponges, bryozoans, rock jingles, and tube-forming polychaetes often occur. These algal and encrusting invertebrate communities host a number of mobile invertebrates and small fish such as blennies, pipefish and kelpfish and can also attract perches, opaleye, and scorpionfish. Sand bass and kelp bass often occur in association with such piers. As encrusting organisms die or are broken free of the piles, they drop to the bayfloor and create a zone of enriched sediment and more diverse rubble that supports gobies, blennies, and scavenging demersal fish at higher concentrations than typically observed away from the structures. Within the water column around piers, schooling pelagic fish tend to aggregate for shelter or forage. This often attracts larger predatory fish as well. Around small piers and at the exposed portions of larger piers, the biomass, abundance, and species richness of fish typically rises relative to that observed in surrounding open mud bottom habitats.

However, larger piers tend to include areas beneath the piers that experience reduced circulation and light levels (NAVFACSW 2010). Pile communities of large piers are distinguished from natural intertidal reefs and the man-made hard substrate habitats of riprap armorment, pontoons, docks, and artificial reefs, by having extensive intertidal areas (periodically exposed to air) and limited light. Merkel & Associates (1999 referenced in NAVFACSW 2010) performed a study of wharf shading impacts to associated encrusting communities and to fish. Infaunal communities continued to be present in the shaded regions. In contrast, it was determined that encrusting pile communities were not as numerous or species rich on the inside shaded piles. These areas promote a gradient of cryptic invertebrate community development beginning with jingles and bryozoans in the twilight zone, transitioning to sponges and ultimately very little growth in the darkest most quiescent waters beneath the piers. Only one detailed study including multi-season data has been conducted describing the invertebrate communities on concrete and wooden piles in San Diego Bay (Ford et al. 1975 referenced in NAVFACSW 2010). This study was conducted on concrete and wooden piles at the B Street, Broadway, and Navy Piers during 1972-1973. The attached and free living invertebrates associated with the piles included polychaete worms, crustaceans, molluscs, cnidarians, tunicates, and sponges in order of abundance. Species composition and abundance was found to be highly seasonally variable.

The invertebrate fouling community on the pilings appears to attract schooling fish, which feed on the attached invertebrates and algae. The piers provide refuge to principally nocturnal species such as black croaker, round stingray, smooth hound. As a result, large numbers of fish may be found beneath pier structures and biomass may exceed that of open waters due to fish size, however, species richness generally is depressed below that observed in open bay environments. In the deepest recesses of the piers, fish abundance and biomass also decline to low levels (NAVFAC SW 2010). Total fish abundance is heavily influenced by transient, schooling pelagic fish. Fish surveys beneath large wharfs at Pier 13 at Naval Station and CVN Pier 700 at NAS North Island showed that seasonal differences in fish communities can be greater than differences associated with the light gradient (NAVFACSW and POSD 2011).

The invertebrate and fish community of large piers are reported to differ between the north and south areas of San Diego Bay. The communities present on these and other manmade structures, as well as communities on soft bottom habitats and in the water column are subject to the same gradient in availability of oceanic water with distance from the mouth of the bay. The availability of food with a moving current, the supply of larval recruits, and water quality all depend on the level of flushing (NAVFACSW 2010). Species characteristic of open coastal communities were observed in a north bay pier site and were not present at a pier site in the southern bay (NAVFACSW 2010). These included the California scorpionfish (*Scorpaena guttata*), rock scallop (*Crassedoma giganteum*), California sea cucumber (*Parastichopus californicus*), giant spined star (*Pisaster giganteus*), and giant keyhole limpet (*Megathura crenulata*).

3.3.4 Vegetated Substrate: Eelgrass habitat and Its Use

Eelgrass (*Zoestera marina*) is a subtidal marine angiosperm typically found in protected bays and estuaries throughout the temperate Northern Hemisphere. In the San Diego region, eelgrass growth is generally limited at its upper limit by desiccation stress and at its deeper limit by light availability. Eelgrass is typically found on loose sands and stable muds, and it does not grow on steep slopes. As has occurred in bays and estuaries all along the Pacific coast and elsewhere in the world, eelgrass beds in San Diego Bay have suffered substantial losses and impacts due to

their location in sheltered waters where human activity is concentrated. Historic losses were due to bay fill and deepening. Today, eelgrass is protected under the Clean Water Act and other laws, and any impacts are fully mitigated.

As of 1999, Eelgrass beds occupy 1,065 acres (431 ha) or 7% of the total acreage in San Diego Bay (NAVFACSW and POSD 2011). About 29% of the existing shallow waters (-2.2 to -12 ft [-0.7 to -4m] MLLW) are vegetated with eelgrass. This represents an overall loss of 41% from historic proportions due to filling in of the bay margins and dredging to deeper depths. Eelgrass beds have persisted for years in areas of San Diego Bay ranging from zero MLLW to depths of at least 23 ft (7 m) below MLLW, depending on levels of light and water turbidity (Figures 3-5, 3-6, and 3-7). In the south bay the depth range is from 0.0 to 1.8 m (0.0 to –6 ft) MLLW, central bay 0.0 to –2.4 m (0.0 to –8 ft) MLLW, and north bay 0.0 to –3.7 m (0.0 to –12 ft) MLLW. Near the mouth in north bay, there is a different form (wider blades) that extends down to –5.5 to 7.3 m (–18 to –24 ft). In 2004, eelgrass coverage was estimated at approximately 147 acres in the northern ½ of the bay, compared to approximately 1,240 acres in the southern half. The potential area for eelgrass growth in San Diego Bay may be saturated such that these beds currently exist to the extent that bathymetric regime, water clarity for sunlight, water temperature, and characteristics of the sediment allow (NAVFACSW and POSD 2011).

Eelgrass occurs in the shallow subtidal zone (-2.2 to -12 ft MLLW) to the north of the existing fuel pier. As of 2011, there was 0.05 ac of eelgrass and an additional 0.05 ac of habitat that historically supported eelgrass where the new fuel pier is proposed. Large eelgrass beds also occur outside of the project area approximately 1100 ft to the north of the proposed fuel pier along the southern tip of Shelter Island and 1400 ft across the bay along the western edge of North Island. Eelgrass occurs adjacent to the Navy marine mammal enclosures to the south of the existing pier. As of 2011, there was 0.67 ac of eelgrass and an additional 0.32 ac of habitat that historically supported eelgrass located at the proposed temporary Navy marine mammal enclosure relocation site. Eelgrass habitat within the new fuel pier and marine mammal relocation areas are a tiny proportion of the 1,831 ac of eelgrass as of 2011 and an additional 868 ac of habitat that historically supported eelgrass within and adjacent to San Diego Bay.

The roots and rhizomes of eelgrass help stabilize the unconsolidated substrate by forming an interlocking matrix that inhibits erosion. The plants themselves keep water clearer by trapping fine sediments and preventing their resuspension. Leaves cut down wave action and currents; the resulting decrease in turbulence causes more fine sediment to be deposited. Eelgrass beds are an important component of the San Diego Bay food web. Much of the eelgrass primary productivity enters the food web as detritus. Sediments within eelgrass beds are loaded with detrital leaves, rhizomes, and nutrients that fuel infaunal invertebrates. These provide food for fishes and sometimes birds including the endangered California least tern. Fish and invertebrates use eelgrass beds to escape from predators, as a food source, and as a nursery. Eelgrass plants provide surfaces for egg attachment and sheltered locations for juveniles to hide and feed. Abundant algae and invertebrates that grow on the leaf blades provide primary and secondary productivity for consumption by larval and juvenile fish. Fish produced from these beds are consumed by fish-eating birds, including the California least tern. Waterfowl, especially surf scoter, scaup, and brant are present in high numbers in late fall and winter. Black brant, in particular, rely heavily on eelgrass of central and south bay as they are one of the few birds that



Figure 3-5
Eelgrass Beds in the Project Area



0 0.1 0.2
Kilometers
Miles
0 0.1 0.2

Figure 3-6
Eelgrass in the Vicinity of the Fuel Pier

N



Figure 3-7
Eelgrass in the Vicinity of the Proposed Temporary Marine Mammal Enclosure Relocation Site

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a, 2012

consume it directly. A small population of the federally endangered eastern Pacific green sea turtle (*Chelonia mydas*) feeds on eelgrass growing in several beds near the South Bay Power Plant in south bay (USFWS 1997).

Based on the abundances and distribution of 40 top ranking fishes by total biomass or abundance in surveys from 1994 through 1999 of intertidal, unvegetated nearshore, eelgrass (vegetated nearshore), and channel habitats within San Diego Bay, Allen et al. (2006) reported that at least 11 fish species were associated with eelgrass beds in the north quadrant of the bay. The eelgrass habitat that Allen et al. (2006) surveyed in the North Bay is located off NAS North Island about 3 km toward the interior of the bay from the proposed project area. Eelgrass habitat in the north bay is a nursery area for the young-of-year of eight species: black surfperch (*Embiotoca jacksoni*), dwarf surfperch (*Micrometrus minimus*), spotted kelpfish (*Gibbonsia elegans*), kelp bass (*Paralabrax clathratus*), spotted sand bass (*Paralabrax maculatofasciatus*), bay blenny (*Hypsoblennius gentilis*), salema (*Xenistius californiensis*), and California halibut (*Parlichthys californicus*). These species diminished in abundance further south into the bay. The adults and juveniles of four year-round bay residents: shiner surfperch (*Cymastogster aggregata*), giant kelpfish (*Heterosticus rostratus*), barred pipefish (*Syngnathus auliscus*) and bay pipefish (*Syngnathus leptorhynchus*) were associated with eelgrass habitat in all quadrants of the bay except the southernmost.

Near the proposed project area, eelgrass habitat supports a diversity of fish species. Pondella et al. (2006) conducted quarterly scuba surveys from 1997 to 2002 to monitor and evaluate eelgrass mitigation and fishery enhancement structures in San Diego Bay. Pondella et al. observed 32 fish species in the eelgrass transplantation bed that was inshore of rocky artificial reef structures located off NAS North Island across the channel from the proposed project area. Three EFH species, northern anchovy, jack mackerel, and Pacific sardine, were observed in the transplantation site. About 1.5 km northeast of the fuel pier, a persistent eelgrass bed on a 2 m depth shoal at the west end of Shelter Island was used as a control. There, Pondella et al. found a similar assemblage of 28 fish species which included one EFH species, California scorpionfish; interestingly, the highly transient EFH pelagic species were not observed.

3.3.5 Vessel Traffic and Ambient Underwater Soundscape

As illustrated by Table 3-3 below, San Diego Bay is heavily used by commercial, recreational, and military vessels, with an average of 82,413 vessel movements (in or out of the bay) per year. This equates to about 225 vessel transits per day, a majority of which are presumed to occur during daylight hours. The number of transits does not include recreational boaters that use San Diego Bay, estimated to number 200,000 (San Diego Harbor Safety Commission 2009).

Table 3-3. Port of San Diego Average Annual Vessel Traffic

VESSEL TYPE	VESSEL MOVEMENTS (Inbound and Outbound)		
	Subtotal by Vessel Type		*Total*
	Cargo	*Others*	
Total Annual Movements for All Vessel Types			**82,413**
Deep Draft Commercial Vessel (Cargo plus Cruise)			1,175
Cargo Ships (largest vessel: 1,000' length,106' beam, 41'draft)		740	
Bulk	20		
Container Ships	100		
General Cargo	180		
Roll On/Roll Off	440		
Cruise Ships (largest vessel: 1,000' length, 106' beam, 34' draft)		435	
Excursion Ships (largest vessel: 222' length, 57' beam, 6' draft)		68,000	68,000
Commercial Sportfishing (average vessel size: 123' length, 32' berth, 13' draft)		10,094	10,094
Military (largest vessel: 1,115' length, 252'beam (flight deck), 39' draft)		3,144	3,144

Note: Tug traffic was not included in the above statistics since inner harbor tug movements alone exceed 7,000 for a typical year.

Source: San Diego Harbor Safety Committee 2009.

Based on acoustic monitoring of ship noise in Glacier Bay, Alaska (Kipple and Gabriele 2007), sound source levels from a variety of vessel types and sizes are typically within the range of 160-170 decibels (dB) at 1m. Ship noise occurs over a broad frequency range (roughly 0.1 to 35 kilohertz [kHz]), with peak noise at higher frequency for smaller vessels. Ship noise thus has the potential to obscure underwater sound that would otherwise emanate from the project site to locations farther up the bay or offshore through the mouth.

In the project area, extensive measurements were made of underwater noise levels during March and April 2012 (Appendix A). Mean and median values were predominantly in the range of 120-130 dB referenced at 1 micro pascal (re 1µPa), with substantially higher intermittent sound in excess of 150 dB re 1µPa due to passing ships, and sound energy concentrated between 100 Hz and 2 kHz, broadly overlapping the peak frequencies expected for pile driving.

3.4 Description of Habitats at Nearshore Disposal Area

The Imperial Beach disposal area is located offshore of Imperial Beach, approximately 12 miles south of San Diego along the Pacific Coast, south of the Imperial Beach Pier. The coastline where the Imperial Beach Sediment Benefit Reuse Receiver Site is situated is severely eroded and in great need of beach replenishment (U.S. Army Corps of Engineers 2012).

The disposal area is relatively shallow and exposed to the waves and currents of the open coast, resulting in temperatures that reflect regional seasonal conditions, slight variations in salinity, and high dissolved oxygen. Turbidity varies with wave conditions which resuspend bottom sediments and periods of heavy discharge from the Tijuana River, which is also a source of pollutants (SANDAG 2011; U.S. Army Corps of Engineers 2012).

Sediments in the disposal area are predominantly sand, as shown in Table 3-4 (Tierra Data 2012).

Table 3-4. Sediment Characteristics of the Disposal Site vs. Dredging Area

Site Location	Site ID	Units	Gravel	Total Sand	Silt	Clay	Mean Grain Size (mm)	Sample Description
Disposal Site	IBNR-1	%	0	98.49	0.91	0.61	0.269	Medium Sand
	IBNR-2	%	0	97.81	1.48	0.71	0.238	Fine Sand
	IBNR-3	%	0	98.9	0.54	0.55	0.278	Medium Sand
	IBNR-4	%	0	97.21	1.99	0.8	0.189	Fine Sand
	IBNR-5	%	0.04	97.53	1.68	0.76	0.200	Fine Sand
	IBNR-6	%	0	97.76	1.53	0.72	0.212	Fine Sand
Pier 180	Area 1	%	0.03	86.81	10.54	2.62	0.220	Fine Sand
	Area1 Dup.	%	0.03	86.03	11.27	2.67	0.210	Fine Sand
	Area 2	%	0.24	86.67	10.41	2.69	0.320	Medium Sand

Source: Tierra Data 2012.

The sandy bed is sensitive to large storms and shifting sediments that bury or expose the low-lying rocky substrate which consists entirely of rounded gravel, cobble, and small boulders. The city of Imperial Beach is taking part in a larger, regional beach nourishment project led by the San Diego Association of Governments (SANDAG) (U.S. Army Corps of Engineers 2012).This area was used for disposal during the 2004 San Diego Harbor Central Navigation Channel Deepening Project and is the disposal site for the approved San Diego Harbor Maintenance Dredging Project (U.S. Army Corps of Engineers 2012).

The nearshore receiver site is located within the Silver Strand Littoral Cell (U.S. Army Corps of Engineers 2012). The sources of sand for beaches within the littoral cell are Tijuana River Delta, erosion of the Playas de Tijuana sea cliffs, and beach nourishment projects. The primary sink for beach sands is the shoal off the southern Zuniga Jetty at the entrance to San Diego Bay. Nearshore currents move sand into and out of the beach receiver site, while longshore currents move sands along the shoreline. Waves and wave driven currents are responsible for eroding the shoreline in the vicinity of the nearshore receiver sites.

Marine vegetated substrate is very patchy and ephemeral in the Imperial Beach area. Small kelp beds appear and disappear more or less randomly and are generally restricted to areas of subtidal

rocks, boulders, and cobble within the photic zone (depths of 20 to 60 feet) (North and MBC Applied Environmental Sciences 2001). Much of the hard substrate is cobble that is sufficiently large to anchor a small plant but lacks stability as numerous gas bladders of the growing plant increase buoyancy. Historically, from 1967-2000, the average bed area per year (ABAPY) ranged from 0 to 0.727 km2 at Imperial Beach; and no kelp coverage was observed during 16 of the 34 annual surveys (North and MBC Applied Environmental Sciences 2001).

Eelgrass is known near Zuniga Jetty near NASNI, however it has not been observed in the vicinity of Imperial Beach (U.S. Army Corps of Engineers 2012). The coverage of low-lying turf and typically understory algae is temporally and spatially variable on rocky substrate (North and MBC Applied Environmental Sciences 2001; U.S. Army Corps of Engineers 2012).

4 ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

An adverse affect to EFH is "any impact that reduces the quality and/or quantity of EFH" (see 50 CFR § 600.91O(a) for further clarification).

4.1 Impacts to Essential Fish Habitat – San Diego Bay

Four managed coastal pelagic fish species (PFMC 1998a), northern anchovy, Pacific sardine, jack mackerel, and Pacific mackerel occur in San Diego Bay (NAVFACSW AND POSD 2011; Allen et al. 2002; Pondella et al. 2006, Pondella and Williams 2009a and 2009b).Northern anchovy and Pacific sardine, can be found throughout the bay in all habitats. Jack mackerel were only found in the north bay survey area and Pacific mackerel were found at all but the southern survey stations (Allen et al. 2002). The managed groundfish species, California scorpionfish, curlfin sole, English sole, grass rockfish, and leopard shark are known to occur in San Diego Bay; however, all likely are uncommon in the proposed project area and in the bay at large. (NAVFACSW AND POSD 2011; Allen et al. 2002; Pondella et al. 2006, Pondella and Williams 2009a and 2009b).

The area surrounding the Fuel Pier is not optimal habitat for FMP species in San Diego Bay due to the existing usage of the facilities, armored shoreline, and historic dredging in the channel adjacent to the site. Juvenile and adult pelagic fish of species which might visit the area are mobile and would be able to avoid any action that may occur at the project site. EFH species and most other fish species that are known to occur around eelgrass habitat, non-vegetated intertidal and subtidal mud and sand habitats, and man-made structures in San Diego Bay may already avoid the proposed project site due to the large amount of vessel traffic through the area and dredging activities. Eggs and larvae should not be harmed by the renovations at the Fuel Pier. Short-term impacts associated with pier demolition and replacement, and with the temporary relocation of the marine mammal program, will occur from increased suspended sediments and noise levels. Turbidity may impact sight feeding, but affected EFH species and other fishes will presumably disperse to surrounding habitats where feeding will be less problematic.

Impacts from in-water project activities would adversely affect EFH by shading eelgrass habitat and by temporarily displacing EFH species due to increased sediment suspension and underwater noise from pier demolition, construction, and dredging activities. However, all of the managed species are not dependent on either eelgrass habitat or artificial substrates, and routinely experience turbid and noisy conditions due to natural processes and ship traffic within the bay. Many fishes that occur in eelgrass feed in unvegetated areas as well, as documented by Allen (1998). For these reasons and for the reasons discussed below, the adverse effects that would be created by the proposed project would be minimal.

4.1.1 Underwater Acoustic Analysis

Most if not all of the fish species occurring in the area routinely experience noisy conditions due to natural processes such as wave action and sounds generated by fishes and invertebrates, and anthropogenic activities such as ship traffic and construction throughout the bay. Much of the ongoing and future infrastructure and industrial maintenance and development in San Diego Bay include pile driving activities. There is increased concern about the potential effect that pile driving has on fishes and other aquatic organisms.

Popper and Hastings (2009) critically examined the peer-reviewed and grey literature on the effects of anthropogenic sounds on fishes and found that very little is known and the results from what are mostly cage-in-field and tank studies are equivocal. Moreover, there is uncertainty in extrapolating the physiological and behavioral effects of sound at different frequencies, pulse rates, intensities, and distances from the source. Injury to fish from intermittent sounds can begin at 206 dB root mean square (rms) re 1µPa (NOAA et al. 2008). However, reef-associated fish have shown only minor behavioral responses to sounds of 210 dB re 1 µPa at 16 m and 195 dB re 1 µPa at 109 m from a seismic air-gun source while remaining on the reef (Wardle et al 2001 summarized in Popper and Hastings 2009). Sound levels as low as 160 dB re 1 µPa for continuous and/or intermittent sounds and 140 dB re 1 µPa from pile driving can cause behavioral disturbance observable as changes in swimming speed and direction (Navy 2011; Mueller-Blenke 2010; CALTRANS 2009). No physical injury or behavioral response has been associated with vibratory pile driving in two reported studies which did not report sound levels (Popper and Hastings 2009).

In 2008, NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game, and transportation agencies of California, Oregon, and Washington agreed in principle to assess project effects using Interim Criteria for Injury to Fish from Pile Driving Activities (FHWG 2008). These interim criteria are provided in Table 4-1. The criteria were developed principally for salmonids in the Northwest and they are conservative, indicating the potential for the identified effect, rather than a likelihood of occurrence. The Navy has not adopted these criteria.

Table 4-1. Interim Criteria for Fish Injury and Disturbance by Underwater Sound from Pile Driving

Effect	*Size of Fish*	*Underwater Impact Pile Driving Criteria*	*Underwater Vibratory Pile Driving Criteria*
Onset of Injury	All fish	206 dB peak re: 1µPa	N/A
	≥ 2 grams	187 dB SEL[1] re: 1µPa^{2}sec	N/A
	< 2 grams	183 dB SEL[1] re: 1µPa^{2}sec	N/A
Behavioral Impacts	All fish	150 dB rms[1] re: 1µPa	150 dB rms re: 1µPa

1. SEL = sound exposure level, rms = root mean square

Recent controlled experiments exposing fish to pile driving noise (CALTRANS 2010; Halverson et al. 2011) and critical reviews (Popper and Hastings 2009; Halverson et al. 2011) have not found evidence of injuries at SELs well above these criteria, and thus do not support their use as thresholds for injuries to fish from pile driving operations.

Underwater sound levels received at a given distance from an acoustic source such as pile driving are a function of the source level and transmission loss (TL). TL underwater is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for transmission loss is:

$$TL = B * \log10(R) + C * R, \text{ where}$$

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R = ratio of receiver distance to source reference distance (usually 1m or 10m)

As widely used in the evaluation of underwater sound from pile driving, linear loss (C) is assumed equal to zero, and "practical spreading" (B=15) is assumed, resulting in the formula for transmission loss is TL = 15 log10 R. For this application, however, a site-specific model was developed for TL from pile driving at a central point at the project site (Appendix B). The model is based on historical temperature-salinity data and location-dependent bathymetry. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. For pile driving at the Navy's Marine Mammal Program relocation site (NMAWC), no site-specific modeling was conducted, and practical spreading loss is assumed.

For each of the project underwater sound sources (Table 4-2), transmission losses based on the model or practical spreading were calculated and mapped with GIS, resulting in the underwater sound contours shown in Figures 4-1 through 4-7. The figures reflect the conventional assumption of a "sound shadow" effect, wherein sound transmission from the source is truncated and not reflected where it intercepts a shoreline or structure. Although the influence of Zuniga Jetty was not modeled, it is reasonable to assume that project sound would not propagate east of the jetty (P. Dahl, personal communication). Hence the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and narrower in reality than shown in the figures.

Seaward of the entrance to the bay, underwater noise from vessels moving into and out of the bay (Section 3.3.5) would presumably fill in and dominate the underwater soundscape across the frequency range of pile driving, masking sound that is of lesser amplitude than typical vessel noise of 150-160 dB (Kipple and Gabrielle 2007). As such, the extension of the model 4-5 km south of the entrance is considered sufficient to cover all scenarios in which fish might reasonably be expected to respond to sound from pile driving or extraction.

In Table 4-2, the sound source levels generated by the different activities are described in terms of three different metrics: peak (the maximum absolute instantaneous sound pressure), root mean square (rms, the square root of the mean of the squared pressure generated by the source), and sound exposure level (SEL, the accumulated sound energy over time, normalized to a one-second interval). These sound source levels are standardized to the received level at a distance of 10 m. For example, when steel piles are being driven with an impact hammer, the received sound levels associated with a single hammer strike would comprise a peak of 210 dB re 1 µPa, an rms level of 195 dB re 1 µPa, and an SEL of 180 dB re 1µPa^2·s. Different interim criteria (= thresholds) for injury or behavioral effects under each of the three metrics have been identified, and the area within which that threshold value is reached or exceeded during each activity is calculated as shown in Table 4-2. To estimate the SEL to which a fish at a given location would be exposed through multiple hammer strikes, a simple summation procedure is used where total SEL = Single Strike SEL + 10log (number of strikes), with a maximum of 100 repeat strikes per pile and 2 piles per day. The associated areas of potential effect within associated potential zones of influence (ZOIs) are shown in Table 4-2.

Table 4-2. Calculated ZOIs Corresponding to Interim Criteria for Fish

Description	*Sound Source Levels*			*Criteria and Areas of Potential ZOIs (km^2)*			
	Source, dB peak @ 10m	***Source, dB rms @ 10m***	***Source, dB SEL @ 10m***	***All Fish Injury – 206 dB peak***	***Fish ≥2g Injury – 187 dB SEL***	***Fish < 2g Injury - 183 dB SEL***	***All Fish Behavior 150 dB rms***
Impact driving steel piles	210	195	180	0.0022	0.1949	0.5718	10.8251
Vibratory driving steel piles	195	180	180	N/A	N/A	N/A	4.0519
Impact driving 24-inch concrete piles	188	176	166	0	0.0010	0.0052	2.3583
Impact driving 16-inch concrete-fiberglass piles	184	173	163	0	0.0003	0.0014	1.3123
Impact driving 18-inch concrete piles at marine mammal relocation site	184	173	163	0	0.0002	0.0008	0.2397
Vibratory extraction – steel piles	180	172	172	N/A	N/A	N/A	1.0240
Vibratory extraction – non-steel piles	170	160	160	N/A	N/A	N/A	0.0240

Notes: Sound levels are expressed in units of dB re 1 µPa for peak and rms, and dB re $1\mu Pa^2 \cdot s$ for SEL. dB = decibel; N/A = not applicable; rms = root-mean-square; µPa = micropascal. Pile driving sound sources based on CALTRANS 2009; WSDOT 2010, 2012, NMFS 2010. SELs for fish injury were calculated by assuming 200 hammer strikes per day.



Figure 4-1
Underwater Sound from Impact Pile Driving,
36-48 " Steel Piles (Source = 195 dB rms)



Figure 4-2
Underwater Sound from Vibratory Pile Driving, 36-48” Steel Piles
(Source = 180 dB rms)



0 0.25 0.5
Kilometers
Miles
0 0.25 0.5

Figure 4-3
Underwater Sound from Impact Pile Driving,
24" Concrete Piles (Source = 176 dB rms)

N



0 0.25 0.5
Kilometers
Miles
0 0.25 0.5

Figure 4-4
Underwater Sound from Impact Pile Driving,
16” Fiberglass-Concrete Piles (Source = 173 dB rms)

N



0 100 200
Meters
Feet
0 300 600

Figure 4-5
Underwater Sound from Impact Pile Driving at Marine Mammal Relocation Site, 18" Concrete Piles (Source = 173 dB rms)

N



Figure 4-6
Underwater Sound from Vibratory Steel Pile Extraction
(Source = 172 dB rms)



Figure 4-7
Underwater Sound from Vibratory Non-Steel Pile Extraction
(Source = 160 dB rms)

Temporary Relocation of the Marine Mammal Enclosures

Since the relocation of the mammal enclosures used for the Navy's Marine Mammal Program is temporary, potential impacts on fish resulting from such relocation would also be temporary. Fish up to a distance of 341 m from the pile driving location may be disturbed by underwater sound in excess of 150 dB, but the areas of potential injurious effects are very small (Table 4-2 and Figure 4-5), and fish would be expected to disperse away from or avoid the area during pile driving, rather than remain stationary and risk injury. Therefore, there would be no adverse effect from sound levels on EFH under the Magnuson-Stevens Act from the temporary relocation of the marine mammal enclosures to Pier 619 and Marinas 548 and 607.

Underwater Noise from Pier Demolition and Construction

As described in Section 2.5, pile driving and demolition activities generating underwater sound would occur seasonally (essentially limited to fall-winter months) and intermittently over a three-year period. Figures 4-1 through 4-7 (with the exception of 4-5) show the underwater sound contours associated with various activities and Table 4-2 provides the corresponding areas of effect. In general, areas of potential injury are small and limited to the immediate area of pile driving, whereas the areas of potential behavioral effects, particularly for steel pile installation are relatively large, up to 10.8 km^2.

The 206 dB injury threshold would only be exceeded during impact installation of the steel piles, and only encompassing 0.0022 km^2 - within about 26 m of the pile driver. It is unlikely that fish would remain this close to the pile being driven after the ramp-up period. The areas encompassing the weight-based criteria for potential injury are somewhat larger (Table 4-2), but as noted previously, there is little evidence for injurious effects to fish at these SELs (Popper and Hastings 2009; CALTRANS 2010; Halverson et al. 2011).

In general, fish are likely to be temporarily disturbed or leave the immediate project area of demolition and construction until activities cease. Thus, underwater noise would create an adverse effect on EFH under the Magnuson-Stevens Act, but this effect would be minimal due to its limited temporal and geographic scale. Furthermore, fish species would return to the project area following the completion of in-water activities.

Underwater Noise from Dredging

Underwater noise from dredging would have temporary adverse effects due to direct displacement of pelagic and benthic fishes, possibly including managed coastal pelagic and groundfish species. Individuals might respond to the noise associated with dredging by moving away from the sound source, and transient fishes may avoid entering the area while activities are underway. Conspecific communication and behaviors associated with avoiding predators or finding prey might be affected. Thus, underwater noise would create an adverse effect on EFH under the Magnuson-Stevens Act, but this effect would be minimal due to its limited temporal and geographic scale. There is no risk of physiological injury to fish from the sound generated by the dredging. Furthermore, fish species would return to the project area following the completion of in-water activities.

4.1.2 Water Column

Dredging and Other Sediment Disturbance

Dredging and sediment disturbance during pile removal and installation would have temporary adverse effects due to direct displacement of pelagic and benthic fishes, possibly including managed coastal pelagic and groundfish species, by sediment disturbance (turbidity) in the water column during the dredging and sediment disposal operations.

Turbidity plumes of suspended particulates may reduce light penetration and lower the rate of photosynthesis (e.g., adjacent eelgrass beds) and the primary productivity of an aquatic area if suspended for variable periods of time. CPS finfish may suffer reduced feeding ability if suspended particulates persist. The contents of the suspended material may react with the dissolved oxygen in the water and result in short-term oxygen depletion to aquatic resources. Toxic metals and organics, pathogens, and viruses absorbed or adsorbed to fine-grained particulates in the material may become biologically available to organisms either in the water column or through food chain processes.

This greater potential for adverse effects would exist if there were substantial amounts of fine sediments; however, testing of samples of material to be dredged indicated that grain sizes are predominately of coarser grain, beach-compatible grain sands. This material settles quickly instead of remaining suspended in the water column. Based on observations of turbidity caused by bottom disturbances in areas similar to the project sites, turbidity plumes are expected to persist for less than one hour following disturbance (AMEC 2008).

On the beneficial side, dredging could increase water circulation and indirectly benefit fish resources. Tidal flushing and mixing are important for transporting organisms especially plankton, dispersing pollutants, maintaining water quality for marine life, and moderating water temperature that has been affected by exchange with the atmosphere or heating, such as by the South Bay Power Plant (NAVFACSW and POSD 2011).

4.1.3 Benthic Habitats and Communities

Dredging

Dredging would have temporary adverse effects due to a) direct displacement of benthic and pelagic fishes, possibly including managed groundfish species, by noise and sediment disturbance (turbidity) during the dredging operation; and b) the excavation and removal of infaunal prey resources. No vegetation occurs within the proposed dredging footprint. Greater potential for adverse effects would exist if there were substantial amounts of fine sediments and organisms in the proposed project area; however, testing of samples of material to be dredged indicated that grain sizes are predominately of coarser grain, beach-compatible grain sands. This material settles quickly instead of remaining suspended in the water column. Based on observations of turbidity caused by bottom disturbances in areas similar to the project sites, turbidity plumes are expected to persist for less than one hour following disturbance (AMEC 2008).

Hence, there would be minimal, temporary, adverse effects on EFH due to sediment disturbance during project activities.

Habitat Alteration

Pier removal would reduce the algal and invertebrate production associated with encrusting communities on the pilings but would only impact eelgrass by temporarily increasing turbidity, as discussed above. Also as discussed above, dredging could indirectly improve EFH by increasing water circulation. Hence, there would be minimal, temporary, adverse effects on EFH from habitat alteration due to pier removal and dredging activities.

Based on the number and sizes of piles that are part of the existing fuel pier versus the proposed new pier, there would be a net decrease in underwater hard surface area, as well as a change in the type of substrate. This is viewed as inconsequential for EFH given the abundance of artificial substrate habitat in San Diego Bay.

Pier construction would result in a net decrease of 5,315 sq ft (0.12 ac) of surface shading. A portion of this area is also eelgrass habitat. During development of the pier design, the alignment for the proposed pier was positioned to minimize eelgrass disturbance and reduce the amount of eelgrass habitat shaded. However, not all eelgrass could be avoided, and approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. In addition, approximately 0.67 ac of eelgrass habitat as of 2011, and an additional 0.32 ac of historical eelgrass habitat, would be subject to disturbance and shading by the Navy Marine Mammal Program relocation to NMAWC; this impact would be temporary as the facilities would be removed after approximately 4 years.

Thus, there would be a minor adverse effect to EFH from pier construction due to the shading of eelgrass habitat; however, this impact would be minimal and would be offset by use of the Navy's eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage.

Although fish abundance, diversity, and biomass beneath the inner portions of large piers may be reduced compared to open water, they are elevated near the outer margins of pier structures. This is in part due to the fact that, over time, algae and invertebrates are expected to colonize the new pier, and the resultant production of organic material from the new pier would tend to offset the effects of reduced sunlight.

The new pier would create habitat for fish that is generally similar to that of the existing pier, with a net loss of structural habitat, and a corresponding gain of open water habitat. Overall, the small magnitude of change and similarity of existing and future conditions suggests no ecological change related to fish abundance, diversity, or biomass would be expected to occur in the project vicinity. To the extent that structural and/or shaded habitats are preferred or avoided by certain species, utilization of the project site by different fish species may shift slightly toward or away from the project site, relative to the existing condition. Considering this, and the characteristics of the EFH species that may potentially occur in the project area and the habitat characteristics of the area itself, there would be no adverse effect to EFH from the small increase of open water habitat.

4.1.4 Marine Vegetation: eelgrass beds

Temporary Relocation of the Marine Mammal Enclosures

Since the relocation of the mammal enclosures used for the Navy Marine Mammal Program is temporary, potential impacts resulting from such relocation would also be temporary. The only HAPC in the area, eelgrass, is growing or has previously grown under the active Pier 619 and Marinas 548 and 607. One permanent eelgrass monitoring transect, NB5, is located between Pier 619 and Marina 548 (NAVFAC SW 2008). Since the bottom of the mammal enclosures is a mesh and is not an opaque, solid structure, any eelgrass underlying the enclosures would be only partially shaded. The small number of piles would allow pile driving to be completed in eight days. Underwater peak sound levels are expected to be no more than 184 dB rms re 1 µPa at 10 m and as such, there is very little potential for injury to fish in eelgrass beds. Areas within the interim SEL criteria for injury are very small (Table 4-2), and as noted above, there is little evidence to suggest that injuries would occur at these SELs. Fish may respond to the pile driving noise by leaving the area; however, species would return to the project area following the completion of in-water activities. Therefore, there would be no adverse effect on EFH under the Magnuson-Stevens Act from the temporary relocation of the marine mammal enclosures to Pier 619 and Marinas 548 and 607.

Pier Removal

Pier removal would only impact eelgrass by increasing turbidity, as discussed above. Also as discussed above, dredging could indirectly improve EFH by increasing water circulation. Hence, there would be minimal, temporary, adverse effects on EFH from habitat alteration due to pier removal and dredging activities.

Relocation of Everingham Brothers Bait Company Bait Barges

Both proposed bait barge temporary location sites are located over deep subtidal soft sediment habitat and would not shade any eelgrass. Therefore, the temporary relocation of the bait barges would not result in any impacts to eelgrass habitat or community.

Pier Construction

Pier construction would result in a net decrease of 5,315 sq ft (0.12 ac) of surface shading. A portion of this area is also eelgrass habitat. During development of the pier design, the alignment for the proposed pier was positioned to minimize eelgrass disturbance and reduce the amount of eelgrass habitat shaded. However, not all eelgrass could be avoided, and approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. In addition, approximately 0.67 ac of eelgrass habitat as of 2011, and an additional 0.32 ac of historical eelgrass habitat, would be subject to disturbance and shading by the Navy Marine Mammal Program relocation to NMAWC; this impact would be temporary as the facilities would be removed after approximately 4 years.

Dredging

Dredging would be limited to the area of the Turning Basin (Figure 2-2). All of the 17.9 ac proposed to be dredged occur in deep subtidal water and have been dredged historically. Eelgrass habitat is inshore and outside of the area that would be affected by turbidity and vessel traffic associated with the dredging and sediment disposal (Figure 3-5). Dredging would occur during

ebb tide when any turbidity that was actually caused would flow away from eelgrass habitat. As such, there would be no injury to fish in eelgrass beds. On the beneficial side, dredging could increase water circulation and indirectly benefit eelgrass habitat. Therefore, there would be no adverse effect on EFH under the Magnuson-Stevens Act from dredging.

4.2 Impacts to Essential Fish Habitat – Imperial Beach Nearshore Disposal Area

The nearshore disposal area is habitat for the same 4 managed CPS that occur in the bay, and for 25 managed groundfish species (Table 3-2).

4.2.1 Underwater Noise from Disposal

Underwater noise from disposal operations (pumps, vessel engines) would have effects similar to those described above for dredging, resulting in minor, temporary behavioral effects to fish, with no risk of injury and no adverse effect to EFH.

4.2.2 Water Column

While the disposal area is a naturally dynamic sandy bottom environment, recurring sediment disposal for beach nourishment augments the natural supply of sediment and increases the degree of instability. Sediments disposed in the submerged nearshore area are pushed up-coast and onto the beach by prevailing currents, while sediments on the beach are continually eroded by wave action and redistributed over time into the nearshore area. The proposed project's dredged sediments would constitute a small fraction of the amounts to be deposited by other previously approved users (U.S. Army Corps of Engineers 2012), and would be compatible with existing conditions at the site (Table 3-4). Turbidity associated with disposal would be brief as the sandy sediments would rapidly settle and the relatively small percentage of fines would be rapidly dispersed by waves and currents, resulting in no adverse effect to EFH in the water column.

4.2.3 Benthic Habitats and Communities

Benthic habitat would be temporarily altered – made shallower by the mound of deposited sediment - but would re-equilibrate over time in response to prevailing wave and current conditions. Species occurring in the disposal area would be buried or displaced. Such effects would be temporary as sandy shore species are mobile, adapted to shifting sands and episodic turbidity, and are expected to unbury and/or recolonize the area almost immediately (Allen and Pondella 2006). The U.S. Army Corps of Engineers (2012) reviewed the impacts of its much larger disposal project and found insignificant effects on Pismo clams (*Tivela stultorum*) and benthic habitat in general.

No eelgrass occurs in the disposal area. Canopy kelp which is patchily distributed offshore of the disposal area is unlikely to be affected by suspended sediments because the coarser fraction of disposed sediments would remain in the beach and nearshore area, while the lesser amount of fines would be rapidly dispersed. No effects on HAPC would occur.

Given this natural and modified setting, the one-time use of the site by the project for sediment disposal would have only minor, temporary effects, which would not be considered an adverse effect to EFH under the Magnuson-Stevens Act.

4.3 Proposed Conservation Measures and Guidelines for EFH Protection

Avoidance and minimization measures integrated into the project design pertaining to EFH include the following:

1. Dredging and other in-water demolition or construction that is a source of turbidity and underwater noise would avoid the endangered California least tern breeding season (April 1 - September 15).
2. Pre-, post-, and one-year post-construction eelgrass surveys will be conducted at the Pt. Loma Fuel Pier location and at the NMAWC marine mammal relocation site. Eelgrass mitigation bank credits would be used to offset any remaining eelgrass impacts.
3. The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site.
4. Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water.
5. During project implementation the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence.
6. A survey for the invasive alga *Caulerpa taxifolia* would be conducted before initiating in-water project activities, consistent with NMFS and California Department of Fish and Game (CDFG) requirements (NMFS 2008). If *Caulerpa taxifolia* is found in the study area during this survey, NMFS-approved *Caulerpa* Control Protocols would be followed.

The following avoidance and minimization measures would be followed during the proposed pile driving and dredging activities.

7. Prior to the start of pile driving each day, after each break of more than 30 minutes, and if any increase in the intensity is required, the Navy would use a ramp-up procedure. The procedure involves a slow increase in the pile driving to allow animals in the area to disperse.

The following EFH conservation measures are also proposed in response to input from NMFS.

8. The Navy will direct contractors to use methods of pile removal that minimize the suspension of sediments and disturbance of the substrate. Such methods include minimizing the use of jetting where possible.
9. The Navy will collaborate with NMFS by collecting opportunistic data on the physiological and behavioral effects of pile driving on fish during project construction.

5 CONCLUSIONS

As described in the above effects analysis, the Navy has determined that the project, regardless of which design alternative is ultimately chosen during the NEPA process, would have minimal, adverse effects on EFH for federally managed fish species within the Coastal Pelagic Species and West Coast Groundfish FMPs. Of the 94 or more species which are federally managed under these plans, 9 are likely to occur at the San Diego Bay project sites and 29 at the Imperial Beach receiving site, and could be affected.

Potential impacts to EFH would differ from species to species, depending on life history, habitat use (by demersal or pelagic species), and abundance in the project area. Juvenile fish of the EFH pelagic species (northern anchovy, Pacific sardine, Pacific mackerel and jack mackerel) are in transient schools that can number a few fish to 10,000s and freely move through the proposed project area among all intertidal and subtidal habitats.

Five EFH groundfish species (California scorpionfish, grass rockfish, curlfin sole, English sole, grass rockfish, and leopard shark) are uncommon if not rare in the proposed San Diego Bay project area. California scorpionfish is expected to be the most abundant among the five demersal species and the most likely to occur under the fuel pier structure and in the turning basin area. This species is not territorial and does not have restrictive home ranges. Juveniles of California scorpionfish, grass rockfish, and leopard shark are reported to utilize eelgrass beds as nursery habitat in San Diego Bay. Soft sediment habitat under the pier and in the turning basin area is where the flatfishes, curlfin sole and English sole, are most likely to occur. Leopard shark are transient predators that if present would be expected to freely move in and out of the project area. The effects of the project would include the temporary removal of habitat that provides shelter and/or prey resources; increased turbidity; and behavioral disturbance due to noise.

The area surrounding the Fuel Pier is not optimal habitat for FMP species in San Diego Bay due to the existing usage of the facilities, armored shoreline, and dredging in the channel adjacent to the site. Juvenile and adult pelagic fish of species which might visit the area are mobile and would be able to avoid any action that may occur at the project site. Most species may already avoid this area due to the large amount of vessel traffic through the area and dredging activities. Eggs and larvae should not be harmed by the renovations at the Fuel Pier. Short-term impacts associated with pier demolition and replacement, and with the temporary relocation of the marine mammal program, will occur from increased suspended sediments and noise levels. Turbidity may impact sight feeding, but affected species will presumably disperse to surrounding waters where feeding will be less problematic.

Use of the existing disposal area at Imperial Beach would have minor, temporary effects on benthic and water column habitats with no lasting effects on habitat conditions or fish populations expected.

The inclusion of Best Management Practices cited above the effects will further reduce potential effects on EFH. No persistent impacts on FMP species, populations, or the ecological functions provided by EFH would occur.

In conclusion, the Proposed Action would have only minor, temporary adverse effects to EFH.

6 LITERATURE CITED

Allen, L.G., A.M. Findlay, and C.M. Phalen. 2002. Structure and Standing Stock of the Fish Assemblages of San Diego Bay, California from 1994-1999. Bulletin of the Southern California Academy of Sciences 101:49-85.

Allen, L. G. and D.J. Pondella II. 2006. Surf zone, coastal pelagic zone, and harbors. Pages 149-166 *in* Allen, L.G., D.J. Pondella II, and M.H. Horn (eds.). The ecology of marine fishes, California and adjacent waters. University of California Press.

AMEC Earth & Environmental, Inc (AMEC). 2008. Water Quality Monitoring Report P-440 Pier 8 Reconstruction and Pier 14 Demolition Project, Naval Base San Diego. 07 March.

California Department of Transportation (CALTRANS). 2009. Final Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. February.

_____. 2010. Mad River Bridges Replacement Project Effects of Pile Driving Sound on Juvenile Steelhead. 24 March.

Carlisle, A. & Smith, S.E. 2009. Triakis semifasciata. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Downloaded on 08 May 2012.

Fisheries Hydroacoustics Working Group (FHWG). 2008. Memorandum: Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. Signed by NOAA's Fisheries Northwest and Southwest Regions, U.S. Fish and Wildlife Service Regions 1 & 8, California/Washington/Oregon Departments of Transportation, California Department of Fish and Game, and the U.S. Federal Highway Administration. Available online at http://www.wsdot.wa.gov/NR/rdonlyres/4019ED62-B403-489C-AF05-5F4713D663C9/0/BA_InterimCriteriaAgree.pdf.

Halverson, M.B., B.M. Casper, C.M. Woodley, T.J. Carlson, and A.N. Popper. 2011. Predicting and mitigating hydroacoustic impacts on fish from pile installations. NCHRP Research Results Digest 363, Project 25-28, National Cooperative Highway Research Program, Transportation Research Board, National Academy of Sciences, Washington, D.C. Online at http://www.trb.org/Publications/Blurbs/166159.aspx.

Kipple, B.M. and C.M. Gabriele. 2007. Underwater noise from skiffs to ships *in* Piatt, J.F. and Gende, S.M., eds, Proceedings of the Fourth Glacier Bay Science Symposium, October 26-28, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5047, p. 172-175.

Kramer, S. H. 1991. The shallow-water flatfishes of San Diego County. CalCOFI Reports 32:128-142.

Leet, W., C. Dewees, R. Klingbeil, and E. Larson (Eds.) 2001. California's Living Marine Resources: A Status Report. California Department of Fish and Game Publication SG01-11, Sacramento, California

Merkel & Associates. 2009. 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update. January.

Mueller-Blenkle, C., McGregor, P.K., Gill, A.B., Andersson, M.H., Metcalfe, J., Bendall, V., Sigray, P., Wood, D.T. & Thomsen, F. 2010) Effects of Pile-driving Noise on the Behaviour of Marine Fish. COWRIE Ref: Fish 06-08, Technical Report 31st March 2010

National Marine Fisheries Service (NMFS). 2007. EFH for the Pacific Council. Website Accessed October 30, 2007. www.nmfs.noaa.gov/habitat/habitatprotection/profile/pacific/curlfin_solehome.htm

Moffatt & Nichol – Blaylock. 2012. Redline revisions made by A. Alcorn to Draft Environmental Assessment Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151) San Diego, California. Prepared by NAVFAC Southwest. May 2011. Revisions sent via email to L. Seneca, NAVFAC Southwest. 20 February.

National Marine Fisheries Service (NMFS). 2008. Caulerpa Control Protocol version 4-February 25, 2008. Available online at: http://swr.nmfs.noaa.gov/hcd/caulerpa/ccp.pdf.

_____. 2010. Takes of Marine Mammals Incidental to Specified Activities; Piling and Structure Removal in Woodard Bay Natural Resources Conservation Area, Washington. Federal Register 75:48941-48947. 12 August.

Naval Facilities Engineering Command Southwest (NAVFACSW). 2008. Evaluation of Temporal and Spatial changes of Eelgrass (*Zostera marina*) within San Diego Bay using Permanent Transects. Prepared by Tierra Data Inc. February

_____. 2010. Characterization of Essential Fish Habitat in San Diego Bay. PHASE 2: Qualitative Habitat Characterization and Mapping Report. Coastal IPT. Prepared by Merkel & Associates, Inc. September.

NAVFACSW and Port of San Diego (POSD). 2011. San Diego Bay Integrated Natural Resources Management Plan, Draft. San Diego, California. Prepared by Tierra Data Inc., Escondido, California. November.

Navy. 2007. Final Environmental Assessment (MILCON P-401) Replace Fuel Storage Tanks and Facilities, Naval Base Point Loma, San Diego, California. November.

Navy. 2010a. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Naval Base Point Loma, DFSP, FISC, and San Diego, California. January.

Navy. 2010b. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Appendix F Structural Evaluation and Seismic Analysis. Naval Base Point Loma, DFSP, FISC, San Diego, California. January.

Navy. 2010c. Project Brochure, FY 2013 MILCON Project P-151 Replace Fuel Pier, Appendix H Cost Estimate "Success". Prepared Moffett Nichol-Blaylock. January.

Navy. 2010d. Attachment D Dredging Study Replace Fuel Pier NBPL DFSP FISC San Diego. MILCON P-151.

Navy. 2011. Memorandum: Essential Fish Habitat Assessments and Consultations. 5090.1C; Chapter 24. J.P. Quinn, Deputy Director, Energy and Environmental Readiness Division (OPNAV N45), Office of the Chief of Naval Operations. Ser N456M111 U 1588080. 22 March.

Pacific Fishery Management Council (PFMC). 1998a. Essential Fish Habitat Coastal Pelagic Species. Modified from: Coastal Pelagics Species Fishery Management Plan [Amendment 8 to the Northern Anchovy Fishery Management Plan]; Pacific Fishery Management Council, Portland, OR.

_____. 1998b. The Coast Pelagic Fishery Management Plan. Pacific Management Fishery Council. 2130 SW Fifth Avenue, Suite 224, Portland, Oregon. http://www.pcouncil.org/cps/cpsfmp.html

_____. 1998c. Essential Fish Habitat West Coastal Groundfish Appendix [http://www.pcouncil.org/groundfish/gfother/gfefh.html]. Pacific Management Fishery Council. 2130 SW Fifth Avenue, Suite 224, Portland, Oregon.

_____. 2005. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon and Washington Groundfish Fishery, Appendix B, Part 2: Groundfish Life History Descriptions. PFMC, Portland, OR. November. Available online at http://www.pcouncil.org/wp-content/uploads/GF_FMP_App_B2.pdf.

_____. 2011. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon and Washington Groundfish Fishery, PFMC, Portland, OR. July. Available online at http://www.pcouncil.org/groundfish/fishery-management-plan/.

North, W.J. and MBC Applied Environmental Sciences. 2001. The Status of Kelp Beds of San Diego and Orange Counties for the years 1990 to 2000. Prepared for the Region Nine Kelp Survey Consortium.

Pacific Fishery Management Council. 2011. Pacific Coast Groundfish Fishery Management Plan for the Calfornia, Oregon, and Washington Groundfish Fishery. December.

Pondella, D.J. and J.P. Williams. 2009a. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2008. Moore Laboratory of Zoology.

Pondella D. J., L.Allen, M. T. Craig, and B. Gintert. 2006. Evaluation of eelgrass mitigation and fishery enhancement structures in San Diego Bay, California. Bulletin of Marine Science 78(1):115-131.

Popper, A.N. and M. C. Hastings. 2009. The effects of anthropogenic sources of sound on fishes. Journal of Fish Biology. 75:455-488.

Robbins, E.A. 2006. Essential Fish Habitat in Santa Monica Bay, San Pedro Bay, and San Diego Bay: A Reference Guide for Managers. Masters project submitted in partial fulfillment of the requirements for the Master of Environmental Management degree in the Nicholas School of the Environment and Earth Sciences of Duke University.

San Diego Association of Governments (SANDAG) and U.S. Army Corps of Engineers. 2011. Revised Environmental Assessment/Final Environmental Impact Report for the San Diego Regional Beach Sand Project II.

San Diego Harbor Safety Committee. 2009. San Diego Harbor Safety Plan (Approved May 2009).

Science Applications International Corporation (SAIC). 1998. The State of San Diego Bay: What Users Need to Know. An Environmental White Paper. Prepared for the San Diego Port Tenants Association. San Diego, California.

Terra Costa Consulting Group Inc. 2010. Limited Geotechnical Study Defense Logistics Agency Project Documentation for P-151. Prepared for Moffatt & Nichol-Blaylock. 15 January.

Tierra Data, Inc. (TDI). 2012. Sediment Grain Size Distribution and Mean Grain Size - Offshore Disposal Sites compared to Pier 180 Dredging Site. 18 April.

U.S. Army Corps of Engineers. 2012. San Diego Harbor Maintenance Dredging Project, San Diego County, California. Final Supplemental Environmental Assessment. June.

Vantuna Research Group. 2006. Fisheries Inventory and Utilization of San Diego Bay, San Diego, California for Surveys Conducted in April and July 2005. Moore Laboratory of Zoology. Occidental College. February. 103 pp.

WSDOT. 2010. Keystone Ferry Terminal – vibratory pile monitoring technical memorandum. May 2010.

WSDOT. 2012. Columbia River Crossing Test Pile Project Vibratory Extraction Sound Levels. Prepared by J. Coleman, David Evans and Associates, Inc. 1 August 2011.

[This page intentionally left blank.]

Appendix A
Acoustic Transmission Loss Model for Pile Driving

[This page intentionally left blank.]

Applied Physics Laboratory
University of Washington

1013 NE 40th Street
Box 355640
Seattle, WA 98105-6698

206-543-1300
FAX 206-543-6785
www.apl.washington.edu

January 25, 2011

To: Mitchell A. Perdue, CRM
Senior Biologist
Naval Facilities Engineering Command Southwest Coastal IPT
Naval Station San Diego
2730 McKean St., Bldg 291
San Diego, CA 92136

Email copies sent to:
Derek Lerma
Tierra Data Inc.
Derek@tierradata.com

Anurag Kumar
Marine Resource Bioacoustician
Naval Facilities Engineering Command Atlantic
anurag.kumar@navy.mil

From: Peter H. Dahl
Principal Engineer and Professor
Applied Physics Laboratory and Dept. of Mechanical Engineering
University of Washington, Seattle

Dara M. Farrell
Predoctoral Research Associate I
Applied Physics Laboratory and Dept. of Mechanical Engineering
University of Washington, Seattle

This memorandum summarizes our results of modeling acoustic transmission loss (TL) for San Diego Bay associated with underwater noise generated by impact pile driving. The TL modeling assumes a nominal pile driving location at position 477888.7 N, 3618101W where the nominal water depth is 14.7 m. A note on the model deliverable in the form of ArcGIS raster data is given at the end of this memorandum.

Our model assumes an average sound speed of 1504 m/s based on historical temperature-salinity data, and location-dependent bathymetry, both provided to us by NAVAC. Note that for purposes of modeling TL we have smoothed this bathymetry over a 100 m smoothing window and removed any features considered artifact. For geoacoustic properties of the sediments we use sound speed[1] and attenuation[2] for sand based a frequency of 500 Hz. Additional assumptions entering into the modeling are summarized as follows:

1. The spectrum of acoustic energy associated with impact pile driving is confined to frequencies less than about 2000 Hz[3]
2. The model is intended to simulate depth-averaged TL, which is specifically applicable to peak pressure emanating from an impact pile driving source, but also applies more generally to SEL and RMS measures.
3. The concept of a Mach cone that emanates from impact pile driving is incorporated in our TL model which causes the acoustic amplitude to decay as $R^{1/2}$ (cylindrical spreading) where R is range from the pile source, out to range of R*, or roughly 3 times the water depth. The Mach cone and precise definition of R* are discussed in ref.[3].
4. Beyond ranges of R* the amplitude decays as $R^{3/2}$. This decay mirrors the so-called practical spreading model (PSM), but our model differs fundamentally from the PSM. The primary differences are (i) model properties associated with R*, and (ii) depth-dependence in our model.
5. Depth-dependence is handled in two ways. For cases in which the depth increases from the source impact pile driving, the sound pressure amplitude decays as $(H/Ho)^{1/2}$ where H is the depth as a function of range from source and Ho is the depth at the source. This behavior applies unless and until the depth reaches a modal cut-off depth, associated with a frequency of 500 Hz. At this point the modal decay coefficient corresponding to the first mode at 500 Hz is applied, which increases TL at a rate significantly greater than $R^{3/2}$.

Numerical results of the model are incorporated into a TIFF file (Dahl_Model.tif) that is attached to this email report. This file can be added as a layer in an ArcGIS map and transects can be drawn and interpolated (using the Interpolate Shape tool). In this way the model associated with any radial transect that originates from the source location can be extracted. Figure 1 displays a summary of the model for San Diego Bay along with two representative transects, with TL versus range for these two transects plotted in Fig. 2.

[1]K. L. Williams, D. R. Jackson, E. I. Thorsos, D. Tang, and S. G. Schock,"Comparison of sound speed and attenuation measured in a sandy sediment to predictions based on the Biot theory of porous media," IEEE J. Ocean. Eng. 27, 413–428 (2002).

[2] J. Zhou, X. Zhang, and D. P. Knobles, "Low-frequency geoacoustic model for the effective properties of sandy bottoms," J. Acoust. Soc. Am. 125, 2847–2866 (2009).

[3] P.G. Reinhall, & P.H. Dahl, "Underwater Mach wave radiation from impact pile driving: Theory and observation", J. Acoust. Soc. Am. 130, 3, 1209-1216 (September 01, 2011).

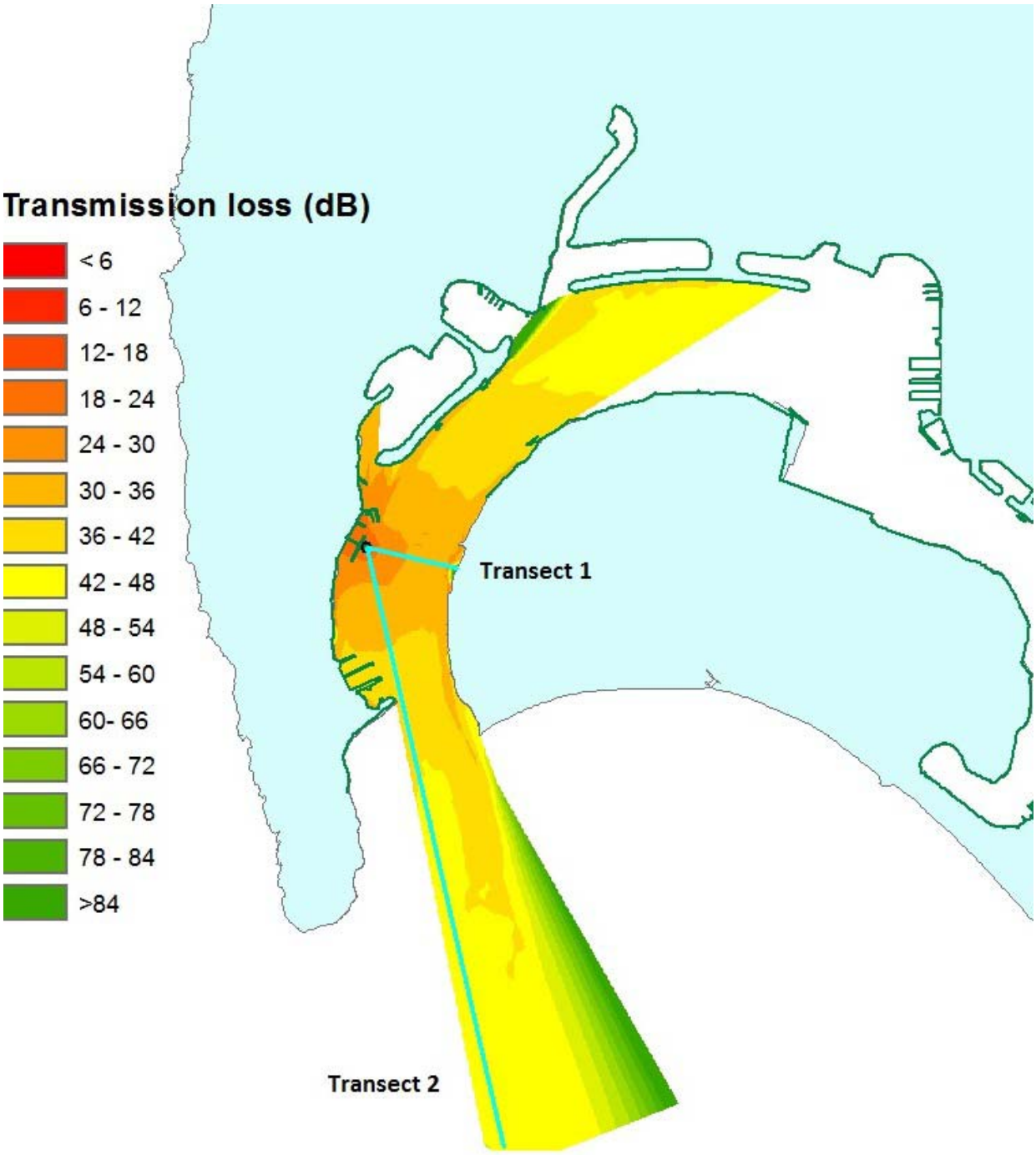


Figure 1. Transmission loss in San Diego associated with impact pile driving source located at 477888.7 N, 3618101W. Two transects that originate from the source are shown.

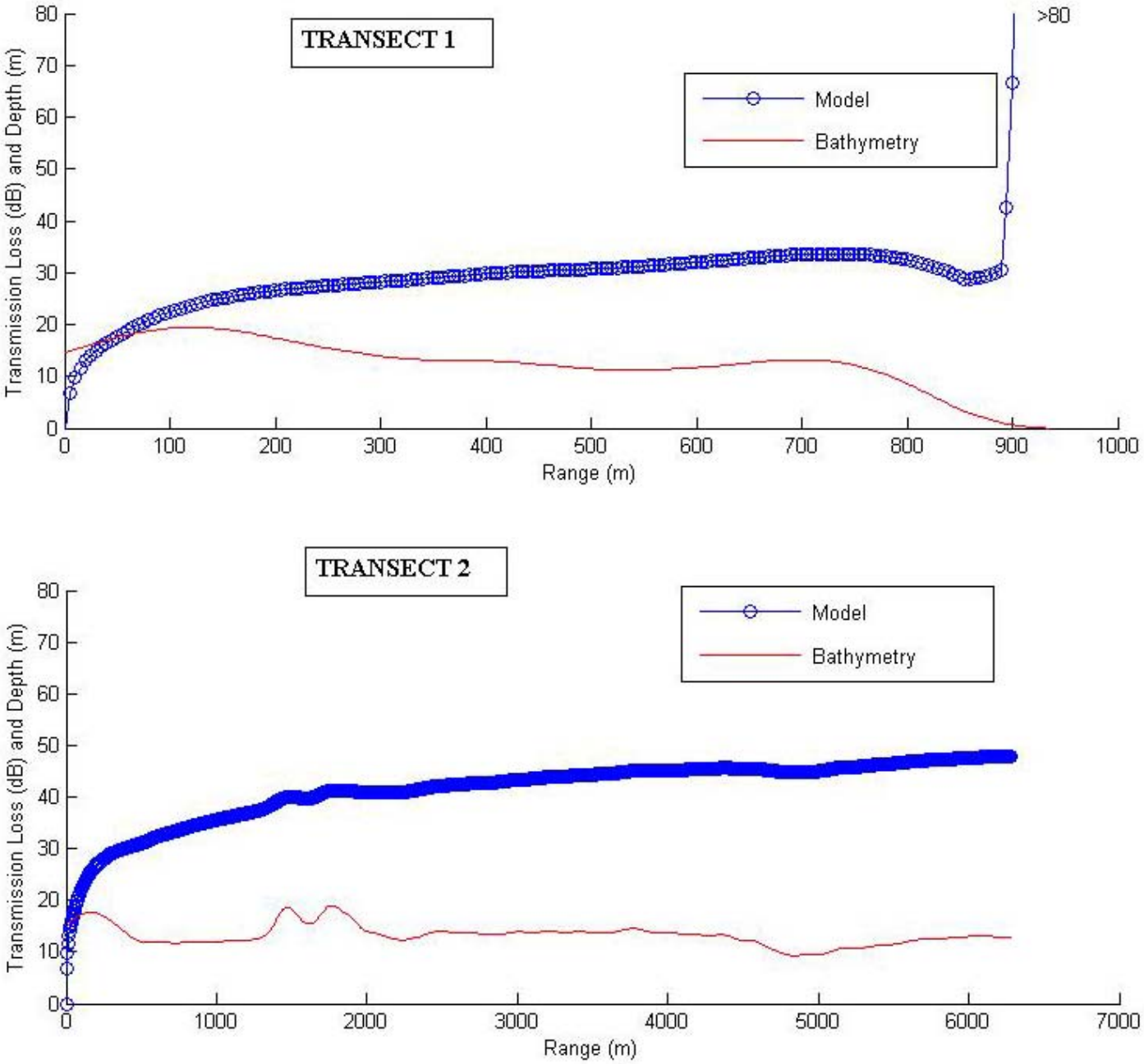
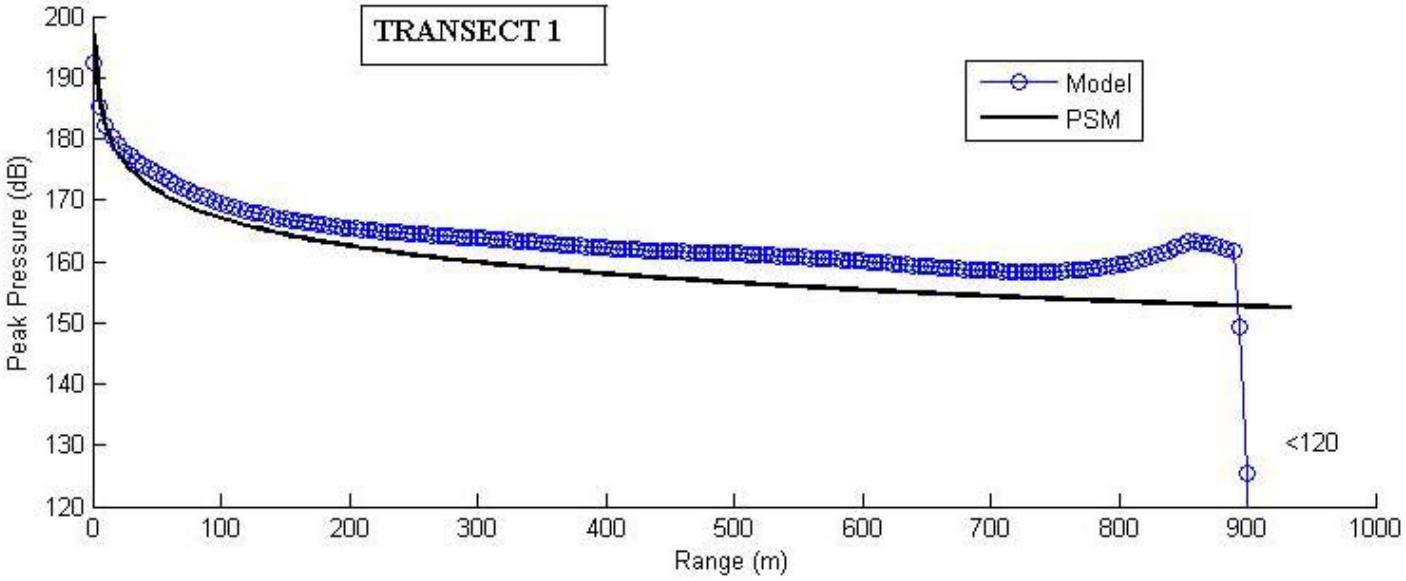


Figure 2. Transmission loss (in dB) and bathymetry (in m) for sample transects in San Diego plotted on the same scale. Note that for transect 1 only the first 80 dB of TL is plotted.

An example of how the model is applied, along with how results from it can differ from results obtained with the PSM is shown in Fig. 3. For this we assume a pile driving peak amplitude of 182 dB re 1 μPa exists at range 10 m for water depth 14.7 m, as given by the Cal Trans Report[4] for 0.6 m (24 inch) AZ steel sheet pile. Current use of the PSM takes this 182 dB value as a 10-m datum, from which estimates at extended range R m from the pile are computed to be equal to 182 – 15log10(R/10). For

[4] California Department of Transportation, "Technical Guidance for the Assessment and Mitigation of the Hydroacoustic Effects of Pile-driving on Fish" (2009).

example, at range 100 m, the estimate for peak level is reduced by 15 dB and is estimated to be 167 dB re 1 μPa. The model provided here gives TL starting from range 1 m (0 dB), and will show a TL at 10 m equal to 10 dB owing to cylindrical spreading and the influence of R*. Thus, to use the Cal Trans value as a 10-m datum, *one must subtract 10 dB from our model TL curve such that at range 10 m TL = 0 dB.* Results of this simple operation are shown in Fig. 3 along with comparable results using the PSM.



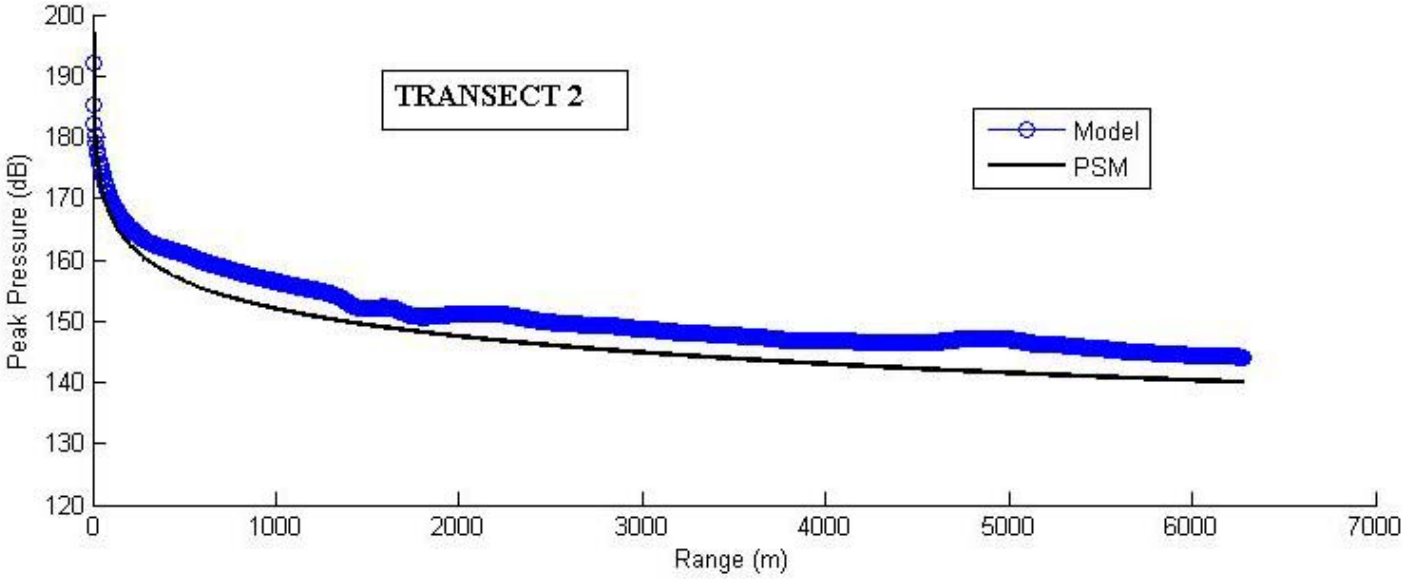


Figure 3. Comparison of peak levels calculated using PSM and Model based on a peak amplitude of 182 dB re 1 μPa, at range 10 m (or 10-m datum) .

A note on ArcGIS raster data

The model incorporated into a map of TL, such as Fig. 1, is provided in .tif format and included in the attached zip file. Note that recovery of the model TL curve associated with a particular transect from the ArcGIS raster data will produce an artifact in that curve for ranges < 10 m as shown in Fig. 4. A simple work-around for this effect is to ensure in subsequent calculations that TL = 0 dB for range = 1 m, and TL = 10 dB for range = 10m; beyond these ranges the accuracy of the recovered TL curve will be sufficient.

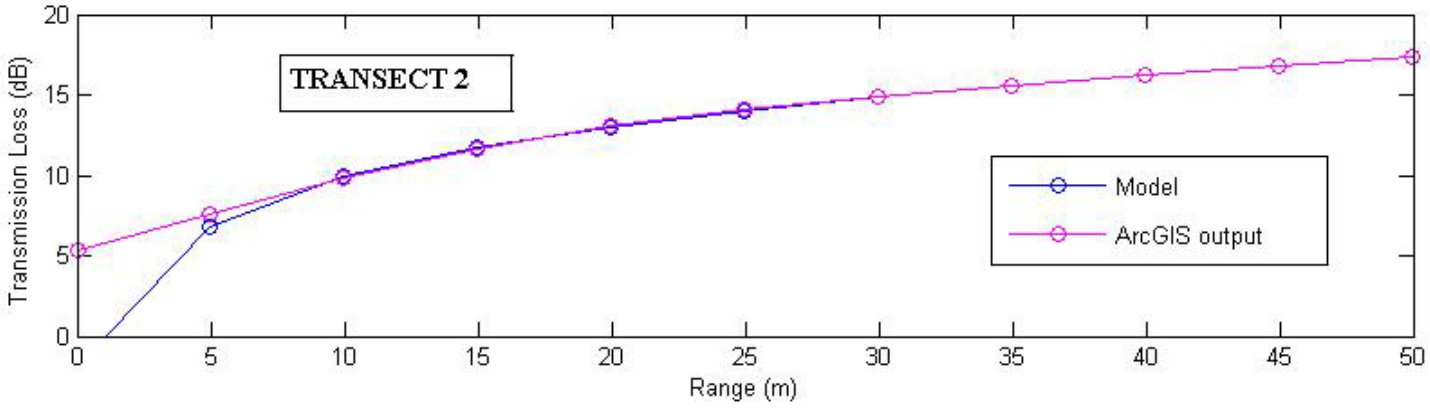


Figure 4. Comparison of ArcGIS output and Matlab model output for Transmission loss (in dB) for transect 2. The first 50 m of range is displayed.

Appendix B
Ambient Underwater Sound Measurements in San Diego Bay
(From Navy IHA Application)

[This page intentionally left blank.]

P-151 Fuel Pier MILCON

Ambient Sound Data Acquisition

Tierra Data Inc. (TDI), in collaboration with Dr. Ken Richter of SPAWAR Systems, continue to collect, process, and analyze ambient acoustic data within the projected zone of influence (ZOI) for both impact pile driving and vibratory pile driving scheduled to take place during the construction of the P – 151 Fuel Pier MILCON within San Diego Bay. Acoustic sound modeling of the project footprint and San Diego Bay, performed by Dr. Peter Dahl of the University of Washington, bounded the area from which sound pressure level (SPL) measurements were taken. Station locations were chosen to collect ambient data in the domain of Peter Dahl's transmission loss model. While collecting data, an observational log was maintained with the date, time, depth, and GPS location of the hydrophone as well as possible sound sources noted on the surface. Table B-1 is the log for acoustic data collection from April 30 to June 1, 2012 with only the first of any noise sources noted (for brevity).

SPLs were collected at mid water depth and 1 m below the surface on 7 separate days during daylight with a calibrated omni-directional hydrophone (Reson TC 4033) with a relatively flat response from a few Hz to 80 kHz. Gear was deployed from a 20ft Boston Whaler either anchored or tied to a buoy or structure. Sound pressures were recorded in 1/3 octave bins from 3 Hz to 20 kHz every 0.01 seconds (Larson Davis 831 sound level meter) for approximately 10 minutes at each location and depth. Hence, approximately 60,000 measurements over this frequency range were collected at each location and depth on 7 occasions. Statistics on the root-mean-square (rms) pressure levels over the 0.01 second intervals for each frequency band were recorded. In addition, statistics on the rms pressure level integrated from 3 Hz to 20 kHz were recorded, as well as the instantaneous peak pressure recorded over the 10 minute recording window at each station and depth.

Figures B-1, B-2 and B-3 are spatial contour plots of the median SPL data for each 10 minute collection, median SPL data collected at 1 m below the surface, and median SPL data collected from the mid water column, respectively. Average ambient SPLs ranged between roughly 120 and 132 dB. The black crosses mark the sampling locations as described in Section 2.3.4, Figure 2-3, and Table B-1. *

Additional acoustic data acquisition will now extend over longer time intervals, in additional locations, and overnight to capture potential variation in the ambient sound levels within northern San Diego Bay.

*Note: The section and figure referenced are in the IHA application. The corresponding section and figure in the EA are Section 3.2.2.3 and Figure 3.4-4.

Table B-1: Observational log of acoustic sample locations for data shown.

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Monday, April 30, 2012	2:43 PM	32°43.427'	-117°11.472'	121.5	147.4	Site 1	1m	14:42:17 GMT-07	small bout	
Monday, April 30, 2012	2:57 PM	32°43.424'	-117°11.472'	122.1	136.1	Site 1	8m	15:08:30 GMT-07	end - no events	
Monday, April 30, 2012	3:23 PM	32°43.180'	-117°12.120'	123.3	139.8	Site 2	1m	15:35:00 GMT-07	end - no events	
Monday, April 30, 2012	3:35 PM	32°43.180'	-117°12.119'	123.2	140.5	Site 2	8m	15:36:00 GMT-07	end - no events	
Monday, April 30, 2012	3:57 PM	32°43.236'	-117°13.020'	122.9	130.7	Site 3	1m	16:07:00 GMT-07	end - no events	
Monday, April 30, 2012	4:08 PM	32°43.235'	-117°13.020'	130.8	165.9	Site 3	8m	16:18:00 GMT-07	Navy ship & tug in channel	.3 miles
Monday, April 30, 2012	4:33 PM	32°42.713'	-117°14.056'	122	138	Site 4	1m	16:44:11 GMT-07	end - no events	
Monday, April 30, 2012	4:45 PM	32°42.712'	-117°14.056'	123	143	Site 4	6m	16:55:00 GMT-07	end - no events	
Monday, April 30, 2012	5:14 PM	32°40.384'	-117°13.464'	129.2	143.9	Site 8	1m	17:24:00 GMT-07	2 Navy boats	500m
Monday, April 30, 2012	5:24 PM	32°40.384'	-117°13.463'	129.9	135.2	Site 8	8m	17:35:00 GMT-07	no events	
Monday, April 30, 2012	5:49 PM	32°39.358'	-117°13.384'	121.1	138.3	Site 9	1m	18:00:00 GMT-07	no events	
Monday, April 30, 2012	5:59 PM	32°39.360'	-117°13.383'	120.8	132.4	Site 9	8m	18:10:00 GMT-07	no events	
Tuesday, May 01, 2012	8:45 AM	32°43.448'	-117°11.486'	121.5	134.6	Site 1	1m	08:57:00 GMT-07	end - no events	
Tuesday, May 01, 2012	8:58 AM	32°43.447'	-117°11.487'	121	135.4	Site 1	8m	09:08:00 GMT-07	end - no events	
Tuesday, May 01, 2012	9:17 AM	32°43.175'	-117°12.161'	122.6	148.3	Site 2	1m	09:26:00 GMT-07	8m Navy boat	200m
Tuesday, May 01, 2012	9:40 AM	32°43.171'	-117°12.165'	124.1	136.9	Site 2	8m	09:34:00 GMT-07	Navy security boats 10m - idle	
Tuesday, May 01, 2012	9:48 AM	32°43.243'	-117°13.016'	123.4	147.8	Site 3	1m	10:00:00 GMT-07	Commercial fishing boat idles by 40m	
Tuesday, May 01, 2012	10:01 AM	32°43.243'	-117°13.016'	126.3	151.1	Site 3	8m	10:06:00 GMT-07	Commercial crab boat - desiel - 20m	
Tuesday, May 01, 2012	10:29 AM	32°42.711'	-117°14.067'	122.6	148.7	Site 4	1m	10:39:00 GMT-07	end - no events	
Tuesday, May 01, 2012	10:40 AM	32°42.710'	-117°14.067'	122.5	143.5	Site 4	6m	10:50:00 GMT-07	end - no events	
Tuesday, May 01, 2012	11:04 AM	32°41.934'	-117°13.570'	120.3	137.5	Site 5	1m	11:14:00 GMT-07	end - no events	
Tuesday, May 01, 2012	11:32 AM	32°41.663'	-117°14.356'	128.6	142.9	bait barge	1m	11:42:00 GMT-07	pulled anchor - paused and restart	
Tuesday, May 01, 2012	11:54 AM	32°41.018'	-117°13.444'	121	136.3	Site 7	1m	12:05:00 GMT-07	end? - no events	
Tuesday, May 01, 2012	1:28 PM	32°40.410'	-117°13.476'	129.2	152.9	Site 8	1m	13:38:00 GMT-07	end - no events	
Tuesday, May 01, 2012	1:40 PM	32°40.408'	-117°13.474'	129.3	132.2	Site 8	8m	13:51:00 GMT-07	end - no events	
Tuesday, May 01, 2012	2:03 PM	32°39.366'	-117°13.400'	121.2	155.1	Site 9	1m	14:04:48 GMT-07	Survey vessel engine running first 30 sec	2m
Tuesday, May 01, 2012	2:13 PM	32°39.366'	-117°13.399'	122.4	130.5	Site 9	8m	14:15:00 GMT-07	Navy ship in Channel	300m
Tuesday, May 01, 2012	2:29 PM	32°39.301'	-117°12.919'	121.1	157.8	Site 10	1m	14:37:00 GMT-07	moved cable by hand	0m
Tuesday, May 01, 2012	2:40 PM	32°39.300'	-117°12.920'	119.5	132.3	Site 10	8m	14:51:00 GMT-07	end - no events	
Wednesday, May 02, 2012	11:10 AM	32°43.437'	-117°11.488'	119.7	127.7	Site 1	1m	11:13:34 GMT-07	3m inflatible	
Wednesday, May 02, 2012	11:22 AM	32°43.436'	-117°11.489'	122.3	134.5	Site 1	8m	11:23:00 GMT-07	10m & 7m boats	
Wednesday, May 02, 2012	11:57 AM	32°43.168'	-117°12.148'	123.2	139.3	Site 2	8m	11:59:00 GMT-07	5 - 4m speed boats in a line	100m
Wednesday, May 02, 2012	12:18 PM	32°43.251'	-117°13.018'	123.2	134.4	Site 3	1m	12:25:00 GMT-07	2 - 20m boats	150m
Wednesday, May 02, 2012	12:29 PM	32°43.248'	-117°13.014'	124.8	150.9	Site 3	8m	12:31:00 GMT-07	14m sailboat	200m
Wednesday, May 02, 2012	1:01 PM	32°42.712'	-117°14.057'	124.1	140.1	Site 4	1m	13:04:26 GMT-07	15m boat	100m

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Wednesday, May 02, 2012	1:12 PM	32°42.713'	-117°14.060'	123.1	153.3	Site 4	6m	13:17:30 GMT-07	15m boat	100m
Wednesday, May 02, 2012	1:38 PM	32°41.929'	-117°13.575'	115.7	142.9	5				
Wednesday, May 02, 2012	1:44 PM	32°41.930'	-117°13.576'	120.2	162.2	Site 5	1m	13:47:30 GMT-07	Security boat	200m
Wednesday, May 02, 2012	2:03 PM	32°41.739'	-117°14.163'	125.5	138.9	Site 6	1m	14:07:15 GMT-07	20m fishing boat	
Wednesday, May 02, 2012	2:14 PM	32°41.739'	-117°14.163'	124.9	128	bait barge	8m	14:14:24 GMT-07	20m fishing boat	50m
Wednesday, May 02, 2012	2:25 PM	32°41.740'	-117°14.161'	127.5	135.5	bait barge				
Wednesday, May 02, 2012	2:34 PM	32°41.031'	-117°13.441'	120.2	140.8	Site 7	1m	14:34:00 GMT-07	30m navy vessel	300m
Wednesday, May 02, 2012	2:53 PM	32°40.397'	-117°13.471'	129.1	137.1	Site 8	1m	14:53:01 GMT-07	30m Navy vessel	150m
Wednesday, May 02, 2012	3:04 PM	32°40.398'	-117°13.471'	129.4	136.3	Site 8	8m	15:05:31 GMT-07	Navy ship	150m
Wednesday, May 02, 2012	3:26 PM	32°39.301'	-117°12.911'	119.9	135.1	Site 10	1m	15:31:00 GMT-07	Sub	400m
Wednesday, May 02, 2012	3:38 PM	32°39.302'	-117°12.914'	121.9	137.7	Site 10	8m	15:38:00 GMT-07	30m sailboat	50m
Wednesday, May 02, 2012	3:57 PM	32°39.372'	-117°13.372'	119.5	136.2	Site 9	1m	15:58:00 GMT-07	no events	
Wednesday, May 02, 2012	4:08 PM	32°39.371'	-117°13.373'	120	128.7	Site 9	8m	16:08:00 GMT-07	no events	
Saturday, May 05, 2012	8:54 AM	32°43.438'	-117°11.485'	118.7	141.8	Site 1	1m	08:55:27 GMT-07	Security boat	200m
Saturday, May 05, 2012	9:06 AM	32°43.436'	-117°11.491'	119.8	137.8	Site 1	1m	08:55:27 GMT-07	Security boat	200m
Saturday, May 05, 2012	9:30 AM	32°43.158'	-117°12.137'	119.7	133.3	Site 2	1m	09:32:21 GMT-07	7m boat	100m
Saturday, May 05, 2012	9:41 AM	32°43.160'	-117°12.140'	121.3	139.2	Site 2	8m	09:42:07 GMT-07	10m security boat	70m
Saturday, May 05, 2012	10:03 AM	32°43.241'	-117°13.027'	122.5	144.9	Site 3	1m	10:03:32 GMT-07	15m boat	60 m
Saturday, May 05, 2012	10:14 AM	32°43.244'	-117°13.028'	124.9	135.9	Site 3	8m	10:14:59 GMT-07	3m inflatable and 9m boat	60m
Saturday, May 05, 2012	10:56 AM	32°42.698'	-117°14.043'	121.5	137.9	Site 4	1m	10:56:28 GMT-07	3m inflatable	35m
Saturday, May 05, 2012	11:06 AM	32°42.697'	-117°14.042'	122.9	144.5	Site 4	7m	11:07:39 GMT-07	15m boat (same boat as Event 3 in Site 4 1m session)	20m
Saturday, May 05, 2012	11:35 AM	32°41.733'	-117°14.168'	123.7	128.9	bait barge	1m	11:35:51 GMT-07	10m boat	20m
Saturday, May 05, 2012	11:46 AM	32°41.733'	-117°14.168'	128.3	145.6	bait barge	8m	11:48:22 GMT-07	5 5m boats on tour	25m
Saturday, May 05, 2012	12:15 PM	32°41.019'	-117°13.436'	117.6	144.8	Site 7	1m	12:15:30 GMT-07	several boats	200m
Saturday, May 05, 2012	12:33 PM	32°40.419'	-117°13.441'	130.5	143.2	Site 8	1m	12:38:36 GMT-07	13m sailboat (mininal effect)	25m
Saturday, May 05, 2012	12:44 PM	32°40.420'	-117°13.441'	131	148.6	Site 8	8m	12:52:13 GMT-07	F16(?) jet right above us	300m
Tuesday, May 15, 2012	10:50 AM	32°43.433'	-117°11.495'	116	163.4	Site 1	1m	10:54	28ft 2xOB	200m
Tuesday, May 15, 2012	11:03 AM	32°43.431'	-117°11.493'	120.1	161.2	Site 1	8m	11:11	28ft 2xOB	200m
Tuesday, May 15, 2012	11:22 AM	32°43.161'	-117°12.138'	119.1	134.6	Site 2	1m	11:31	30ft Sailboat	25m
Tuesday, May 15, 2012	11:33 AM	32°43.162'	-117°12.137'	121.3	137.1	Site 2	8m	11:36	21ft IO	75m
Tuesday, May 15, 2012	11:51 AM	32°43.245'	-117°13.010'	121.7	138.6	Site 3	1m	11:53	16ft OB	40m
Tuesday, May 15, 2012	12:01 PM	32°43.248'	-117°13.010'	122.7	157.3	Site 3	8m	12:08	80ft 2xIn	60m
Tuesday, May 15, 2012	12:28 PM	32°42.693'	-117°14.057'	119.5	137.8	Site 4	1m	12:38	70ft 2xIN	30m
Tuesday, May 15, 2012	12:39 PM	32°42.690'	-117°14.057'	130.3	147.9	Site 4	8m	12:47	30ft IO	10m
Tuesday, May 15, 2012	12:59 PM	32°41.738'	-117°14.161'	122.1	138.4	bait barge	1m	12:59	50ft In	60m
Tuesday, May 15, 2012	1:10 PM	32°41.739'	-117°14.162'	123.8	139.7	bait barge	8m	13:10	30ft In	30m
Tuesday, May 15, 2012	1:27 PM	32°40.395'	-117°13.468'	126.9	134.4	Site 8	1m	No Events		
Tuesday, May 15, 2012	1:39 PM	32°40.397'	-117°13.467'	127.8	131.3	Site 8	8m	No Events		

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Thursday, May 24, 2012	10:08 AM	32°43.440'	-117°11.475'	126.7	144.5	site 1	1 m	10:11:55	30 m tour boat	200 m
Thursday, May 24, 2012	10:21 AM	32°43.438'	-117°11.474'	128.1	138.6	site 1	8m	10:22:01	Navy tug at 300 m and Navy whaler at 100 m	
Thursday, May 24, 2012	10:46 AM	32°43.161'	-117°12.126'	129.5	142.2	site 2	1m	10:47:00	15 m boat and tour boat 30m at 200 m	70 m
Thursday, May 24, 2012	11:05 AM	32°43.247'	-117°12.997'	131.3	135.5	site 3	1m	11:05:50	10 m boat	50 m
Thursday, May 24, 2012	11:20 AM	32°43.246'	-117°12.996'	124.7	138	site 3	15 m	11:24:57	high speed navy rib boat 9 m	200 m
Thursday, May 24, 2012	11:49 AM	32°42.717'	-117°14.051'	129.3	128.3	Site 4	1 m	11:58:47	10 m sail boat	50 m
Thursday, May 24, 2012	12:02 PM	32°42.717'	-117°14.051'	124.8	144.2	site 4	7m	12:03:48	3m infatable	30m
Thursday, May 24, 2012	12:30 PM	32°41.738'	-117°14.165'	124.4	135.4	bait barge	1m	12:32:40	navy rib boat 8 m speeding	400m
Thursday, May 24, 2012	12:04 PM	32°41.737'	-117°14.165'	132.9	141.2	bait barge	12 m	12:44:25	20 m fishing boat	400 m
Thursday, May 24, 2012	1:08 PM	32°41.024'	-117°13.434'	123.8	137.7	site 7	1m	no events		
Friday, June 01, 2012	9:33 AM	32°43.438'	-117°11.484'	123.8	144.1	1	1	9:40:52	1	30
Friday, June 01, 2012	9:47 AM	32°43.437'	-117°11.486'	125.5	143.4	1	28 feet	9:50:30	15 foot boat	30 meters
Friday, June 01, 2012	10:14 AM	32°43.163'	-117°12.130'	124.1	140.5	2	1	10:16:03	25 foot	300 yards
Friday, June 01, 2012	10:28 AM	32°43.161'	-117°12.132'	124.8	144.6	2	45 feet	10:37:55	police boat 20 foot	500 feet
Friday, June 01, 2012	10:52 AM	32°43.239'	-117°13.016'	121.3	132.3	3	1	10:57:45	45 foot	30 feet
Friday, June 01, 2012	11:04 AM	32°43.246'	-117°13.017'	127	141	3	7 meters	11:05:13	30 foot sail boat	200 feet
Friday, June 01, 2012	11:34 AM	32°42.704'	-117°14.058'	118.5	136.5	4	1	11:35:47	50 foot	50 foot
Friday, June 01, 2012	11:45 AM	32°42.705'	-117°14.059'	120.4	143.2	4	27 feet	11:46:43	40 foot sailboat	60 feet
Friday, June 01, 2012	12:21 PM	32°41.727'	-117°14.175'	118.9	130.6	bait barge	1			
Friday, June 01, 2012	12:34 PM	32°41.727'	-117°14.173'	123.6	151.1	bait barge	50 feet	12:36:47	60 foot in-engine boat	50 feet
Friday, June 01, 2012	2:52 PM	32°41.907'	-117°13.580'	113.4	134.6	5	1	14:55:35	20 ft	120 feet
Friday, June 01, 2012	3:12 PM	32°41.028'	-117°13.440'	116.3	130.5	7	1			
Friday, June 01, 2012	3:25 PM	32°41.028'	-117°13.440'	123	138.4	7	12 feet	15:28:04	12 ft	125 feet
Friday, June 01, 2012	3:42 PM	32°40.399'	-117°13.479'	125.2	134.8	8	1			
Friday, June 01, 2012	3:54 PM	32°40.399'	-117°13.478'	125.7	130.6	8	26 feet	15:58:18	24 ft	450 feet
Friday, June 01, 2012	4:15 PM	32°39.358'	-117°13.378'	116.4	136.7	9	1			
Friday, June 01, 2012	4:27 PM	32°39.357'	-117°13.380'	115.4	130.3	9	50 feet			

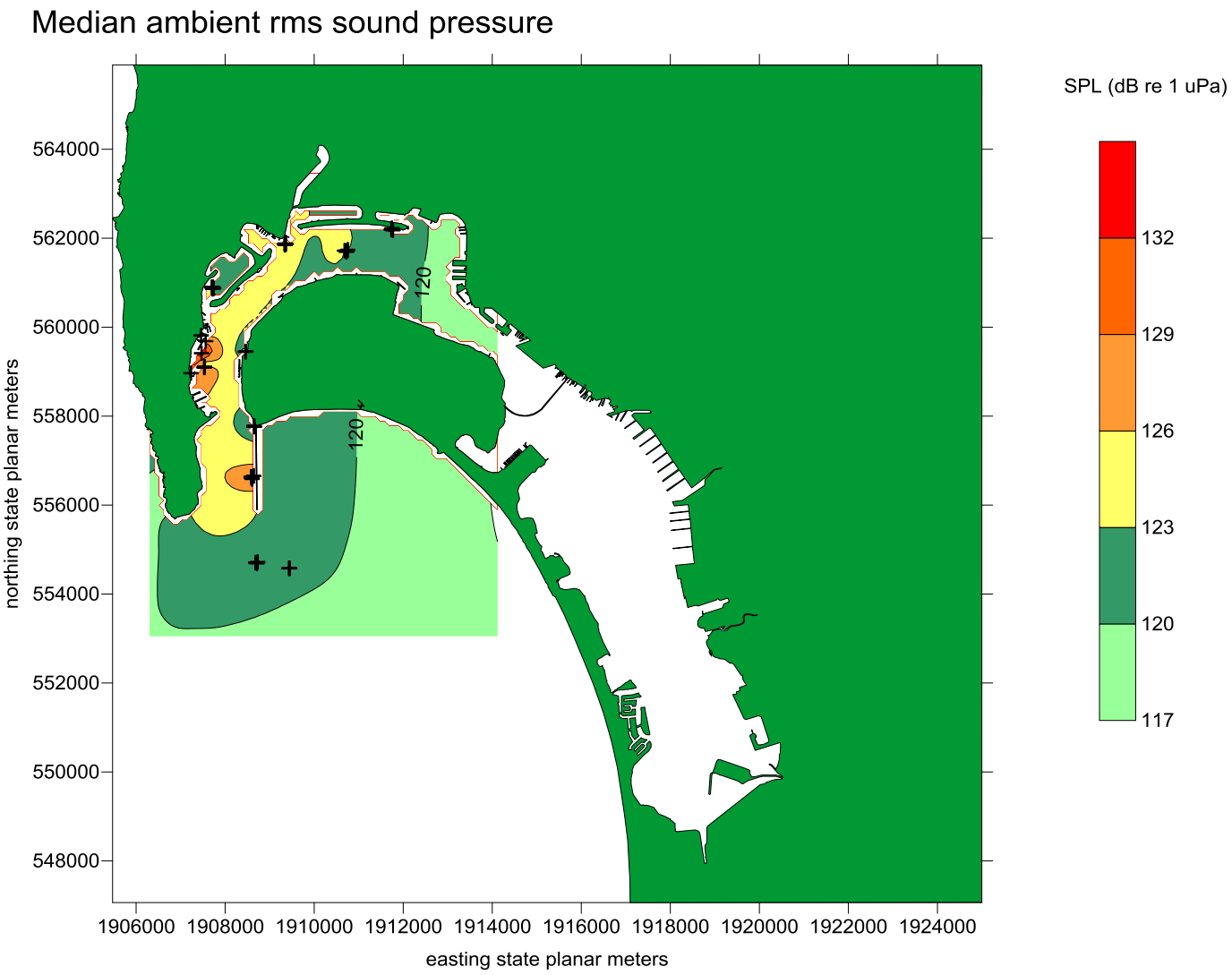


Figure B-1: Median ambient SPL, averaged through depth.

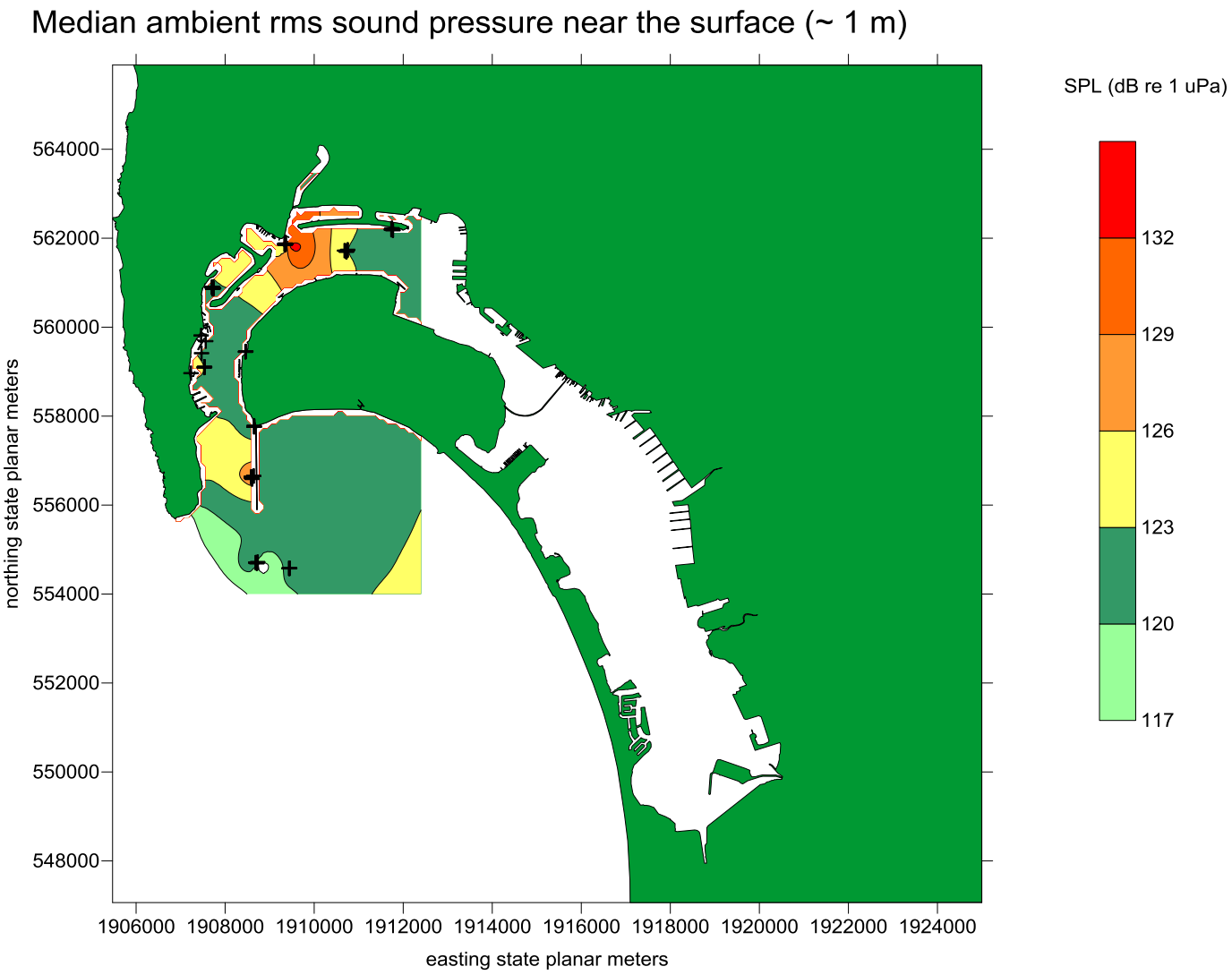


Figure B-2: Median ambient SPL, measured 1 m below the surface.

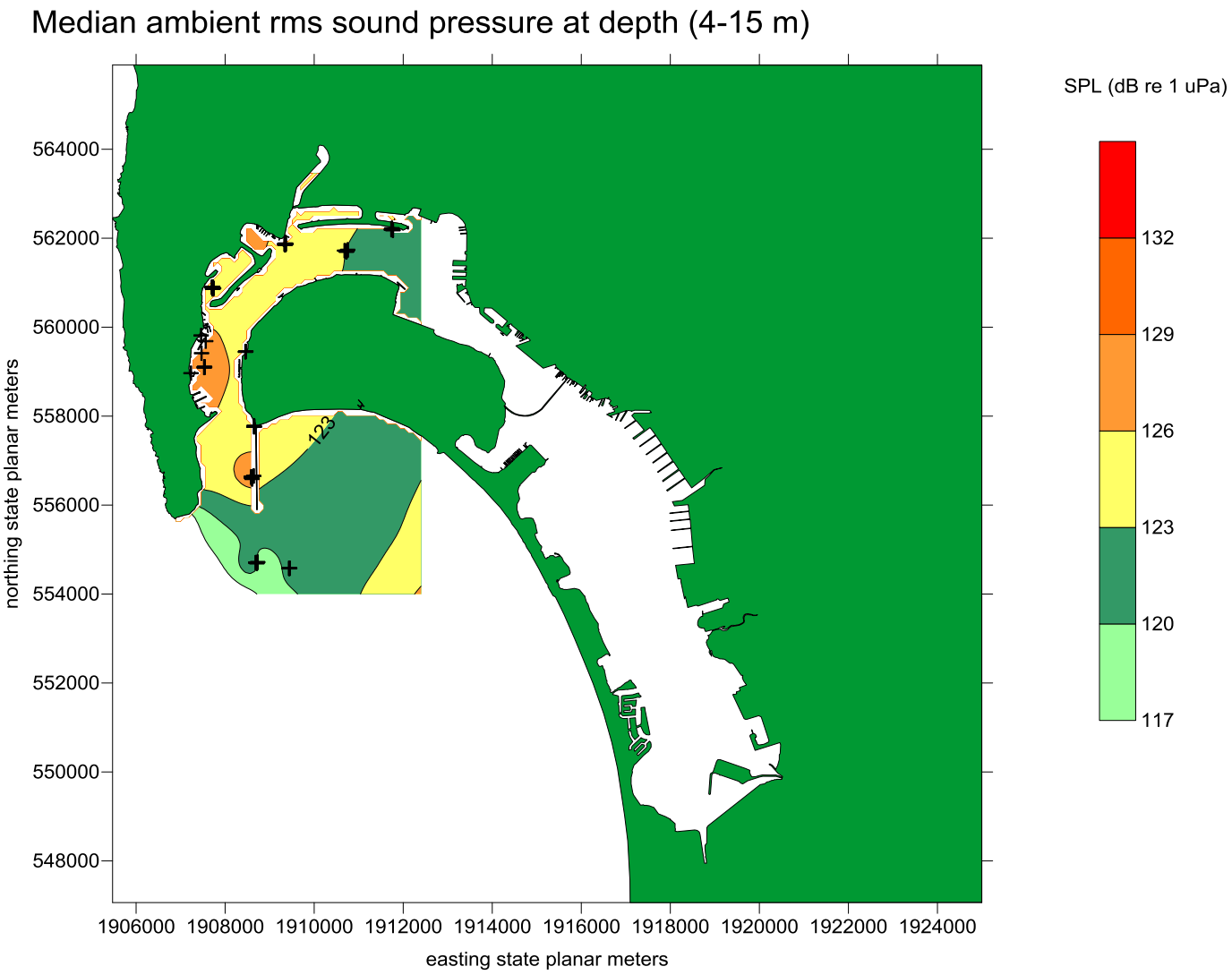


Figure B-3: Median ambient SPL, measured 1 at mid water column

[This Page Intentionally Left Blank]

Appendix E.2

Memorandum of Understanding Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California

[This Page Intentionally Left Blank]

MEMORANDUM OF UNDERSTANDING
BETWEEN
U.S. FISH AND WILDLIFE SERVICE
AND
THE U.S. NAVY
CONCERNING CONSERVATION OF
THE ENDANGERED CALIFORNIA LEAST TERN
IN SAN DIEGO BAY, CALIFORNIA

This Memorandum of Understanding (MOU) is entered into by the Department of the Interior, U.S. Fish and Wildlife Service, hereinafter referred to as the Service, and the U.S. Navy represented by Commander, Navy Region Southwest, hereinafter referred to as the Navy, pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1533, 1534, 1536). This MOU continues efforts in endangered species conservation between the Service and the Navy in Southern California started in October 1987 and renewed in 1993. The Navy has requested extensions of the MOU for 1999 and 2000, which have been agreed to by the Service.

BACKGROUND

The purpose and objective of the MOU is to establish standards and conditions for Navy in-water construction activities conducted in San Diego Bay to prevent adverse effects to the State of California and federally listed endangered California least tern *(Sterna antillarum browni)* [tern], while optimizing the Navy's ability to proceed with in-water construction as needed and in full compliance with the applicable portions of the federal Endangered Species Act and its regulations. Maintenance, construction, and demolition of Navy facilities routinely require in-water construction activities in San Diego Bay including pier and quay wall construction and repair, pile driving, placement of sheet pile, riprap, dredging, and removal of existing dolphins, piers and piles.

This MOU defines geographical areas and physical conditions under which in-water Naval construction activities may occur in San Diego Bay without the need to conduct formal consultation pursuant to section 7 of the Endangered Species Act. Attachment A of the MOU provides a list of conservation measures to be implemented by the Navy to improve nesting and foraging success of the tern population dependent upon San Diego Bay (Bay) and the near shore marine waters of the Pacific Ocean (Ocean). Land-based Naval construction activities that may affect the tern are not covered under this MOU and will be addressed on a case-by-case basis through consultation with the Service pursuant to the Endangered Species Act.

DESCRIPTION AND BIOLOGY

The occurrence in and use of Bay by the tern typically occurs between April 1 and September 15 of each year. During this period the tern migrates north from wintering areas in Central and South America to southern California coastal areas to nest and raise its young. There are six recognized tern nesting colonies adjacent to the Bay. These nesting colony locations include Naval Air Station (NAS) North Island; Naval Amphibious Base (NAB) Coronado; Lindbergh Field (San Diego International Airport); "D" Street Fill, a parcel of land jointly administered by Sweetwater Marsh National Wildlife Refuge and the Port of San Diego; Chula Vista Wildlife Reserve; and the levees at South San Diego Bay National Wildlife Refuge (Figure 1). The first two of the above listed locations are located on Navy property. NAS North Island includes the main nesting colony, known as the "Mat" site and four alternate nesting colony sites, Runway 1-1, Ammo Dump, Runway 1-8 and the base of Zuniga Point. These alternate nesting colony sites are shown in Figure 2. NAB Coronado has three main tern nesting sites including North and South Delta Beaches, which are adjacent to the Bay, and the Ocean Beach site, which is adjacent to the Pacific Ocean (Figure 3).

During the nesting season, adult terns and their young feed almost exclusively on small marine fish captured in the surface waters (top two feet) within the Bay, in river mouths in the Bay such as the Sweetwater Channel, and in near shore ocean waters adjacent to the Silver Strand. Figures 2-5 depict tern nesting sites and foraging areas on or adjacent to Navy lands in the Bay.

Major reasons for the failure of tern breeding colonies adjacent to the Bay, including those found on Navy properties, are believed to have been avian and mammal predation, loss of nesting and foraging habitat, and human disturbance. Additional adverse impacts to the terns can occur if in-water construction activities inhibit or prevent foraging opportunities for the tern or disrupt nesting pairs on the colony. Poor foraging may affect the survival of chicks by requiring adult terns to forage farther from their nesting colony or for a longer period of time, thus leaving tern chicks at the nesting colony unprotected from predators. It has also been shown that chick survival can be reduced during El Niño events when size and availability of food resources are typically altered.

STATUS OF CONSERVATION EFFORTS

In accordance with the 1987 MOU, the Navy established a permanent, full-time natural resource position at the Naval Facilities Engineering Command office in San Diego in 1988 to manage a tern conservation program and coordinate with the Service on Navy projects that may affect the tern. The natural resource position developed and managed the overall strategy for the tern colonies on Navy lands in four major areas: predator management, tern monitoring, site preparation of tern nesting colonies, and biological information gathering. Through establishment of this position these management objectives have been successfully met.

Predator management has been carried out under a Cooperative Agreement with the U.S. Department of Agriculture, Wildlife Services (WS), formerly known as Animal Damage Control,

since March 1988, when initial efforts to control both avian and mammalian predators began. Predator management activities have been conducted at NAS North Island, Naval Training Center (NTC) San Diego, and NAB Coronado since the 1989 breeding season. Predator management and biological monitoring of the NTC colony site was suspended after the 1998 tern nesting season by the Navy as a result of the cessation of base operations under the 1993 Base Closure and Realignment Act. The Service acquired the NTC tern colony and a 15-acre buffer area from the Navy when this installation permanently closed. The NTC property was exchanged for Western Salt property owned by H.G. Fenton Company and lands administered by the State Lands Commission. These lands totaled approximately 1,400 acres. This action was described in an internal section 7 consultation (1-6-98-FW-49) dated October 13, 1998 and released the Navy from any future tern management responsibilities for NTC.

The Navy's predator management program has resulted in significant reductions in the numbers of both avian and mammalian predators found at the tern nesting sites, thereby enhancing the species' productivity. From 1984 to 1987 the tern fledglings per pair averaged .38; between 1988 and 1991 the number of tern fledglings averaged .50 per pair, a 32% increase in fledgling production. Between 1992 and 1999, tern fledglings per pair averaged .66, an increase of over 74% from the 1984-1987 period. Undoubtedly, a significant portion of the increased productivity can be attributed to the predator management program.

The implementation of an objective, scientific, long-term monitoring program for tern nesting colonies has provided critical information essential in developing a prudent management strategy in San Diego Bay. The retention of a tern expert since 1988 to oversee monitoring of individual nesting sites and prepare annual reports on breeding success of the tern colonies occurring on Naval property has been a key element in this successful monitoring program. This expert is exceptionally familiar with tern populations in San Diego County and specifically in San Diego Bay, and has provided the Navy with sound, basic information on the breeding biology of the terns at the Navy sites, and has been instrumental in advising the Navy in the development of its overall tern conservation strategy.

The Navy also funded basic research in assessing the effects of in-water pile driving activities on fish behavior, as well as research in identifying foraging areas important to the terns. Key foraging areas for the tern adjacent to Navy lands (See shaded areas in Figures 2-5) were identified as part of this research along with long-term observations of the tern.

Major improvements have been completed by the Navy adjacent to their tern nesting colonies. A 10-acre tern nesting site was first prepared in 1988 at South Delta Beach, NAB Coronado. This site has been prepared and monitored every year since then and supported its first successful tern nest in 1992. In 1996 the South Delta Beach site was further enhanced by expanding the 10-acre nesting site to 15 acres, adding a four-foot sand berm along the tidal flats to protect tern nests from high tide events, and placing a two-foot layer of clean sand (without a soil component) in the center portion of the original 10-acre site to enhance nesting substrate for the tern and reduce the likelihood for the establishment of predatory ant colonies that have been documented to

adversely affect tern eggs and chicks. These improvements have contributed significantly to tern use of South Delta Beach, increasing the number of active nests from one in 1992 to 80 in 1999.

The North Delta Beach nesting area has also been enhanced to protect nesting terns. In 1992, large, low profile signs were placed facing the Bay warning pleasure boaters of the sites' protected status. In 1996, a sand berm was also placed along the northern and a portion of the eastern shoreline to protect tern nests in areas prone to flood at high tides. These improvements have helped the North Delta Beach site to grow from 46 nests in 1989 to 344 nests in 1999. Ten acres of eelgrass was planted in the spring of 1990 immediately east of North Delta Beach as compensation for Naval construction projects. Eelgrass provides important habitat for a number of species of marine fish, including tern forage species, and may provide an enhanced foraging area for terns that nest on the North and South Delta Beach sites. Beginning in November 2000, the Navy constructed an enhancement island approximately .5 km north of North Delta Beach using dredge materials to provide approximately 20 acres (9 acres of inter-tidal and 11 acres of sub-tidal) of potential foraging area for terns and other marine birds.

Fences have been built or replaced at NAS North Island (1992) and the south edge of the South Delta Beach (1994) tern colonies. Permanent grids have been established at North and South Delta Beach and NAS North Island tern colony sites. These grids serve to mark nest sites so that they can be definitively located and monitored from year to year for the purposes of measuring changes.

In 1997, the Navy, San Diego Gas and Electric Company, and the City of Coronado jointly combined efforts to underground power lines along Highway 75 that parallel Delta Beach. This effort resulted in reduced perching opportunities for avian predators of the tern, and eliminated the possibility for tern mortality due to impact with the overhead wires.

SPECIFIC OBLIGATIONS OF THE PARTIES

The Navy and the Service mutually agree that the goal of this MOU is to promote the survival and the recovery of the tern population in San Diego Bay. To help achieve this goal, the protection and enhancement of the nesting colonies and preservation of sufficient foraging opportunities immediately adjacent to tern nesting colonies shall be pursued on both Navy and Service owned lands.

The Navy and the Service will hold two meetings each calendar year to discuss the obligations and provisions of the MOU. The meetings will be held in April and October at a time and location to be mutually agreed to by Service and Navy representatives. The purpose of the April meeting will be to identify and review the future Navy construction projects, to the extent feasible. This meeting will focus on the known projects that could affect biological resources of San Diego Bay or the near shore marine waters of the Pacific Ocean utilized by the tern.

During the October meeting the following will be jointly reviewed by the Navy and the Service to evaluate whether identified objectives should be modified or reprioritized or new objectives

should be added: a) tern recovery objectives, b) the priority of tern compensation projects to be initiated during the current fiscal year, c) funding needed to implement the objectives, 4) recommendations for improving tern management, and 5) opportunities to cooperatively partner to achieve meeting the identified conservation objectives.

MOU objectives in subsequent years will be mutually determined through these meetings when the previous year's results are reviewed and the next year's objectives are proposed. All in-water construction projects are subject to this MOU regardless of whether they were foreseen prior to and briefed at the April or October meeting. In addition to Service and Navy representatives, the appropriate contractor and other government personnel who have worked at the Navy tern colony sites shall attend the October meeting. Attachment A will be revised annually, as necessary, to reflect these decisions. The mutually agreed to objectives will be described in a letter to the Service prepared by the Navy.

The Parties may forego the April and/or the October meeting in any year, because in some years the purposes of the meetings may be accomplished through other communications between the parties.

At any time during this MOU should the Navy require emergency in-water repairs to any of its piers, wharfs, pilings or quay walls during the tern breeding season, the Navy shall present the Service with all available information on the emergency need, including but not limited to, a brief page of description of the work needed to be done, the method(s) to be used to effect the repairs, an estimate of the number of days needed to complete in-water repairs as well as for the total repair, a detailed map showing the portion(s) of the structure(s) requiring the repair, and any measures the Navy will incorporate into the project to avoid and/or minimize effects to the terns. The Service then agrees to review the Navy submittal and provide a brief written response within 5 working days unless otherwise mutually agreed upon.

Each of the meetings described above, as well as actions for emergency in-water repairs, will constitute informal consultation between the Service and the Navy pursuant to section 7 of the Endangered Species Act, where mutually agreed upon conservation measures can be incorporated into the project description so as not likely to adversely effect the tern.

NAVY OBLIGATIONS

In order to support Naval activities in San Diego Bay, various types of in-water construction activities are conducted in the waters of San Diego Bay. The Navy believes that to accomplish this construction in a timely manner, to reduce costs, and to ensure required fleet support, it is necessary to be able to initiate construction throughout the year, including during the tern nesting season (April 1-September 15).

In concert with the goal of this MOU, subject to limitations discussed in the Miscellaneous Provisions section of this MOU, the Navy will: (1) to the maximum extent practicable eliminate impacts from in-water construction occurring within tern nesting and foraging areas by

scheduling construction activities outside the tern nesting season (September 16 to March 31) or incorporate specific measures within individual projects to minimize potential affects to terns (i.e. employment of silt curtains during dredging operations, use of vibratory hammer instead of use of a conventional piston driven pile driver etc.) and/or (2) offset effects of in-water construction to terns by implementing the obligations identified in this MOU. The Navy will provide a management program that will continue a predator management effort at its current level for tern colonies existing on Navy properties in and adjacent to San Diego Bay, and provide additional or improved nesting and foraging habitat wherever possible. The Navy agrees to accomplish items one through six below and complete the specific obligations outlined in Attachment A by providing an annual funding source of at least $250,000 for the purpose of implementing this tern management program. Current obligations are listed in order of priority. If the stipulated tern recovery obligations can be accomplished for less than the amount of annual funds identified above, then the amount committed for that year by the Navy can be decreased accordingly. It is recognized by the Navy that a proactive program for enhancing tern survival continues to be included within these funds.

In addition to the implementation of compensation measures identified in Attachment A of this MOU, and subject to the availability of appropriated funds, the Navy agrees to: (a) as necessary, continue to study and evaluate through research projects the effects of in-water construction activities on the foraging behavior of marine birds, especially terns, in San Diego Bay, (b) maintain a permanent position to oversee the Navy's in-water construction MOU conservation program obligations to the tern in San Diego Bay, and (c) place a high priority in using clean dredged material from Navy projects to enhance the substrate of tern nesting colony sites and foraging areas within San Diego Bay. These obligations are further described below:

1. Reserve funding and designate a Navy biologist to oversee, coordinate and implement the Navy's obligations identified in this MOU, including executing contracts to provide annual tern monitors and predator management personnel at Navy tern nesting colony sites. In addition, a program to control predatory ants at tern colony sites is required so long as this predator continues to be identified as a threat to tern eggs or chicks at individual tern nesting sites.

2. Meet with Service personnel in April of each year to discuss planned Navy in-water projects in San Diego Bay and near shore marine waters of the Pacific Ocean utilized by the tern, and other projects adjacent to tern colonies that may affect the tern and its nesting and foraging habitat, and seek mutually agreed upon conservation measures to avoid or minimize effects to this species. During these meetings the Navy will provide the Service with an updated table or list that summarizes individual in-water construction projects and the amount of San Diego Bay waters that have been covered by wharves, piers, and/or floating structures.

3. In October of each year, meet with the Service to discuss tern recovery objectives, the priority of tern compensation projects to be initiated during the current fiscal year, funding needed to implement the objectives, and recommendations for improving tern management on Navy

lands. Any changes to these mutually agreed upon tern recovery objectives will be identified in a letter prepared by the Navy within 45 days from the October meeting.

4. Give a high priority to using non-contaminated, beach quality dredged material of appropriate sediment grain size from future Navy dredging projects as a source of material to enhance: (a) the substrate of existing tern nesting colony sites on San Diego Bay Naval bases or (b) foraging habitat for the tern in San Diego Bay. This latter enhancement option involves the shallowing of San Diego Bay waters that are greater than -10 feet Mean Lower Low Water (MLLW) or deeper.

5. When the parties mutually identify specific issues concerning the tern that may be the result of the Navy's in-water construction activities conducted in San Diego Bay, and when the parties determine a study is necessary, a study plan will be developed by the Navy in consultation with the Service to investigate and attempt to resolve the issue. Issues may need to be prioritized, and if so, will be prioritized jointly by the Navy and the Service. Issues may require a focused study to resolve the issue and could include, but are not limited to, impacts to nesting terns, tern foraging behavior or foraging areas. The specific study design will be developed in consultation with the Service. Such studies may require that contractors obtain a Section 10(a) permit from the Service.

6. The Navy will provide the Service copies of its annual tern monitoring reports that summarize numbers of nests, eggs, chicks, fledglings, and adults that occurred at each Navy tern nesting colony, as well as copies of any tern research reports prepared for the Navy.

SERVICE OBLIGATIONS

Through informal consultation conducted in the development of this MOU, the Service hereby agrees that:

1. The Service recognizes that the proactive management program as implemented by the Navy has resulted in direct benefits (i.e., increases in fledgling production) to terns that would not have been achievable with rescheduling in-water construction during the non-breeding season of the tern or compensation obtained on a project-by-project basis and will include such recognition during its analysis of whether a Navy activity triggers formal, informal, or any consultation at all.

2. Navy in-water construction activities may be conducted in the Bay or the Ocean during any time of the year without the requirement of conducting a formal section 7 consultation because they are not likely to adversely affect the tern, provided that the projects are located outside the shaded (nesting) areas shown in Figures 2–5, and provided that:

    a. Surface turbidity resulting from dredging projects must not be allowed to intrude into those areas that are within a one-kilometer (i.e., 3,280.6 feet or 0.6 mile) radius from all active tern nesting colonies located in Bay. Surface turbidity is defined as an obvious

discoloration of the top three meters (9.8 feet) of the water column visible to the human eye. Surface turbidity from any dredging project conducted between April 1 and September 15 shall not exceed 1 hectare (2.47 acres) in length or width, persist longer than one (1) hour, and be in or adjacent to a foraging area of high to very high value to foraging terns as identified in Figures 2-5 by the shaded areas.

b. Noise from pile driving, sheet pile driving, or other heavy construction activity within 500 meters of an active tern nesting area is not to exceed ambient decibel levels as measured at the perimeter of individual tern nesting areas. Vibrations from these activities shall not be allowed to disrupt nesting or loafing terns, particularly in areas of the Bay that have been previously filled.

3. Proposed Naval projects located in the shaded areas (Figures 2–5) would require initial review by the Service through informal consultation if in-water construction activity during the nesting season (April 1 to September 15) is desired. The Navy will avoid formal consultation if it can be demonstrate to the Service that its proposed project is not likely to adversely affect the tern. If the Navy gives the Service a letter or other written communication showing the Service that the conditions listed below will be met, the Service will concur with the Navy's assessment. The Service will review these projects on a case-by-case basis or as a group of projects with similar objectives, and will respond in writing whether they concur with the Navy's assessment. If the Service does not concur, it shall specify which of the conditions listed below have not been properly shown, and the reasons that it believes that they have not.

a. The Navy's written communication to the Service must contain detailed discussion of dredging methodology and means to control turbidity from project construction activities, including dredged material disposal. This information will be provided to show that the project is not likely to adversely affect tern nesting or foraging activities.

b. Noise levels from pile driving, sheet pile driving, or other heavy construction activity shall be as described in 2.b. above. Vibrations from these activities shall not be allowed to disrupt nesting or loafing terns.

4. The Service will review and evaluate all studies that are conducted in conjunction with this MOU on a continuous basis with the intention of modifying the restrictions placed on Navy in-water construction activities, as warranted.

5. The Service shall attend a minimum of two meetings each year with the Navy (i.e. April and October) to determine the priority of tern compensation projects to be initiated during the next fiscal year and review the Navy's current list and description of proposed construction projects to be conducted in the Bay and near shore marine waters of the Ocean. The mutually agreed upon tern compensation projects will be identified in a letter prepared by the Navy within 45 days from the October meeting.

6. The Service agrees to monitor and conduct predator management at each Service tern nesting colony and to provide the Navy with copies of its annual tern monitoring reports that summarize numbers of nests, eggs, chicks, fledglings, and adults that occurred at each Service tern nesting colony, as well as copies of any tern research reports prepared for the Service.

7. Prior to completion and approval of the Comprehensive Conservation Plan (CCP), the Service will continue to provide for: (1) predator management, (2) annual monitoring of the tern and WSPL, (3) preseason site preparation at the Tijuana Slough NWR, Sweetwater Marsh NWR, and South San Diego Bay Unit, and (4) enhancement of tern and Western snowy plover nesting substrate at the South San Diego Bay Unit. The Service, in developing the CCP, agrees to assist in promoting the long-term viability of tern and Western snowy plover populations by preserving the continuity of the above initiatives to the greatest extent possible. This will facilitate a balanced dispersal of nesting opportunities among federal and state agencies and municipalities within San Diego Bay. After completion and approval of the CCP, the Service will incorporate all applicable habitat and species management projects into the Refuge Operations Needs System to request funding.

8. The Service shall work to ensure that other non-Department of the Navy entities that administer areas used by terns, shall manage these areas so that they are sufficiently attractive to terns and provided with a level of management that will result in a level of productivity comparable to that accomplished at Navy sites. This will provide for a more balanced and biologically sound distribution of tern breeding populations in the Bay and surrounding areas. The Service shall provide information on the progress of this effort annually at the October meeting. Other relevant entities include but are not limited to the Service's own Refuges Division, the State of California, County of San Diego, San Diego Unified Port District, and the City of San Diego, as well as all other surrounding municipalities.

9. The Service shall make all reasonable efforts to finalize the tern recovery plan currently under revision, and provide a public review draft within six months of the signature of this document. If the Service forms a tern recovery team, the Service shall include a Navy representative as a full team member.

MISCELLANEOUS PROVISIONS

This MOU is effective when signed by both parties and shall extend for a period of 2 years from that date. The MOU can be updated at any time as an improved database is developed from studies conducted in San Diego Bay and elsewhere. Any amendment to this MOU must be in writing signed by all parties. Nothing in this MOU is intended to abrogate the responsibility of the Navy or the Service to comply with any provision(s) of the Endangered Species Act, Migratory Bird Treaty Act, Clean Water Act, or River and Harbor Act or other applicable federal laws.

While the parties agree that their annual budget submissions will be sufficient to cover the tasks and goals described herein, pursuant to the Anti-Deficiency Act, 31 U.S.C. §1341, *et seq.*, any

requirement for the payment or obligation of funds, including funding for staffing resources, pursuant to this MOU (including any attachment), shall be subject to the availability of funds appropriated by Congress, and no provision herein shall be interpreted to require obligation or payment of funds in advance of an appropriation. Nor shall this MOU be construed to require the violation of any other applicable federal law. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established for targeted tasks under this MOU shall be appropriately adjusted. Nothing in this MOU shall be construed as implying that Congress will, at a later time, appropriate funds sufficient to meet deficiencies. Immediate action, in the form of a written letter, is warranted should either party determine that the payment of obligation of funds pursuant to this MOU could not be fulfilled in a given fiscal year. That party should provide an anticipated schedule when such funds would be available to fulfill the terms of this MOU.

This MOU may be modified only by written agreement of the parties. Modification includes extension of its term. This MOU may be terminated by either party by a procedure that begins with written notification to the other party that such measure is being considered. Within 30 days of such notification the parties will meet to informally address all concerns raised. If resolution of the concerns cannot be negotiated, The MOU may be dissolved upon written notice by the party wanting to terminate the MOU. Said final termination notice must be within 60 days following the meeting and state the reasons for dissolution of the MOU.

Paul Henson
for Mr. Steve Thompson
California/Nevada Operations Manager
U.S. Fish and Wildlife Service

5/19/04
Date

C. Schanze
C. SCHANZE
Captain, CEC, U.S. Navy
By direction of the
Commander, Navy Region Southwest

04 DEC 03
Date

A. Gonzales
A. GONZALES
Captain, U.S. Navy
By direction of the
Commander, Navy Region Southwest

6/14/04
Date

D.R. Landon
D. LANDON
Captain, U.S. Navy
Commanding Officer
Naval Base Coronado

12 Nov 03
Date

ATTACHMENT A

MEMORANDUM OF UNDERSTANDING BETWEEN U.S. FISH AND WILDLIFE SERVICE AND THE U.S. NAVY CONCERNING CONSERVATION OF THE ENDANGERED CALIFORNIA LEAST TERN IN SAN DIEGO BAY, CALIFORNIA

Navy conservation measures ranked in the order that they should be implemented:

1. Prepare tern nesting colony sites on NAS North Island identified as the "MAT" site and NAB Coronado identified as North and South Delta Beaches and Ocean Beach by March 1 of each year. Preparation of the Alternate Site "Ammo Dump" (2B) will not be done until issues of site contamination have been resolved. Site preparation includes grading or mowing or use of Service-approved herbicides to remove annual plant growth, inspection/replacement or reinstallation of the chick barrier around the perimeter of the tern colony, inspection/ repair/replacement of nest site grid poles and placement of chick shelters throughout the nesting colony. Chick shelters, usually consisting of ceramic roofing tiles, should be placed at approximately 15 meter intervals throughout the entire nesting sites.

2. Provide funding for and conduct monitoring at all tern nesting colonies on Navy property adjacent to San Diego Bay including, NAS North Island and NAB Coronado, to determine the breeding status of the colony. A minimum tern monitoring effort of four (4) days a week per individual nesting colony site should occur from May 1 through July 31, and three (3) days a week from April 15-30 August 1-31 or until the terns have departed each nesting colony site. At a minimum, the following information shall be recorded for each nesting site: the number of adult nesting pairs, number and location of nests, number of eggs laid, number of chicks, fledglings produced, level of depredation, and the known causes of depredation. Monitors must be experienced with the identification of the different age classes of terns, vocalizations of terns and other shorebirds that occur in San Diego Bay, and have specific knowledge concerning the breeding and foraging behavior of terns.

3. Provide funding for predator management at all least tern colonies on Navy property in San Diego Bay including, NAS North Island and NAB Coronado. Only professional predator management personnel shall be used. A predator management program shall be developed specifically for feral cats, other mammalian predators (i.e., foxes, skunks, rats, cats and dogs), and avian predators (i.e., ravens, gulls, loggerhead shrikes, herons, owls and American kestrels). A minimum predator management effort of five (5) days a week for an eight (8) month period from January 1 through August 31of each year is required. It may be necessary

to use drugs or poisoned bait to deal with some avian and mammalian species. In these cases, personnel licensed to use such drugs shall be required. The Navy and the Service will develop strategy in advance for the management of known sensitive, but not federally listed, predators such as the Western gull-billed tern (*Sterna nilotica vanrossemi*) and peregrine falcon (*Falco peregrinus*).

4. Maintain annually and replace, as needed, all fences around active tern nesting sites on Navy lands in San Diego Bay. This includes maintaining and replacing Nixalite (an anti-perching material) on the top of the fence, any visual barriers on or attached to the fence, chick movement barriers along the bottom of the fence and the repair or replacement of tern conservation signs. The fence design shall preclude cats and dogs (both feral and domestic) from entering the nesting colony.

5. Develop, implement and maintain an ant control program at all the nesting sites on Navy lands in San Diego Bay as long as ants continue to be documented as a cause of tern egg and chick mortalities.

6. Place tern decoys in appropriate numbers and locations on all active tern nesting sites on Navy lands in San Diego Bay, and at as many alternate nesting sites as decoys will allow, to encourage tern use of a suitable habitat for nesting. The use of decoys shall not discourage nesting efforts of the federally listed Western snowy plover (*Charadrius alexandrinus nivosus).*

7. Initiate appropriate pet control regulations, conduct an installation-wide pet licensing program for dogs and cats, and encourage the spay-neutering of pets on NAS North Island and NAB Coronado to reduce feral dog and cat populations. Information should be provided to all owners of dogs and cats concerning the potential problems their pets can cause to indigenous wildlife, especially to federally listed and sensitive species nesting on Navy land. The pet control regulations shall also reflect the intent of Executive Order 13112, Invasive Species, and Department of the Navy Policy Letter Preventing Feral Cat and Dog Populations on Navy Property dated 10 January 2002, in the prohibition of establishing/maintaining feral cat colonies on Navy land.

8. Provide additional foraging opportunities for terns through one or more of the following: creation/rehabilitation of eelgrass beds and creation/rehabilitation of inter-tidal/sub-tidal bay habitat.

9. Continue to investigate the feasibility of creating a new tern nesting site at the Naval Radio Receiving Facility, Imperial Beach, as compatible with operational and training requirements.

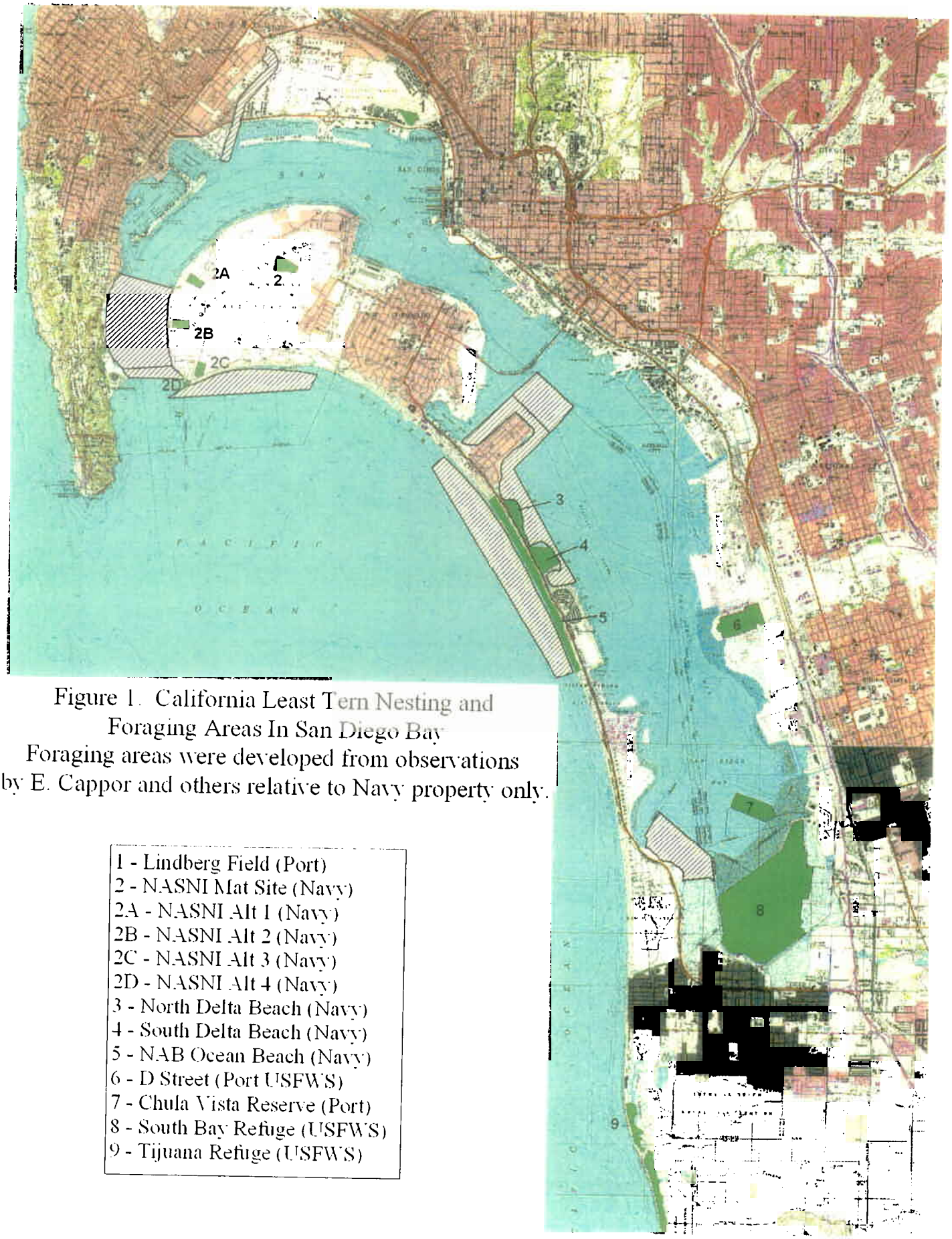


Figure 1. California Least Tern Nesting and Foraging Areas In San Diego Bay
Foraging areas were developed from observations by E. Cappor and others relative to Navy property only.

1 - Lindberg Field (Port)
2 - NASNI Mat Site (Navy)
2A - NASNI Alt 1 (Navy)
2B - NASNI Alt 2 (Navy)
2C - NASNI Alt 3 (Navy)
2D - NASNI Alt 4 (Navy)
3 - North Delta Beach (Navy)
4 - South Delta Beach (Navy)
5 - NAB Ocean Beach (Navy)
6 - D Street (Port USFWS)
7 - Chula Vista Reserve (Port)
8 - South Bay Refuge (USFWS)
9 - Tijuana Refuge (USFWS)

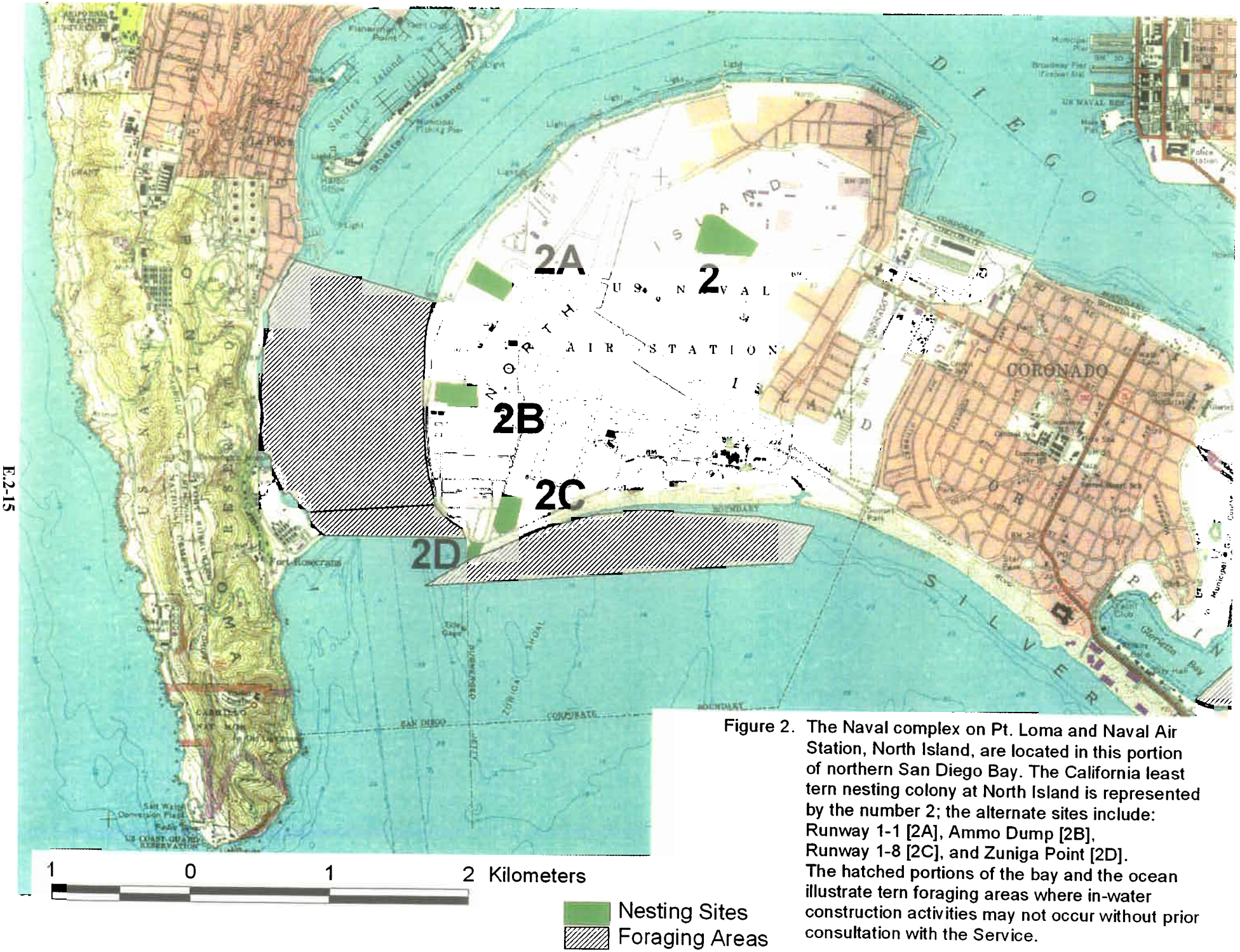


Figure 2. The Naval complex on Pt. Loma and Naval Air Station, North Island, are located in this portion of northern San Diego Bay. The California least tern nesting colony at North Island is represented by the number 2; the alternate sites include: Runway 1-1 [2A], Ammo Dump [2B], Runway 1-8 [2C], and Zuniga Point [2D]. The hatched portions of the bay and the ocean illustrate tern foraging areas where in-water construction activities may not occur without prior consultation with the Service.

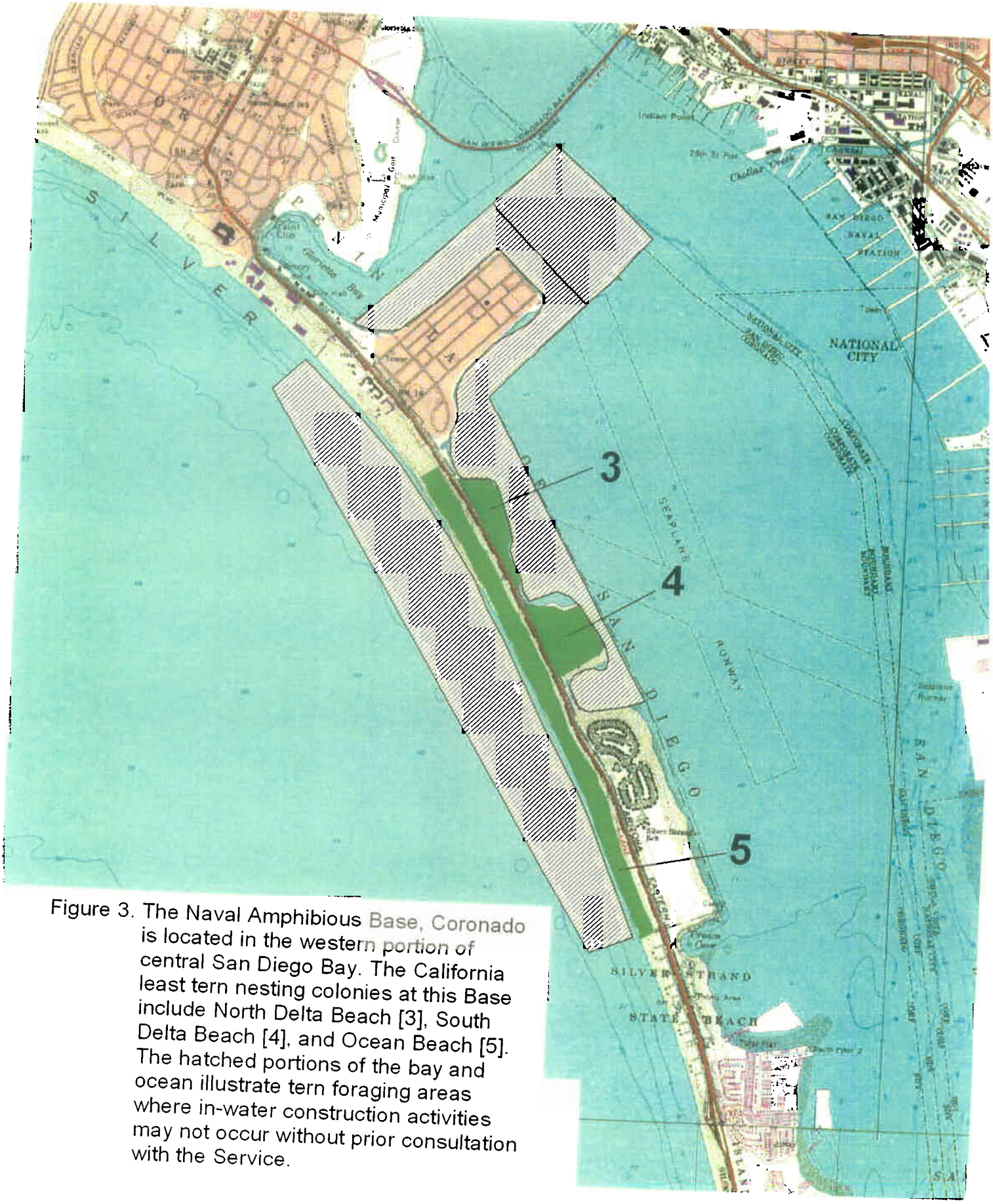


Figure 3. The Naval Amphibious Base, Coronado is located in the western portion of central San Diego Bay. The California least tern nesting colonies at this Base include North Delta Beach [3], South Delta Beach [4], and Ocean Beach [5]. The hatched portions of the bay and ocean illustrate tern foraging areas where in-water construction activities may not occur without prior consultation with the Service.

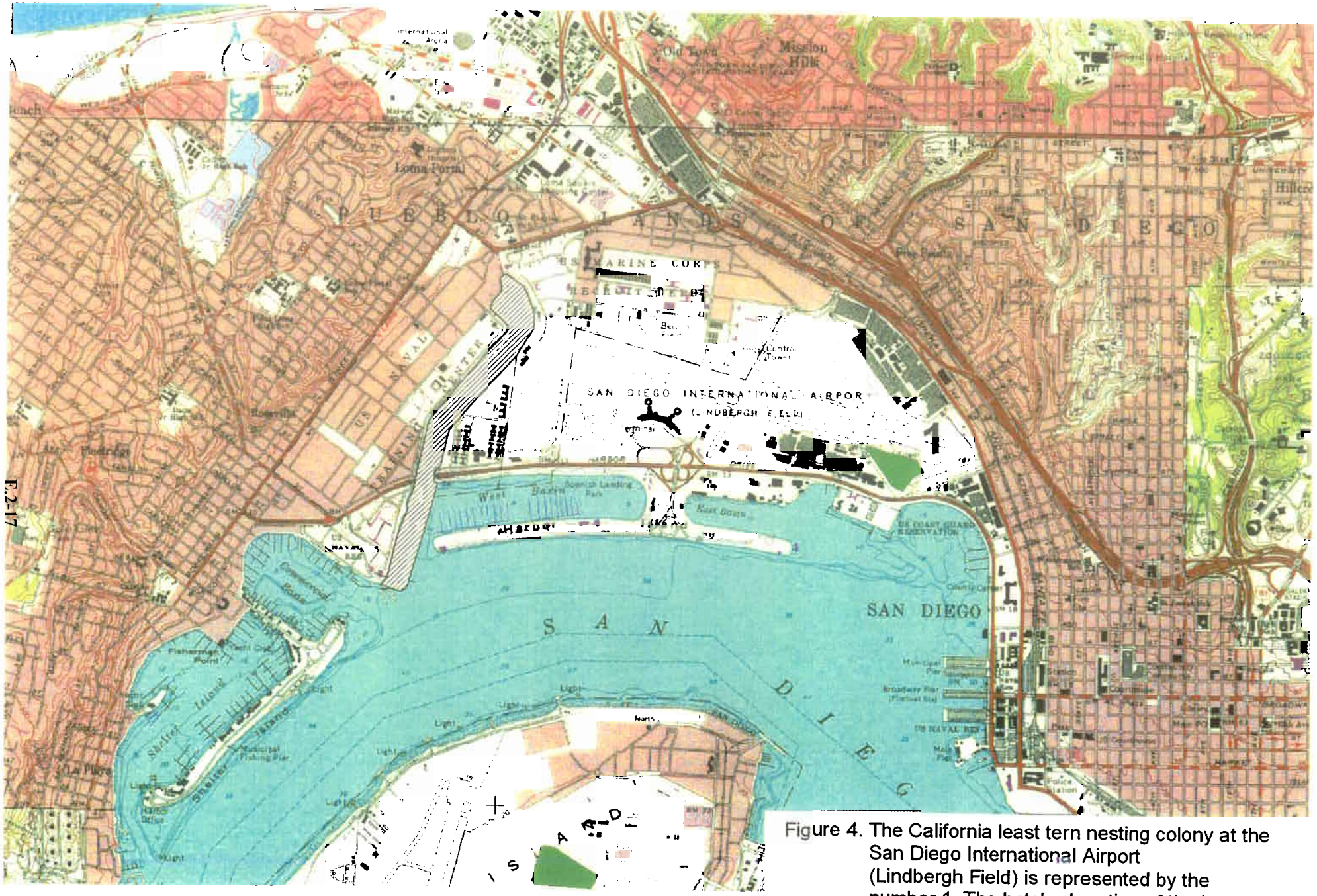
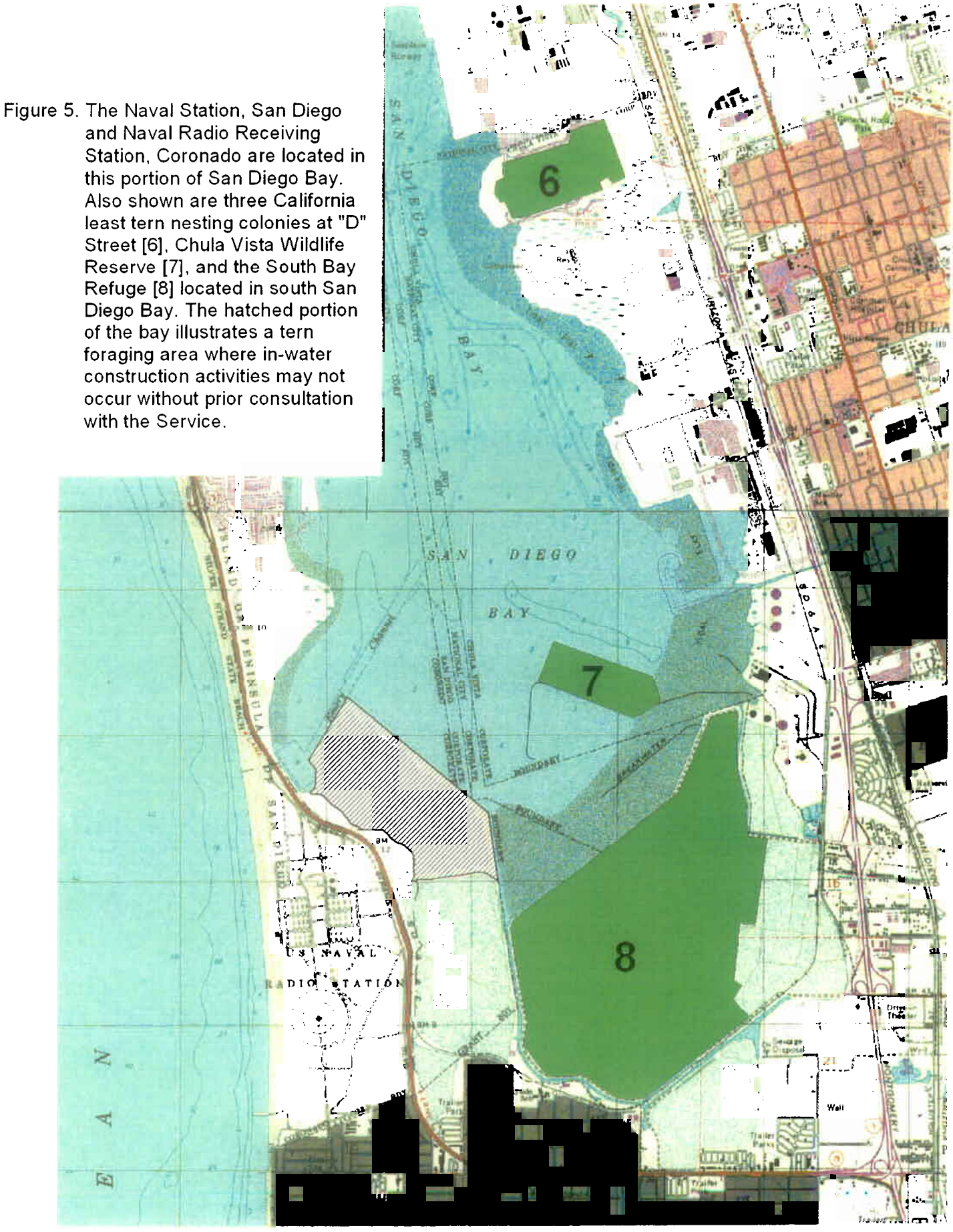


Figure 4. The California least tern nesting colony at the San Diego International Airport (Lindbergh Field) is represented by the number 1. The hatched portion of the bay illustrates a tern foraging area where in-water construction activities may not occur without prior consultation with the Service.

Figure 5. The Naval Station, San Diego and Naval Radio Receiving Station, Coronado are located in this portion of San Diego Bay. Also shown are three California least tern nesting colonies at "D" Street [6], Chula Vista Wildlife Reserve [7], and the South Bay Refuge [8] located in south San Diego Bay. The hatched portion of the bay illustrates a tern foraging area where in-water construction activities may not occur without prior consultation with the Service.



Appendix E.3

Approval for Use of Established Eelgrass Mitigation Bank Credits

[This Page Intentionally Left Blank]

DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION SOUTHWEST
937 NO. HARBOR DR.
SAN DIEGO, CALIFORNIA 92132-0058

IN REPLY REFER TO:
5090
Ser N40JRR.cs/0006
March 11, 2011

From: Commander Navy Region Southwest
To: Defense Logistics Agency (DLA) Enterprise Support, Installation Management (Attn: Mr. John Davis)

Subj: REQUEST FOR CREDITS FROM CNRSW EELGRASS MITIGATION BANK IN SUPPORT OF MILCON P-151, NAVAL STATION POINT LOMA

Ref: (a) Mitigation Banking Instrument between CNRSW and USACE and NOAA Fisheries for the San Diego Eelgrass Mitigation Bank dated 2 July 2008.

1. CNRSW approves the application of available eelgrass habitat credits in support of the Defense Logistics Agency, Pier 180 (MILCON P-151) project at Naval Station Point Loma.

2. Per reference (a), Eelgrass habitat loss as a result of the construction and maintenance of the new Pier 180 (MILCON P-151) will be mitigated by accessing the available credits from the subject Bank (north and north-central ecoregions).

3. There may be a monitoring fee not to exceed $10,000 to utilize the bank credits. This fee will be used to conduct eelgrass surveys of the Mitigation Bank sites that will be used to provide the offset for the proposed project. The monitoring fee shall be paid from the MILCON project.

4. For questions pertaining to this matter, please feel free to contact Chris Stathos at (619) 532-2308.

C. L. STATHOS
By direction

[This Page Intentionally Left Blank]

Appendix E.4

Acoustic Transmission Loss Model for Pile Driving

[This Page Intentionally Left Blank]

Applied Physics Laboratory
University of Washington

1013 NE 40th Street
Box 355640
Seattle, WA 98105-6698

206-543-1300
FAX 206-543-6785
www.apl.washington.edu

January 25, 2011

To: Mitchell A. Perdue, CRM
Senior Biologist
Naval Facilities Engineering Command Southwest Coastal IPT
Naval Station San Diego
2730 McKean St., Bldg 291
San Diego, CA 92136

Email copies sent to:
Derek Lerma
Tierra Data Inc.
Derek@tierradata.com

Anurag Kumar
Marine Resource Bioacoustician
Naval Facilities Engineering Command Atlantic
anurag.kumar@navy.mil

From: Peter H. Dahl
Principal Engineer and Professor
Applied Physics Laboratory and Dept. of Mechanical Engineering
University of Washington, Seattle

Dara M. Farrell
Predoctoral Research Associate I
Applied Physics Laboratory and Dept. of Mechanical Engineering
University of Washington, Seattle

This memorandum summarizes our results of modeling acoustic transmission loss (TL) for San Diego Bay associated with underwater noise generated by impact pile driving. The TL modeling assumes a nominal pile driving location at position 477888.7 N, 3618101W where the nominal water depth is 14.7 m. A note on the model deliverable in the form of ArcGIS raster data is given at the end of this memorandum.

Our model assumes an average sound speed of 1504 m/s based on historical temperature-salinity data, and location-dependent bathymetry, both provided to us by NAVAC. Note that for purposes of modeling TL we have smoothed this bathymetry over a 100 m smoothing window and removed any features considered artifact. For geoacoustic properties of the sediments we use sound speed[1] and attenuation[2] for sand based a frequency of 500 Hz. Additional assumptions entering into the modeling are summarized as follows:

1. The spectrum of acoustic energy associated with impact pile driving is confined to frequencies less than about 2000 Hz[3]
2. The model is intended to simulate depth-averaged TL, which is specifically applicable to peak pressure emanating from an impact pile driving source, but also applies more generally to SEL and RMS measures.
3. The concept of a Mach cone that emanates from impact pile driving is incorporated in our TL model which causes the acoustic amplitude to decay as $R^{1/2}$ (cylindrical spreading) where R is range from the pile source, out to range of R*, or roughly 3 times the water depth. The Mach cone and precise definition of R* are discussed in ref.[3].
4. Beyond ranges of R* the amplitude decays as $R^{3/2}$. This decay mirrors the so-called practical spreading model (PSM), but our model differs fundamentally from the PSM. The primary differences are (i) model properties associated with R*, and (ii) depth-dependence in our model.
5. Depth-dependence is handled in two ways. For cases in which the depth increases from the source impact pile driving, the sound pressure amplitude decays as $(H/Ho)^{1/2}$ where H is the depth as a function of range from source and Ho is the depth at the source. This behavior applies unless and until the depth reaches a modal cut-off depth, associated with a frequency of 500 Hz. At this point the modal decay coefficient corresponding to the first mode at 500 Hz is applied, which increases TL at a rate significantly greater than $R^{3/2}$.

Numerical results of the model are incorporated into a TIFF file (Dahl_Model.tif) that is attached to this email report. This file can be added as a layer in an ArcGIS map and transects can be drawn and interpolated (using the Interpolate Shape tool). In this way the model associated with any radial transect that originates from the source location can be extracted. Figure 1 displays a summary of the model for San Diego Bay along with two representative transects, with TL versus range for these two transects plotted in Fig. 2.

[1] K. L. Williams, D. R. Jackson, E. I. Thorsos, D. Tang, and S. G. Schock,"Comparison of sound speed and attenuation measured in a sandy sediment to predictions based on the Biot theory of porous media," IEEE J. Ocean. Eng. 27, 413–428 (2002).

[2] J. Zhou, X. Zhang, and D. P. Knobles, "Low-frequency geoacoustic model for the effective properties of sandy bottoms," J. Acoust. Soc. Am. 125, 2847–2866 (2009).

[3] P.G. Reinhall, & P.H. Dahl, "Underwater Mach wave radiation from impact pile driving: Theory and observation", J. Acoust. Soc. Am. 130, 3, 1209-1216 (September 01, 2011).

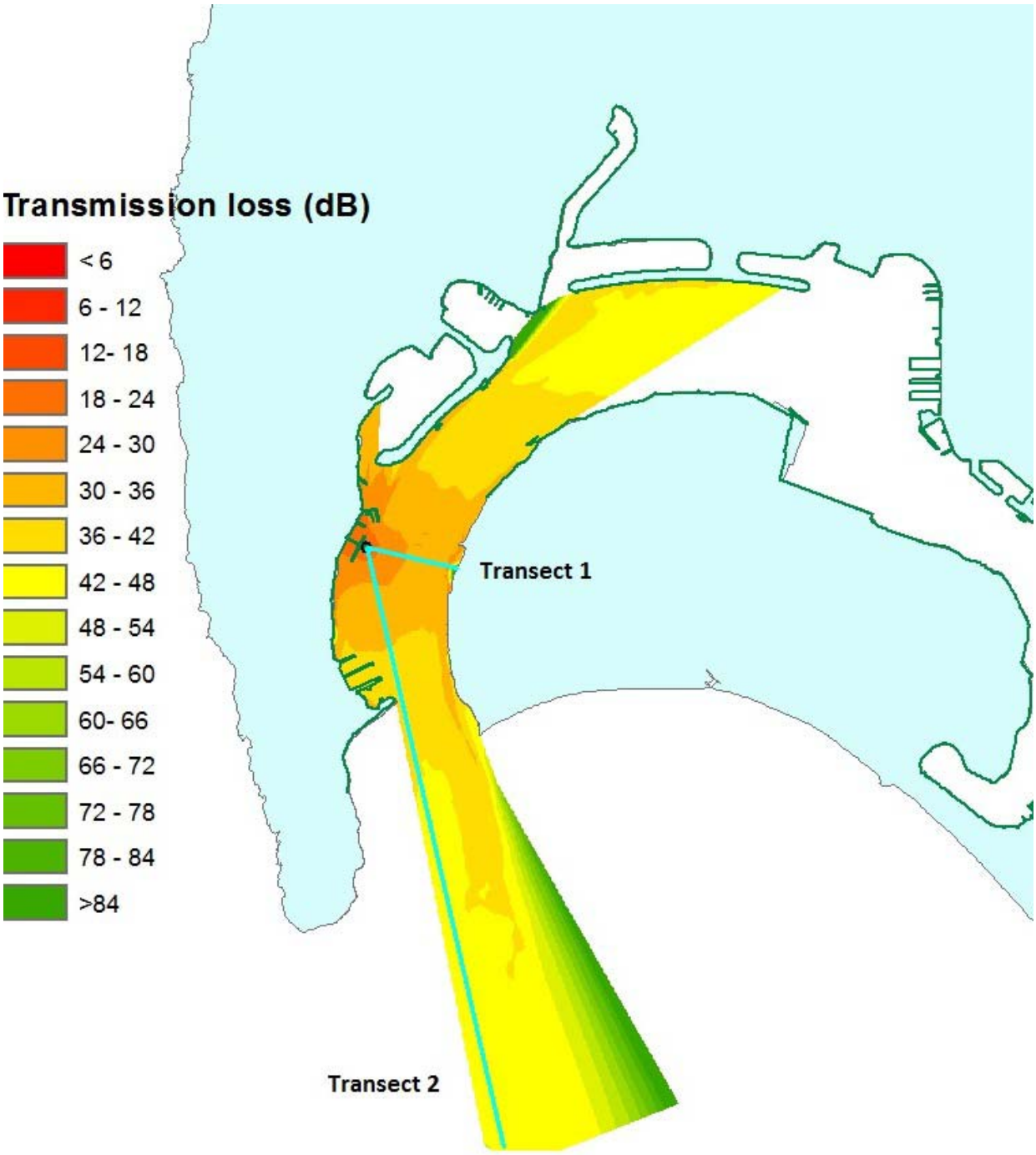


Figure 1. Transmission loss in San Diego associated with impact pile driving source located at 477888.7 N, 3618101W. Two transects that originate from the source are shown.

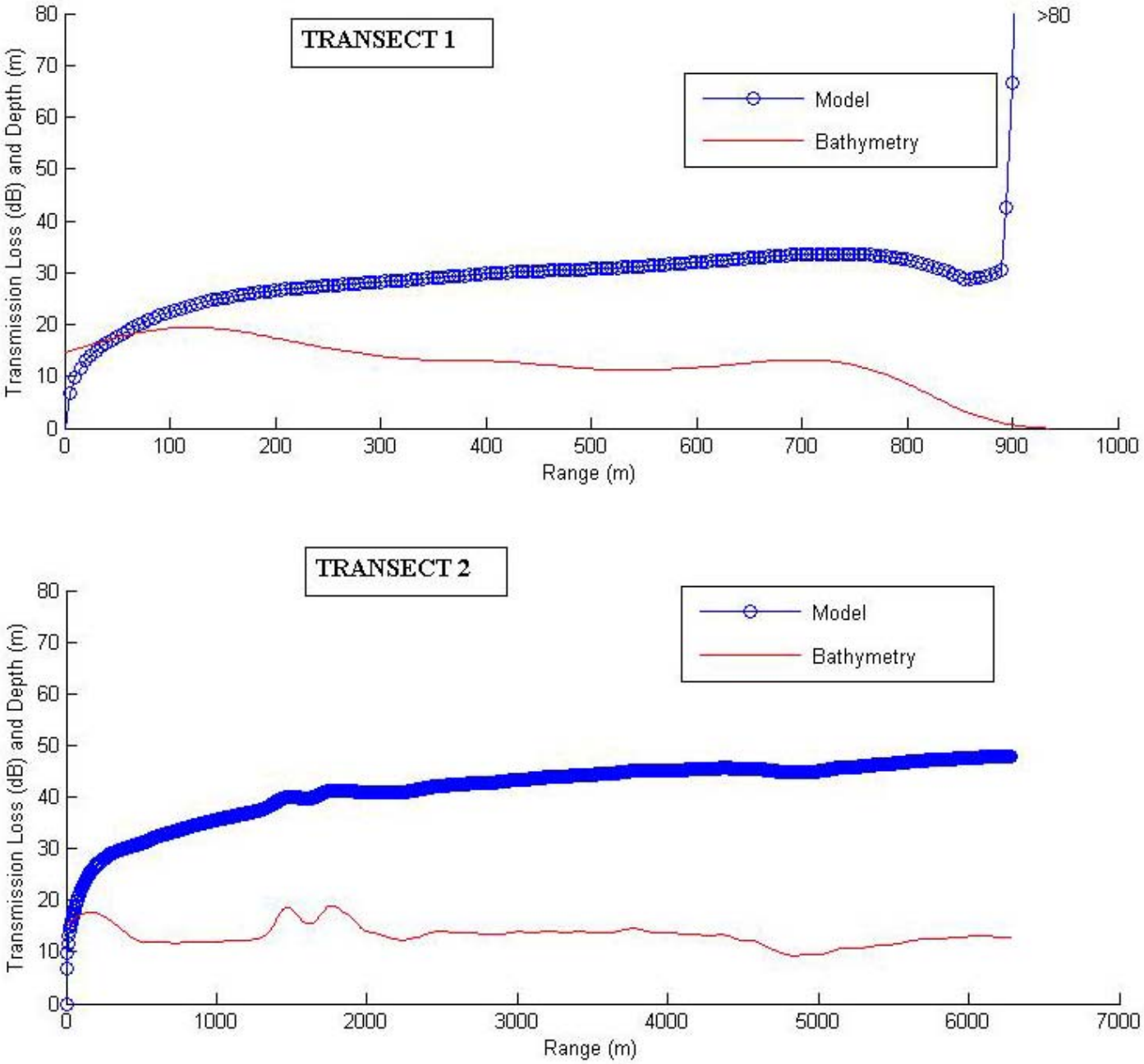
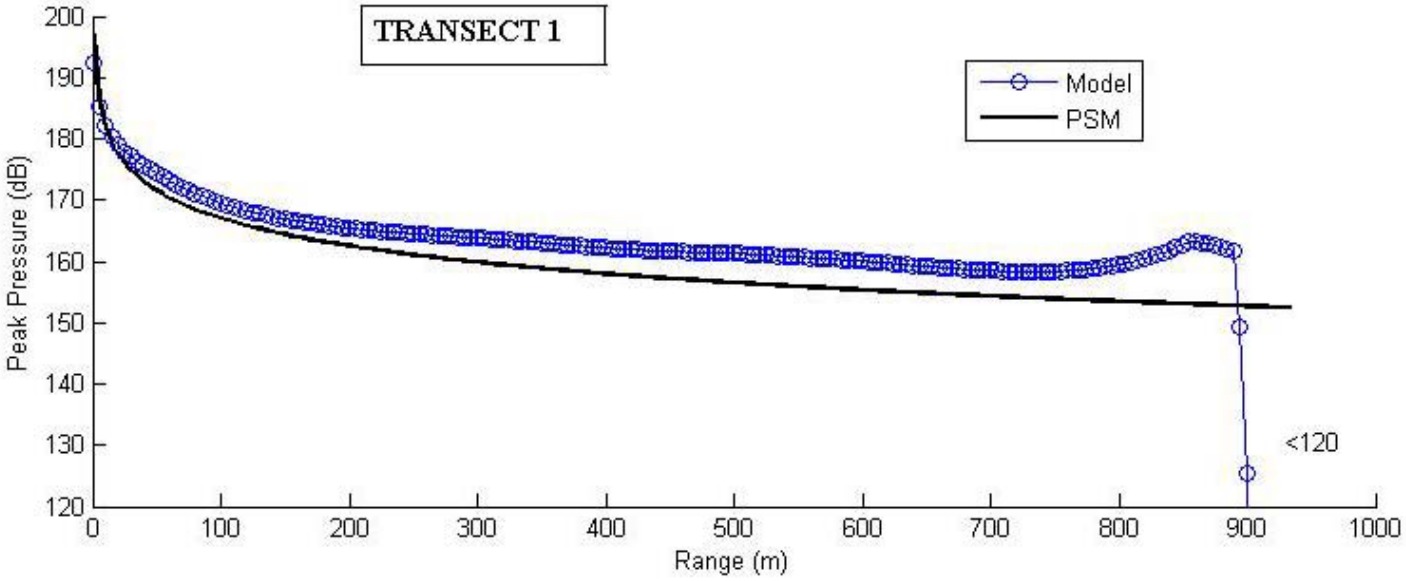


Figure 2. Transmission loss (in dB) and bathymetry (in m) for sample transects in San Diego plotted on the same scale. Note that for transect 1 only the first 80 dB of TL is plotted.

An example of how the model is applied, along with how results from it can differ from results obtained with the PSM is shown in Fig. 3. For this we assume a pile driving peak amplitude of 182 dB re 1 μPa exists at range 10 m for water depth 14.7 m, as given by the Cal Trans Report[4] for 0.6 m (24 inch) AZ steel sheet pile. Current use of the PSM takes this 182 dB value as a 10-m datum, from which estimates at extended range R m from the pile are computed to be equal to 182 – 15log10(R/10). For

[4] California Department of Transportation, "Technical Guidance for the Assessment and Mitigation of the Hydroacoustic Effects of Pile-driving on Fish" (2009).

example, at range 100 m, the estimate for peak level is reduced by 15 dB and is estimated to be 167 dB re 1 μPa. The model provided here gives TL starting from range 1 m (0 dB), and will show a TL at 10 m equal to 10 dB owing to cylindrical spreading and the influence of R*. Thus, to use the Cal Trans value as a 10-m datum, *one must subtract 10 dB from our model TL curve such that at range 10 m TL = 0 dB.* Results of this simple operation are shown in Fig. 3 along with comparable results using the PSM.



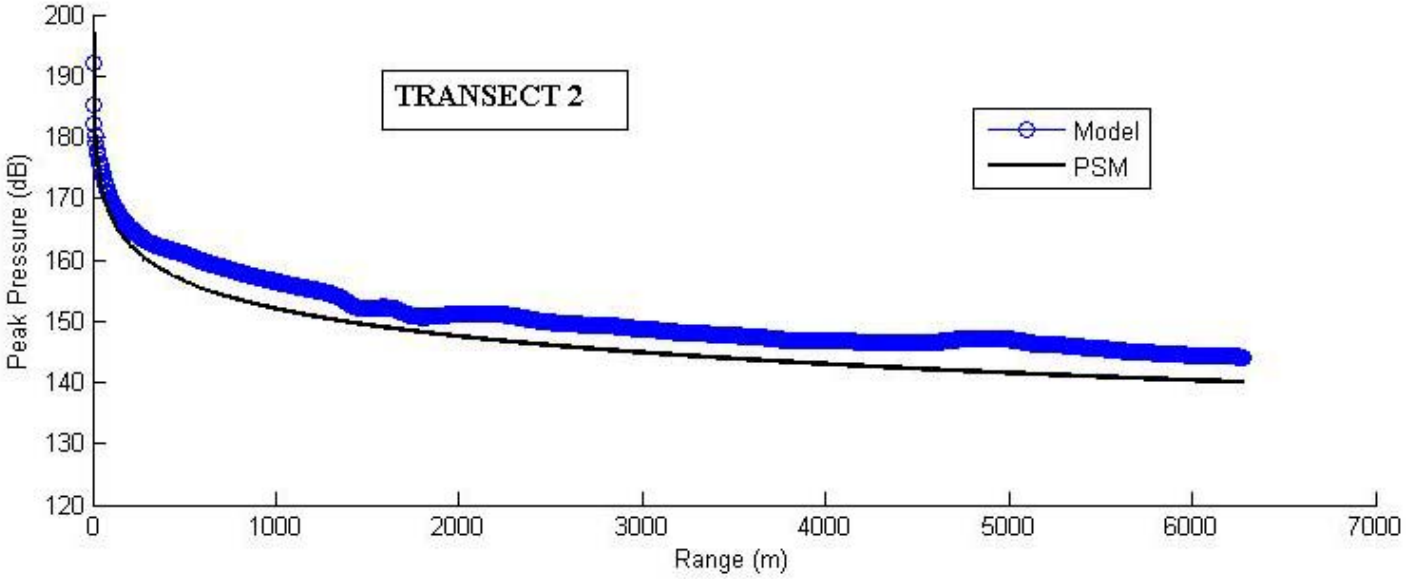


Figure 3. Comparison of peak levels calculated using PSM and Model based on a peak amplitude of 182 dB re 1 μPa, at range 10 m (or 10-m datum) .

A note on ArcGIS raster data

The model incorporated into a map of TL, such as Fig. 1, is provided in .tif format and included in the attached zip file. Note that recovery of the model TL curve associated with a particular transect from the ArcGIS raster data will produce an artifact in that curve for ranges < 10 m as shown in Fig. 4. A simple work-around for this effect is to ensure in subsequent calculations that TL = 0 dB for range = 1 m, and TL = 10 dB for range = 10m; beyond these ranges the accuracy of the recovered TL curve will be sufficient.

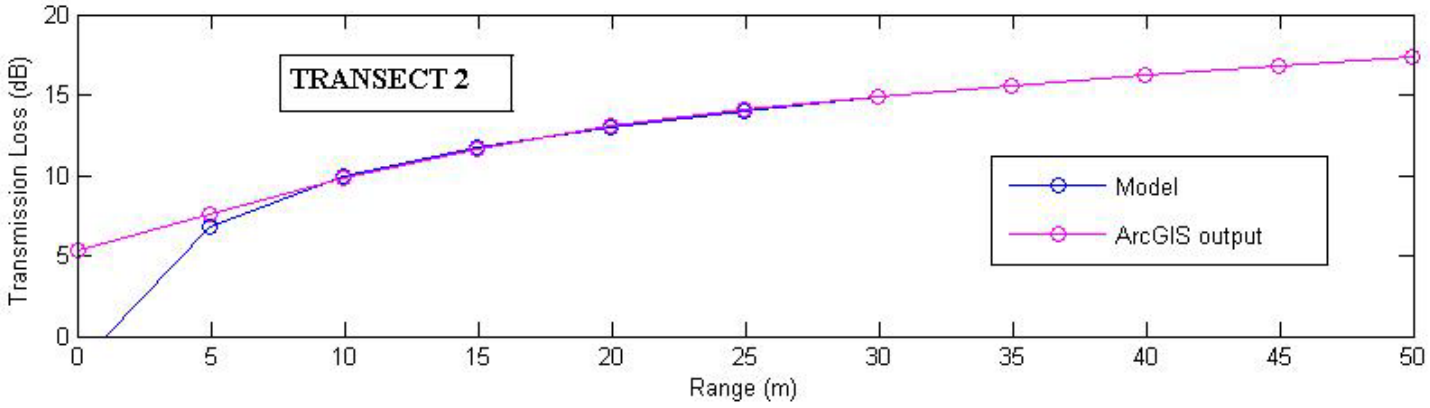


Figure 4. Comparison of ArcGIS output and Matlab model output for Transmission loss (in dB) for transect 2. The first 50 m of range is displayed.

Appendix E.5

Ambient Underwater Sound Measurements in San Diego Bay

(From Navy IHA Application)

[This Page Intentionally Left Blank]

P-151 Fuel Pier MILCON

Ambient Sound Data Acquisition

Tierra Data Inc. (TDI), in collaboration with Dr. Ken Richter of SPAWAR Systems, continue to collect, process, and analyze ambient acoustic data within the projected zone of influence (ZOI) for both impact pile driving and vibratory pile driving scheduled to take place during the construction of the P – 151 Fuel Pier MILCON within San Diego Bay. Acoustic sound modeling of the project footprint and San Diego Bay, performed by Dr. Peter Dahl of the University of Washington, bounded the area from which sound pressure level (SPL) measurements were taken. Station locations were chosen to collect ambient data in the domain of Peter Dahl's transmission loss model. While collecting data, an observational log was maintained with the date, time, depth, and GPS location of the hydrophone as well as possible sound sources noted on the surface. Table B-1 is the log for acoustic data collection from April 30 to June 1, 2012 with only the first of any noise sources noted (for brevity).

SPLs were collected at mid water depth and 1 m below the surface on 7 separate days during daylight with a calibrated omni-directional hydrophone (Reson TC 4033) with a relatively flat response from a few Hz to 80 kHz. Gear was deployed from a 20ft Boston Whaler either anchored or tied to a buoy or structure. Sound pressures were recorded in 1/3 octave bins from 3 Hz to 20 kHz every 0.01 seconds (Larson Davis 831 sound level meter) for approximately 10 minutes at each location and depth. Hence, approximately 60,000 measurements over this frequency range were collected at each location and depth on 7 occasions. Statistics on the root-mean-square (rms) pressure levels over the 0.01 second intervals for each frequency band were recorded. In addition, statistics on the rms pressure level integrated from 3 Hz to 20 kHz were recorded, as well as the instantaneous peak pressure recorded over the 10 minute recording window at each station and depth.

Figures B-1, B-2 and B-3 are spatial contour plots of the median SPL data for each 10 minute collection, median SPL data collected at 1 m below the surface, and median SPL data collected from the mid water column, respectively. Average ambient SPLs ranged between roughly 120 and 132 dB. The black crosses mark the sampling locations as described in Section 2.3.4, Figure 2-3, and Table B-1.*

Additional acoustic data acquisition will now extend over longer time intervals, in additional locations, and overnight to capture potential variation in the ambient sound levels within northern San Diego Bay.

*Note: The section and figure referenced are in the IHA application. The corresponding section and figure in the EA are Section 3.2.2.3 and Figure 3.4-4.

Table B-1: Observational log of acoustic sample locations for data shown.

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Monday, April 30, 2012	2:43 PM	32°43.427'	-117°11.472'	121.5	147.4	Site 1	1m	14:42:17 GMT-07	small bout	
Monday, April 30, 2012	2:57 PM	32°43.424'	-117°11.472'	122.1	136.1	Site 1	8m	15:08:30 GMT-07	end - no events	
Monday, April 30, 2012	3:23 PM	32°43.180'	-117°12.120'	123.3	139.8	Site 2	1m	15:35:00 GMT-07	end - no events	
Monday, April 30, 2012	3:35 PM	32°43.180'	-117°12.119'	123.2	140.5	Site 2	8m	15:36:00 GMT-07	end - no events	
Monday, April 30, 2012	3:57 PM	32°43.236'	-117°13.020'	122.9	130.7	Site 3	1m	16:07:00 GMT-07	end - no events	
Monday, April 30, 2012	4:08 PM	32°43.235'	-117°13.020'	130.8	165.9	Site 3	8m	16:18:00 GMT-07	Navy ship & tug in channel	.3 miles
Monday, April 30, 2012	4:33 PM	32°42.713'	-117°14.056'	122	138	Site 4	1m	16:44:11 GMT-07	end - no events	
Monday, April 30, 2012	4:45 PM	32°42.712'	-117°14.056'	123	143	Site 4	6m	16:55:00 GMT-07	end - no events	
Monday, April 30, 2012	5:14 PM	32°40.384'	-117°13.464'	129.2	143.9	Site 8	1m	17:24:00 GMT-07	2 Navy boats	500m
Monday, April 30, 2012	5:24 PM	32°40.384'	-117°13.463'	129.9	135.2	Site 8	8m	17:35:00 GMT-07	no events	
Monday, April 30, 2012	5:49 PM	32°39.358'	-117°13.384'	121.1	138.3	Site 9	1m	18:00:00 GMT-07	no events	
Monday, April 30, 2012	5:59 PM	32°39.360'	-117°13.383'	120.8	132.4	Site 9	8m	18:10:00 GMT-07	no events	
Tuesday, May 01, 2012	8:45 AM	32°43.448'	-117°11.486'	121.5	134.6	Site 1	1m	08:57:00 GMT-07	end - no events	
Tuesday, May 01, 2012	8:58 AM	32°43.447'	-117°11.487'	121	135.4	Site 1	8m	09:08:00 GMT-07	end - no events	
Tuesday, May 01, 2012	9:17 AM	32°43.175'	-117°12.161'	122.6	148.3	Site 2	1m	09:26:00 GMT-07	8m Navy boat	200m
Tuesday, May 01, 2012	9:40 AM	32°43.171'	-117°12.165'	124.1	136.9	Site 2	8m	09:34:00 GMT-07	Navy security boats 10m - idle	
Tuesday, May 01, 2012	9:48 AM	32°43.243'	-117°13.016'	123.4	147.8	Site 3	1m	10:00:00 GMT-07	Commercial fishing boat idles by 40m	
Tuesday, May 01, 2012	10:01 AM	32°43.243'	-117°13.016'	126.3	151.1	Site 3	8m	10:06:00 GMT-07	Commercial crab boat - desiel - 20m	
Tuesday, May 01, 2012	10:29 AM	32°42.711'	-117°14.067'	122.6	148.7	Site 4	1m	10:39:00 GMT-07	end - no events	
Tuesday, May 01, 2012	10:40 AM	32°42.710'	-117°14.067'	122.5	143.5	Site 4	6m	10:50:00 GMT-07	end - no events	
Tuesday, May 01, 2012	11:04 AM	32°41.934'	-117°13.570'	120.3	137.5	Site 5	1m	11:14:00 GMT-07	end - no events	
Tuesday, May 01, 2012	11:32 AM	32°41.663'	-117°14.356'	128.6	142.9	bait barge	1m	11:42:00 GMT-07	pulled anchor - paused and restart	
Tuesday, May 01, 2012	11:54 AM	32°41.018'	-117°13.444'	121	136.3	Site 7	1m	12:05:00 GMT-07	end? - no events	
Tuesday, May 01, 2012	1:28 PM	32°40.410'	-117°13.476'	129.2	152.9	Site 8	1m	13:38:00 GMT-07	end - no events	
Tuesday, May 01, 2012	1:40 PM	32°40.408'	-117°13.474'	129.3	132.2	Site 8	8m	13:51:00 GMT-07	end - no events	
Tuesday, May 01, 2012	2:03 PM	32°39.366'	-117°13.400'	121.2	155.1	Site 9	1m	14:04:48 GMT-07	Survey vessel engine running first 30 sec	2m
Tuesday, May 01, 2012	2:13 PM	32°39.366'	-117°13.399'	122.4	130.5	Site 9	8m	14:15:00 GMT-07	Navy ship in Channel	300m
Tuesday, May 01, 2012	2:29 PM	32°39.301'	-117°12.919'	121.1	157.8	Site 10	1m	14:37:00 GMT-07	moved cable by hand	0m
Tuesday, May 01, 2012	2:40 PM	32°39.300'	-117°12.920'	119.5	132.3	Site 10	8m	14:51:00 GMT-07	end - no events	
Wednesday, May 02, 2012	11:10 AM	32°43.437'	-117°11.488'	119.7	127.7	Site 1	1m	11:13:34 GMT-07	3m inflatible	
Wednesday, May 02, 2012	11:22 AM	32°43.436'	-117°11.489'	122.3	134.5	Site 1	8m	11:23:00 GMT-07	10m & 7m boats	
Wednesday, May 02, 2012	11:57 AM	32°43.168'	-117°12.148'	123.2	139.3	Site 2	8m	11:59:00 GMT-07	5 - 4m speed boats in a line	100m
Wednesday, May 02, 2012	12:18 PM	32°43.251'	-117°13.018'	123.2	134.4	Site 3	1m	12:25:00 GMT-07	2 - 20m boats	150m
Wednesday, May 02, 2012	12:29 PM	32°43.248'	-117°13.014'	124.8	150.9	Site 3	8m	12:31:00 GMT-07	14m sailboat	200m
Wednesday, May 02, 2012	1:01 PM	32°42.712'	-117°14.057'	124.1	140.1	Site 4	1m	13:04:26 GMT-07	15m boat	100m

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Wednesday, May 02, 2012	1:12 PM	32°42.713'	-117°14.060'	123.1	153.3	Site 4	6m	13:17:30 GMT-07	15m boat	100m
Wednesday, May 02, 2012	1:38 PM	32°41.929'	-117°13.575'	115.7	142.9	5				
Wednesday, May 02, 2012	1:44 PM	32°41.930'	-117°13.576'	120.2	162.2	Site 5	1m	13:47:30 GMT-07	Security boat	200m
Wednesday, May 02, 2012	2:03 PM	32°41.739'	-117°14.163'	125.5	138.9	Site 6	1m	14:07:15 GMT-07	20m fishing boat	
Wednesday, May 02, 2012	2:14 PM	32°41.739'	-117°14.163'	124.9	128	bait barge	8m	14:14:24 GMT-07	20m fishing boat	50m
Wednesday, May 02, 2012	2:25 PM	32°41.740'	-117°14.161'	127.5	135.5	bait barge				
Wednesday, May 02, 2012	2:34 PM	32°41.031'	-117°13.441'	120.2	140.8	Site 7	1m	14:34:00 GMT-07	30m navy vessel	300m
Wednesday, May 02, 2012	2:53 PM	32°40.397'	-117°13.471'	129.1	137.1	Site 8	1m	14:53:01 GMT-07	30m Navy vessel	150m
Wednesday, May 02, 2012	3:04 PM	32°40.398'	-117°13.471'	129.4	136.3	Site 8	8m	15:05:31 GMT-07	Navy ship	150m
Wednesday, May 02, 2012	3:26 PM	32°39.301'	-117°12.911'	119.9	135.1	Site 10	1m	15:31:00 GMT-07	Sub	400m
Wednesday, May 02, 2012	3:38 PM	32°39.302'	-117°12.914'	121.9	137.7	Site 10	8m	15:38:00 GMT-07	30m sailboat	50m
Wednesday, May 02, 2012	3:57 PM	32°39.372'	-117°13.372'	119.5	136.2	Site 9	1m	15:58:00 GMT-07	no events	
Wednesday, May 02, 2012	4:08 PM	32°39.371'	-117°13.373'	120	128.7	Site 9	8m	16:08:00 GMT-07	no events	
Saturday, May 05, 2012	8:54 AM	32°43.438'	-117°11.485'	118.7	141.8	Site 1	1m	08:55:27 GMT-07	Security boat	200m
Saturday, May 05, 2012	9:06 AM	32°43.436'	-117°11.491'	119.8	137.8	Site 1	1m	08:55:27 GMT-07	Security boat	200m
Saturday, May 05, 2012	9:30 AM	32°43.158'	-117°12.137'	119.7	133.3	Site 2	1m	09:32:21 GMT-07	7m boat	100m
Saturday, May 05, 2012	9:41 AM	32°43.160'	-117°12.140'	121.3	139.2	Site 2	8m	09:42:07 GMT-07	10m security boat	70m
Saturday, May 05, 2012	10:03 AM	32°43.241'	-117°13.027'	122.5	144.9	Site 3	1m	10:03:32 GMT-07	15m boat	60 m
Saturday, May 05, 2012	10:14 AM	32°43.244'	-117°13.028'	124.9	135.9	Site 3	8m	10:14:59 GMT-07	3m inflatable and 9m boat	60m
Saturday, May 05, 2012	10:56 AM	32°42.698'	-117°14.043'	121.5	137.9	Site 4	1m	10:56:28 GMT-07	3m inflatable	35m
Saturday, May 05, 2012	11:06 AM	32°42.697'	-117°14.042'	122.9	144.5	Site 4	7m	11:07:39 GMT-07	15m boat (same boat as Event 3 in Site 4 1m session)	20m
Saturday, May 05, 2012	11:35 AM	32°41.733'	-117°14.168'	123.7	128.9	bait barge	1m	11:35:51 GMT-07	10m boat	20m
Saturday, May 05, 2012	11:46 AM	32°41.733'	-117°14.168'	128.3	145.6	bait barge	8m	11:48:22 GMT-07	5 5m boats on tour	25m
Saturday, May 05, 2012	12:15 PM	32°41.019'	-117°13.436'	117.6	144.8	Site 7	1m	12:15:30 GMT-07	several boats	200m
Saturday, May 05, 2012	12:33 PM	32°40.419'	-117°13.441'	130.5	143.2	Site 8	1m	12:38:36 GMT-07	13m sailboat (mininal effect)	25m
Saturday, May 05, 2012	12:44 PM	32°40.420'	-117°13.441'	131	148.6	Site 8	8m	12:52:13 GMT-07	F16(?) jet right above us	300m
Tuesday, May 15, 2012	10:50 AM	32°43.433'	-117°11.495'	116	163.4	Site 1	1m	10:54	28ft 2xOB	200m
Tuesday, May 15, 2012	11:03 AM	32°43.431'	-117°11.493'	120.1	161.2	Site 1	8m	11:11	28ft 2xOB	200m
Tuesday, May 15, 2012	11:22 AM	32°43.161'	-117°12.138'	119.1	134.6	Site 2	1m	11:31	30ft Sailboat	25m
Tuesday, May 15, 2012	11:33 AM	32°43.162'	-117°12.137'	121.3	137.1	Site 2	8m	11:36	21ft IO	75m
Tuesday, May 15, 2012	11:51 AM	32°43.245'	-117°13.010'	121.7	138.6	Site 3	1m	11:53	16ft OB	40m
Tuesday, May 15, 2012	12:01 PM	32°43.248'	-117°13.010'	122.7	157.3	Site 3	8m	12:08	80ft 2xIn	60m
Tuesday, May 15, 2012	12:28 PM	32°42.693'	-117°14.057'	119.5	137.8	Site 4	1m	12:38	70ft 2xIN	30m
Tuesday, May 15, 2012	12:39 PM	32°42.690'	-117°14.057'	130.3	147.9	Site 4	8m	12:47	30ft IO	10m
Tuesday, May 15, 2012	12:59 PM	32°41.738'	-117°14.161'	122.1	138.4	bait barge	1m	12:59	50ft In	60m
Tuesday, May 15, 2012	1:10 PM	32°41.739'	-117°14.162'	123.8	139.7	bait barge	8m	13:10	30ft In	30m
Tuesday, May 15, 2012	1:27 PM	32°40.395'	-117°13.468'	126.9	134.4	Site 8	1m	No Events		
Tuesday, May 15, 2012	1:39 PM	32°40.397'	-117°13.467'	127.8	131.3	Site 8	8m	No Events		

Date	Time	Latitude	Longitude	Median RMS Pressure	Max RMS Pressure	Location	Depth	Time	Event	Distance
Thursday, May 24, 2012	10:08 AM	32°43.440'	-117°11.475'	126.7	144.5	site 1	1 m	10:11:55	30 m tour boat	200 m
Thursday, May 24, 2012	10:21 AM	32°43.438'	-117°11.474'	128.1	138.6	site 1	8m	10:22:01	Navy tug at 300 m and Navy whaler at 100 m	
Thursday, May 24, 2012	10:46 AM	32°43.161'	-117°12.126'	129.5	142.2	site 2	1m	10:47:00	15 m boat and tour boat 30m at 200 m	70 m
Thursday, May 24, 2012	11:05 AM	32°43.247'	-117°12.997'	131.3	135.5	site 3	1m	11:05:50	10 m boat	50 m
Thursday, May 24, 2012	11:20 AM	32°43.246'	-117°12.996'	124.7	138	site 3	15 m	11:24:57	high speed navy rib boat 9 m	200 m
Thursday, May 24, 2012	11:49 AM	32°42.717'	-117°14.051'	129.3	128.3	Site 4	1 m	11:58:47	10 m sail boat	50 m
Thursday, May 24, 2012	12:02 PM	32°42.717'	-117°14.051'	124.8	144.2	site 4	7m	12:03:48	3m infatable	30m
Thursday, May 24, 2012	12:30 PM	32°41.738'	-117°14.165'	124.4	135.4	bait barge	1m	12:32:40	navy rib boat 8 m speeding	400m
Thursday, May 24, 2012	12:04 PM	32°41.737'	-117°14.165'	132.9	141.2	bait barge	12 m	12:44:25	20 m fishing boat	400 m
Thursday, May 24, 2012	1:08 PM	32°41.024'	-117°13.434'	123.8	137.7	site 7	1m	no events		
Friday, June 01, 2012	9:33 AM	32°43.438'	-117°11.484'	123.8	144.1	1	1	9:40:52	1	30
Friday, June 01, 2012	9:47 AM	32°43.437'	-117°11.486'	125.5	143.4	1	28 feet	9:50:30	15 foot boat	30 meters
Friday, June 01, 2012	10:14 AM	32°43.163'	-117°12.130'	124.1	140.5	2	1	10:16:03	25 foot	300 yards
Friday, June 01, 2012	10:28 AM	32°43.161'	-117°12.132'	124.8	144.6	2	45 feet	10:37:55	police boat 20 foot	500 feet
Friday, June 01, 2012	10:52 AM	32°43.239'	-117°13.016'	121.3	132.3	3	1	10:57:45	45 foot	30 feet
Friday, June 01, 2012	11:04 AM	32°43.246'	-117°13.017'	127	141	3	7 meters	11:05:13	30 foot sail boat	200 feet
Friday, June 01, 2012	11:34 AM	32°42.704'	-117°14.058'	118.5	136.5	4	1	11:35:47	50 foot	50 foot
Friday, June 01, 2012	11:45 AM	32°42.705'	-117°14.059'	120.4	143.2	4	27 feet	11:46:43	40 foot sailboat	60 feet
Friday, June 01, 2012	12:21 PM	32°41.727'	-117°14.175'	118.9	130.6	bait barge	1			
Friday, June 01, 2012	12:34 PM	32°41.727'	-117°14.173'	123.6	151.1	bait barge	50 feet	12:36:47	60 foot in-engine boat	50 feet
Friday, June 01, 2012	2:52 PM	32°41.907'	-117°13.580'	113.4	134.6	5	1	14:55:35	20 ft	120 feet
Friday, June 01, 2012	3:12 PM	32°41.028'	-117°13.440'	116.3	130.5	7	1			
Friday, June 01, 2012	3:25 PM	32°41.028'	-117°13.440'	123	138.4	7	12 feet	15:28:04	12 ft	125 feet
Friday, June 01, 2012	3:42 PM	32°40.399'	-117°13.479'	125.2	134.8	8	1			
Friday, June 01, 2012	3:54 PM	32°40.399'	-117°13.478'	125.7	130.6	8	26 feet	15:58:18	24 ft	450 feet
Friday, June 01, 2012	4:15 PM	32°39.358'	-117°13.378'	116.4	136.7	9	1			
Friday, June 01, 2012	4:27 PM	32°39.357'	-117°13.380'	115.4	130.3	9	50 feet			

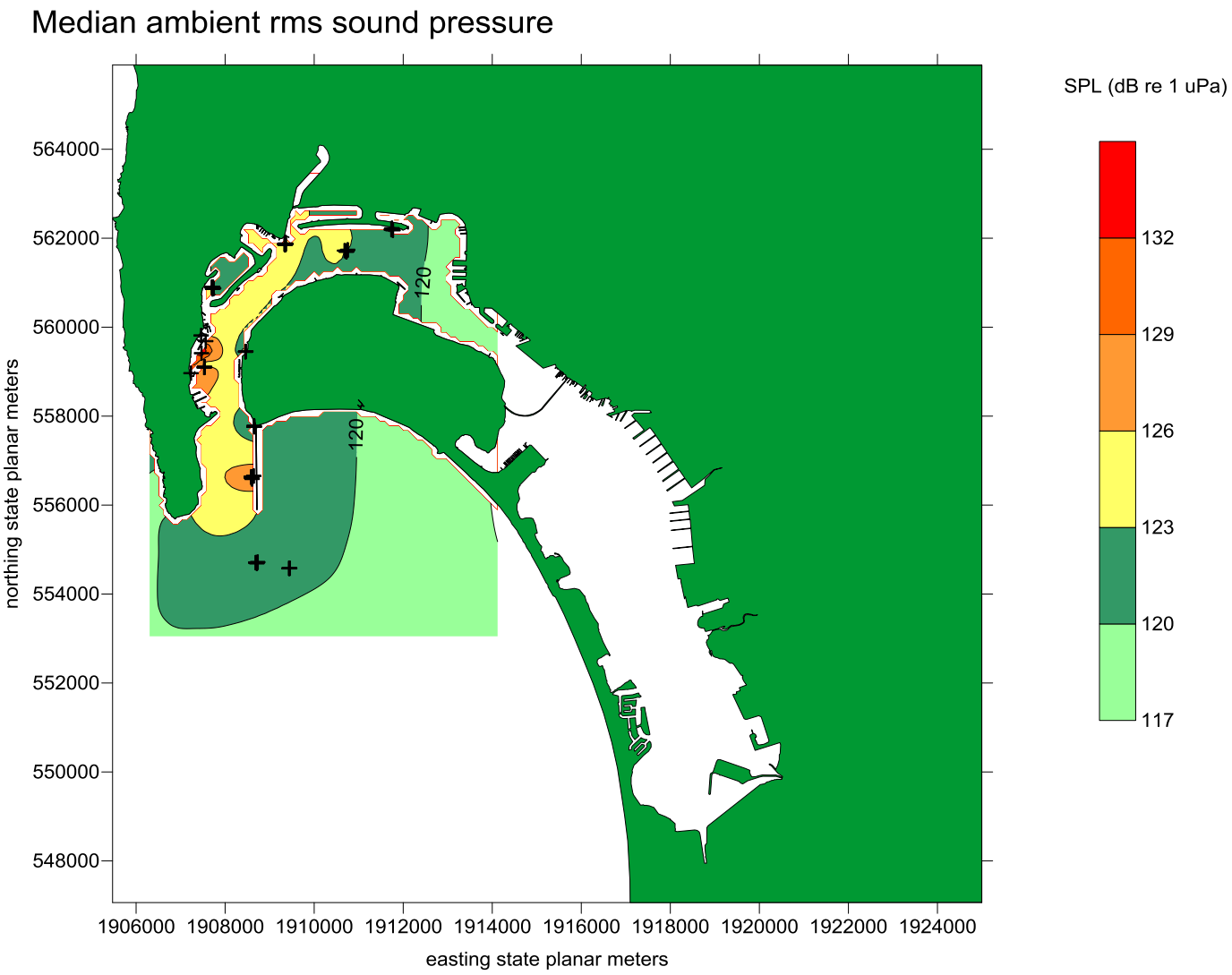


Figure B-1: Median ambient SPL, averaged through depth.

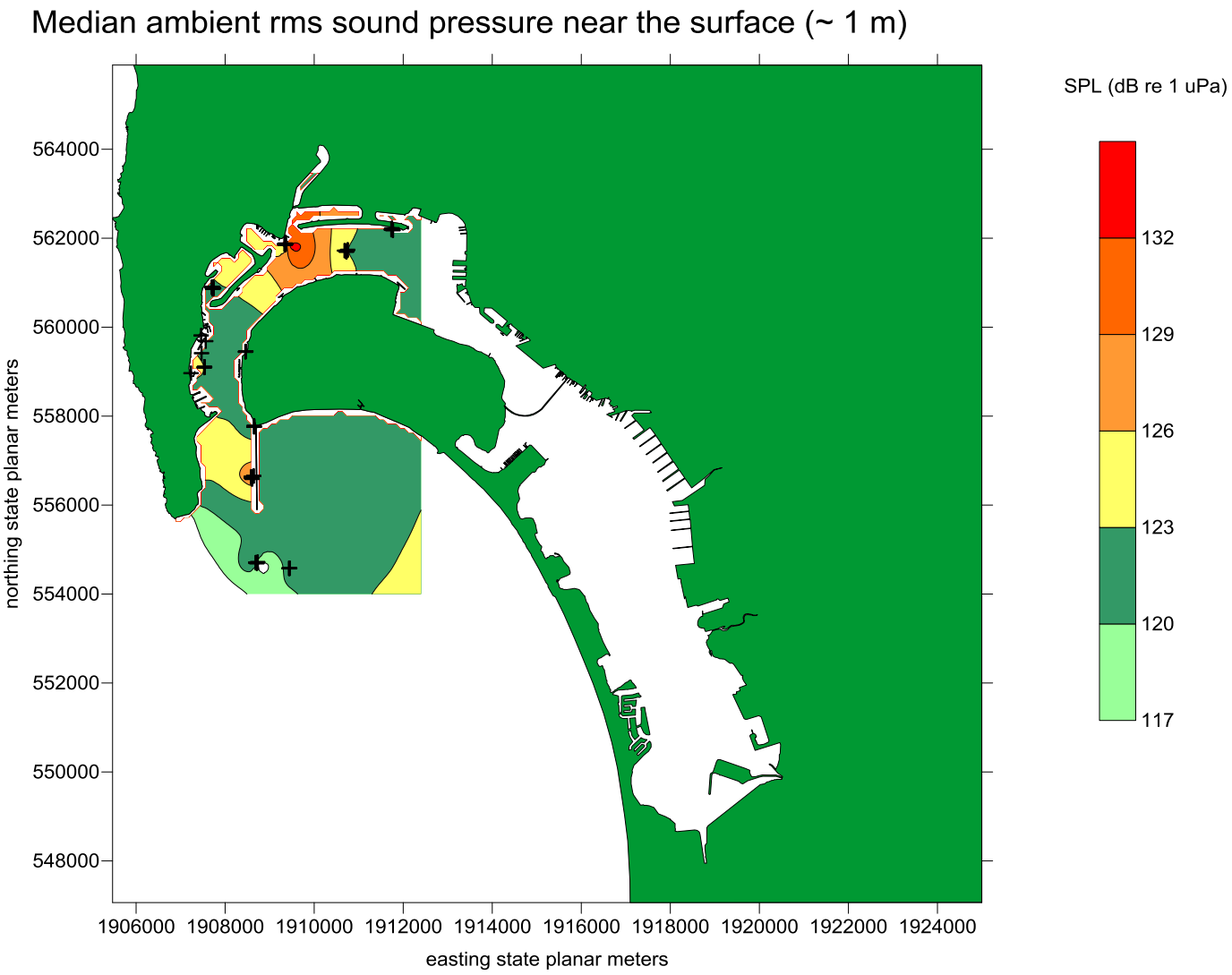


Figure B-2: Median ambient SPL, measured 1 m below the surface.

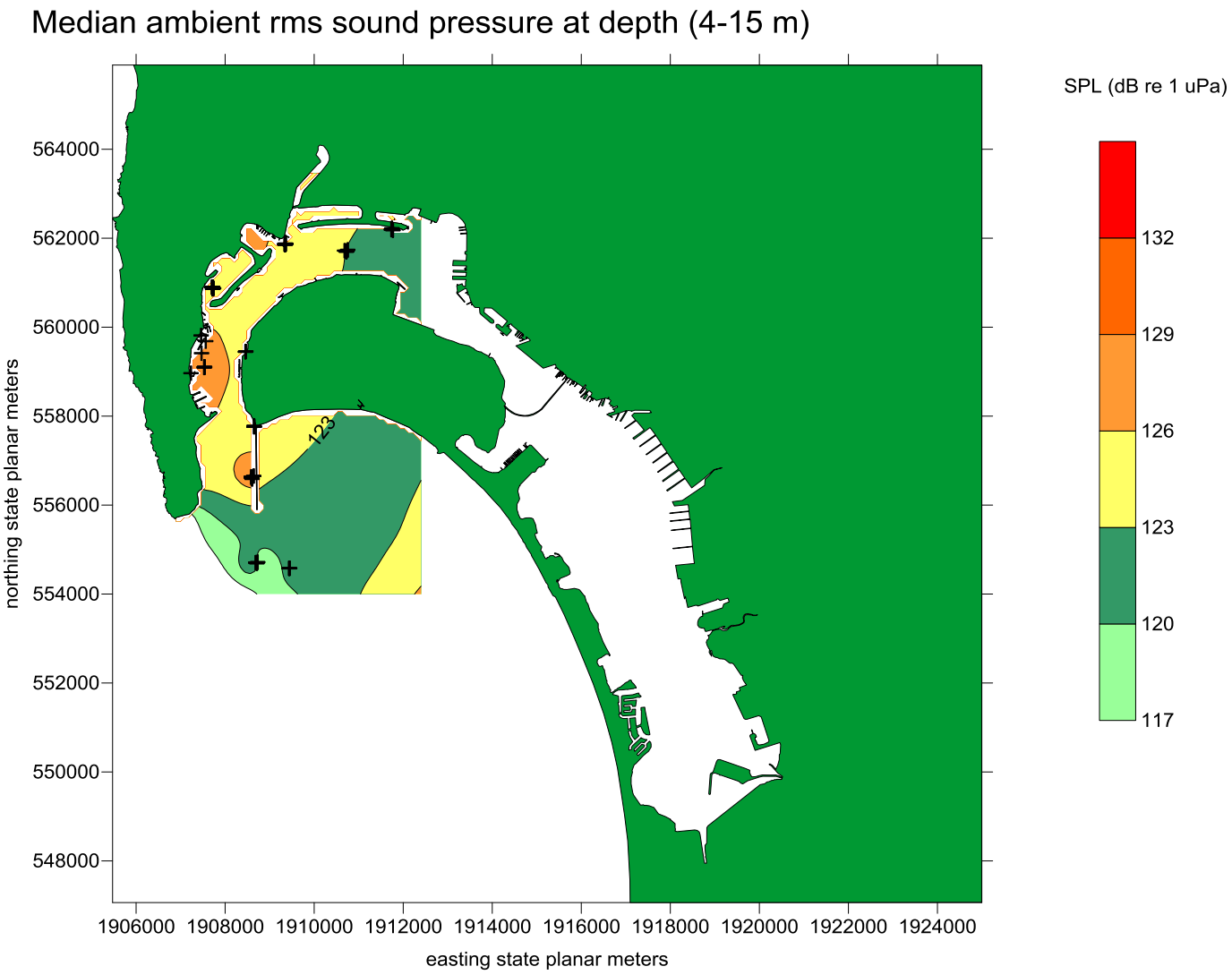


Figure B-3: Median ambient SPL, measured 1 at mid water column

[This Page Intentionally Left Blank]

Appendix F

Airborne Noise Modeling Data

[This Page Intentionally Left Blank]

RCNM Background

The Roadway Construction Noise Model (RCNM) is the Federal Highway Administration's (FHWA) national model for the prediction of construction noise. Due to the fact that construction is often conducted in close proximity to residences and businesses, construction noise must be controlled and monitored to avoid impacts on surrounding communities. In addition to community issues, excessive noise can threaten a construction project's progress. Each project needs to balance the community's need for peace and quiet with the contractor's need to progress the work.

The Central Artery/Tunnel (CA/T) project in Boston, Massachusetts, which began in the early 1990s, is the largest urban construction project ever conducted in the United States. Its noise control program developed the Construction Noise Control Specification 721.560, the most comprehensive noise specification ever developed in the United States. As part of the CA/T project noise control program, a construction noise prediction spreadsheet was developed. Because the CA/T prediction tool can benefit other state and local governments, the FHWA developed the RCNM, which is based on the noise prediction calculations and the equipment database used in the CA/T prediction spreadsheet. The RCNM provides a construction noise screening tool to easily predict construction noise levels and to determine compliance with noise limits for a variety of construction noise projects of varying complexity.

Although developed for road construction, RCNM allows for user input of construction equipment that may not necessarily be associated with roadway noise. Much of the default equipment provided in RCNM is construction equipment that can be found on any typical construction project. In the case for the Fuel Pier construction, user inputs include tugboat and workboat noise levels. This functionality makes RCNM a useful tool for noise calculations for any type of construction project and not limited to roadways.

The following noise results tables are the output of RCNM used in this EA.

[This Page Intentionally Left Blank]

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/12/2012
Case Description: NMAWC Pile Driving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Harbor Island Marina	Commercial	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	575.0	0.0
Crane	No	16		80.6	575.0	0.0
Workboat	No	40		80.0	575.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	80.1	73.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	59.3	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	58.8	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.1	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Fun House Preschool	Commercial	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	2380.0	0.0
Crane	No	16		80.6	2380.0	0.0
Workboat	No	40		80.0	2380.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	67.7	60.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	47.0	39.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Workboat	46.4	42.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.7	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Baypoint Preschool	Commercial	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	2100.0	0.0
Crane	No	16		80.6	2100.0	0.0
Workboat	No	40		80.0	2100.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	68.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	48.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.5	43.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.8	61.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
High Tech High School	Commercial	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	2600.0	0.0
Crane	No	16		80.6	2600.0	0.0
Workboat	No	40		80.0	2600.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	66.9	60.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.2	38.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	45.7	41.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Total	66.9	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #5 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Tattnal Way	Residential	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	1310.0	0.0
Crane	No	16		80.6	1310.0	0.0
Workboat	No	40		80.0	1310.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	72.9	65.9	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	52.2	44.2	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	51.6	47.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	72.9	66.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #6 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Patrick Wade CDC	Commercial	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	2210.0	0.0
Crane	No	16		80.6	2210.0	0.0
Workboat	No	40		80.0	2210.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Impact Pile Driver	68.4	61.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	47.6	39.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.1	43.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.4	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - Indicator piles and mooring dolphin

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2550.0	0.0
Impact Pile Driver	Yes	20		101.3	2550.0	0.0
Workboat	No	40		80.0	2550.0	0.0
Crane	No	16		80.6	2550.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	52.8	52.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	67.1	60.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	45.8	41.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.4	38.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	67.1	61.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2650.0	0.0
Impact Pile Driver	Yes	20		101.3	2650.0	0.0
Workboat	No	40		80.0	2650.0	0.0
Crane	No	16		80.6	2650.0	0.0

Results

	Calculated (dBA)	Noise Limits (dBA) Day	Evening	Night	Noise Limit Exceedance (dBA) Day	Evening	Night

P1 Indicator piles

Equipment		Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat		52.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver		66.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat		45.5	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		46.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.8	60.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - North Pier Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2500.0	0.0
Front End Loader	No	40		79.1	2500.0	0.0
Workboat	No	40		80.0	2500.0	0.0
Hydra Break Ram	Yes	10	90.0		2500.0	0.0
Concrete Saw	No	20		89.6	2500.0	0.0
Excavator	No	40		80.7	2500.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2500.0	0.0
Crane	No	16		80.6	2500.0	0.0
Flat Bed Truck	No	40		74.3	2500.0	0.0
Flat Bed Truck	No	40		74.3	2500.0	0.0
Excavator	No	40		80.7	2500.0	0.0
Hydra Break Ram	Yes	10	90.0		2500.0	0.0
Jackhammer	Yes	20		88.9	2500.0	0.0
Jackhammer	Yes	20		88.9	2500.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Tug boat	53.0	53.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Front End Loader	45.1	41.2	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	46.0	42.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.0	46.0	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.6	48.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.7	42.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.3	49.3	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.6	38.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.3	36.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.3	36.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.7	42.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.0	46.0	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Jackhammer	54.9	47.9	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Jackhammer	54.9	47.9	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	56.3	58.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

North Pier Demolition

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2500.0	0.0
Front End Loader	No	40		79.1	2500.0	0.0
Workboat	No	40		80.0	2500.0	0.0
Hydra Break Ram	Yes	10	90.0		2500.0	0.0
Concrete Saw	No	20		89.6	2500.0	0.0
Excavator	No	40		80.7	2500.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2500.0	0.0
Crane	No	16		80.6	2500.0	0.0
Flat Bed Truck	No	40		74.3	2500.0	0.0
Flat Bed Truck	No	40		74.3	2500.0	0.0
Excavator	No	40		80.7	2500.0	0.0
Hydra Break Ram	Yes	10	90.0		2500.0	0.0
Jackhammer	Yes	20		88.9	2500.0	0.0
Jackhammer	Yes	20		88.9	2500.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	53.0	53.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	45.1	41.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	46.0	42.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	56.0	46.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	55.6	48.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	46.7	42.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.6	38.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	40.3	36.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	40.3	36.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	46.7	42.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	56.0	46.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jackhammer	54.9	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jackhammer	54.9	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	56.3	58.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - Approach Pier Construction with pile driving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2470.0	0.0
Impact Pile Driver	Yes	20		101.3	2470.0	0.0
Front End Loader	No	40		79.1	2470.0	0.0
Workboat	No	40		80.0	2470.0	0.0
Hydra Break Ram	Yes	10	90.0		2470.0	0.0
Concrete Saw	No	20		89.6	2470.0	0.0
Excavator	No	40		80.7	2470.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2470.0	0.0
Crane	No	16		80.6	2470.0	0.0
Flat Bed Truck	No	40		74.3	2470.0	0.0
Flat Bed Truck	No	40		74.3	2470.0	0.0
Concrete Mixer Truck	No	40		78.8	2470.0	0.0
Concrete Batch Plant	No	15	83.0		2470.0	0.0
Dump Truck	No	40		76.5	2470.0	0.0
Paver	No	50		77.2	2470.0	0.0
Welder / Torch	No	40		74.0	2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	53.1	53.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	67.4	60.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Front End Loader	45.2	41.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	46.1	42.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.1	46.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.7	48.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.8	42.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.4	49.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.7	38.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.4	36.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.4	36.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Mixer Truck	44.9	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Batch Plant	49.1	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Dump Truck	42.6	38.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Paver	43.3	40.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Welder / Torch	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	67.4	62.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Approach pier construction with pile driving

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2220.0	0.0
Impact Pile Driver	Yes	20		101.3	2220.0	0.0
Front End Loader	No	40		79.1	2220.0	0.0
Workboat	No	40		80.0	2220.0	0.0
Hydra Break Ram	Yes	10	90.0		2220.0	0.0
Concrete Saw	No	20		89.6	2220.0	0.0
Excavator	No	40		80.7	2220.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2220.0	0.0
Crane	No	16		80.6	2220.0	0.0
Flat Bed Truck	No	40		74.3	2220.0	0.0
Flat Bed Truck	No	40		74.3	2220.0	0.0
Concrete Mixer Truck	No	40		78.8	2200.0	0.0
Concrete Batch Plant	No	15	83.0		2220.0	0.0
Dump Truck	No	40		76.5	2220.0	0.0
Paver	No	50		77.2	2220.0	0.0
Welder / Torch	No	40		74.0	2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	54.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	68.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	46.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.1	43.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	57.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	56.6	49.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	47.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	57.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	47.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	45.9	42.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	50.1	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.5	39.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	44.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	41.1	37.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.3	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Approach pier construction wo pile driving
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - Approach Pier Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2470.0	0.0
Front End Loader	No	40		79.1	2470.0	0.0
Workboat	No	40		80.0	2470.0	0.0
Hydra Break Ram	Yes	10	90.0		2470.0	0.0
Concrete Saw	No	20		89.6	2470.0	0.0
Excavator	No	40		80.7	2470.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2470.0	0.0
Crane	No	16		80.6	2470.0	0.0
Flat Bed Truck	No	40		74.3	2470.0	0.0
Flat Bed Truck	No	40		74.3	2470.0	0.0
Concrete Mixer Truck	No	40		78.8	2470.0	0.0
Concrete Batch Plant	No	15	83.0		2470.0	0.0
Dump Truck	No	40		76.5	2470.0	0.0
Paver	No	50		77.2	2470.0	0.0
Welder / Torch	No	40		74.0	2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	53.1	53.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Front End Loader	45.2	41.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	46.1	42.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.1	46.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.7	48.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.8	42.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.4	49.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.7	38.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.4	36.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.4	36.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Mixer Truck	44.9	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Batch Plant	49.1	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Dump Truck	42.6	38.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Paver	43.3	40.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Welder / Torch	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	56.4	57.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night

Approach pier construction wo pile driving

NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2220.0	0.0
Front End Loader	No	40		79.1	2220.0	0.0
Workboat	No	40		80.0	2220.0	0.0
Hydra Break Ram	Yes	10	90.0		2220.0	0.0
Concrete Saw	No	20		89.6	2220.0	0.0
Excavator	No	40		80.7	2220.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2220.0	0.0
Crane	No	16		80.6	2220.0	0.0
Flat Bed Truck	No	40		74.3	2220.0	0.0
Flat Bed Truck	No	40		74.3	2220.0	0.0
Concrete Mixer Truck	No	40		78.8	2200.0	0.0
Concrete Batch Plant	No	15	83.0		2220.0	0.0
Dump Truck	No	40		76.5	2220.0	0.0
Paver	No	50		77.2	2220.0	0.0
Welder / Torch	No	40		74.0	2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	54.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	46.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.1	43.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	57.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	56.6	49.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	47.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	57.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	47.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.3	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	45.9	42.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	50.1	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	43.5	39.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	44.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	41.1	37.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	57.3	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - North Pier Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2550.0	0.0
Impact Pile Driver	Yes	20		101.3	2550.0	0.0
Front End Loader	No	40		79.1	2550.0	0.0
Workboat	No	40		80.0	2550.0	0.0
Hydra Break Ram	Yes	10	90.0		2550.0	0.0
Concrete Saw	No	20		89.6	2550.0	0.0
Excavator	No	40		80.7	2550.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2550.0	0.0
Crane	No	16		80.6	2550.0	0.0
Flat Bed Truck	No	40		74.3	2550.0	0.0
Flat Bed Truck	No	40		74.3	2550.0	0.0
Crane	No	16		80.6	2550.0	0.0
Workboat	No	40		80.0	2550.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	52.8	52.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	67.1	60.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Front End Loader	45.0	41.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	45.8	41.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	55.8	45.8	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.4	48.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.6	42.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.1	49.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.4	38.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.4	38.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	45.8	41.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	67.1	61.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

	Spec	Actual	Receptor	Estimated

P1 North Pier Construction

Description	Impact Device	Usage (%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Tug boat	No	100		87.0	2650.0	0.0
Impact Pile Driver	Yes	20		101.3	2650.0	0.0
Front End Loader	No	40		79.1	2650.0	0.0
Workboat	No	40		80.0	2650.0	0.0
Hydra Break Ram	Yes	10	90.0		2650.0	0.0
Concrete Saw	No	20		89.6	2650.0	0.0
Excavator	No	40		80.7	2650.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2650.0	0.0
Crane	No	16		80.6	2650.0	0.0
Flat Bed Truck	No	40		74.3	2650.0	0.0
Flat Bed Truck	No	40		74.3	2650.0	0.0
Crane	No	16		80.6	2650.0	0.0
Workboat	No	40		80.0	2650.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	52.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	66.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	44.6	40.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	45.5	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	55.5	45.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	55.1	48.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	46.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	55.8	48.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	39.8	35.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	39.8	35.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	45.5	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.8	61.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 1 - North Pier Construction - no pile driving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2550.0	0.0
Front End Loader	No	40		79.1	2550.0	0.0
Workboat	No	40		80.0	2550.0	0.0
Hydra Break Ram	Yes	10	90.0		2550.0	0.0
Concrete Saw	No	20		89.6	2550.0	0.0
Excavator	No	40		80.7	2550.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2550.0	0.0
Crane	No	16		80.6	2550.0	0.0
Flat Bed Truck	No	40		74.3	2550.0	0.0
Flat Bed Truck	No	40		74.3	2550.0	0.0
Crane	No	16		80.6	2550.0	0.0
Workboat	No	40		80.0	2550.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	52.8	52.8	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Front End Loader	45.0	41.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	45.8	41.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	55.8	45.8	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.4	48.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.6	42.6	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.1	49.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.4	38.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Flat Bed Truck	40.1	36.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	46.4	38.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	45.8	41.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	56.1	56.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)

P1 North Pier Construction no pile driving

Tug boat	No	100		87.0	2650.0	0.0
Front End Loader	No	40		79.1	2650.0	0.0
Workboat	No	40		80.0	2650.0	0.0
Hydra Break Ram	Yes	10	90.0		2650.0	0.0
Concrete Saw	No	20		89.6	2650.0	0.0
Excavator	No	40		80.7	2650.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2650.0	0.0
Crane	No	16		80.6	2650.0	0.0
Flat Bed Truck	No	40		74.3	2650.0	0.0
Flat Bed Truck	No	40		74.3	2650.0	0.0
Crane	No	16		80.6	2650.0	0.0
Workboat	No	40		80.0	2650.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	52.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	44.6	40.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	45.5	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	55.5	45.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	55.1	48.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	46.2	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	55.8	48.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	39.8	35.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	39.8	35.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	46.1	38.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	45.5	41.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.8	56.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P2 South Pier mooring Dolphins
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 2 - South Pier Construction mooring dolphins

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	3170.0	0.0
Impact Pile Driver	Yes	20		101.3	3170.0	0.0
Workboat	No	40		80.0	3170.0	0.0
Crane	No	16		80.6	3170.0	0.0

Results

Equipment		Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Tug boat		51.0	51.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver		65.2	58.2	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat		44.0	40.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane		44.5	36.5	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
	Total	65.2	59.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2300.0	0.0
Impact Pile Driver	Yes	20		101.3	2300.0	0.0
Workboat	No	40		80.0	2300.0	0.0
Crane	No	16		80.6	2300.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Tug boat	53.7	53.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	68.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P2 South Pier mooring Dolphins

Workboat		46.7	42.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		47.3	39.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.0	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/14/2012
Case Description: Cumulative with Scripps Pier

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	400.0	0.0
Impact Pile Driver	Yes	20		101.3	400.0	0.0
Concrete Batch Plant	No	15	83.0		400.0	0.0
Workboat	No	40		80.0	400.0	0.0
Hydra Break Ram	Yes	10	90.0		400.0	0.0
Concrete Saw	No	20		89.6	400.0	0.0
Excavator	No	40		80.7	400.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	400.0	0.0
All Other Equipment > 5 HP	No	50	85.0		400.0	0.0
All Other Equipment > 5 HP	No	50	85.0		400.0	0.0
Tug boat	No	100		87.0	2470.0	0.0
Impact Pile Driver	Yes	20		101.3	2470.0	0.0
Concrete Batch Plant	No	15	83.0		2470.0	0.0
Workboat	No	40		80.0	2470.0	0.0
Hydra Break Ram	Yes	10	90.0		2470.0	0.0
Concrete Saw	No	20		89.6	2470.0	0.0
Excavator	No	40		80.7	2470.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	68.9	68.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	83.2	76.2	90.0	75.0	N/A	N/A	N/A	N/A	None	1.2	N/A	N/A	N/A	N/A
Concrete Batch Plant	64.9	56.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	61.9	58.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	71.9	61.9	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	71.5	64.5	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	62.6	58.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	72.2	65.2	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	66.9	63.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	66.9	63.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Tug boat	53.1	53.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	67.4	60.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Batch Plant	49.1	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	46.1	42.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.1	46.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.7	48.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.8	42.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.4	49.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

						cumulative									
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	83.2	78.2	85.0	75.0	N/A	N/A	N/A	N/A	None	3.2	N/A	N/A	N/A	N/A

**** Receptor #2 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
CDC (bldg 377)	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	3600.0	0.0
Impact Pile Driver	Yes	20		101.3	3600.0	0.0
Concrete Batch Plant	No	15	83.0		3600.0	0.0
Workboat	No	40		80.0	3600.0	0.0
Hydra Break Ram	Yes	10	90.0		3600.0	0.0
Concrete Saw	No	20		89.6	3600.0	0.0
Excavator	No	40		80.7	3600.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	3600.0	0.0
All Other Equipment > 5 HP	No	50	85.0		3600.0	0.0
All Other Equipment > 5 HP	No	50	85.0		3600.0	0.0
Tug boat	No	100		87.0	2220.0	0.0
Impact Pile Driver	Yes	20		101.3	2220.0	0.0
Concrete Batch Plant	No	15	83.0		2220.0	0.0
Workboat	No	40		80.0	2220.0	0.0
Hydra Break Ram	Yes	10	90.0		2220.0	0.0
Concrete Saw	No	20		89.6	2220.0	0.0
Excavator	No	40		80.7	2220.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	49.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	64.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	45.9	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	42.9	38.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	52.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	52.4	45.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	43.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	53.1	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	47.9	44.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	47.9	44.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tug boat	54.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	68.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	50.1	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.1	43.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	57.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	56.6	49.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	47.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	57.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

						cumulative									
All Other Equipment > 5 HP		52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.3	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/14/2012
Case Description: Cumulative with Scripps Pier

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	400.0	0.0
Impact Pile Driver	Yes	20		101.3	400.0	0.0
Concrete Batch Plant	No	15	83.0		400.0	0.0
Workboat	No	40		80.0	400.0	0.0
Hydra Break Ram	Yes	10	90.0		400.0	0.0
Concrete Saw	No	20		89.6	400.0	0.0
Excavator	No	40		80.7	400.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	400.0	0.0
Crane	No	16		80.6	400.0	0.0
All Other Equipment > 5 HP	No	50	85.0		400.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Tug boat	68.9	68.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	83.2	76.2	90.0	75.0	N/A	N/A	N/A	N/A	None	1.2	N/A	N/A	N/A	N/A
Concrete Batch Plant	64.9	56.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	61.9	58.0	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	71.9	61.9	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	71.5	64.5	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	62.6	58.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	72.2	65.2	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane	62.5	54.5	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	66.9	63.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	83.2	77.9	85.0	75.0	N/A	N/A	N/A	N/A	None	2.9	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
CDC (bldg 377)	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	3600.0	0.0
Impact Pile Driver	Yes	20		101.3	3600.0	0.0
Concrete Batch Plant	No	15	83.0		3600.0	0.0

				Cumulative Scripps only		
Workboat	No	40		80.0	3600.0	0.0
Hydra Break Ram	Yes	10	90.0		3600.0	0.0
Concrete Saw	No	20		89.6	3600.0	0.0
Excavator	No	40		80.7	3600.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	3600.0	0.0
Crane	No	16		80.6	3600.0	0.0
All Other Equipment > 5 HP	No	50	85.0		3600.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	49.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	64.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	45.9	37.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	42.9	38.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	52.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	52.4	45.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	43.6	39.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	53.1	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	43.4	35.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	47.9	44.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.1	58.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/14/2012
Case Description: Cumulative with Scripps Pier

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2470.0	0.0
Impact Pile Driver	Yes	20		101.3	2470.0	0.0
Concrete Batch Plant	No	15	83.0		2470.0	0.0
Workboat	No	40		80.0	2470.0	0.0
Hydra Break Ram	Yes	10	90.0		2470.0	0.0
Concrete Saw	No	20		89.6	2470.0	0.0
Excavator	No	40		80.7	2470.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2470.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Tug boat	53.1	53.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver	67.4	60.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Batch Plant	49.1	40.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat	46.1	42.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Hydra Break Ram	56.1	46.1	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Concrete Saw	55.7	48.7	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Excavator	46.8	42.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	56.4	49.4	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	51.1	48.1	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Total	67.4	62.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
CDC (bldg 377)	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2220.0	0.0
Impact Pile Driver	Yes	20		101.3	2220.0	0.0
Concrete Batch Plant	No	15	83.0		2220.0	0.0

				Cumulative Approach Pier only		
Workboat	No	40		80.0	2220.0	0.0
Hydra Break Ram	Yes	10	90.0		2220.0	0.0
Concrete Saw	No	20		89.6	2220.0	0.0
Excavator	No	40		80.7	2220.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0
All Other Equipment > 5 HP	No	50	85.0		2220.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	54.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	68.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Batch Plant	50.1	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Workboat	47.1	43.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydra Break Ram	57.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	56.6	49.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	47.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	57.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	52.1	49.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.3	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P2 South Pier Abutment Piles
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2012
Case Description: Phase 2 - South Pier Abutment Piles

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
La Playa	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2430.0	0.0
Impact Pile Driver	Yes	20		101.3	2430.0	0.0
Workboat	No	40		80.0	2430.0	0.0
Crane	No	16		80.6	2430.0	0.0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat		53.3	53.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Impact Pile Driver		67.5	60.5	90.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Workboat		46.3	42.3	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
Crane		46.8	38.9	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A
	Total	67.5	61.4	85.0	75.0	N/A	N/A	N/A	N/A	None	None	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
NBPL CDC	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tug boat	No	100		87.0	2023.0	0.0
Impact Pile Driver	Yes	20		101.3	2023.0	0.0
Workboat	No	40		80.0	2023.0	0.0
Crane	No	16		80.6	2023.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tug boat	54.9	54.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Impact Pile Driver	69.1	62.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P2 South Pier Abutment Piles

Workboat		47.9	43.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		48.4	40.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	69.1	63.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix G

Record of Non-Applicability for Clean Air Act Conformity (RONA) and Air Quality Data

[This Page Intentionally Left Blank]

Record of Non-Applicability (RONA)

[This Page Intentionally Left Blank]

RECORD OF NON-APPLICABILITY (RONA)
FOR CLEAN AIR ACT CONFORMITY
SAN DIEGO AIR BASIN

This Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule*, in the 30 November 1993, Federal Register (40 CFR Parts 6, 51, and 93). The U.S. Navy published *Clean Air Act Conformity Guidance* in Appendix F, OPNAVINST 5090.1C, dated 30 October 2007. These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal Agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 51.853[b]). *De minimis* levels (in tons/year) for the air basin potentially affected by the Proposed Action are listed in Table 1.

Table 1
***De minimis* Levels for Criteria Pollutants in the San Diego Air Basin**

Criteria Pollutant	*De minimis* Level (tons/year)
• Carbon Monoxide (CO)	• 100
• Volatile Organic Compounds (VOC)	• 100
• Oxides of Nitrogen (NO_x)	• 100

PROPOSED ACTION

Action Proponent: U.S. Navy

Location: Naval Base Point Loma

Proposed Action Name: Naval Base Point Loma Fuel Pier Replacement and Dredging

Proposed Action and Emissions Summary: The Proposed Action would involve demolition of the aging and seismically deficient Fuel Pier (Pier 180) at Naval Base Point Loma (NBPL), construction of a new enhanced Fuel Pier with optimum capability to support current and projected fueling needs of the DoN and Department of Homeland Security (DHS), and performance of associated dredging. Project demolition, construction, and dredging would occur simultaneously, and would commence in fiscal year (FY) 2013 and be completed by FY 2015. The Proposed Action would generally allow the future year fueling of newer and larger ships. The Proposed Action would create the infrastructure necessary to support increased berthing capability by providing a facility with additional berthing length, versatility in accommodating a wide variety of ships and additional deep draft berthing capabilities. The Proposed Action would also greatly reduce the time and money associated with berth shifts, i.e., re-positioning ships while in port for refueling, maintenance, and training, etc.

Air Emissions Summary: The Proposed Action would result in air emissions from construction activities. Because no changes in operations are proposed as part of the Proposed Action, operational emissions would not differ from the baseline. The construction required for the Proposed Action was assumed to commence in FY 2013 and be completed by FY 2015. Based on the air quality analysis for the proposed action, the maximum estimated emissions would be below conformity *de minimis* levels (Table 2).

Table 2
Estimated Total Net Project Emissions - Tons per Year

Calendar Year (CY)	Pollutant		
	CO	**VOC**	**NOx**
2013	2.69	0.24	1.50
2014	15.63	3.04	39.70
2015	22.84	14.27	44.89
2016	14.24	9.75	35.52
General Conformity *De minimis* Thresholds (Tons per year)	100	100	100
• Exceed threshold?	**No**	**No**	**No**

Date RONA prepared: 23 April 2013

EMISSIONS EVALUATION AND CONCLUSION

The Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Table 2 above, which is a summary of the calculations, methodology, data, and references included in the attachment to the RONA. Therefore, the Navy concludes that further formal Conformity Determination procedures are not required, resulting in this Record of Non-Applicability.

RONA APPROVAL

Date: 3 June 2013

Signature: Robert J. Chichester

Robert Chichester
Naval Base Point Loma IEPD

[This Page Intentionally Left Blank]

Construction Emissions Calculations

[This Page Intentionally Left Blank]

Emissions Summary
NBPL P-151

2013 Emissions	Emission (tons/year)					
	CO	VOC	NOx	SOx	PM10	PM2.5
Marine Mammal Relocation						
Drive Piles	0.18	0.06	0.34	0.00	0.02	0.02
Worker Trips	1.13	0.06	0.10	0.00	0.01	0.00
Support Vessels	0.03	0.00	0.31	0.00	0.01	0.01
Subtotal	**1.35**	**0.12**	**0.75**	**0.00**	**0.03**	**0.03**
Dredge Turning Basin and Discharge Sediment						
Dredge Turning Basin	2.80	0.83	9.50	0.01	0.29	0.26
Truck Trips	0.16	0.06	0.78	0.00	0.01	0.00
Worker Trips	1.13	0.06	0.10	0.00	0.01	0.00
Support Vessels	0.17	0.02	1.88	0.00	0.05	0.00
Subtotal	**1.35**	**0.12**	**0.75**	**0.00**	**0.03**	**0.03**
Total 2013	**2.69**	**0.24**	**1.50**	**0.00**	**0.07**	**0.05**

Emissions Summary
NBPL P-151

2014 Emissions	Emission (tons/year)					
	CO	VOC	NOx	SOx	PM10	PM2.5
Marine Mammal Relocation						
Drive Piles	0.18	0.06	0.34	0.00	0.02	0.02
Worker Trips	1.13	0.06	0.10	0.00	0.01	0.00
Support Vessels	0.03	0.00	0.31	0.00	0.01	0.01
Subtotal	**1.35**	**0.12**	**0.75**	**0.00**	**0.03**	**0.03**
North Segment Demolition						
Piling Removal	0.72	0.23	1.81	0.00	0.07	0.06
Deck Removal	1.24	0.39	3.31	0.00	0.12	0.11
Asphalt Debris Removal	0.78	0.26	1.77	0.00	0.08	0.07
Demo & Material Transport	0.55	0.18	1.58	0.00	0.06	0.05
Truck Trips	0.08	0.03	0.38	0.00	0.00	0.00
Worker Trips	0.37	0.02	0.03	0.00	0.00	0.00
Support Vessels	0.14	0.01	1.49	0.00	0.04	0.04
Subtotal	**3.87**	**1.12**	**10.37**	**0.01**	**0.37**	**0.33**
Access Pier Construction						
Indicator Pile Driving	0.06	0.02	0.12	0.00	0.01	0.00
Drive Abutment Piles	0.16	0.04	0.36	0.00	0.01	0.01
Landside Pipe Installation	0.16	0.04	0.36	0.00	0.01	0.01
Construct Abutment	0.40	0.12	0.83	0.00	0.04	0.03
Construct Dolphin Mooring	0.18	0.06	0.43	0.00	0.02	0.02
Drive Structural Piles	0.74	0.20	1.66	0.00	0.07	0.06
Truck Trips	0.95	0.38	4.58	0.01	0.05	0.01
Worker Trips	2.27	0.12	0.20	0.00	0.02	0.01
Support Vessels	0.59	0.05	6.34	0.00	0.16	0.16
Subtotal	**5.51**	**1.04**	**14.89**	**0.02**	**0.38**	**0.32**
North Pier Construction						
Drive Structural Piles	0.57	0.15	1.44	0.00	0.05	0.05
Truck Trips	0.16	0.07	0.79	0.00	0.01	0.00
Worker Trips	2.27	0.12	0.20	0.00	0.02	0.01
Support Vessels	0.59	0.05	6.34	0.00	0.16	0.16
Subtotal	**3.59**	**0.39**	**8.77**	**0.01**	**0.24**	**0.21**
Dredging	**1.31**	**0.37**	**4.92**	**0.00**	**0.15**	**0.14**
Total 2014, Preferred Alternative	**15.63**	**3.04**	**39.70**	**0.05**	**1.17**	**1.03**
Total 2014, Delayed Dredging Alternative	**14.32**	**2.67**	**34.78**	**0.05**	**1.02**	**0.88**

Emissions Summary
NBPL P-151

2015 Emissions	Emission (tons/year)					
	CO	VOC	NOx	SOx	PM10	PM2.5
Access Pier Construction						
Form and Place 1st Stage Pile Caps	2.11	0.63	3.56	0.00	0.19	0.17
Form/Place Deck Slabs, 2nd Stg Caps, Beams & Curbs	1.78	0.55	3.56	0.00	0.17	0.15
Form and Place CIP Columns & Walls for Ramp	0.31	0.10	0.62	0.00	0.03	0.03
Form and Place Column Girders for Ramp	0.53	0.16	0.89	0.00	0.05	0.04
Form/Place Ramp Deck & Curbs	0.47	0.15	0.95	0.00	0.04	0.04
Access Pier Pipe Installation	1.33	0.41	2.67	0.00	0.13	0.11
Drive Secondary Fender Piles	0.14	0.04	0.37	0.00	0.01	0.01
Install Secondary Fender System	0.41	0.13	0.83	0.00	0.04	0.03
Truck Trips	0.95	4.58	0.38	0.01	0.05	0.01
Worker Trips	2.27	0.20	0.12	0.00	0.02	0.01
Support Vessels	0.59	0.05	6.34	0.00	0.16	0.16
Subtotal	**10.90**	**7.00**	**20.31**	**0.03**	**0.89**	**0.76**
North Pier Construction						
Form and Place 1st Stage Pile Caps	2.11	0.63	3.56	0.00	0.19	0.17
Form/Place Deck Slab/2nd Stg Caps/Beams Lower	1.33	0.41	2.67	0.00	0.13	0.11
Form and Place CIP Columns & Walls	1.33	0.41	2.67	0.00	0.13	0.11
Form and Place Column Girders	1.06	0.31	1.78	0.00	0.10	0.09
Drive Primary Fender Piles	0.43	0.12	1.12	0.00	0.04	0.04
Drive Secondary Fender Piles	0.17	0.05	0.45	0.00	0.02	0.01
Install Primary Fender System	0.39	0.11	0.56	0.00	0.03	0.03
Truck Trips	0.95	4.58	0.38	0.01	0.05	0.01
Worker Trips	2.27	0.20	0.12	0.00	0.02	0.01
Support Vessels	0.59	0.05	6.34	0.00	0.16	0.16
Subtotal	**10.63**	**6.89**	**19.66**	**0.03**	**0.86**	**0.74**
Dredging	**1.31**	**0.37**	**4.92**	**0.00**	**0.15**	**0.14**
Total 2015, Preferred Alternative	**22.84**	**14.27**	**44.89**	**0.07**	**1.90**	**1.65**
Total 2015, Delayed Dredging Alternative	**21.53**	**13.89**	**39.97**	**0.07**	**1.75**	**1.50**

Emissions Summary
NBPL P-151

2016 Emissions	Emission (tons/year)					
	CO	VOC	NOx	SOx	PM10	PM2.5
North Pier Construction						
North Pier Pipe Installation	0.94	0.28	1.58	0.00	0.09	0.08
Form/Place Deck Slab 2nd Stg Caps/Beams Upper Level	1.33	0.41	2.67	0.00	0.13	0.11
Install Loading Arm System	0.29	0.09	0.42	0.00	0.03	0.02
Turn On Service to North Pier	0.03	0.01	0.03	0.00	0.00	0.00
Truck Trips	0.95	4.58	0.38	0.01	0.05	0.01
Worker Trips	2.27	0.20	0.12	0.00	0.02	0.01
Support Vessels	0.59	0.05	6.34	0.00	0.16	0.16
Subtotal	**6.40**	**5.63**	**11.56**	**0.02**	**0.47**	**0.39**
South Dolphins Construction						
Drive Mooring Dolphin Piles	0.20	0.06	0.53	0.00	0.02	0.02
Construct Dolphin Superstructure	0.46	0.14	0.91	0.00	0.04	0.04
Install Fender System Framing and Components	0.19	0.06	0.28	0.00	0.02	0.02
Truck Trips	0.23	1.09	0.09	0.00	0.01	0.00
Worker Trips	0.54	0.05	0.03	0.00	0.00	0.00
Support Vessels	0.76	0.07	8.16	0.01	0.20	0.20
Subtotal	**2.38**	**1.46**	**10.00**	**0.01**	**0.30**	**0.28**
South Pier & Access Pier Demolition						
Remove Utilities, Appurtenances, & Fender System	0.89	0.32	1.76	0.00	0.08	0.07
Deck Removal	0.67	0.23	1.28	0.00	0.06	0.05
Piling Removal	0.80	0.29	1.58	0.00	0.07	0.06
Truck Trips	0.14	0.69	0.06	0.00	0.01	0.00
Worker Trips	0.67	0.06	0.04	0.00	0.01	0.00
Support Vessels	0.23	0.02	2.45	0.00	0.06	0.06
Subtotal	**3.41**	**1.61**	**7.16**	**0.01**	**0.27**	**0.24**
Abutment Piles						
Drive Abutment Piles	0.17	0.05	0.44	0.00	0.02	0.01
Form/Place Abutment Cap & Landside Tie-In	0.25	0.07	0.42	0.00	0.02	0.02
Truck Trips	0.11	0.55	0.05	0.00	0.01	0.00
Worker Trips	0.14	0.01	0.01	0.00	0.00	0.00
Support Vessels	0.09	0.01	0.97	0.00	0.02	0.02
Subtotal	**0.75**	**0.69**	**1.89**	**0.00**	**0.07**	**0.06**
Dredging	**1.31**	**0.37**	**4.92**	**0.00**	**0.15**	**#REF!**
Total 2016, Preferred Alternative	**14.24**	**9.75**	**35.52**	**0.05**	**1.26**	**#REF!**
Total 2016. Delayed Dredging Alternative	**12.94**	**9.38**	**30.60**	**0.05**	**1.11**	**0.97**

Marine Mammal/Pile Program

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Drive Piles																
Barge Crane - 150 Ton	DIESEL	250	0.569	0.163	1.533	0.00177	0.057	1	8	40	0.091	0.026	0.245	0.000	0.009	0.008
Delmag D12 Hammer	DIESEL	36.21	0.274	0.084	0.271	0.00036	0.023	1	8	40	0.044	0.013	0.043	0.000	0.004	0.003
Jet Pump	DIESEL	50	0.312	0.105	0.323	0.00044	0.027	1	8	40	0.050	0.017	0.052	0.000	0.004	0.004
											0.185	**0.056**	**0.340**	**0.000**	**0.017**	**0.015**
Total											**0.18**	**0.06**	**0.34**	**0.00**	**0.02**	**0.02**

Work Days/Week 5

Dredge Turning Basin

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Dredge Turning Basin																
Dredge	DIESEL	100			See Dredging			1	8	90	2.796	0.827	9.505	0.009	0.289	0.257
											2.80	**0.83**	**9.50**	**0.01**	**0.29**	**0.26**
Total											**2.80**	**0.83**	**9.50**	**0.01**	**0.29**	**0.26**

Work Days/Week 5

North Segment
Demolition

Emission Factors											Total Emissions (Metric Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Piling Removal																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	4	84	0.086	0.031	0.075	0.000	0.007	0.007
Barge Crane - 250 Ton	DIESEL	399	0.529	0.155	1.423	0.00177	0.052	1	9.5	84	0.211	0.062	0.568	0.001	0.021	0.018
Heavy Truck	DIESEL	489	0.636	0.217	1.787	0.00267	0.063	1	8	84	0.214	0.073	0.600	0.001	0.021	0.019
Wharf Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	84	0.211	0.062	0.568	0.001	0.021	0.018
											0.72	**0.23**	**1.81**	**0.00**	**0.07**	**0.06**
Deck Removal																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	4	84	0.086	0.031	0.075	0.000	0.007	0.007
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	84	0.124	0.042	0.407	0.001	0.014	0.012
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	84	0.211	0.062	0.568	0.001	0.021	0.018
Dump Truck	DIESEL	489	0.636	0.217	1.787	0.00267	0.063	1	8	84	0.214	0.073	0.600	0.001	0.021	0.019
Wharf Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	84	0.211	0.062	0.568	0.001	0.021	0.018
Breakers	DIESEL	320	0.523	0.145	1.519	0.00250	0.049	1	8	84	0.176	0.049	0.510	0.001	0.017	0.015
Concrete Saws	DIESEL	10	0.068	0.020	0.126	0.00021	0.005	4	8	84	0.091	0.027	0.169	0.000	0.007	0.006
Flatbed Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	84	0.129	0.047	0.416	0.001	0.014	0.012
											1.24	**0.39**	**3.31**	**0.00**	**0.12**	**0.11**
Asphalt Debris Removal																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	4	84	0.086	0.031	0.075	0.000	0.007	0.007
Dump Truck	DIESEL	489	0.636	0.217	1.787	0.00267	0.063	1	8	84	0.214	0.073	0.600	0.001	0.021	0.019
Barge-Mounted Excavator	DIESEL	320	0.527	0.173	1.476	0.00229	0.052	1	8	84	0.177	0.058	0.496	0.001	0.017	0.015
Generator	DIESEL	45	0.264	0.087	0.285	0.00040	0.023	2	8	84	0.177	0.059	0.191	0.000	0.016	0.014
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	84	0.124	0.042	0.407	0.001	0.014	0.012
											0.78	**0.26**	**1.77**	**0.00**	**0.08**	**0.07**
Demo & Material Transport																
Wharf Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	84	0.211	0.062	0.568	0.001	0.021	0.018
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	84	0.124	0.042	0.407	0.001	0.014	0.012
Dump Truck	DIESEL	489	0.636	0.217	1.787	0.00267	0.063	1	8	84	0.214	0.073	0.600	0.001	0.021	0.019
											0.55	**0.18**	**1.58**	**0.00**	**0.06**	**0.05**
TOTAL											**3.29**	**1.06**	**8.47**	**0.01**	**0.32**	**0.29**

Assumptions:

* Per project schedule, North Segment Demolition occurs in 2012
* Remove utilities, appurtenances, & fenders assumes 42 days.
* Deck Removal assumes 90 days.
* Pier Removal assumes 60 days.

Notes:

(a) Emission factors from http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html, SCAQMD OFFROAD Emission Factors, Years 2012 through 2015

Work Days/Week 5

Access Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Indicator Pile Driving																
Barge Crane - 150 Ton	DIESEL	250	0.569	0.163	1.533	0.00177	0.057	1	8	17	0.039	0.011	0.104	0.000	0.004	0.003
Delmag D12 Hammer	DIESEL	36	0.274	0.084	0.271	0.00036	0.023	1	8	17	0.019	0.006	0.018	0.000	0.002	0.001
Jet Pump	DIESEL	50	0.312	0.105	0.323	0.00044	0.027	1	8	17	0.021	0.007	0.022	0.000	0.002	0.002
											0.06	**0.02**	**0.12**	**0.00**	**0.01**	**0.00**
Drive Abutment Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	13	0.033	0.010	0.088	0.000	0.003	0.003
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	13	0.032	0.009	0.094	0.000	0.003	0.003
Jet Pump	DIESEL	50	0.312	0.105	0.323	0.00044	0.027	1	9.5	13	0.019	0.006	0.020	0.000	0.002	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	13	0.045	0.008	0.065	0.000	0.004	0.003
											0.16	**0.04**	**0.36**	**0.00**	**0.01**	**0.01**
Landside Pipe Installation																
Scraper	DIESEL	313	1.211	0.319	2.829	0.00315	0.110	1	8	20	0.097	0.025	0.226	0.000	0.009	0.008
Roller	DIESEL	95	0.406	0.099	0.625	0.00069	0.053	1	8	20	0.033	0.008	0.050	0.000	0.004	0.004
Concrete Mixer	DIESEL	125	0.758	0.144	1.030	0.00141	0.060	2	8	20	0.121	0.023	0.165	0.000	0.010	0.009
Paver	DIESEL	100	0.506	0.139	0.836	0.00081	0.073	2	8	20	0.081	0.022	0.134	0.000	0.012	0.010
											0.33	**0.08**	**0.57**	**0.00**	**0.03**	**0.03**
Construct Abutment																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	28	0.057	0.021	0.050	0.000	0.005	0.004
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	28	0.059	0.017	0.159	0.000	0.006	0.005
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	28	0.043	0.016	0.139	0.000	0.005	0.004
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	28	0.043	0.016	0.139	0.000	0.005	0.004
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	28	0.081	0.015	0.117	0.000	0.007	0.006
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	28	0.059	0.020	0.064	0.000	0.005	0.005
Wharf Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	28	0.059	0.017	0.159	0.000	0.006	0.005
											0.402	**0.121**	**0.826**	**0.001**	**0.038**	**0.034**
Construct Dolphin Mooring																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	25	0.051	0.018	0.044	0.000	0.004	0.004
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	25	0.053	0.016	0.142	0.000	0.005	0.005
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	25	0.038	0.014	0.124	0.000	0.004	0.004
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	25	0.073	0.014	0.104	0.000	0.006	0.005
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	25	0.053	0.017	0.057	0.000	0.005	0.004
Wharf Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	25	0.053	0.016	0.142	0.000	0.005	0.005
											0.18	**0.06**	**0.43**	**0.00**	**0.02**	**0.02**

Access Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Drive Structural Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	60	0.151	0.044	0.406	0.001	0.015	0.013
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	60	0.149	0.041	0.433	0.001	0.014	0.012
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	60	0.149	0.041	0.433	0.001	0.014	0.012
Jet Pump	DIESEL	50	0.312	0.105	0.323	0.00044	0.027	1	9.5	60	0.089	0.030	0.092	0.000	0.008	0.007
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	60	0.207	0.039	0.298	0.000	0.017	0.015
											0.74	**0.20**	**1.66**	**0.00**	**0.07**	**0.06**
Form and Place 1st Stage Pile Caps																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	180	0.367	0.133	0.320	0.000	0.032	0.028
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	180	0.381	0.112	1.025	0.001	0.037	0.033
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	180	0.522	0.097	0.752	0.001	0.043	0.038
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	180	0.265	0.091	0.873	0.001	0.030	0.027
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	180	0.380	0.126	0.410	0.001	0.034	0.030
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	180	0.198	0.070	0.182	0.000	0.017	0.015
											2.11	**0.63**	**3.56**	**0.00**	**0.19**	**0.17**
Form/Place Deck Slabs, 2nd Stg Caps, Beams & Curbs																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	120	0.244	0.088	0.213	0.000	0.021	0.019
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	120	0.254	0.074	0.683	0.001	0.025	0.022
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	120	0.184	0.067	0.594	0.001	0.020	0.018
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	120	0.184	0.067	0.594	0.001	0.020	0.018
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	120	0.348	0.065	0.502	0.001	0.028	0.025
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	120	0.177	0.060	0.582	0.001	0.020	0.018
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	120	0.253	0.084	0.273	0.000	0.022	0.020
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	120	0.132	0.047	0.122	0.000	0.012	0.010
											1.78	**0.55**	**3.56**	**0.00**	**0.17**	**0.15**
Form and Place CIP Columns & Walls for Ramp																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	21	0.043	0.015	0.037	0.000	0.004	0.003
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	21	0.044	0.013	0.120	0.000	0.004	0.004
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	21	0.032	0.012	0.104	0.000	0.003	0.003
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	21	0.032	0.012	0.104	0.000	0.003	0.003
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	21	0.061	0.011	0.088	0.000	0.005	0.004

Access Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	21	0.031	0.011	0.102	0.000	0.004	0.003
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	21	0.044	0.015	0.048	0.000	0.004	0.003
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	21	0.023	0.008	0.021	0.000	0.002	0.002
											0.31	**0.10**	**0.62**	**0.00**	**0.03**	**0.03**
Form and Place Column Girders for Ramp																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	45	0.092	0.033	0.080	0.000	0.008	0.007
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	45	0.095	0.028	0.256	0.000	0.009	0.008
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	45	0.131	0.024	0.188	0.000	0.011	0.009
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	45	0.066	0.023	0.218	0.000	0.008	0.007
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	45	0.095	0.031	0.102	0.000	0.008	0.007
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	45	0.050	0.018	0.046	0.000	0.004	0.004
											0.53	**0.16**	**0.89**	**0.00**	**0.05**	**0.04**
Form/Place Ramp Deck & Curbs																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	32	0.065	0.024	0.057	0.000	0.006	0.005
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	32	0.068	0.020	0.182	0.000	0.007	0.006
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	32	0.049	0.018	0.158	0.000	0.005	0.005
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	32	0.049	0.018	0.158	0.000	0.005	0.005
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	32	0.093	0.017	0.134	0.000	0.008	0.007
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	32	0.047	0.016	0.155	0.000	0.005	0.005
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	32	0.068	0.022	0.073	0.000	0.006	0.005
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	32	0.035	0.013	0.032	0.000	0.003	0.003
											0.47	**0.15**	**0.95**	**0.00**	**0.04**	**0.04**
Access Pier Pipe Installation																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	90	0.183	0.066	0.160	0.000	0.016	0.014
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	90	0.191	0.056	0.512	0.001	0.019	0.017
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	90	0.261	0.049	0.376	0.001	0.021	0.019
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	90	0.133	0.045	0.436	0.001	0.015	0.013
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	90	0.190	0.063	0.205	0.000	0.017	0.015
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	90	0.099	0.035	0.091	0.000	0.009	0.008
											1.33	**0.41**	**2.67**	**0.00**	**0.13**	**0.11**
Drive Secondary Fender Piles																

Access Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	9.5	10	0.050	0.015	0.135	0.000	0.005	0.004
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	10	0.025	0.007	0.072	0.000	0.002	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	10	0.034	0.006	0.050	0.000	0.003	0.003
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	9.5	10	0.035	0.012	0.115	0.000	0.004	0.004
											0.145	**0.040**	**0.372**	**0.001**	**0.014**	**0.012**
Install Secondary Fender System																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	28	0.057	0.021	0.050	0.000	0.005	0.004
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	28	0.059	0.017	0.159	0.000	0.006	0.005
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	28	0.043	0.016	0.139	0.000	0.005	0.004
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	28	0.043	0.016	0.139	0.000	0.005	0.004
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	28	0.081	0.015	0.117	0.000	0.007	0.006
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	28	0.041	0.014	0.136	0.000	0.005	0.004
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	28	0.059	0.020	0.064	0.000	0.005	0.005
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	28	0.031	0.011	0.028	0.000	0.003	0.002
											0.41	**0.13**	**0.83**	**0.00**	**0.04**	**0.03**
Total											**8.40**	**2.53**	**16.31**	**0.02**	**0.78**	**0.70**

Work Days/Week 5

North
Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Drive Structural Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	45	0.113	0.033	0.304	0.000	0.011	0.010
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	45	0.112	0.031	0.325	0.001	0.010	0.009
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	45	0.112	0.031	0.325	0.001	0.010	0.009
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	45	0.155	0.029	0.223	0.000	0.013	0.011
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	9.5	45	0.079	0.027	0.259	0.000	0.009	0.008
											0.57	**0.15**	**1.44**	**0.00**	**0.05**	**0.05**
Drive Mooring Dolphin Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	9.5	12	0.030	0.009	0.081	0.000	0.003	0.003
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	12	0.030	0.008	0.087	0.000	0.003	0.002
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	12	0.030	0.008	0.087	0.000	0.003	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	12	0.041	0.008	0.060	0.000	0.003	0.003
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	9.5	12	0.021	0.007	0.069	0.000	0.002	0.002
											0.15	**0.04**	**0.38**	**0.00**	**0.01**	**0.01**
Form and Place 1st Stage Pile Caps																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	180	0.367	0.133	0.320	0.000	0.032	0.028
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	180	0.381	0.112	1.025	0.001	0.037	0.033
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	180	0.522	0.097	0.752	0.001	0.043	0.038
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	180	0.265	0.091	0.873	0.001	0.030	0.027
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	180	0.380	0.126	0.410	0.001	0.034	0.030
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	180	0.198	0.070	0.182	0.000	0.017	0.015
											2.11	**0.63**	**3.56**	**0.00**	**0.19**	**0.17**
Form/Place Deck Slab/2nd Stg Caps/Beams Lower																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	90	0.183	0.066	0.160	0.000	0.016	0.014
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	90	0.191	0.056	0.512	0.001	0.019	0.017
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	90	0.261	0.049	0.376	0.001	0.021	0.019
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	90	0.133	0.045	0.436	0.001	0.015	0.013
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	90	0.190	0.063	0.205	0.000	0.017	0.015
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	90	0.099	0.035	0.091	0.000	0.009	0.008
											1.33	**0.41**	**2.67**	**0.00**	**0.13**	**0.11**
Form and Place CIP Columns & Walls																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	90	0.183	0.066	0.160	0.000	0.016	0.014
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	90	0.191	0.056	0.512	0.001	0.019	0.017
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013

North
Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	90	0.261	0.049	0.376	0.001	0.021	0.019
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	90	0.133	0.045	0.436	0.001	0.015	0.013
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	90	0.190	0.063	0.205	0.000	0.017	0.015
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	90	0.099	0.035	0.091	0.000	0.009	0.008
											1.33	**0.41**	**2.67**	**0.00**	**0.13**	**0.11**
Form and Place Column Girders																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	90	0.183	0.066	0.160	0.000	0.016	0.014
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	90	0.191	0.056	0.512	0.001	0.019	0.017
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	90	0.261	0.049	0.376	0.001	0.021	0.019
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	90	0.133	0.045	0.436	0.001	0.015	0.013
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	90	0.190	0.063	0.205	0.000	0.017	0.015
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	90	0.099	0.035	0.091	0.000	0.009	0.008
											1.06	**0.31**	**1.78**	**0.00**	**0.10**	**0.09**
North Pier Pipe Installation																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	80	0.163	0.059	0.142	0.000	0.014	0.013
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	80	0.169	0.050	0.455	0.001	0.017	0.015
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	80	0.232	0.043	0.334	0.000	0.019	0.017
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	80	0.118	0.040	0.388	0.001	0.013	0.012
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	80	0.169	0.056	0.182	0.000	0.015	0.013
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	80	0.088	0.031	0.081	0.000	0.008	0.007
											0.94	**0.28**	**1.58**	**0.00**	**0.09**	**0.08**
Form/Place Deck Slab 2nd Stg Caps/Beams Upper Level																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	90	0.183	0.066	0.160	0.000	0.016	0.014
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	90	0.191	0.056	0.512	0.001	0.019	0.017
Concrete Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
Concrete Pump Truck	DIESEL	210	0.384	0.140	1.237	0.00187	0.041	1	8	90	0.138	0.050	0.445	0.001	0.015	0.013
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	90	0.261	0.049	0.376	0.001	0.021	0.019
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	90	0.133	0.045	0.436	0.001	0.015	0.013
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	90	0.190	0.063	0.205	0.000	0.017	0.015
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	90	0.099	0.035	0.091	0.000	0.009	0.008
											1.33	**0.41**	**2.67**	**0.00**	**0.13**	**0.11**
Install Loading Arm System																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	30	0.061	0.022	0.053	0.000	0.005	0.005

North
Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	30	0.087	0.016	0.125	0.000	0.007	0.006
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	30	0.044	0.015	0.145	0.000	0.005	0.004
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	30	0.063	0.021	0.068	0.000	0.006	0.005
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	30	0.033	0.012	0.030	0.000	0.003	0.003
											0.29	**0.09**	**0.42**	**0.00**	**0.03**	**0.02**
Drive Primary Fender Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	9.5	30	0.151	0.044	0.406	0.001	0.015	0.013
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	30	0.075	0.021	0.216	0.000	0.007	0.006
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	30	0.103	0.019	0.149	0.000	0.008	0.008
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	9.5	30	0.105	0.036	0.346	0.000	0.012	0.011
											0.43	**0.12**	**1.12**	**0.00**	**0.04**	**0.04**
Drive Secondary Fender Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	9.5	12	0.060	0.018	0.162	0.000	0.006	0.005
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	12	0.030	0.008	0.087	0.000	0.003	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	12	0.041	0.008	0.060	0.000	0.003	0.003
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	9.5	12	0.042	0.014	0.138	0.000	0.005	0.004
											0.17	**0.05**	**0.45**	**0.00**	**0.02**	**0.01**
Install Primary Fender System																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	40	0.081	0.029	0.071	0.000	0.007	0.006
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	40	0.116	0.022	0.167	0.000	0.009	0.008
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	40	0.059	0.020	0.194	0.000	0.007	0.006
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	40	0.084	0.028	0.091	0.000	0.007	0.007
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	40	0.044	0.016	0.041	0.000	0.004	0.003
											0.39	**0.11**	**0.56**	**0.00**	**0.03**	**0.03**
Turn On Service to North Pier																
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	14	0.030	0.010	0.032	0.000	0.003	0.002
											0.03	**0.01**	**0.03**	**0.00**	**0.00**	**0.00**
Total											**10.14**	**3.04**	**19.34**	**0.03**	**0.94**	**0.84**

Work Days/Week 5

South
Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Drive Mooring Dolphin Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	9.5	12	0.060	0.018	0.162	0.000	0.006	0.005
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	12	0.030	0.008	0.087	0.000	0.003	0.002
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	12	0.030	0.008	0.087	0.000	0.003	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	12	0.041	0.008	0.060	0.000	0.003	0.003
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	9.5	12	0.042	0.014	0.138	0.000	0.005	0.004
											0.20	**0.06**	**0.53**	**0.00**	**0.02**	**0.02**
Construct Dolphin Superstructure																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	30	0.061	0.022	0.053	0.000	0.005	0.005
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	8	30	0.127	0.037	0.342	0.000	0.012	0.011
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	30	0.087	0.016	0.125	0.000	0.007	0.006
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	8	30	0.088	0.030	0.291	0.000	0.010	0.009
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	30	0.063	0.021	0.068	0.000	0.006	0.005
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	30	0.033	0.012	0.030	0.000	0.003	0.003
											0.46	**0.14**	**0.91**	**0.00**	**0.04**	**0.04**
Install Fender System Framing and Components																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	20	0.041	0.015	0.036	0.000	0.004	0.003
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	20	0.058	0.011	0.084	0.000	0.005	0.004
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	20	0.029	0.010	0.097	0.000	0.003	0.003
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	20	0.042	0.014	0.046	0.000	0.004	0.003
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	20	0.022	0.008	0.020	0.000	0.002	0.002
											0.19	**0.06**	**0.28**	**0.00**	**0.02**	**0.02**
Total											**0.86**	**0.25**	**1.73**	**0.00**	**0.08**	**0.07**

Work Days/Week 5

Heavy Equipment North Segment
Demolition Emissions

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Remove Utilities, Appurtenances, & Fender System																
Barge-Mounted Excavator	DIESEL	320	0.510	0.166	1.313	0.00229	0.046	2	8	60	0.245	0.080	0.630	0.001	0.022	0.020
Generator	DIESEL	45	0.273	0.255	0.273	0.00040	0.021	2	8	60	0.131	0.122	0.131	0.000	0.010	0.009
20-Ton Forklift	DIESEL	130	0.725	0.127	0.975	0.00141	0.053	2	8	60	0.348	0.061	0.468	0.001	0.026	0.023
Wheeled Loader	DIESEL	250	0.355	0.119	1.097	0.00168	0.038	2	8	60	0.171	0.057	0.526	0.001	0.018	0.016
											0.89	**0.32**	**1.76**	**0.00**	**0.08**	**0.07**
Deck Removal																
Air Compressor	DIESEL	50	0.169	0.053	0.177	0.00025	0.014	2	4	40	0.027	0.009	0.028	0.000	0.002	0.002
Concrete Saws	DIESEL	10	0.068	0.020	0.126	0.00021	0.005	4	8	40	0.043	0.013	0.081	0.000	0.003	0.003
Barge-Mounted Excavator	DIESEL	320	0.510	0.166	1.313	0.00229	0.046	2	8	40	0.163	0.053	0.420	0.001	0.015	0.013
Generator	DIESEL	45	0.273	0.255	0.273	0.00040	0.021	2	8	40	0.087	0.081	0.087	0.000	0.007	0.006
20-Ton Forklift	DIESEL	130	0.725	0.127	0.975	0.00141	0.053	2	8	40	0.232	0.040	0.312	0.000	0.017	0.015
Wheeled Loader	DIESEL	250	0.355	0.119	1.097	0.00168	0.038	2	8	40	0.114	0.038	0.351	0.001	0.012	0.011
											0.67	**0.23**	**1.28**	**0.00**	**0.06**	**0.05**
Piling Removal																
Barge-Mounted Excavator	DIESEL	320	0.510	0.166	1.313	0.00229	0.046	2	8	54	0.220	0.072	0.567	0.001	0.020	0.018
Generator	DIESEL	45	0.273	0.255	0.273	0.00040	0.021	2	8	54	0.118	0.110	0.118	0.000	0.009	0.008
20-Ton Forklift	DIESEL	130	0.725	0.127	0.975	0.00141	0.053	2	8	54	0.313	0.055	0.421	0.001	0.023	0.021
Wheeled Loader	DIESEL	250	0.355	0.119	1.097	0.00168	0.038	2	8	54	0.153	0.051	0.474	0.001	0.016	0.014
											0.80	**0.29**	**1.58**	**0.00**	**0.07**	**0.06**
TOTAL											**2.37**	**0.84**	**4.61**	**0.01**	**0.20**	**0.18**

Assumptions:

* Per project schedule, South Pier Demolition occurs in 2014
* Remove utilities, appurtenances, & fenders assumes 84 days.
* Deck Removal assumes 56 days.
* Pier Removal assumes 56 days.

Notes:

(a) Emission factors from http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html, SCAQMD OFFROAD Emission Factors, Years 2012 through 2015

Work Days/Week 5

South
Pier Construction

Emission Factors											Total Emissions (Tons)					
Equipment	FUEL	HP	CO (lb/hr)	VOC (lb/hr)	NOX (lb/hr)	SOX (lb/hr)	PM10 (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO	VOC	NOX	SOX	PM10	PM2.5
Drive Abutment Piles																
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	2	9.5	10	0.050	0.015	0.135	0.000	0.005	0.004
Impact Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	10	0.025	0.007	0.072	0.000	0.002	0.002
Vibratory Hammer	DIESEL	250	0.523	0.145	1.519	0.00250	0.049	1	9.5	10	0.025	0.007	0.072	0.000	0.002	0.002
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	9.5	10	0.034	0.006	0.050	0.000	0.003	0.003
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	2	9.5	10	0.035	0.012	0.115	0.000	0.004	0.004
											0.17	**0.05**	**0.44**	**0.00**	**0.02**	**0.01**
Form/Place Abutment Cap & Landside Tie-In																
Air Compressor	DIESEL	50	0.255	0.092	0.222	0.00029	0.022	2	8	21	0.043	0.015	0.037	0.000	0.004	0.003
Barge Crane - 150 Ton	DIESEL	250	0.529	0.155	1.423	0.00177	0.052	1	8	21	0.044	0.013	0.120	0.000	0.004	0.004
20-Ton Forklift	DIESEL	130	0.726	0.135	1.045	0.00141	0.059	1	8	21	0.061	0.011	0.088	0.000	0.005	0.004
Wheeled Loader	DIESEL	250	0.368	0.126	1.212	0.00168	0.042	1	8	21	0.031	0.011	0.102	0.000	0.004	0.003
Generator	DIESEL	33	0.264	0.087	0.285	0.00040	0.023	2	8	21	0.044	0.015	0.048	0.000	0.004	0.003
Welders	DIESEL	45	0.275	0.098	0.253	0.00034	0.024	1	8	21	0.023	0.008	0.021	0.000	0.002	0.002
											0.25	**0.07**	**0.42**	**0.00**	**0.02**	**0.02**
Total											**0.42**	**0.12**	**0.86**	**0.00**	**0.04**	**0.03**

Work Days/Week 5

Construction Truck Trips

Construction Phase	Vehicle Class	Daily truck trips	Total No. of Vehicle	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	VOCs Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Emissions, tons per year CO	NOx	VOCs	SOx	PM10	PM2.5
Demolition																											
Transport Trucks	Heavy-duty truck, diesel	12	2000	15	26	2.69720812	13.036345	1.08537279	0.024	0.14868971	0.035	0.028	0.13679453	0.009	0.012	1.86	8.97	0.75	0.02	0.10	0.02	0.15	0.75	0.06	0.00	0.01	0.01
TOTAL																**1.86**	**8.97**	**0.75**	**0.02**	**0.10**	**0.02**	**0.15**	**0.75**	**0.06**	**0.00**	**0.01**	**0.01**

ASSUMPTIONS:

* Assuming 26 miles round trip per vehicle (distance to Miramar Landfill = 13 miles)
* Assume startup after 8 hours
* Assume 45 minutes run time total
* 2012 Emission Factors from EMFAC2007, average temp 60F

Total truck trips for demolition - 2,000 trips

Construction Phase	Vehicle Class		Total No. of Vehicle	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	VOCs Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Emissions, tons per year CO	NOx	VOCs	SOx	PM10	PM2.5
Deliveries																											
Transport Trucks	Heavy-duty truck, diesel		4600	15	40	2.69720812	13.036345	1.08537279	0.024	0.14868971	0.035	0.028	0.13679453	0.009	0.012	7.29	35.25	2.94	0.06	0.40	0.09	0.55	2.64	0.22	0.00	0.04	0.03
TOTAL																**7.29**	**35.25**	**2.94**	**0.06**	**0.40**	**0.09**	**0.55**	**2.64**	**0.22**	**0.00**	**0.04**	**0.03**

ASSUMPTIONS:

* Assuming 40 miles round trip per vehicle

Construction Worker Commute Emission Calculations

Construction Phase	Vehicle Class	No. of Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_X		Running Exhaust (g/mi)	Start-Up (g/start)[a]	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evaporative (g/mi)	Diurnal Evaporative (g/hr)	SOx		PM10				PM2.5			
					Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]							Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Tire Wear (g/mi)	Brake Wear (g/mi)
Marine Mammal Relocation	Light-duty truck, catalyst	30	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
Dredge Turning Basin	Light-duty truck, catalyst	30	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
North Segment Demolition	Light-duty truck, catalyst	30	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
Access Pier Construction	Light-duty truck, catalyst	60	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
North Pier Construction	Light-duty truck, catalyst	60	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
South Pier Construction	Light-duty truck, catalyst	60	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
South Pier & Access Pier Demolition	Light-duty truck, catalyst	30	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005
Abutment	Light-duty truck, catalyst	30	35	40	2.85109453	8.891	0.27134995	0.429	0.07975433	0.621	0.193	0.024	0.043	0.049	0.004	0.002	0.00369253	0.017	0.008	0.013	0.00337906	0.016	0.002	0.005

Emissions, lbs/day							Emissions, tons per phase					
CO	NOx	VOCs	SOx	PM10	PM2.5	Days/year	CO	NOx	VOCs	SOx	PM10	PM2.5
8.72	0.77	0.47	0.01	0.07	0.03	260	1.13344771	0.10070062	0.06142612	0.00141008	0.00878466	0.00384473
8.72	0.77	0.47	0.01	0.07	0.03	260	1.13344771	0.10070062	0.06142612	0.00141008	0.00878466	0.00384473
8.72	0.77	0.47	0.01	0.07	0.03	84	0.3661908	0.03253405	0.01984536	0.00045557	0.00283812	0.00124215
17.44	1.55	0.95	0.02	0.14	0.06	260	2.26689542	0.20140123	0.12285224	0.00282017	0.01756933	0.00768947
17.44	1.55	0.95	0.02	0.14	0.06	260	2.26689542	0.20140123	0.12285224	0.00282017	0.01756933	0.00768947
17.44	1.55	0.95	0.02	0.14	0.06	62	0.54056737	0.04802645	0.02929554	0.0006725	0.00418961	0.00183364
8.72	0.77	0.47	0.01	0.07	0.03	154	0.6713498	0.05964575	0.03638316	0.0008352	0.00520322	0.00227727
8.72	0.77	0.47	0.01	0.07	0.03	31	0.13514184	0.01200661	0.00732388	0.00016813	0.0010474	0.00045841

ASSUMPTIONS:

* Assuming 40 miles round trip per vehicle
* Assuming 30 workers per construction phase for
* Assume startup after 8 hours
* Assume 45 minutes run time total
* 2014 Emission Factors from EMFAC2011, average temp 60F

Work Days/Week 5

Support Vessel Emissions

Marine Mammal Relocation											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Pile Driving Support	75	kW	85.0%	1	California Diesel	4	8	32	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.16	0.01	1.74	0.00	0.04	0.0	0.0	0.0	0.0	0.0
Work Boat	Marine Mammal Pen Move	93	kW	85.0%	4	California Diesel	8	8	64	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.0	0.0	0.3	0.0	0.0
																MAX Daily:	**0.97**	**0.08**	**10.46**	**0.01**	**0.26**	**0.03**	**0.00**	**0.31**	**0.00**	**0.01**

Dredge Turning Basin and Discharge Sediment											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Pile Driving Support	75	kW	85.0%	1	California Diesel	4	90	360	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.16	0.01	1.74	0.00	0.04	0.0	0.0	0.3	0.0	0.0
Tugboats	Pile Driving Support	186	kW	85.0%	2	California Diesel	4	90	360	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.1	0.0	1.6	0.0	0.0
																MAX Daily:	**0.97**	**0.08**	**10.46**	**0.01**	**0.26**	**0.17**	**0.02**	**1.88**	**0.00**	**0.05**

North Segment Demolition											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Demolition Support	75	kW	85.0%	2	California Diesel	4	61	244	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.32	0.03	3.49	0.00	0.09	0.0	0.0	0.4	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	61	244	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.1	0.0	1.1	0.0	0.0
																MAX Daily:	**1.13**	**0.10**	**12.20**	**0.01**	**0.30**	**0.14**	**0.01**	**1.49**	**0.00**	**0.04**

Access Pier Construction											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Construction Support	75	kW	85.0%	2	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.32	0.03	3.49	0.00	0.09	0.2	0.0	1.8	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.4	0.0	4.5	0.0	0.1
																MAX Daily:	**1.13**	**0.10**	**12.20**	**0.01**	**0.30**	**0.59**	**0.05**	**6.34**	**0.00**	**0.16**

Support Vessel Emissions

North Pier Construction											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Construction Support	75	kW	85.0%	2	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.32	0.03	3.49	0.00	0.09	0.2	0.0	1.8	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.4	0.0	4.5	0.0	0.1
																MAX Daily:	**1.13**	**0.10**	**12.20**	**0.01**	**0.30**	**0.59**	**0.05**	**6.34**	**0.00**	**0.16**

South Pier Construction											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Construction Support	75	kW	85.0%	4	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.65	0.06	6.97	0.01	0.17	0.3	0.0	3.6	0.0	0.1
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.4	0.0	4.5	0.0	0.1
																MAX Daily:	**1.46**	**0.13**	**15.68**	**0.01**	**0.39**	**0.76**	**0.07**	**8.16**	**0.01**	**0.20**

South Pier and Access Pier Demolition											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Demolition Support	75	kW	85.0%	4	California Diesel	4	78	312	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.65	0.06	6.97	0.01	0.17	0.1	0.0	1.1	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	78	312	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.1	0.0	1.4	0.0	0.0
																MAX Daily:	**1.46**	**0.13**	**15.68**	**0.01**	**0.39**	**0.23**	**0.02**	**2.45**	**0.00**	**0.06**

Abutment											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Work Boat	Construction Support	75	kW	85.0%	4	California Diesel	4	31	124	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.65	0.06	6.97	0.01	0.17	0.0	0.0	0.4	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	31	124	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.1	0.0	0.5	0.0	0.0
																MAX Daily:	**1.46**	**0.13**	**15.68**	**0.01**	**0.39**	**0.09**	**0.01**	**0.97**	**0.00**	**0.02**

Dredging											Emission Factors						Hourly Emission Rates (lb/hr)					Annual Emission Rates (ton/yr)				
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**PM10**	**NOx**	**CO**	**SO2**	**VOC ***	**Emission factor units**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**	**CO**	**VOC**	**NOx**	**SO2**	**PM10**
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	40	160	222.33	0.26	10.61	0.99	0.01	0.09	g/kW-hr	0.81	0.07	8.71	0.01	0.22	0.1	0.0	0.7	0.0	0.0
																MAX Daily:	**0.81**	**0.07**	**8.71**	**0.01**	**0.22**	**0.06**	**0.01**	**0.70**	**0.00**	**0.02**

Work Days/Week 5

SOURCE:

Load factors based on recommdations in EPA420-R-00-002, Table 5-2, assumed for maneuvering.

Emission Factors from Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data, USEPA, Feb 2000, EPA420-R-00-002, page 5-3.

Emission factors from AP-42 1.3 for Fuel Oil Combustion - No 6 Oil Industrial Fired Boilers

* VOC emissions are actuallyTHC for Marine Vessels

0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.15	% Nitrogen content of the Fuel Oil used for the boilers
0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.944	kg/l density of residual oil, from AP-42 Appendix A

Dredging Emissions

			Emission Factors[a]									Emissions						Emission, tons (total)					
Equipment	FUEL	HP	Load Factor	CO (g/hp-hr)	VOC (g/hp-hr)	NOX (g/hp-hr)	SOX (g/hp-hr)	PM10 (g/hp-hr)	No of Equipment	Hrs Per Day	Days in Service	CO lbs/day	VOC lbs/day	NOX lbs/day	SOX lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO tons (total)	VOC tons (total)	NOX tons (total)	SOX tons (total)	PM10 tons (total)	PM2.5 tons (total)
Dredging Equipment																							
Main genset	DIESEL	2,935	51	1.83E+00	5.30E-01	6.25E+00	6.00E-03	1.84E-01	1	8	40	48.31	13.99	165.00	0.16	4.86	4.32	0.966	0.280	3.300	0.003	0.097	0.086
Aux genset	DIESEL	550	74	1.49E+00	4.60E-01	4.80E+00	3.00E-03	1.64E-01	1	8	40	10.70	3.30	34.46	0.02	1.18	1.05	0.214	0.066	0.689	0.000	0.024	0.021
Spud winch	DIESEL	250	51	1.39E+00	4.80E-01	5.23E+00	6.00E-03	1.72E-01	1	8	40	3.13	1.08	11.76	0.01	0.39	0.34	0.063	0.022	0.235	0.000	0.008	0.007
												62.13	**18.37**	**211.22**	**0.19**	**6.42**	**5.72**	**1.24**	**0.37**	**4.22**	**0.00**	**0.13**	**0.11**
TOTAL																							

Assumptions:

Notes:

(a) Emission factors from OFFROAD Model, SDAB, for Dredging Equipment

Work Days/Week 5

Assumptions: Dredge will be similar to the Manson "Valhalla" Clamshell Dredge

Dredge	Engine	Model Year	Max hp	*Assumed Hours of Operation
Valhalla	Main genset	2000	2,935	18
Valhalla	Aux genset	2000	550	24
Valhalla	Spud winch	2000	250	6

Emission Factors

Commercial Marine Vessel Emissions

Pollutant	Exponent (x)	Intercept (b)	Coefficient (a)
PM	1.5	0.2551	0.0059
NOX	1.5	10.4496	0.1255
NO2	1.5	15.5247	0.18865
SO2	0	0	2.3735
CO	1	0	0.8378
HC	1.5	0	0.0667
CO2	1	648.6	44.1

Emission Factor equation is in the form:
Emissions Rate (g/kW-hr) = a * (Fractional Load of Engine Power)$^{-x}$ + b

For SO2, the equation is:
Emissions Rate (g/kW-hr) = a * (Fuel Sulfur Flow in g/kW-hr) + b = a * (fuel consumption in g/kW-hr) * (% sulfur in fuel/100) + b
Requires an estimate of the % sulfur in the fuel.

Fuel Consumption Estimation equation:
Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717

Emission Factor Source: Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data, USEPA, February 2000, EPA420-R-00-002, page 5-3.

[This Page Intentionally Left Blank]

Greenhouse Gas (GHG) Emissions Calculations

[This Page Intentionally Left Blank]

Emissions Summary
NBPL P-151

2013 Emissions	Emission (metric tons/year)		
	CO2	CH4	N2O
Marine Mammal Relocation			
Drive Piles	22.42	0.00	0.03
Worker Trips	105.98	0.01	0.01
Support Vessels	20.25	0.02	0.01
Subtotal	**148.66**	**0.03**	**0.04**
Dredge Turning Basin and Discharge Sediment			
Dredge Turning Basin and Discharge Sediment	916.22	0.08	10.08
Truck Trips	160.31	0.01	0.00
Worker Trips	105.98	0.01	0.01
Support Vessels	124.26	0.13	0.05
Subtotal	**1306.78**	**0.22**	**10.13**
Total 2013	**1455.44**	**0.26**	**10.18**

Emissions Summary
NBPL P-151

2014 Emissions	Emission (metric tons/year)		
	CO2	CH4	N2O
Marine Mammal Relocation			
Drive Piles	22.42	0.00	0.03
Worker Trips	105.98	0.01	0.01
Support Vessels	20.25	0.02	0.01
Subtotal	**148.66**	**0.03**	**0.04**
North Segment Demolition			
Piling Removal	188.49	0.02	0.17
Deck Removal	402.08	0.03	0.31
Asphalt Debris Removal	248.16	0.02	0.17
Demo & Material Transport	186.31	0.01	0.15
Truck Trips	77.84	0.00	0.04
Worker Trips	105.98	0.01	0.01
Support Vessels	98.26	0.10	0.04
Subtotal	**1307.12**	**0.20**	**0.89**
Access Pier Construction			
Indicator Pile Driving	9.53	0.00	0.01
Drive Abutment Piles	48.16	0.00	0.03
Landside Pipe Installation	61.52	0.01	0.05
Construct Abutment	88.27	0.01	0.08
Construct Dolphin Mooring	48.98	0.01	0.04
Drive Structural Piles	222.26	0.02	0.16
Truck Trips	947.29	0.04	0.01
Worker Trips	211.97	0.01	0.02
Support Vessels	418.81	0.44	0.16
Subtotal	**2047.25**	**0.53**	**0.55**
North Pier Construction			
Drive Structural Piles	166.70	0.01	0.14
Truck Trips	163.95	0.01	0.00
Worker Trips	211.97	0.01	0.02
Support Vessels	418.81	0.44	0.16
Subtotal	**961.43**	**0.47**	**0.31**
Dredging	**453.23**	**0.08**	**4.50**
Total 2014, Preferred Alternative	**4917.69**	**1.32**	**6.28**
Total 2014, Delayed Dredging Alternative	**4464.46**	**1.24**	**1.79**

Emissions Summary
NBPL P-151

2015 Emissions	Emission (metric tons/year)		
	CO2	CH4	N2O
Access Pier Construction			
Form and Place 1st Stage Pile Caps	372.80	0.05	0.34
Form/Place Deck Slabs, 2nd Stg Caps, Beams & Curbs	408.42	0.05	0.34
Form and Place CIP Columns & Walls for Ramp	71.47	0.01	0.06
Form and Place Column Girders for Ramp	93.20	0.01	0.08
Form/Place Ramp Deck & Curbs	108.91	0.01	0.09
Access Pier Pipe Installation	306.31	0.04	0.25
Drive Secondary Fender Piles	42.82	0.00	0.04
Install Secondary Fender System	95.30	0.01	0.08
Truck Trips	947.29	0.04	0.01
Worker Trips	211.97	0.01	0.02
Support Vessels	418.81	0.44	0.16
Subtotal	**3077.31**	**0.68**	**1.46**
North Pier Construction			
Form and Place 1st Stage Pile Caps	372.80	0.05	0.34
Form/Place Deck Slab/2nd Stg Caps/Beams Lower	306.31	0.04	0.25
Form and Place CIP Columns & Walls	306.31	0.04	0.25
Form and Place Column Girders	186.40	0.03	0.17
Drive Primary Fender Piles	108.68	0.01	0.11
Drive Secondary Fender Piles	43.47	0.00	0.04
Install Primary Fender System	64.90	0.01	0.05
Truck Trips	947.29	0.04	0.01
Worker Trips	211.97	0.01	0.02
Support Vessels	418.81	0.44	0.16
Subtotal	**2966.96**	**0.67**	**1.40**
Dredging	**453.23**	**0.08**	**4.50**
Total 2015, Preferred Alternative	**6497.50**	**1.42**	**7.35**
Total 2015, Delayed Dredging Alternative	**6044.26**	**1.34**	**2.86**

Emissions Summary
NBPL P-151

2016 Emissions	Emission (metric tons/year)		
	CO2	CH4	N2O
North Pier Construction			
North Pier Pipe Installation	165.69	0.02	0.15
Form/Place Deck Slab 2nd Stg Caps/Beams Upper Leve	306.31	0.04	0.25
Install Loading Arm System	48.67	0.01	0.04
Turn On Service to North Pier	3.43	0.00	0.00
Truck Trips	947.29	0.04	0.01
Worker Trips	211.97	0.01	0.02
Support Vessels	418.81	0.44	0.16
Subtotal	**2102.18**	**0.56**	**0.63**
South Dolphins Construction			
Drive Mooring Dolphin Piles	57.96	0.00	0.05
Construct Dolphin Superstructure	93.47	0.01	0.09
Install Fender System Framing and Components	32.45	0.01	0.03
Truck Trips	225.89	0.01	0.00
Worker Trips	211.97	0.01	0.02
Support Vessels	538.47	0.57	0.20
Subtotal	**1160.21**	**0.61**	**0.38**
South Pier & Access Pier Demolition			
Remove Utilities, Appurtenances, & Fender System	258.35	0.02	0.17
Deck Removal	186.34	0.02	0.12
Piling Removal	232.52	0.02	0.15
Truck Trips	142.71	0.01	0.07
Worker Trips	105.98	0.01	0.01
Support Vessels	161.54	0.17	0.06
Subtotal	**1087.45**	**0.25**	**0.57**
Abutment Piles			
Drive Abutment Piles	48.30	0.00	0.04
Form/Place Abutment Cap & Landside Tie-In	43.49	0.01	0.04
Truck Trips	112.95	0.00	0.00
Worker Trips	105.98	0.01	0.01
Support Vessels	64.20	0.07	0.02
Subtotal	**374.93**	**0.09**	**0.12**
Dredging	**453.23**	**0.08**	**4.50**
Total 2016, Preferred Alternative	**5178.00**	**1.58**	**6.20**
Total 2016, Delayed Dredging Alternative	**4724.77**	**1.50**	**1.70**

Marine Mammal/Pile Program

Emission Factors										Total Emissions (Metric Ton		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Drive Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.533	0.14561	1	8	40	17.945	0.002	0.023
Delmag D12 Hammer	DIESEL	36.21	28.0	0.008	0.271	0.02572	1	8	40	4.478	0.001	0.004
Jet Pump	DIESEL	50	34.335	0.009	0.323	0.03067	1	8	40	5.494	0.002	0.005
										22.42	**0.00**	**0.03**
Total										**22.42**	**0.00**	**0.03**

Work Days/Week 5

Dredge Turning Basin

Emission Factors										Total Emissions (Metric Ton		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Dredge Turning Basin and Discharge Sediment												
Dredge	DIESEL	100		See Dredging			1	8	90	916.224	0.077	10.076
										916.22	**0.08**	**10.08**
Total										**916.22**	**0.08**	**10.08**

Work Days/Week 5

North Segment
Demolition

Emission Factors										otal Emissions (Metric Ton		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equip ment	Hours Per Day	Days in Service	CO2	CH4	N2O
Piling Removal												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	4	84	7.483	0.003	0.007
Barge Crane - 250 Ton	DIESEL	399	112.159	0.009	1.423	0.13519	1	9.5	84	44.751	0.004	0.054
Heavy Truck	DIESEL	489	272.334	0.020	1.787	0.16972	1	8	84	91.504	0.007	0.057
Wharf Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	84	44.751	0.004	0.054
										188.49	**0.02**	**0.17**
Deck Removal												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	4	84	7.483	0.003	0.007
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	84	50.056	0.004	0.039
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	84	44.751	0.004	0.054
Dump Truck	DIESEL	489	272.334	0.020	1.787	0.16972	1	8	84	91.504	0.007	0.057
Wharf Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	84	44.751	0.004	0.054
Breakers	DIESEL	320	254.239	0.013	1.519	0.14427	1	8	84	85.424	0.004	0.048
Concrete Saws	DIESEL	10	16.478	0.002	0.126	0.01198	4	8	84	22.146	0.002	0.016
Flatbed Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	84	55.959	0.004	0.039
										402.08	**0.03**	**0.31**
Asphalt Debris Removal												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	4	84	7.483	0.003	0.007
Dump Truck	DIESEL	489	272.334	0.020	1.787	0.16972	1	8	84	91.504	0.007	0.057
Barge-Mounted Excavator	DIESEL	320	233.735	0.016	1.476	0.14025	1	8	84	78.535	0.005	0.047
Generator	DIESEL	45	30.623	0.008	0.285	0.02704	2	8	84	20.579	0.005	0.018
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	84	50.056	0.004	0.039
										248.16	**0.02**	**0.17**
Demo & Material Transport												
Wharf Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	84	44.751	0.004	0.054
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	84	50.056	0.004	0.039
Dump Truck	DIESEL	489	272.334	0.020	1.787	0.16972	1	8	84	91.504	0.007	0.057
										186.31	**0.01**	**0.15**
TOTAL										**1025.03**	**0.09**	**0.80**

Assumptions:

* Per project schedule, North Segment Demolition occurs in 2012
* Remove utilities, appurtenances, & fenders assumes 42 days.
* Deck Removal assumes 90 days.
* Pier Removal assumes 60 days.

Notes:

(a) Emission factors from http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html, SCAQMD OFFROAD Emission Factors, Years 2012 through 2015

Work Days/Week 5

Access Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Indicator Pile Driving												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.533	0.14561	1	8	17	7.627	0.001	0.010
Delmag D12 Hammer	DIESEL	36	28.0	0.008	0.271	0.02572	1	8	17	1.903	0.001	0.002
Jet Pump	DIESEL	50	34.335	0.009	0.323	0.03067	1	8	17	2.335	0.001	0.002
										9.53	**0.00**	**0.01**
Drive Abutment Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	13	6.926	0.001	0.008
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	13	15.699	0.001	0.009
Jet Pump	DIESEL	50	34.335	0.009	0.323	0.03067	1	9.5	13	2.120	0.001	0.002
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	9.5	13	7.713	0.001	0.006
										48.16	**0.00**	**0.03**
Landside Pipe Installation												
Scraper	DIESEL	313	321.429	0.029	2.829	0.26873	1	8	20	25.714	0.002	0.021
Roller	DIESEL	95	58.989	0.009	0.625	0.05941	1	8	20	4.719	0.001	0.005
Concrete Mixer	DIESEL	125	125.088	0.013	1.030	0.09789	2	8	20	20.014	0.002	0.016
Paver	DIESEL	100	69.196	0.013	0.836	0.07939	2	8	20	11.071	0.002	0.013
										61.52	**0.01**	**0.05**
Construct Abutment												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	28	4.989	0.002	0.005
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	28	12.562	0.001	0.015
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	28	18.653	0.001	0.013
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	28	18.653	0.001	0.013
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	28	13.989	0.001	0.011
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	28	6.860	0.002	0.006
Wharf Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	28	12.562	0.001	0.015
										88.267	**0.010**	**0.079**
Construct Dolphin Mooring												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	25	4.454	0.002	0.004
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	25	11.216	0.001	0.014
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	25	16.655	0.001	0.012
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	25	12.490	0.001	0.010
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	25	6.125	0.002	0.005
Wharf Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	25	11.216	0.001	0.014
										48.98	**0.01**	**0.04**

Access Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Drive Structural Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	60	31.965	0.003	0.039
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	60	72.458	0.004	0.041
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	60	72.458	0.004	0.041
Jet Pump	DIESEL	50	34.335	0.009	0.323	0.03067	1	9.5	60	9.785	0.003	0.009
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	9.5	60	35.596	0.003	0.028
										222.26	**0.02**	**0.16**
Form and Place 1st Stage Pile Caps												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	180	32.071	0.012	0.030
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	180	80.754	0.007	0.097
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	180	89.928	0.009	0.071
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	180	107.263	0.008	0.083
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	180	44.097	0.011	0.039
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	180	18.690	0.006	0.017
										372.80	**0.05**	**0.34**
Form/Place Deck Slabs, 2nd Stg Caps, Beams & Curbs												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	120	21.380	0.008	0.020
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	120	53.836	0.005	0.065
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	120	79.942	0.006	0.056
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	120	79.942	0.006	0.056
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	120	59.952	0.006	0.048
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	120	71.509	0.005	0.055
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	120	29.398	0.008	0.026
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	120	12.460	0.004	0.012
										408.42	**0.05**	**0.34**
Form and Place CIP Columns & Walls for Ramp												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	21	3.742	0.001	0.004
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	21	9.421	0.001	0.011
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	21	13.990	0.001	0.010
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	21	13.990	0.001	0.010
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	21	10.492	0.001	0.008

Access Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equip ment	Hours Per Day	Days in Service	CO2	CH4	N2O
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	21	12.514	0.001	0.010
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	21	5.145	0.001	0.005
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	21	2.180	0.001	0.002
										71.47	**0.01**	**0.06**
Form and Place Column Girders for Ramp												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	45	8.018	0.003	0.008
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	45	20.189	0.002	0.024
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	45	22.482	0.002	0.018
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	45	26.816	0.002	0.021
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	45	11.024	0.003	0.010
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	45	4.672	0.002	0.004
										93.20	**0.01**	**0.08**
Form/Place Ramp Deck & Curbs												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	32	5.701	0.002	0.005
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	32	14.356	0.001	0.017
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	32	21.318	0.002	0.015
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	32	21.318	0.002	0.015
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	32	15.987	0.002	0.013
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	32	19.069	0.001	0.015
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	32	7.839	0.002	0.007
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	32	3.323	0.001	0.003
										108.91	**0.01**	**0.09**
Access Pier Pipe Installation												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	90	16.035	0.006	0.015
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	90	40.377	0.003	0.049
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	90	44.964	0.004	0.036
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	90	53.632	0.004	0.041
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	90	22.049	0.006	0.019
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	90	9.345	0.003	0.009

Access Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
										306.31	**0.04**	**0.25**
Drive Secondary Fender Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	9.5	10	10.655	0.001	0.013
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	10	12.076	0.001	0.007
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	9.5	10	5.933	0.001	0.005
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	2	9.5	10	14.153	0.001	0.011
										42.817	**0.003**	**0.035**
Install Secondary Fender System												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	28	4.989	0.002	0.005
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	28	12.562	0.001	0.015
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	28	18.653	0.001	0.013
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	28	18.653	0.001	0.013
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	28	13.989	0.001	0.011
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	28	16.685	0.001	0.013
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	28	6.860	0.002	0.006
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	28	2.907	0.001	0.003
										95.30	**0.01**	**0.08**
Total										**1857.92**	**0.22**	**1.55**

Work Days/Week 5

North
Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Drive Structural Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	45	23.974	0.002	0.029
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	45	54.343	0.003	0.031
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	45	54.343	0.003	0.031
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	45	7.339	0.002	0.021
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	1	9.5	45	26.697	0.003	0.025
										166.70	**0.01**	**0.14**
Drive Mooring Dolphin Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	9.5	12	6.393	0.001	0.008
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	12	14.492	0.001	0.008
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	12	14.492	0.001	0.008
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	12	1.957	0.001	0.006
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	1	9.5	12	7.119	0.001	0.007
										44.45	**0.00**	**0.04**
Form and Place 1st Stage Pile Caps												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	180	32.071	0.012	0.030
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	180	80.754	0.007	0.097
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	180	89.928	0.009	0.071
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	180	107.263	0.008	0.083
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	180	44.097	0.011	0.039
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	180	18.690	0.006	0.017
										372.80	**0.05**	**0.34**
Form/Place Deck Slab/2nd Stg Caps/Beams Lower												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	90	16.035	0.006	0.015
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	90	40.377	0.003	0.049
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	90	44.964	0.004	0.036
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	90	53.632	0.004	0.041
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	90	22.049	0.006	0.019
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	90	9.345	0.003	0.009
										306.31	**0.04**	**0.25**
Form and Place CIP Columns & Walls												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	90	16.035	0.006	0.015
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	90	40.377	0.003	0.049

North
Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	90	44.964	0.004	0.036
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	90	53.632	0.004	0.041
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	90	22.049	0.006	0.019
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	90	9.345	0.003	0.009
										306.31	**0.04**	**0.25**
Form and Place Column Girders												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	90	16.035	0.006	0.015
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	90	40.377	0.003	0.049
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	90	44.964	0.004	0.036
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	90	53.632	0.004	0.041
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	90	22.049	0.006	0.019
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	90	9.345	0.003	0.009
										186.40	**0.03**	**0.17**
North Pier Pipe Installation												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	80	14.254	0.005	0.014
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	80	35.891	0.003	0.043
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	80	39.968	0.004	0.032
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	80	47.673	0.004	0.037
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	80	19.599	0.005	0.017
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	80	8.307	0.003	0.008
										165.69	**0.02**	**0.15**
Form/Place Deck Slab 2nd Stg Caps/Beams Upper Level												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	90	16.035	0.006	0.015
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	90	40.377	0.003	0.049
Concrete Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
Concrete Pump Truck	DIESEL	210	166.545	0.013	1.237	0.11754	1	8	90	59.956	0.005	0.042
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	90	44.964	0.004	0.036
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	90	53.632	0.004	0.041
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	90	22.049	0.006	0.019
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	90	9.345	0.003	0.009
										306.31	**0.04**	**0.25**

North
Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Install Loading Arm System												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	30	5.345	0.002	0.005
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	30	14.988	0.001	0.012
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	30	17.877	0.001	0.014
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	30	7.350	0.002	0.006
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	30	3.115	0.001	0.003
										48.67	**0.01**	**0.04**
Drive Primary Fender Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	9.5	30	31.965	0.003	0.039
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	30	36.229	0.002	0.021
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	30	4.893	0.001	0.014
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	2	9.5	30	35.596	0.003	0.033
										108.68	**0.01**	**0.11**
Drive Secondary Fender Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	9.5	12	12.786	0.001	0.015
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	12	14.492	0.001	0.008
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	12	1.957	0.001	0.006
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	2	9.5	12	14.239	0.001	0.013
										43.47	**0.00**	**0.04**
Install Primary Fender System												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	40	7.127	0.003	0.007
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	40	19.984	0.002	0.016
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	40	23.836	0.002	0.018
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	40	9.799	0.003	0.009
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	40	4.153	0.001	0.004
										64.90	**0.01**	**0.05**
Turn On Service to North Pier												
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	14	3.430	0.001	0.003
										3.43	**0.00**	**0.00**
Total										**2124.15**	**0.26**	**1.84**

Work Days/Week 5

South
Pier Construction

Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	Total Emissions (Tons) CO2	CH4	N2O
Drive Mooring Dolphin Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	9.5	12	12.786	0.001	0.015
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	12	14.492	0.001	0.008
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	12	14.492	0.001	0.008
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	12	1.957	0.001	0.006
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	2	9.5	12	14.239	0.001	0.013
										57.96	**0.00**	**0.05**
Construct Dolphin Superstructure												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	30	5.345	0.002	0.005
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	8	30	26.918	0.002	0.032
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	30	14.988	0.001	0.012
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	2	8	30	35.754	0.003	0.028
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	30	7.350	0.002	0.006
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	30	3.115	0.001	0.003
										93.47	**0.01**	**0.09**
Install Fender System Framing and Components												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	20	3.563	0.001	0.003
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	20	9.992	0.001	0.008
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	20	11.918	0.001	0.009
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	20	4.900	0.001	0.004
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	20	2.077	0.001	0.002
										32.45	**0.01**	**0.03**
Total										**183.88**	**0.02**	**0.16**

Work Days/Week 5

Heavy Equipment North Segment
Demolition Emissions

			Emission Factors							Total Emissions (Metric Ton		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Remove Utilities, Appurtenances, & Fender System												
Barge-Mounted Excavator	DIESEL	320	233.735	0.016	1.313	0.12470	2	8	60	112.193	0.008	0.060
Generator	DIESEL	45	30.623	0.008	0.273	0.02594	2	8	60	14.699	0.004	0.012
20-Ton Forklift	DIESEL	130	124.900	0.012	0.975	0.09263	2	8	60	59.952	0.006	0.044
Wheeled Loader	DIESEL	250	148.977	0.011	1.097	0.10418	2	8	60	71.509	0.005	0.050
										258.35	**0.02**	**0.17**
Deck Removal												
Air Compressor	DIESEL	50	22.271	0.008	0.177	0.01677	2	4	40	3.563	0.001	0.003
Concrete Saws	DIESEL	10	16.478	0.002	0.126	0.01198	4	8	40	10.546	0.001	0.008
Barge-Mounted Excavator	DIESEL	320	233.735	0.016	1.313	0.12470	2	8	40	74.795	0.005	0.040
Generator	DIESEL	45	30.623	0.008	0.273	0.02594	2	8	40	9.799	0.003	0.008
20-Ton Forklift	DIESEL	130	124.900	0.012	0.975	0.09263	2	8	40	39.968	0.004	0.030
Wheeled Loader	DIESEL	250	148.977	0.011	1.097	0.10418	2	8	40	47.673	0.004	0.033
										186.34	**0.02**	**0.12**
Piling Removal												
Barge-Mounted Excavator	DIESEL	320	233.735	0.016	1.313	0.12470	2	8	54	100.974	0.007	0.054
Generator	DIESEL	45	30.623	0.008	0.273	0.02594	2	8	54	13.229	0.003	0.011
20-Ton Forklift	DIESEL	130	124.900	0.012	0.975	0.09263	2	8	54	53.957	0.005	0.040
Wheeled Loader	DIESEL	250	148.977	0.011	1.097	0.10418	2	8	54	64.358	0.005	0.045
										232.52	**0.02**	**0.15**
TOTAL										**677.21**	**0.06**	**0.44**

Assumptions:

* Per project schedule, South Pier Demolition occurs in 2014
* Remove utilities, appurtenances, & fenders assumes 84 days.
* Deck Removal assumes 56 days.
* Pier Removal assumes 56 days.

Notes:

(a) Emission factors from http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html, SCAQMD OFFROAD Emission Factors, Years 2012 through 2015

Work Days/Week 5

South
Pier Construction

Emission Factors										Total Emissions (Tons)		
Equipment	FUEL	HP	CO2 (lb/hr)	CH4 (lb/hr)	NOX (lb/hr)	N2O (lb/hr)	No of Equipment	Hours Per Day	Days in Service	CO2	CH4	N2O
Drive Abutment Piles												
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	2	9.5	10	10.655	0.001	0.013
Impact Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	10	12.076	0.001	0.007
Vibratory Hammer	DIESEL	250	254.239	0.013	1.519	0.14427	1	9.5	10	12.076	0.001	0.007
20-Ton Forklift	DIESEL	130	34.335	0.009	1.045	0.09926	1	9.5	10	1.631	0.000	0.005
Wheeled Loader	DIESEL	250	124.900	0.012	1.212	0.11519	2	9.5	10	11.865	0.001	0.011
										48.30	**0.00**	**0.04**
Form/Place Abutment Cap & Landside Tie-In												
Air Compressor	DIESEL	50	22.271	0.008	0.222	0.02110	2	8	21	3.742	0.001	0.004
Barge Crane - 150 Ton	DIESEL	250	112.159	0.009	1.423	0.13519	1	8	21	9.421	0.001	0.011
20-Ton Forklift	DIESEL	130	124.900	0.012	1.045	0.09926	1	8	21	10.492	0.001	0.008
Wheeled Loader	DIESEL	250	148.977	0.011	1.212	0.11519	1	8	21	12.514	0.001	0.010
Generator	DIESEL	33	30.623	0.008	0.285	0.02704	2	8	21	5.145	0.001	0.005
Welders	DIESEL	45	25.958	0.009	0.253	0.02408	1	8	21	2.180	0.001	0.002
										43.49	**0.01**	**0.04**
Total										**91.80**	**0.01**	**0.08**

Work Days/Week 5

Construction Truck Trips

Construction Phase	Vehicle Class	Daily truck trips	Total No. of Vehicle	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO2	CH4	N2O	Emissions, metric tons per year CO2	CH4	N2O
Demolition															
Transport Trucks	Heavy-duty truck, diesel	12	2000	15	26	2694.49929	13.036345	0.114	1.238452779	1853.40	0.08	0.85	140.12	0.01	0.06
TOTAL										**1853.40**	**0.08**	**0.85**	**140.12**	**0.01**	**0.06**

ASSUMPTIONS:

* Assuming 26 miles round trip per vehicle (distance to Miramar Landfill = 13 miles)
* Assume startup after 8 hours
* Assume 45 minutes run time total
* 2012 Emission Factors from EMFAC2007, average temp 60F

Total truck trips for demolition - 2,000 trips

Construction Phase	Vehicle Class		Total No. of Vehicle	Speed (mph)	VMT (mi/vehicle-day)	CO2 Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO2	CH4	N2O	Emissions, metric tons per year CO2	CH4	N2O
Deliveries															
Transport Trucks	Heavy-duty truck, diesel		4600	15	40	2694.49929	13.036345	0.114	0.024	7286.87	0.31	0.06	495.80	0.02	0.00
TOTAL										**7286.87**	**0.31**	**0.06**	**495.80**	**0.02**	**0.00**

ASSUMPTIONS:

* Assuming 40 miles round trip per vehicle
* Assume startup after 8 hours
* Assume 45 minutes run time total
* 2014 Emission Factors from EMFAC2011, average temp 60F

Total truck trips for deliveries - 3,000 trips for materials plus 1,600 trips for piles

Construction Worker Commute Emission Calculations

Construction Phase	Vehicle Class	No. of Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO2		NOx		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]	Running Exhaust (g/mi)	Start-Up (g/start)[a]
Marine Mammal Relocation	Light-duty truck, catalyst	30	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
Dredge Turning Basin	Light-duty truck, catalyst	30	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
North Segment Demolition	Light-duty truck, catalyst	30	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
Access Pier Construction	Light-duty truck, catalyst	60	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
North Pier Construction	Light-duty truck, catalyst	60	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
South Pier Construction	Light-duty truck, catalyst	60	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755
South Pier & Access Pier Demolition	Light-duty truck, catalyst	30	35	40	329.567233	202.414	0.27134995	0.429	0.02	0.035	0.025778246	0.040755

TOTAL 2014

Emissions, lbs/day				Emissions, metric tons per year		
CO2	CH4	N2O	Days/y	CO2	CH4	N2O
898.67	0.07	0.07	260	105.9842762	0.00791712	0.00867873
898.67	0.07	0.07	260	105.9842762	0.00791712	0.00867873
898.67	0.07	0.07	84	105.9842762	0.00791712	0.00867873
1797.33	0.07	0.15	260	211.9685525	0.00791712	0.01735745
1797.33	0.07	0.15	260	211.9685525	0.00791712	0.01735745
1797.33	0.07	0.15	62	211.9685525	0.00791712	0.01735745
898.67	0.07	0.07	154	105.9842762	0.00791712	0.00867873
898.67	0.07	0.07	31	105.9842762	0.00791712	0.00867873
898.67	**0.07**	**0.07**		**105.98**	**0.01**	**0.01**
3594.66	**0.13**	**0.29**		**423.94**	**0.02**	**0.03**
2696.00	**0.13**	**0.22**		**317.95**	**0.02**	**0.03**

ASSUMPTIONS:

* Assuming 40 miles round trip per vehicle
* Assuming 30 workers per construction phase for
* Assume startup after 8 hours
* Assume 45 minutes run time total
* 2014 Emission Factors from EMFAC2011, average temp 60F

Work Days/Week 5

Support Vessel Emissions

Marine Mammal Relocation											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	Operation/Location	power rating	units	Load %	No. of units	Fuel Type	hrs /day	Days/ year	hrs/ year	Fuel Consumption (g/kW-hr)	CO2	CH4	N2O	Emission factor units	CO2	CH4	N2O	CO2	CH4	N2O
Work Boat	Pile Driving Support	75	kW	85.0%	1	California Diesel	4	8	32	222.33	700.48	0.74	0.26	g/kW-hr	115.06	0.12	0.04	1.8	0.0	0.0
Work Boat	Marine Mammal Pen Move	93	kW	85.0%	4	California Diesel	8	8	64	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	18.4	0.0	0.0
														MAX Daily:	**690.34**	**0.73**	**0.26**	**20.25**	**0.02**	**0.01**

Dredge Turning Basin and Discharge Sediment											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	Operation/Location	power rating	units	Load %	No. of units	Fuel Type	hrs /day	Days/ year	hrs/ year	Fuel Consumption (g/kW-hr)	CO2	CH4	N2O	Emission factor units	CO2	CH4	N2O	CO2	CH4	N2O
Work Boat	Pile Driving Support	75	kW	85.0%	1	California Diesel	4	90	360	222.33	700.48	0.74	0.26	g/kW-hr	115.06	0.12	0.04	20.7	0.0	0.0
Tugboats	Pile Driving Support	186	kW	85.0%	2	California Diesel	4	90	360	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	103.6	0.1	0.0
														MAX Daily:	**690.34**	**0.73**	**0.26**	**124.26**	**0.13**	**0.05**

North Segment Demolition											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	Operation/Location	power rating	units	Load %	No. of units	Fuel Type	hrs /day	Days/ year	hrs/ year	Fuel Consumption (g/kW-hr)	CO2	CH4	N2O	Emission factor units	CO2	CH4	N2O	CO2	CH4	N2O
Work Boat	Demolition Support	75	kW	85.0%	2	California Diesel	4	61	244	222.33	700.48	0.74	0.26	g/kW-hr	230.11	0.24	0.09	28.1	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	61	244	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	70.2	0.1	0.0
														MAX Daily:	**805.40**	**0.85**	**0.30**	**98.26**	**0.10**	**0.04**

Access Pier Construction											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	Operation/Location	power rating	units	Load %	No. of	Fuel Type	hrs /day	Days/	hrs/	Fuel	CO2	CH4	N2O	Emission	CO2	CH4	N2O	CO2	CH4	N2O
Work Boat	Construction Support	75	kW	85.0%	2	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	230.11	0.24	0.09	119.7	0.1	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	299.1	0.3	0.1
														MAX Daily:	**805.40**	**0.85**	**0.30**	**418.81**	**0.44**	**0.16**

Work Days/Week 5

SOURCE:

Load factors based on recommdations in EPA420-R-00-002, Table 5-2, assumed for maneuvering.

Emission Factors from Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data, USEPA, Feb 2000, EPA420-R-00-002, page 5-3.

Emission factors from AP-42 1.3 for Fuel Oil Combustion - No 6 Oil Industrial Fired Boilers

* VOC emissions are actuallyTHC for Marine Vessels

0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.15	% Nitrogen content of the Fuel Oil used for the boilers
0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.944	kg/l density of residual oil, from AP-42 Appendix A

Support Vessel Emissions

North Pier Construction											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**CO2**	**CH4**	**N2O**	**Emission factor units**	**CO2**	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
Work Boat	Construction Support	75	kW	85.0%	2	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	230.11	0.24	0.09	119.7	0.1	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	299.1	0.3	0.1
														MAX Daily:	**805.40**	**0.85**	**0.30**	**418.81**	**0.44**	**0.16**

South Pier Construction											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**CO2**	**CH4**	**N2O**	**Emission factor units**	**CO2**	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
Work Boat	Construction Support	75	kW	85.0%	4	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	460.23	0.49	0.17	239.3	0.3	0.1
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	260	1040	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	299.1	0.3	0.1
														MAX Daily:	**1035.51**	**1.09**	**0.38**	**538.47**	**0.57**	**0.20**

South Pier and Access Pier Demolition											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**CO2**	**CH4**	**N2O**	**Emission factor units**	**CO2**	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
Work Boat	Demolition Support	75	kW	85.0%	4	California Diesel	4	78	312	222.33	700.48	0.74	0.26	g/kW-hr	460.23	0.49	0.17	71.8	0.1	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	78	312	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	89.7	0.1	0.0
														MAX Daily:	**1035.51**	**1.09**	**0.38**	**161.54**	**0.17**	**0.06**

Abutment											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**CO2**	**CH4**	**N2O**	**Emission factor units**	**CO2**	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
Work Boat	Construction Support	75	kW	85.0%	4	California Diesel	4	31	124	222.33	700.48	0.74	0.26	g/kW-hr	460.23	0.49	0.17	28.5	0.0	0.0
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	31	124	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	35.7	0.0	0.0
														MAX Daily:	**1035.51**	**1.09**	**0.38**	**64.20**	**0.07**	**0.02**

Dredging											Emission Factors				Hourly Emission Rates			Annual Emission Rates		
Equipment Type	**Operation/Location**	**power rating**	**units**	**Load %**	**No. of units**	**Fuel Type**	**hrs /day**	**Days/ year**	**hrs/ year**	**Fuel Consumption (g/kW-hr)**	**CO2**	**CH4**	**N2O**	**Emission factor units**	**CO2**	**CH4**	**N2O**	**CO2**	**CH4**	**N2O**
Tugboats	Construction Support	186	kW	85.0%	2	California Diesel	4	40	160	222.33	700.48	0.74	0.26	g/kW-hr	575.28	0.61	0.21	46.0	0.0	0.0
														MAX Daily:	**575.28**	**0.61**	**0.21**	**46.02**	**0.05**	**0.02**

Work Days/Week 5

SOURCE:

Load factors based on recommdations in EPA420-R-00-002, Table 5-2, assumed for maneuvering.
Emission Factors from Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data, USEPA, Feb 2000, EPA420-R-00-002, page 5-3.
Emission factors from AP-42 1.3 for Fuel Oil Combustion - No 6 Oil Industrial Fired Boilers
* VOC emissions are actuallyTHC for Marine Vessels

0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.15	% Nitrogen content of the Fuel Oil used for the boilers
0.0015	% Sulfur content of the Fuel Oil used in the boiler and main engines,
0.944	kg/l density of residual oil, from AP-42 Appendix A

Dredging Emissions

			Emission Factors[a]							Emissions			Emission, tons (total)		
Equipment	FUEL	HP	Load Factor	CO2 (g/hp-hr)	CH4 (g/hp-hr)	NOX (g/hp-hr)	N2O (g/hp-hr)	No of Equipment	Hrs Per Day	Days in Service	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2 tons (total)	CH4 tons (total)	N2O tons (total)
Dredging Equipment																
Main genset	DIESEL	2,935	51	5.68E+02	4.80E-02	6.25E+00	5.94E-01	1	8	40	15003.15	1.27	165.00	300.063	0.025	3.300
Aux genset	DIESEL	550	74	5.68E+02	4.80E-02	6.25E+00	5.94E-01	1	8	40	4079.42	0.34	44.86	81.588	0.007	0.897
Spud winch	DIESEL	250	51	5.68E+02	4.80E-02	6.25E+00	5.94E-01	1	8	40	1277.95	0.11	14.05	25.559	0.002	0.281
											20360.52	**1.72**	**223.92**	**407.21**	**0.03**	**4.48**
TOTAL																

Assumptions:

Notes:

(a) Emission factors from OFFROAD Model, SDAB, for Dredging Equipment

Work Days/Week 5

Assumptions: Dredge will be similar to the Manson "Valhalla" Clamshell Dredge

Dredge	Engine	Model Year	Max hp	*Assumed Hours of Operation
Valhalla	Main genset	2000	2,935	18
Valhalla	Aux genset	2000	550	24
Valhalla	Spud winch	2000	250	6

Emission Factors

Commercial Marine Vessel Emissions

Pollutant	Exponent (x)	Intercept (b)	Coefficient (a)
PM	1.5	0.2551	0.0059
NOX	1.5	10.4496	0.1255
NO2	1.5	15.5247	0.18865
SO2	0	0	2.3735
CO	1	0	0.8378
HC	1.5	0	0.0667
CO2	1	648.6	44.1

Emission Factor equation is in the form:
Emissions Rate (g/kW-hr) = a * (Fractional Load of Engine Power)$^{-x}$ + b

For SO2, the equation is:
Emissions Rate (g/kW-hr) = a * (Fuel Sulfur Flow in g/kW-hr) + b = a * (fuel consumption in g/kW-hr) * (% sulfur in fuel/100) + b
Requires an estimate of the % sulfur in the fuel.

Fuel Consumption Estimation equation:
Fuel Consumption (g/kW-hr) = 14.12/(Fractional Load) + 205.717

Emission Factor Source: Analysis of Commercial Marine Vessel Emissions and Fuel Consumption Data, USEPA, February 2000, EPA420-R-00-002, page 5-3.

Appendix H

Traffic Count Data

[This Page Intentionally Left Blank]

Prepared by NDS/ATD

VOLUME

Catalina Blvd S/o Dow St

Day: Tuesday
Date: 5/8/2012

City: San Diego
Project #: CA12_4160_002

DAILY TOTALS	NB	SB	EB	WB	Total
	4,367	3,936	0	0	8,303

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0	
00:15	1		0						1	
00:30	1		0						1	
00:45	0	2	0						0	2
01:00	0		0						0	
01:15	0		0						0	
01:30	0		1						1	
01:45	1	1	1	2					2	3
02:00	1		0						1	
02:15	0		1						1	
02:30	0		1						1	
02:45	0	1	0	2					0	3
03:00	0		0						0	
03:15	0		2						2	
03:30	1		0						1	
03:45	1	2	8	10					9	12
04:00	1		3						4	
04:15	1		2						3	
04:30	3		4						7	
04:45	1	6	5	14					6	20
05:00	1		25						26	
05:15	3		31						34	
05:30	11		64						75	
05:45	13	28	106	226					119	254
06:00	26		83						109	
06:15	34		121						155	
06:30	35		135						170	
06:45	49	144	173	512					222	656
07:00	39		150						189	
07:15	67		181						248	
07:30	62		121						183	
07:45	56	224	113	565					169	789
08:00	37		131						168	
08:15	34		99						133	
08:30	18		119						137	
08:45	32	121	79	428					111	549
09:00	30		92						122	
09:15	34		74						108	
09:30	39		58						97	
09:45	36	139	57	281					93	420
10:00	47		61						108	
10:15	60		65						125	
10:30	73		50						123	
10:45	64	244	70	246					134	490
11:00	122		90						212	
11:15	106		89						195	
11:30	111		61						172	
11:45	113	452	83	323					196	775
TOTALS		1364		2609						3973
SPLIT %		34.3%		65.7%						47.9%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	98		83						181	
12:15	94		92						186	
12:30	81		105						186	
12:45	84	357	94	374					178	731
13:00	77		73						150	
13:15	76		78						154	
13:30	103		76						179	
13:45	77	333	71	298					148	631
14:00	94		78						172	
14:15	98		64						162	
14:30	122		55						177	
14:45	85	399	57	254					142	653
15:00	143		51						194	
15:15	138		31						169	
15:30	181		34						215	
15:45	130	592	44	160					174	752
16:00	176		42						218	
16:15	144		25						169	
16:30	184		39						223	
16:45	166	670	25	131					191	801
17:00	152		21						173	
17:15	104		19						123	
17:30	86		17						103	
17:45	87	429	9	66					96	495
18:00	55		13						68	
18:15	46		4						50	
18:30	28		5						33	
18:45	13	142	7	29					20	171
19:00	25		2						27	
19:15	5		2						7	
19:30	11		0						11	
19:45	6	47	3	7					9	54
20:00	7		3						10	
20:15	2		0						2	
20:30	7		0						7	
20:45	5	21	0	3					5	24
21:00	8		0						8	
21:15	1		0						1	
21:30	1		0						1	
21:45	0	10	1	1					1	11
22:00	0		1						1	
22:15	0		1						1	
22:30	0		0						0	
22:45	0		1	3					1	3
23:00	1		0						1	
23:15	1		0						1	
23:30	1		0						1	
23:45	0	3	1	1					1	4
TOTALS		3003		1327						4330
SPLIT %		69.4%		30.6%						52.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	4,367	3,936	0	0	8,303

AM Peak Hour	11:00	06:30			06:45
AM Pk Volume	452	639			842
Pk Hr Factor	0.926	0.883			0.849
7 - 9 Volume	345	993	0	0	1338
7 - 9 Peak Hour	07:00	07:00			07:00
7 - 9 Pk Volume	224	565	0	0	789
Pk Hr Factor	0.836	0.780	0.000	0.000	0.795

PM Peak Hour	16:00	12:00			16:00
PM Pk Volume	670	374			801
Pk Hr Factor	0.910	0.890			0.898
4 - 6 Volume	1099	197	0	0	1296
4 - 6 Peak Hour	16:00	16:00			16:00
4 - 6 Pk Volume	670	131	0	0	801
Pk Hr Factor	0.910	0.780	0.000	0.000	0.898

Prepared by NDS/ATD

VOLUME

Laning Rd N/o Cushing Rd

Day: Tuesday
Date: 5/8/2012

City: San Diego
Project #: CA12_4160_001

DAILY TOTALS	NB	SB	EB	WB	Total
	3,341	3,191	0	0	6,532

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	8		2				10		12:00	66		66				132	
00:15	2		3				5		12:15	65		64				129	
00:30	2		1				3		12:30	74		66				140	
00:45	4	16	2	8			6	24	12:45	51	256	52	248			103	504
01:00	3		1				4		13:00	52		51				103	
01:15	1		5				6		13:15	58		36				94	
01:30	1		1				2		13:30	48		47				95	
01:45	3	8	2	9			5	17	13:45	54	212	49	183			103	395
02:00	2		2				4		14:00	54		39				93	
02:15	0		0				0		14:15	60		48				108	
02:30	1		1				2		14:30	67		31				98	
02:45	0	3	1	4			1	7	14:45	81	262	36	154			117	416
03:00	4		2				6		15:00	127		32				159	
03:15	2		1				3		15:15	87		32				119	
03:30	1		3				4		15:30	90		48				138	
03:45	1	8	6	12			7	20	15:45	75	379	41	153			116	532
04:00	3		5				8		16:00	87		42				129	
04:15	2		6				8		16:15	89		43				132	
04:30	1		10				11		16:30	90		42				132	
04:45	5	11	13	34			18	45	16:45	85	351	38	165			123	516
05:00	5		14				19		17:00	71		38				109	
05:15	9		21				30		17:15	66		48				114	
05:30	11		24				35		17:30	70		49				119	
05:45	12	37	52	111			64	148	17:45	54	261	53	188			107	449
06:00	13		71				84		18:00	63		40				103	
06:15	17		77				94		18:15	41		32				73	
06:30	19		81				100		18:30	52		40				92	
06:45	21	70	106	335			127	405	18:45	36	192	40	152			76	344
07:00	25		110				135		19:00	39		20				59	
07:15	23		103				126		19:15	26		32				58	
07:30	35		113				148		19:30	23		23				46	
07:45	34	117	72	398			106	515	19:45	35	123	27	102			62	225
08:00	47		59				106		20:00	37		27				64	
08:15	53		41				94		20:15	21		19				40	
08:30	45		64				109		20:30	21		18				39	
08:45	30	175	54	218			84	393	20:45	16	95	17	81			33	176
09:00	52		42				94		21:00	29		19				48	
09:15	31		34				65		21:15	24		17				41	
09:30	41		42				83		21:30	16		13				29	
09:45	35	159	42	160			77	319	21:45	15	84	14	63			29	147
10:00	37		44				81		22:00	14		8				22	
10:15	28		45				73		22:15	12		14				26	
10:30	38		42				80		22:30	21		13				34	
10:45	48	151	34	165			82	316	22:45	14	61	6	41			20	102
11:00	65		38				103		23:00	13		4				17	
11:15	70		49				119		23:15	20		7				27	
11:30	61		46				107		23:30	8		4				12	
11:45	64	260	54	187			118	447	23:45	9	50	5	20			14	70
TOTALS		1015		1641				2656	TOTALS		2326		1550				3876
SPLIT %		38.2%		61.8%				40.7%	SPLIT %		60.0%		40.0%				59.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,341	3,191	0	0	6,532

AM Peak Hour	11:45	06:45				06:45	PM Peak Hour	14:45	12:00				14:45
AM Pk Volume	269	432				536	PM Pk Volume	385	248				533
Pk Hr Factor	0.909	0.956				0.905	Pk Hr Factor	0.758	0.939				0.838
7 - 9 Volume	292	616	0	0		908	4 - 6 Volume	612	353	0	0		965
7 - 9 Peak Hour	07:45	07:00				07:00	4 - 6 Peak Hour	16:00	17:00				16:00
7 - 9 Pk Volume	179	398	0	0		515	4 - 6 Pk Volume	351	188	0	0		516
Pk Hr Factor	0.844	0.881	0.000	0.000		0.870	Pk Hr Factor	0.975	0.887	0.000	0.000		0.977

Appendix I

Water and Sediment Quality Investigation

[This Page Intentionally Left Blank]

Final Report
Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation
San Diego Bay
San Diego, California

Prepared For:



Department of the Navy
Naval Facilities Engineering Command Southwest Coastal IPT
2730 McKean St., Bldg. 291
San Diego, CA 92136-5198

Prepared By:
Tierra Data Inc.
10110 West Lilac Rd.
Escondido, CA 92026



April 2013

Table of Contents

1.0 Introduction 1
1.1 Summary of Findings 2
2.0 Existing Water Quality Data 2
2.1 Existing Data for NTC Receiving Waters 3
2.2 Existing Data for the SSC Pens and Relocation Area 6
3.0 Existing Conditions 10
3.1 Existing Marine Mammal Pens at SSC 10
3.2 Proposed Marine Mammal Relocation Area 10
4.0 Existing Condition Results 10
5.0 Hydrodynamic Study Results 13
6.0 Quality Assurance and Quality Control 13
7.0 Discussion 14
8.0 Model of Hydrodynamic Mixing 16
9.0 Sediment Quality 16
10.0 References 17
Appendix A: Hydrodynamic Modeling Study A-1
Appendix B: Marine Mammal Program Fecal and Total Coliform Data B-1
Appendix C: Calscience Analytical Report C-1

List of Figures

Figure 1. NBPL Fuel Pier (P–180) and North Central San Diego Bay. 1
Figure 2. Proposed Marine Mammal Relocation Area Water Quality Sampling Locations. 4
Figure 3. Total and Fecal Coliform (Most Probable Number/100 milliliters) Single Sample Maximum for outfall Stations DW534 and DW537 (CSD 2008-2012) 5
Figure 4. Dry Season Fecal Coliform 30-Day Geomean and Single Sample Maximum at Spanish Landing Station EH-160 (SDCDEH 2009-2012). 5
Figure 5. Dry Season Total Coliform Single Sample Maximum at Spanish Landing Station EH-160 (SDCDEH 2009-2012). 6
Figure 6. Existing Marine Mammal Pens Fecal Coliform 30-day Geomean and Single Sample Maximum for 2010–2012. 7
Figure 7. Existing Marine Mammal Pens Total Coliform 30-day Single Sample Maximum for 2010–2012. 8
Figure 8. Proposed Marine Mammal Relocation Area Fecal Coliform 30-Day Geomean and Single Sample Maximum for 2010–2012. 8
Figure 9. Proposed Marine Mammal Relocation Area Total Coliform Single Sample Maximum for 2010–2012 9
Figure 10. Water Quality Stations Located at the Existing Marine Mammal Pens (EP). 11

List of Tables

Table 1. Rec-1 Beneficial Use Water Quality Objectives for Indicator Bacteria (San Diego Regional Water Quality Control Board 2006). 3
Table 2. Average Bacterial Concentrations During Wet and Dry Weather Seasons. 7
Table 3. Fecal and Total Coliform Concentrations from Field Samples Collected at the Existing and Proposed Relocation Area for the Marine Mammal Pens on January 4, 2013, flood tide. 13
Table 4. Fecal and Total Coliform Concentrations from Field Samples Collected at the Existing and Proposed Relocation Area for the Marine Mammal Pens on January 14, 2013, ebb tide. 13

List of Acronyms and Abbreviations

Bay	San Diego Bay
Calscience	Calscience Environmental Laboratories Inc.
CH3D	Curvilinear Hydrodynamics in Three Dimensions
City	City of San Diego
COC	Chain of Custody
EP	Existing Marine Mammal Pens at SSC
ft	foot/feet
ml	milliliter(s)
MMP	Marine Mammal Program
MPN	Most probable number
Navy	U.S. Navy
ND	Non-Detect
NMAWC	Naval Mine and Antisubmarine Warfare Command
NOAA	National Oceanic and Atmospheric Administration
NTC	Naval Training Center
RA	Marine Mammal relocation area at NMAWC
REC-1	Water quality objectives in waters designated for contact recreation
SDCDEH	County of San Diego Department of Environmental Health
SDRWQCB	San Diego Regional Water Quality Control Board
SPAWAR	Space and Naval Warfare Systems Command
SSC	Space and Naval Warfare Systems Command Systems Center
SSM	Single Sample Maximum
TDI	Tierra Data Inc.

1.0 INTRODUCTION

The U.S. Navy (Navy) is planning to reconstruct the Naval Base Point Loma P-180 fuel pier (P-180). During the reconstruction process the project will need to perform several in-water actions including but not limited to pile removal, pile driving, dredging, and the temporary relocation of the Navy Marine Mammal Program (MMP). The MMP is administered by the Space and Naval Warfare Systems Command Systems Center (SSC). The Existing Marine Mammal Pens at SSC (EP) are adjacent to the project footprint, which necessitates relocation to avoid harmful effects of in-water construction on working mammals. The proposed marine mammal relocation area (RA) is located adjacent to the Navy Mine and Anti-Submarine Warfare Command (NMAWC) near the main channel of San Diego Bay, approximately 1.1 miles east of the current EP location (Figure 1).

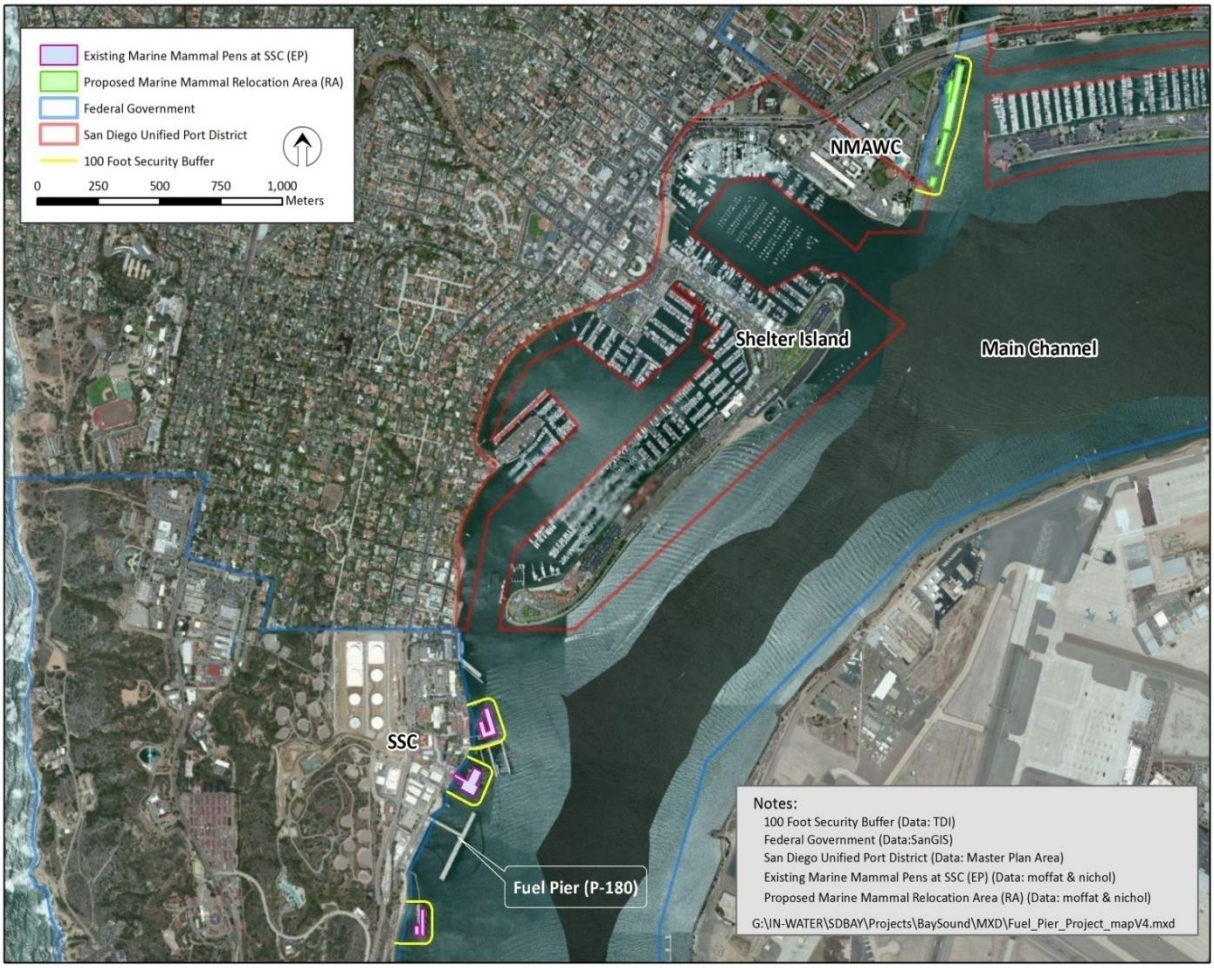


Figure 1.NBPL Fuel Pier (P–180) and North Central San Diego Bay.

Tierra Data Inc. (TDI) was contracted to review available water quality data and provide existing conditions surveys for sediment and indicator bacteria (Fecal/Total Coliforms) for the area around the existing fuel pier (P-180), EP, and the proposed RA. SSC physical oceanographers additionally were tasked with modeling hydrodynamic mixing at both EP and RA to model the relative differences in flushing between the EP and RA locations.

This report presents the findings of the special study of existing water quality and historical conditions within the project footprint, briefly describes the sediment quality, and presents the results of a hydrodynamic modeling study. The separate sections were conducted independently to investigate related as well as unrelated questions. The report presents technical findings analyzed from the review of existing data sets, the implementation of site specific field surveys, and the hydrodynamic modeling conclusions. The interpretation of the data and its results are simply stated and conclusions are limited to the presentation of the results from comprehensive data sets, field survey efforts, hydrodynamic modeling, and regulatory objective level criteria.

1.1 Summary of Findings

Once the marine mammals are moved to the proposed RA site indicator bacteria, fecal and total coliform, concentration values contributed by the marine mammals are not expected to increase the frequency of exceedances of regulatory water quality objectives for indicator bacteria concentrations in waters designated for contact recreation (REC-1) beneficial use standards. The frequency of which the beneficial use standards are exceeded, as a result of the relocation of the MMP, are primarily dependent on external sources related to storm water runoff. Differences in bacteria concentration averages and standard deviations between wet and dry seasons suggest that the greatest probability of exceedances will likely occur during the wet season and would likely be dependent on the frequency and magnitude of rainfall events and resulting storm water input. Results of the hydrodynamic modeling study display that while tidal flushing at the RA is less than at the EP indicator bacteria concentrations contributed from marine mammals waste will not significantly increase exceedances of water quality objectives for indicator bacteria concentrations in waters designated for contact recreation (REC-1) beneficial use standards.

2.0 EXISTING WATER QUALITY DATA

San Diego Bay (Bay) water quality objectives are established by the U.S. Environmental Protection Agency, administered at a statewide level by the State Water Resources Board, and enforced locally by the San Diego Regional Water Quality Control Board (SDRWQCB). The San Diego Region Basin Plan (herein Basin Plan) (SDRWQCB 2006) is the governing document for water quality objectives pertaining to enclosed bays and estuaries within the SDRWQCB jurisdictional area. The water quality objectives for indicator bacteria concentrations in waters designated REC-1 are presented in Table 1.

Table 1.REC-1 Beneficial Use Water Quality Objectives for Indicator Bacteria (SDRWQCB2006).

	Bays and Estuaries	
	Fecal Coliform	Total Coliform
REC-1	200[1]	1000[2]

[1]Based on a minimum of no less than five samples for any 30-day period, fecal coliform shall not exceed a log mean of 200 organisms/100 milliliters. In addition, the concentration shall not exceed 400 organisms/100milliliters for more than 10% of the total samples during any 30-day period.

[2]In the upper 60feet of the water column provided that no more than 20% of the samples at any sampling station, in any 30-day period, may exceed 1000 organisms per 100 milliliters; and provided further that no single sample when verified by an repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 milliliters.

Bacteria concentrations in the environment can be highly variable. Colonies may vary in concentration by orders of magnitudes between samples. The Basin Plan identifies two water quality objectives for designated REC-1 beneficial use areas for fecal coliforms SSM or repeated measures criteria. Fecal coliform SSM objectives stipulate that not more than 10% of the samples within a 30-day period are greater than 400 organisms/100milliliters (ml). For repeated measures, the fecal coliform objective is 200 organisms/100ml, if more than five samples are collected in a 30-day period. Repeated measure comparisons are based on the log average (geomean) of the concentrations in the samples over the 30-day period.

For months with greater than five samples in a 30-day period, evaluation with the REC-1 objectives for repeated measures were used for comparison (200 Most Probable Number [MPN]/100ml) and bacteria results log averaged (geomean) and plotted for 30-day periods. For months with less than five samples, data were evaluated using the SSM fecal coliform objective of 400 MPN/100ml, and the maximum value within the 30-day period was used for evaluation.

2.1 Existing Data for NTC Receiving Waters

Indicator bacteria datasets were obtained from the City of San Diego (City) for outfalls that terminate at the Naval Training Center(NTC)Channel (DW534 and DW537), and dry weather receiving water data results from Spanish Landing (Station EH-160) collected in 2009-2012 by the County of San Diego Department of Environmental Health (SDCDEH) (Figure 2). Data from the City storm water program (Stations DW534 and DW537)from 2008 to 2012displayed12 instances of elevated fecal and total coliform levels (Figure 3).

Bacteria monitoring for San Diego Bay receiving waters is performed by SDCDEH. The SDCDEH conducts weekly dry-weather sampling near Spanish Landing in compliance with Assembly Bill 411 (Figure 2). SDCDEH data from 2009 through the 2012 sampling years indicate that one fecal and one total coliform sample collected at Station EH-160 exceeded the REC-1 SSM objective for the reviewed time period (Figures 4and 5). Fecal coliform bacteria log averages are all below the repeated measures objective level when appropriate to use (>5 samples in 30-day period) (Figure 4).

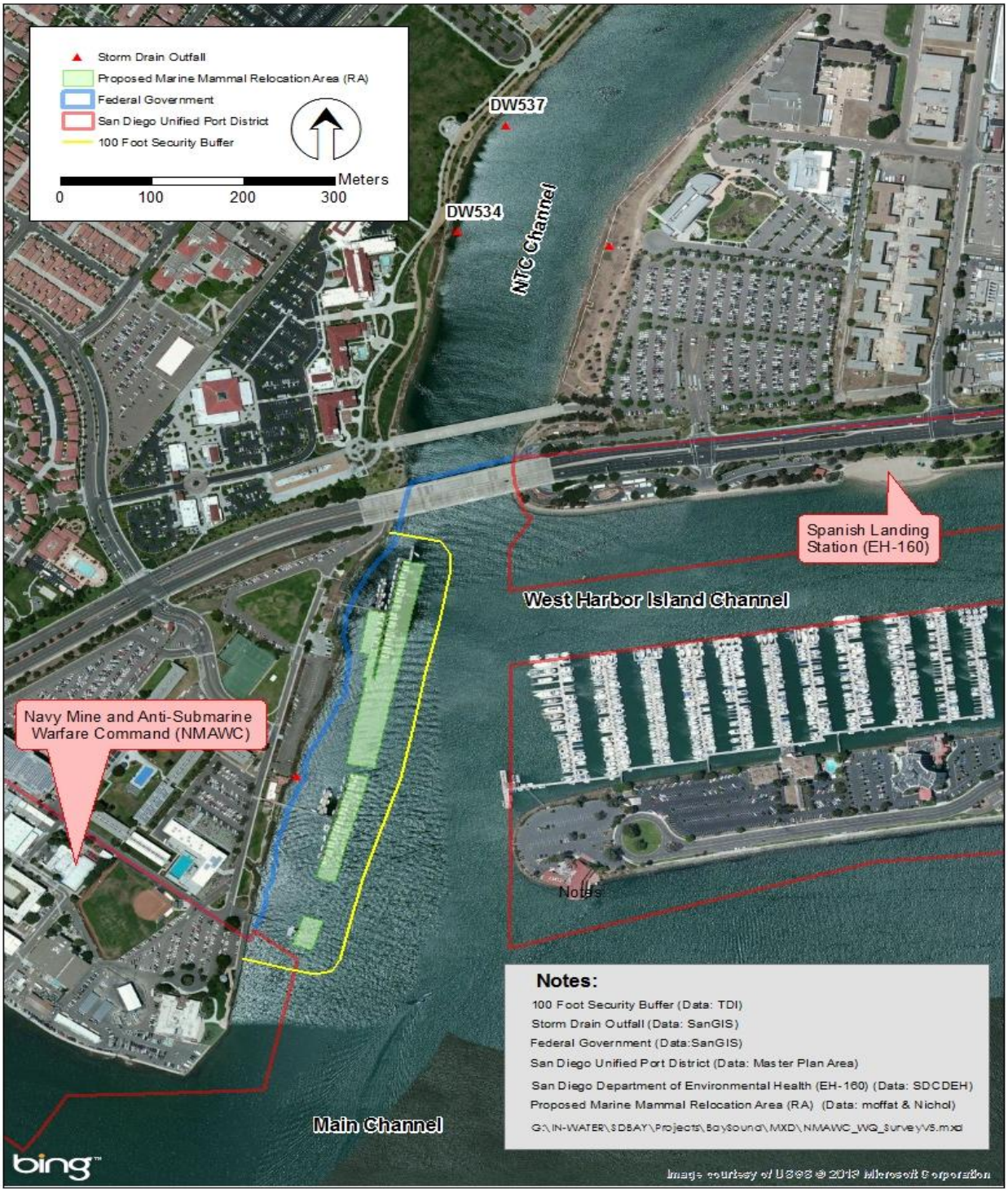


Figure 2.Proposed Marine Mammal Relocation Area.

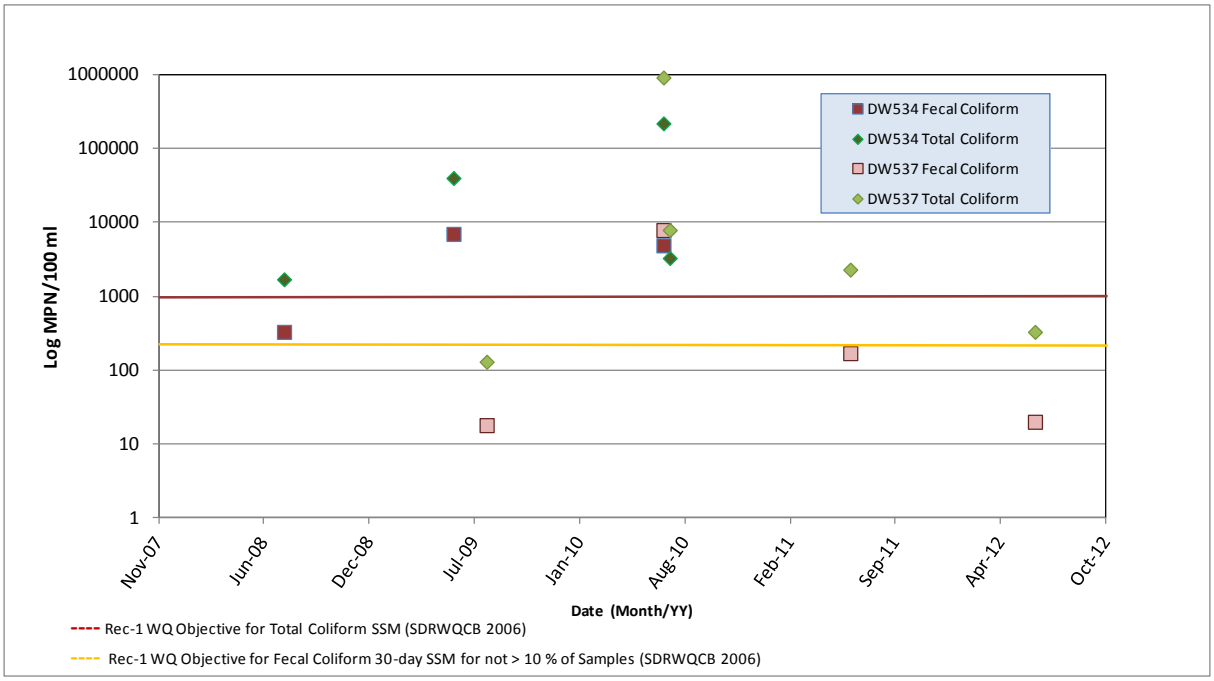


Figure 3.Total and Fecal Coliform (Most Probable Number/100 milliliters)Single Sample Maximum for Outfall Stations DW534 and DW537 (CSD 2008-2012).

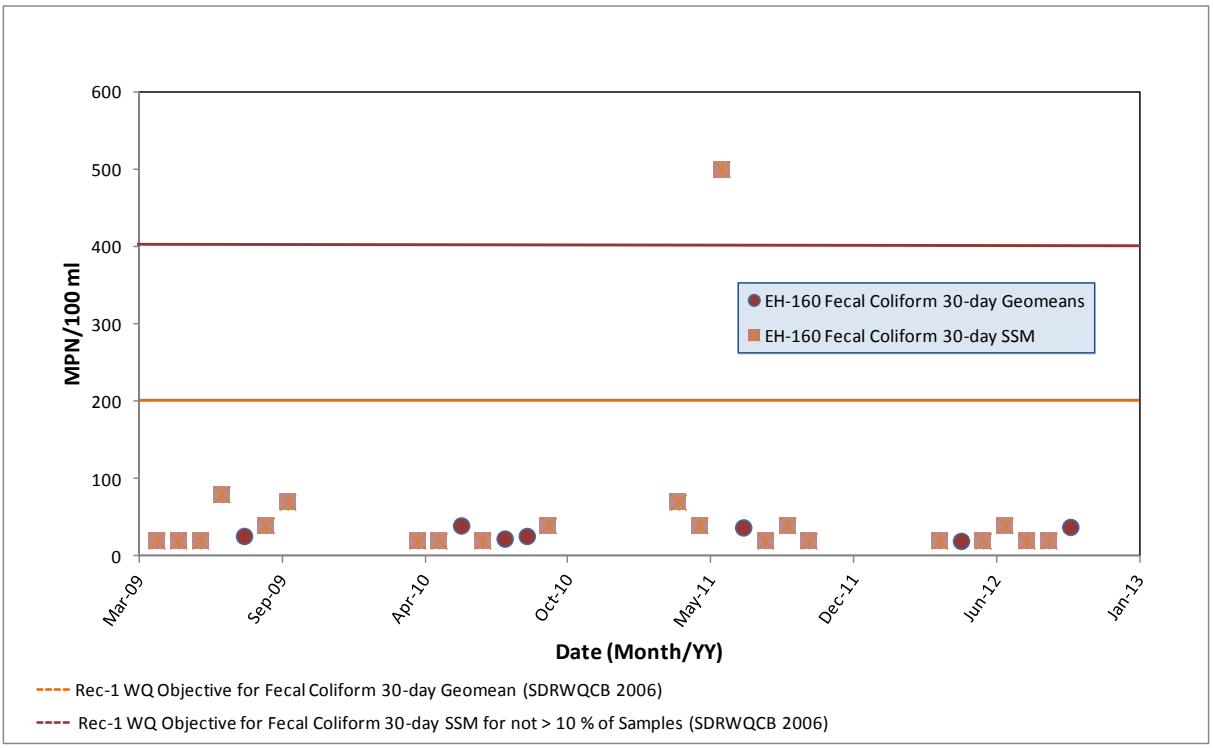


Figure 4.Dry Season Fecal Coliform 30-DayGeomean and Single Sample Maximum at Spanish Landing Station EH-160 (SDCDEH 2009-2012).

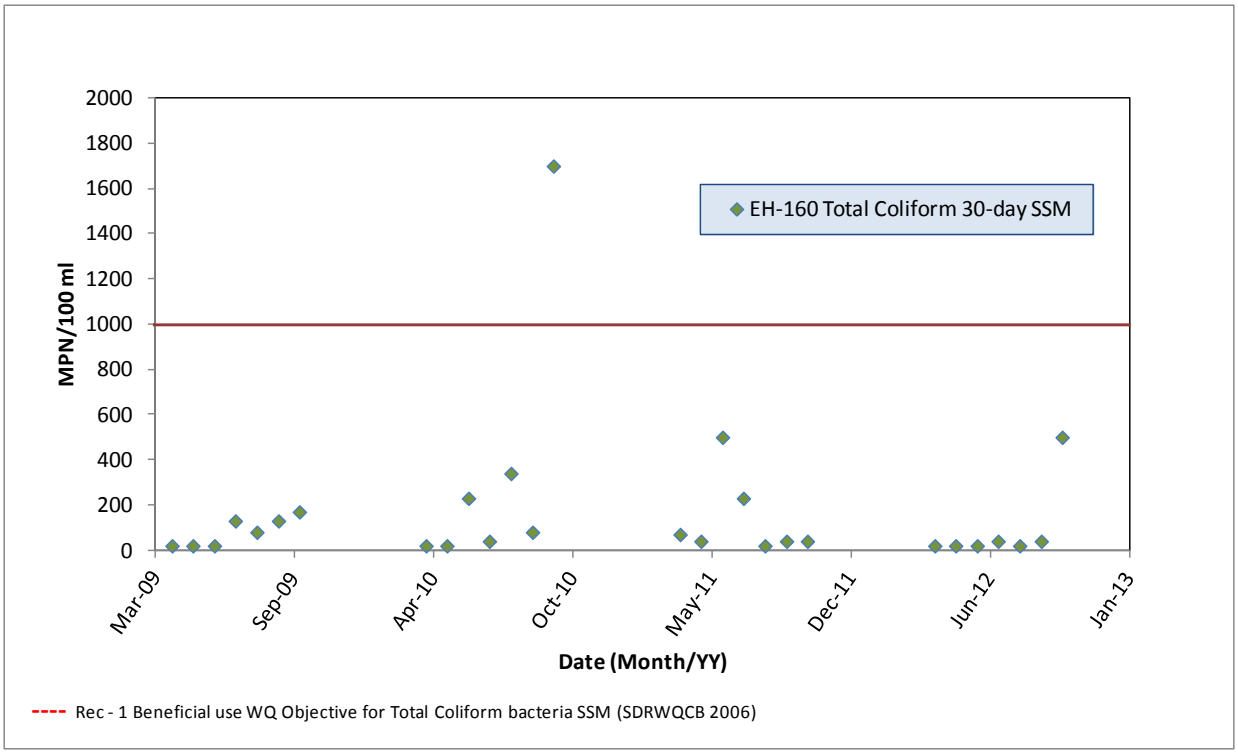


Figure 5.Dry Season Total Coliform Single Sample Maximum at Spanish Landing Station EH-160 (SDCDEH 2009-2012).

2.2 Existing Data for the SSC Pens and Relocation Area

Weekly fecal and total coliform bacteria data were collected by the MMP at the EP and the RA sites from January 2010 to November 2012. The EP and RA sites were sampled between one and seven times per month for fecal and total coliform. Fecal coliform log averages at the EP site for months with greater than five samples (N=11) ranged from 14.91 to 61.47 MPN/100ml and were below the Basin Plan REC-1 objective of 200 MPN/100ml for all analyzed 30-day time periods (Figure 6). Total coliform bacteria concentration at the EP site ranged from 0 to 1210 MPN/100 ml, and were below the REC-1Basin Plan objective of 1000 MPN/100ml for all but one sample (Figure 7).

The RA site had four months that exceeded the REC-1 fecal coliform SSM objective (400 MPN/100ml) (Figure 8). Fecal coliform 30-day log averaged values ranged from 8.53 to 80.86 MPN/100ml, and the highest fecal coliform sample was 9804 MPN/100ml in November of 2010 (Figure 9). All months with greater than five fecal coliform samples in a 30-day period were below the repeated measure objective (200 MPN/100ml). Total coliform at the RA site was above the Basin Plan objective nine times over the review period, with a range from 0 to 24,196 MPN/100ml.

For the purposes of calculating the variance of total and fecal coliforms at the RA site, bacteria data were split by time of year based on generally accepted criteria for a wet weather season (October 1 to April 1).Mean values were calculated based on the average of all samples within the dry (or wet) weather period for the EP and RA sites respectively. Table 2 presents the summary of bacteria concentrations at both the RA and EP sites for the wet and dry seasons.

Table 2. Average Bacterial Concentrations during Wet and Dry Weather Seasons.

Site	Parameter	Season	Average MPN/100-ml	Range	Standard Deviation	NTC flushing Factor
NTC	Fecal Coliform	Dry	23	663	86	3.40
NTC	Fecal Coliform	Wet	294	9804	1414	
SSC	Fecal Coliform	Dry	36	331	56	
SSC	Fecal Coliform	Wet	53	313	66	
NTC	Total Coliform	Dry	220	6488	860	
NTC	Total Coliform	Wet	1339	24196	4347	
SSC	Total Coliform	Dry	89	860	137	
SSC	Total Coliform	Wet	142	1210	193	

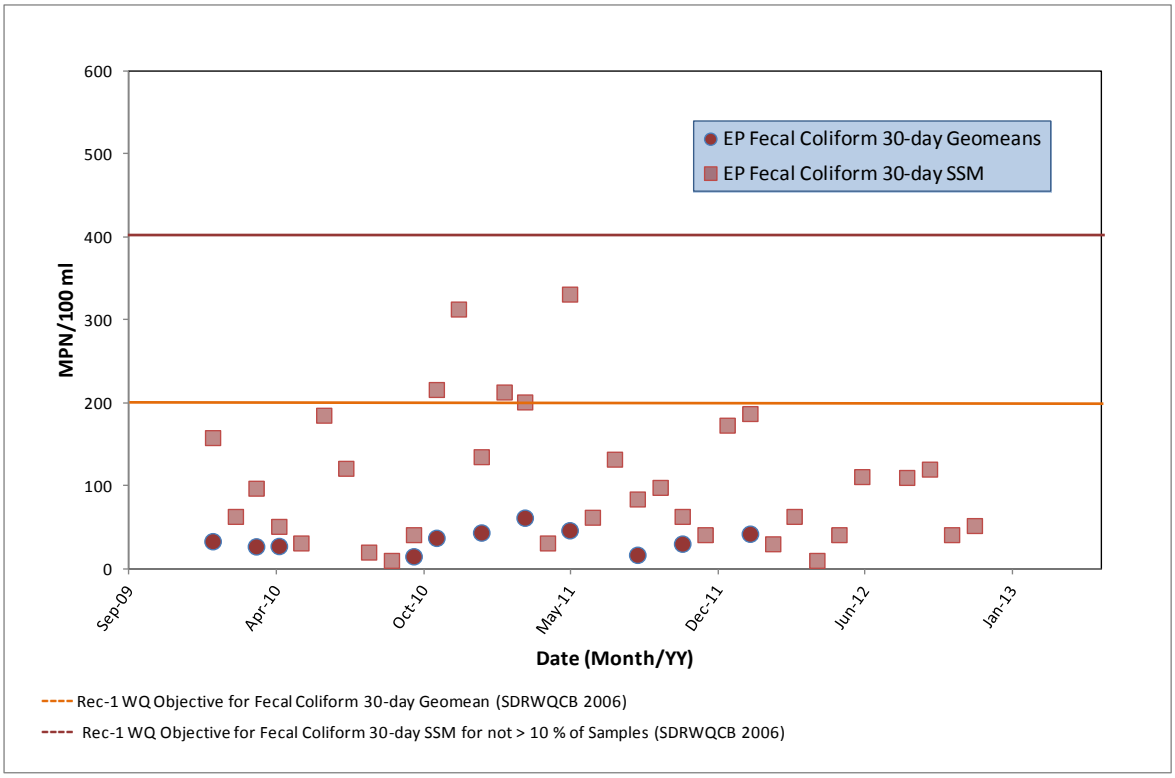


Figure 6.Existing Marine Mammal Pens Fecal Coliform 30-DayGeomean and Single Sample Maximum for 2010–2012.

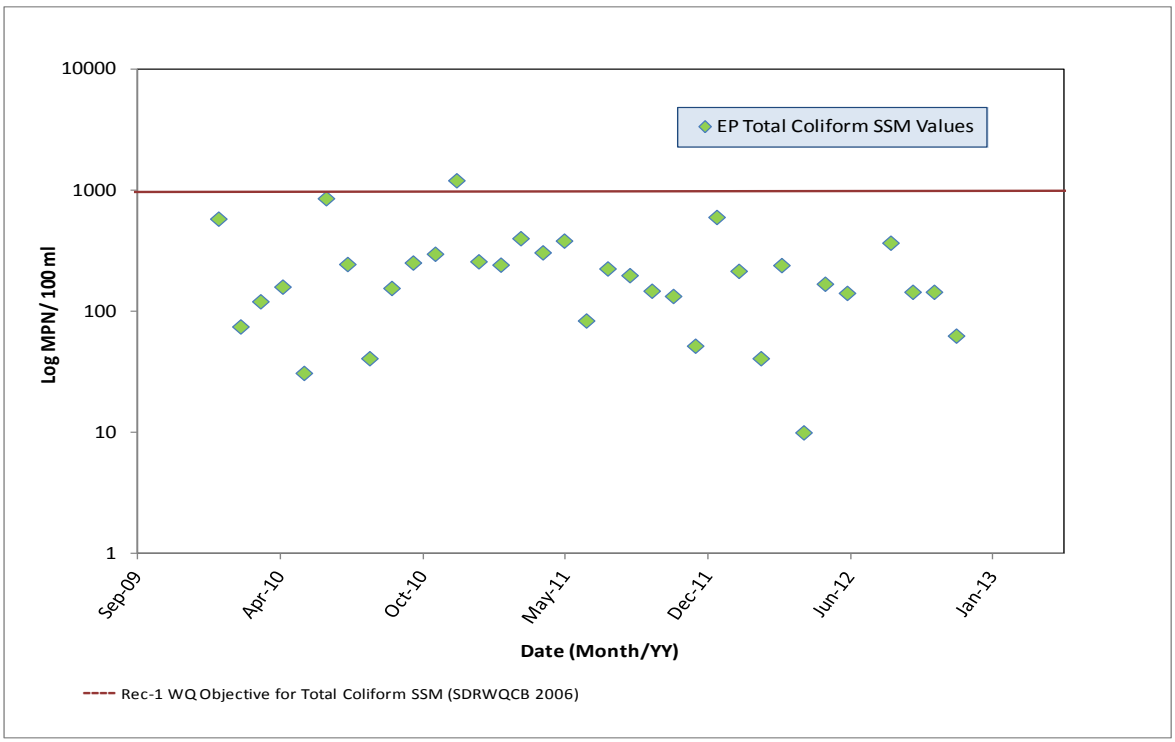


Figure 7.Existing Marine Mammal Pens Total Coliform 30-Day Single Sample Maximum for 2010–2012.

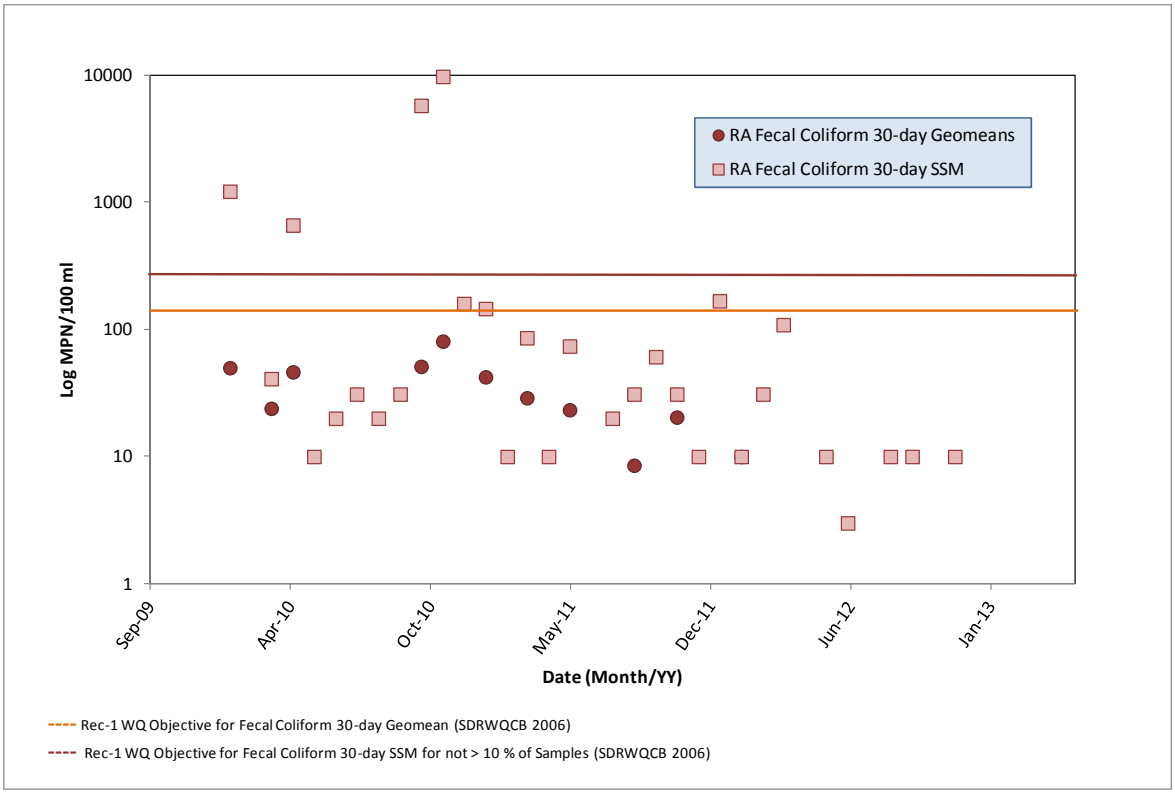


Figure 8.Proposed Marine Mammal Relocation Area Fecal Coliform 30-Day Geomean and Single Sample Maximum for 2010–2012.

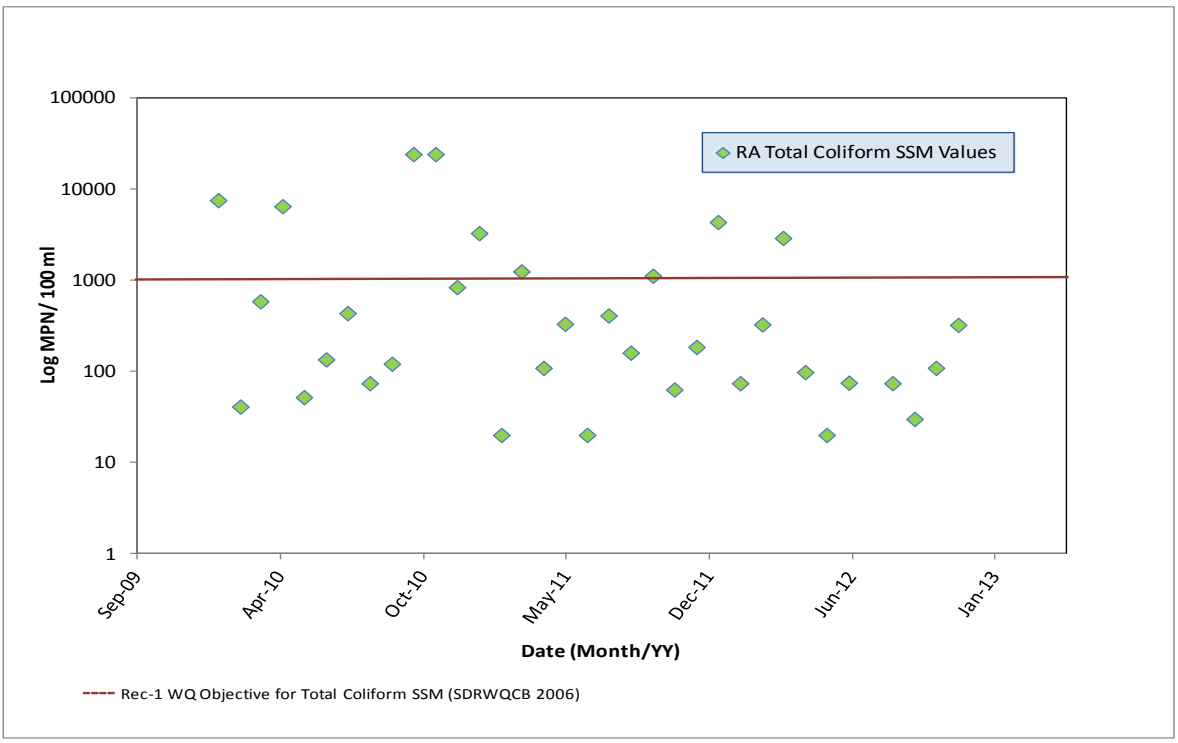


Figure 9.Proposed Marine Mammal Relocation Area Total Coliform Single Sample Maximum for 2010–2012.

3.0 EXISTING CONDITIONS

In conjunction with the review of fecal and total coliform data from stakeholders adjacent to the RA site, TDI performed indicator bacteria collections at multiple locations within the EP and RA sites (Figure 10 and 11). Samples were collected during both ebb and flood tide states in January 2013. Sampling was performed in conjunction with MMP personnel at EP to examine spatial variation in bacterial samples collected at the marine mammal pens at the EP, and at the 100-foot (ft) security boundary.

3.1 Existing Marine Mammal Pens at SSC

Total and fecal coliform samples were collected by TDI scientists at six locations approximately 100 ft from the EP during the field program. Six stations (EP-1 through EP-6) were sampled during an incoming tide on January 4, 2013 between 1130 and 1230 hours, and on an ebb tide on January 16, 2013 between 1200 and 1300 hours (Figure 10). Samples were collected from below the water surface (approximately -2ft) using laboratory provided bottles containing sodium thiosulfate preservative. Bottles were inserted into the water upside down, using a dip pole, and flipped right-side up to fill; the method ensured that surface water contaminants were not introduced into the sample bottle. Samples were stored in a secure container and couriered with appropriate chain of custody to Calscience Environmental Laboratory Inc. (Calscience), in Garden Grove, California for analysis using the Environmental Protection Agency approved method SM9221B.

3.2 Proposed Marine Mammal Relocation Area

The proposed RA is at the convergence of the NTC channel, the West Harbor Island Channel, and the San Diego Bay Main Channel (Figure 11). Four samples were collected approximately 100 ft from the proposed RA, three stations (RA-1, RA-2, and RA-3) and a duplicate were sampled for fecal and total coliform (Figure 11). Sample collection, timing (e.g., flood and ebb tide), and duplicate sampling were consistent with the methods outlined in the section above.

4.0 EXISTING CONDITION RESULTS

Fecal and total coliform samples were collected on January 4, 2013 between 1130 and 1230 hours under flood tide conditions. Laboratory results for fecal and total coliform samples resulted in non-detect (ND) values for both EP and RA (Table 3). The fecal and total coliform reporting limit for Calscience is less than 18 MPN/100 ml. Fecal and total coliform sampling results collected by MMP personnel within the pens at 1000 hours similarly resulted in less than detectable levels of fecal and total coliform.

Fecal and total coliform samples were collected on January 14, 2013 between 1330 and 1430 hours under ebb tide conditions. Fecal coliform bacteria results ranged from non-detect to 18 MPN/100 ml for EP and from non-detect to 68 MPN/100 ml at RA (Table 4). Total coliform bacteria were all non-detect for the EP site and ranged from ND to 140 MPN/100 ml at the RA site. Concurrent fecal and total coliform sampling results collected at EP, by MMP personnel at the pens at 1350hours resulted in 10MPN/100 ml for both fecal and total coliform (Table 4). Analytical reports of the samples analyzed by Calscience are included as Appendix C.

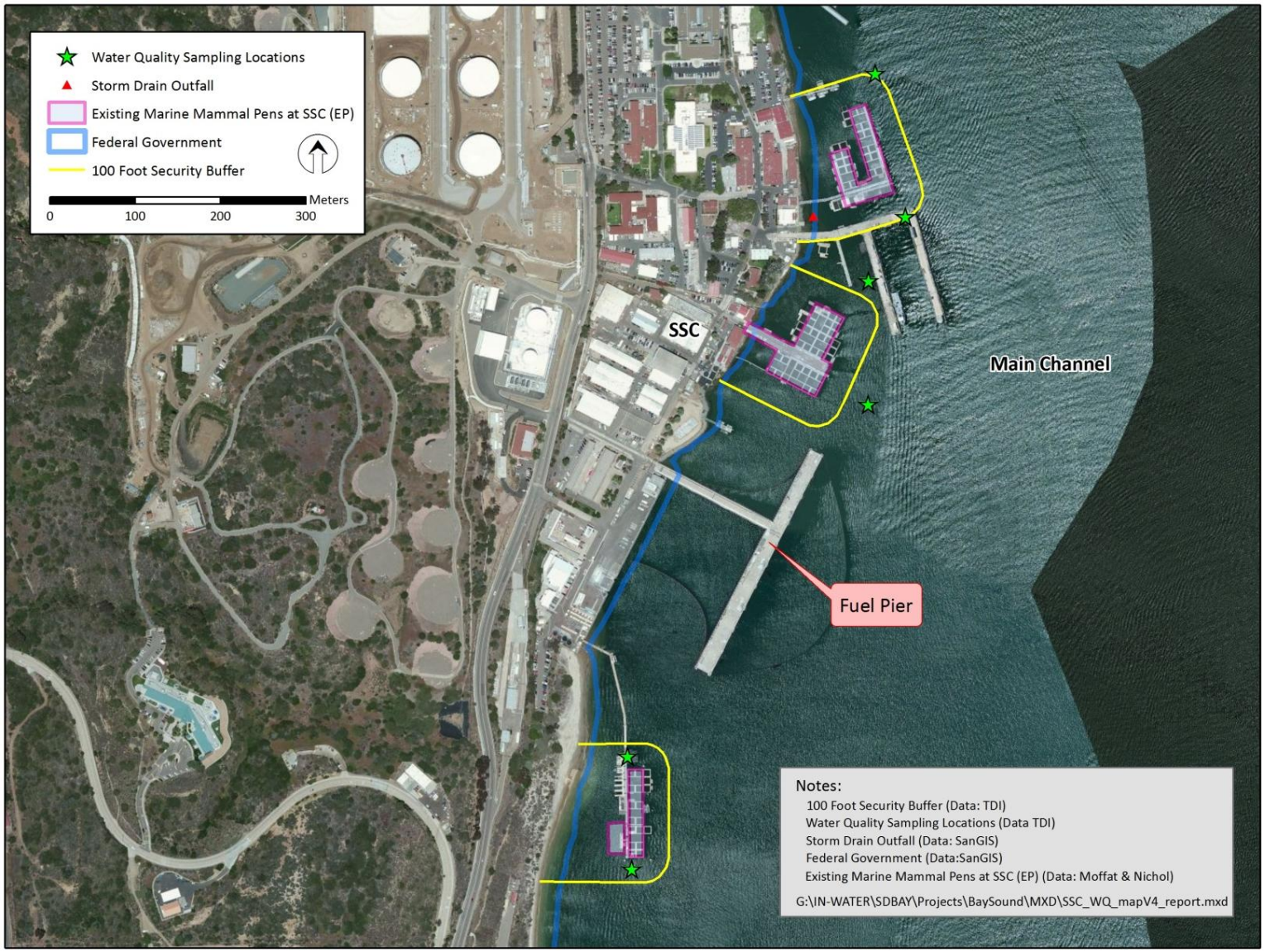


Figure 10.Water Quality Stations Located at the Existing Marine Mammal Pens (EP).

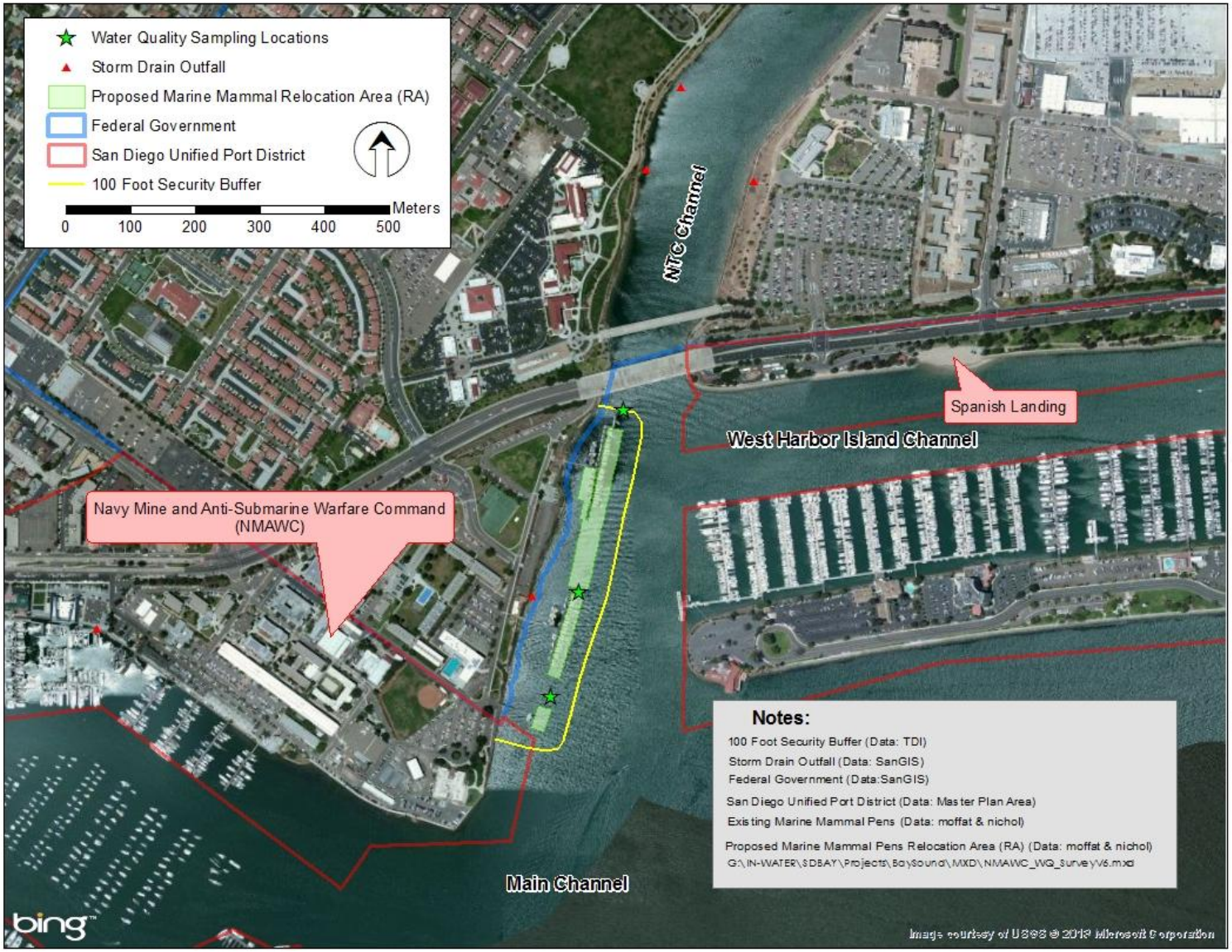


Figure 11.Water Quality Stations Located at the Marine Mammal Relocation Area (RA).

Table 3.Fecal and Total Coliform Concentrations Collected on January 4, 2013, flood tide.

Parameter	Sample Sites											
MPN/100 ml	RA				EP							EP (Navy)
	RA-1	RA-2	RA-3	RA-3 Dup	EP-1	EP-2	EP-3	EP-4	EP-5	EP-6	Blank	EP
Fecal Coliform	<18	<18	<18	<18	<18	<18	<18	<18	<18	<18	<18	0
Total Coliform	<18	<18	<18	<18	<18	<18	<18	<18	<18	<18	<18	0

Table 4.Fecal and Total Coliform Concentrations Collected on January 14, 2013, ebb tide.

Parameter	Sample Sites											
MPN/100 ml	RA				EP							EP (Navy)
	RA-1	RA-2	RA-3	RA-3 Dup	EP-1	EP-2	EP-3	EP-4	EP-5	EP-6	Blank	EP
Fecal Coliform	<18	68	<18	<18	18	<18	<18	<18	<18	<18	<18	10
Total Coliform	<18	140	<18	<18	18	<18	<18	<18	<18	<18	<18	10

5.0 HYDRODYNAMIC STUDY RESULTS

The hydrodynamic model study present modeling results for the average fecal coliform concentrations (MPN/100ml)and nutrient concentrations (µg/ml)throughout the RA site based on projected loading from the proposed number of relocated marine mammals and accepted bacteria and nutrient contributions from individual marine mammal species (Appendix A).The fecal coliform concentrations are a best estimate based on the mean of the four modeled cells within the RA site and because of non-conservative features of bacterial response to sunlight, water temperature, and salinity that were not calibrated for the specific site. Similarly, the model is not able to predict actual nutrient concentrations because loss from plant uptake and nutrient recycling were not included. Considering the exclusion of these physical and biological factors model predictions are conservative and bacteria and nutrient concentrations predicted by the model are likely higher than expected. Examining the hydrodynamic model data results presented in Figure 9 of Appendix A the relocation of the marine mammals to the RA would contribute an average of 90 MPN/100mlof fecal coliform to existing conditions. To evaluate the accuracy of the hydrodynamic model data results, in terms of predicted fecal coliform concentrations, the model was run concurrently for the EP site using applicable marine mammal numbers and waste loading of individual marine mammal species (Figure 8 of Appendix A). Predicted fecal coliform concentrations for the EP modeled cells averaged approximately 5 MPN/100ml and compared favorably to concentrations recorded during the January 2013 field investigation (Table 3)and concentrations recorded during dry season sampling conducted by the MMP at the EP site (Appendix B).

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance and quality control measures were implemented during each of the two sampling events. Water collections were collected at EP and RA on two separate days at the same locations. Collection bottles were supplied by Calscience and the same dip pole sampling device utilized to retrieve

individual water samples from a consistent depth at all sites. All samples followed proper collection processes as outlined in the Surface Waters Ambient Monitoring Program *Quality Assurance Management Plan* Section B-2 (SWRCB 2002). Chain-of-custody (COC) documents were completed and received with each of the submitted samples with each sample container labeled consistent with the COC and in good condition. The samplers name was indicated on the COC and sample containers contained sufficient volume, maintained proper preservation, and were received within the specific holding time.

Calscience performed SM9221B –TC Total Coliforms (Aqueous) and SM9221B/E–FC Fecal Coliforms (Aqueous) analysis as requested by TDI. Calscience followed internal quality assurance procedures and provided a complete analytical report to TDI. Data quality assurance was maintained by the collection of one duplicate sample for each sampling event. Duplicate results were consistent to the replicate station results for each sampling day, indicating consistency in measurements and analysis. All data results provide by Calscience are reported in this document and were checked through a TDI internal data validation processes. The Calscience analytical reports for each sample date are included as Appendix C in this report.

7.0 DISCUSSION

Review of the existing data for indicator bacteria indicate temporal variability of fecal and total coliform concentrations of the EP and RA sites. Results place into context the relatively low frequency in which REC-1 beneficial use fecal and total coliform objective levels were exceeded at the RA location over the 34 months of weekly sampling conducted by the Navy MMP. Data collected by the City at the storm water outfalls, within the NTC channel during the dry season, showed that occasional high levels of bacteria (>100,000 MPN/100 ml) are introduced into receiving waters from runoff. City collected outfall data suggests that potential bacteria sources from wet weather events intermittently contribute to the overall bacteria load within the receiving waters of the proposed RA, and may elevate the likelihood of exceedance of REC-1 objectives levels.

Dry season fecal and total coliform data collected between 2009 and 2012 by the SDCDEH had only one instance of exceeding the REC-1 SSM objective level for fecal coliform and one case of exceeding the total coliform objective level within the NTC channel. Fecal coliform results reported by the SDCDEH exceeded REC-1 objective levels near the RA in June 2011were based on individual sample results and the SSM objective of 400 MPN/100ml. The single total coliform exceedance of the REC-1 objective level at the RA, in September 2010,may be attributed to a wet weather event outside the generally accepted wet weather time period (October 1 through April 1).

Fecal coliform samples collected by the MMP at the EP site were conducted near the marine mammal pens themselves with no exceedances of the SSM or repeated samples objective. Fecal coliform samples collected by the MMP near the pens at EP are less variable than concentrations recorded at the RA. Maximum fecal coliform log averaged values for all 30-day sample periods at both EP and RA were less the REC-1 objective. Maximum SSM values occurred most frequently during the wet season in

combination with measurable rainfall events. Total coliform objective exceedances observed at the RA similarly appear temporally correlated with wet weather conditions. Results indicate that bacteria concentrations are greater and more variable during the wet weather season than during the dry weather season.

Existing conditions survey results indicate fecal and total coliform concentrations at the EP and RA stations were generally below detection. Samples collected by Navy MMP personnel at the EP similarly indicate a pattern of low concentrations of indicator bacteria and support fecal coliform concentrations predicted by the hydrodynamic modeling results. Examination and analysis of indicator bacteria data sets from SDCDEH, MMP, as well as the 2013 field collections provide a relatively comprehensive understanding of the status and temporal variability of fecal and total coliform concentrations within the receiving waters at both the RA and EP sites.

Differences between the individual values and calculated averages of fecal and total coliform concentrations at the RA, from the various data sets, fall within an acceptable range of values and to some degree validate predicted fecal coliform concentration values from the hydrodynamic modeling study. The application of the fecal coliform concentration value (90 MPN/100ml) derived from the hydrodynamic modeling for the RA and supported by individual samples, log averages, or seasonal means from the various data sets for the RA site provides a relevant value to estimate fecal coliform concentrations at the RA. Based on a cumulative sum of the fecal coliform load contributed by the proposed relocation of marine mammals to the RA site (90 MPN/100ml) and fecal coliform concentration existing conditions at the RA site (Appendix B) no additional exceedances of the REC-1 standard for the fecal coliform SSM would have occurred over the nearly three years of measurements at the RA site between 2009 and 2012.Though the hydrodynamic model study did not specifically address predicted total coliform concentration levels it is appropriate to assume that fecal coliform concentration estimates are an accurate surrogate for total coliform concentrations based on the specific marine mammals as the source.

Nutrient source loading examined by the hydrodynamic modeling study using individual marine mammal species contributions and proposed animal relocation numbers reported that concentrations of both nitrogen and phosphorus would not cause exceedances to regulatory standards (Appendix A).Constraints on the results from physical and biological process not accounted for during the modeling effort place the reported values in a conservative context and are not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

Increased mixing and reduced residence times may contribute to the degradation and dissolution of bacteria and are influenced by the proximity to loading sources and water volumes. The 100-ft security boundary at the RA site is slightly more proximal to the channel thalweg; therefore, it is reasonable to expect that actual contributions of fecal and total coliform concentrations at the 100-ft boundary would be less than predicted. Based on the calculated contributions from marine mammals relocated to the RA site, derived from the hydrodynamic modeling, concentrations of both fecal and total coliform are expected to remain below REC-1 objective levels for indicator bacteria. The frequency of which the REC-

1 objective levels will be exceeded near NMAWC once the MMP is relocated is unknown due to the variability of external sources (e.g., storm water runoff, marina inputs, etc), circulation, and degradation of indicator bacteria from ultraviolet radiation. Differences in bacteria concentration averages and standard deviations between wet and dry seasons suggest that the greatest probability of exceedances will likely occur during the wet season and would likely be dependent on the frequency and magnitude of rainfall events and resulting storm water input.

8.0 MODEL OF HYDRODYNAMIC MIXING

Hydrodynamic models have been developed and used to address issues that are relevant to the Navy for San Diego Bay, primarily the transport and fate of sediment, contaminants, and biological components. In the study referenced in this report and included as Appendix A, a calibrated three-dimensional hydrodynamic model has been implemented to simulate and compare hydrodynamic dispersion at EP and RA. The numerical hydrodynamic fate and transport model applied for this study is the Curvilinear Hydrodynamics in Three Dimensions (CH3D). The model simulates hydrodynamic currents in four dimensions (x, y, z and time) and allows for the prediction of the fate and/or transport of metals, fecal coliform, and other contaminants in estuaries and coastal environments under the forcing of tides, wind, and freshwater inflows (Sheng et al. 1991; Wang and Richter 1999).

The objective of the modeling was to conduct CH3D model simulations for the steady state concentrations of marine mammal waste at EP and RA as well as compare the simulated hydrodynamic dispersion between the sites. Results of the model display that tidal currents at RA are less than at EP and will result in slower dispersal and locally higher concentrations of waste by products. Hydrodynamic mixing (i.e., tidal flushing) of the EP and RA sites evaluated the relative dispersion rates of fecal coliform and nutrient concentrations and simulated hydrodynamic dispersion between the sites. Results of the modeling displayed that while hydrodynamic flushing is between 3.0 and 3.4 times higher at the EP then at the RA, based on the distribution of loading within individual modeled cells, fecal coliform concentrations contributed by relocated marine mammals would conservatively average 90 MPN/100ml for the RA site.

9.0 SEDIMENT QUALITY

Sediment quality was examined for its potential impacts to Essential Fish Habitat and benthic biota in areas immediately adjacent to the existing P-180 Point Loma fuel pier and the dock structures at the RA. Sediment physical and chemical testing was performed to characterize the concentrations of contaminates in sediments that may be potentially suspended during pile removal at both sites. Sediment core samples collected at both sites were composited and analyzed for a suite of chemical and physical parameters. A comprehensive sediment characterization report was prepared separately (Navy 2013).

10.0 REFERENCES

California Water Quality Control Board, Surface Waters Ambient Monitoring Program, Quality Assurance Management Plan, Section B-2 as amended 12/22/2002.

Sheng, Y.P., 1990. Evolution of a Three-Dimensional Curvilinear-Grid Hydrodynamic Model for Estuaries, Lakes and Coastal Waters: CH3D, In: Spaulding, M.L. (ed.), Estuarine and Coastal Modeling, ASCE, pp. 40-49.

State Water Resources Control Board Resolution No. 68-16, Basin Plan, San Diego Regional Water Quality Control Board 2006.

U.S. Department of the Navy. 2012. Draft Environmental Assessment, Naval Base Point LomaFuel Pier Replacement and Dredging (P-151/DESC1306) San Diego, California. Prepared by Naval Facilities Engineering Command, Southwest.

U.S. Department of the Navy. 2013. Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Sediment Quality Investigation, San Diego Bay, San Diego, California. Draft Report submitted to Naval Facilities Engineering Command Southwest. Prepared by Tierra Data Inc., Escondido, California.

Wang, P.F., and K.E. Richter.1999. A Hydrodynamic Modeling Study Using CH3D for Sinclair Inlet, Draft Report, Space and Naval Warfare Systems Center, San Diego.

APPENDIX A: HYDRODYNAMIC MODELING STUDY

Modeling of Hydrodynamic Mixing of Marine Mammal Waste at Two Locations in San Diego Bay



March 2013

Prepared for:
Naval Facilities Engineering Command Southwest,
Coastal IPT
2730 McKean Street, Bldg. 291, San Diego,
California 92101

Prepared by:
SPAWAR Systems Center Pacific
San Diego, CA 92152

1.0 Introduction

Contaminant mixing and transport in San Diego Bay (SDB) has been studied by Space and Naval Warfare Systems Command (SPAWAR) Systems Center(SSC) Pacific over two decades. Hydrodynamic models have been developed and used to address issues that are relevant to the Navy for San Diego Bay, primarily the transport and fate of sediment, contaminants, and biological components. In this study, the calibrated three-dimensional hydrodynamic model, CH3D, has been implemented to simulate and compare hydrodynamic dispersion of wastes from the existingmarine mammal pens at SSC (EP)to dispersion at the proposed marine mammal relocation area at Navy Mine and Anti-Submarine Warfare Command (NMAWC) (RA) near Spanish Landing. It is assumed that an equal amount of waste is continuously released at each site, (in this case 800 kg/year) and the model predicts water concentrations in the vicinity. The fecal waste is not modeled to degrade over time but is assumed to act as a conservative tracer, diluted by hydrodynamic dispersal. Results show that dispersion at the existing site is greater than at the proposed site, due to tidal flushing. The model predicts waste concentrations at the RA will be about three times higher than those at the EP.

Objectives

1) Conduct CH3D model simulations for the steady state concentrations in the existing site off SSC and the future release site.
2) Compare the simulated hydrodynamic dispersion of dolphin waste released from the existing site and the future site.

2.0 Model Background

The numerical hydrodynamic fate and transport model applied for this study is the Curvilinear Hydrodynamics in Three Dimensions (CH3D). This model is a boundary-fitted finite difference, Z-coordinate model developed at the U.S. Army Corps of Engineers Waterways Experiment Station (Johnson et al. 1991) to simulate physical processes in bays, rivers, lakes and estuaries (Wang and Martin 1991; Wang 1992; Wang and McCutcheon 1993; Wang et al. 1997, 1998; Johnson et al. 1995). The model simulates hydrodynamic currents in four dimensions (x, y, z and time) and allows for the prediction of the fate and/or transport of metals, fecal coliforms and other contaminants in estuaries and coastal environments under the forcing of tides, wind and freshwater inflows (Sheng et al. 1991; Wang and Richter 1999). It has been applied to a number of Navy-U.S. EPA joint projects, including the Environmental Investment (ENVVEST) TMDL project for Sinclair Inlet, WA (Wang and Richter 1999), the Uniform National Discharge Standards (UNDS) Program for ship discharges in Norfolk, VA, and the NPDES permit study for the Pearl Harbor Naval Shipyard. The grid of existing CH3D for San Diego Bay covers an area of approximately 215 km2, with about 7000 grid elements, and a resolution of approximately 100 meters (Figure 1).

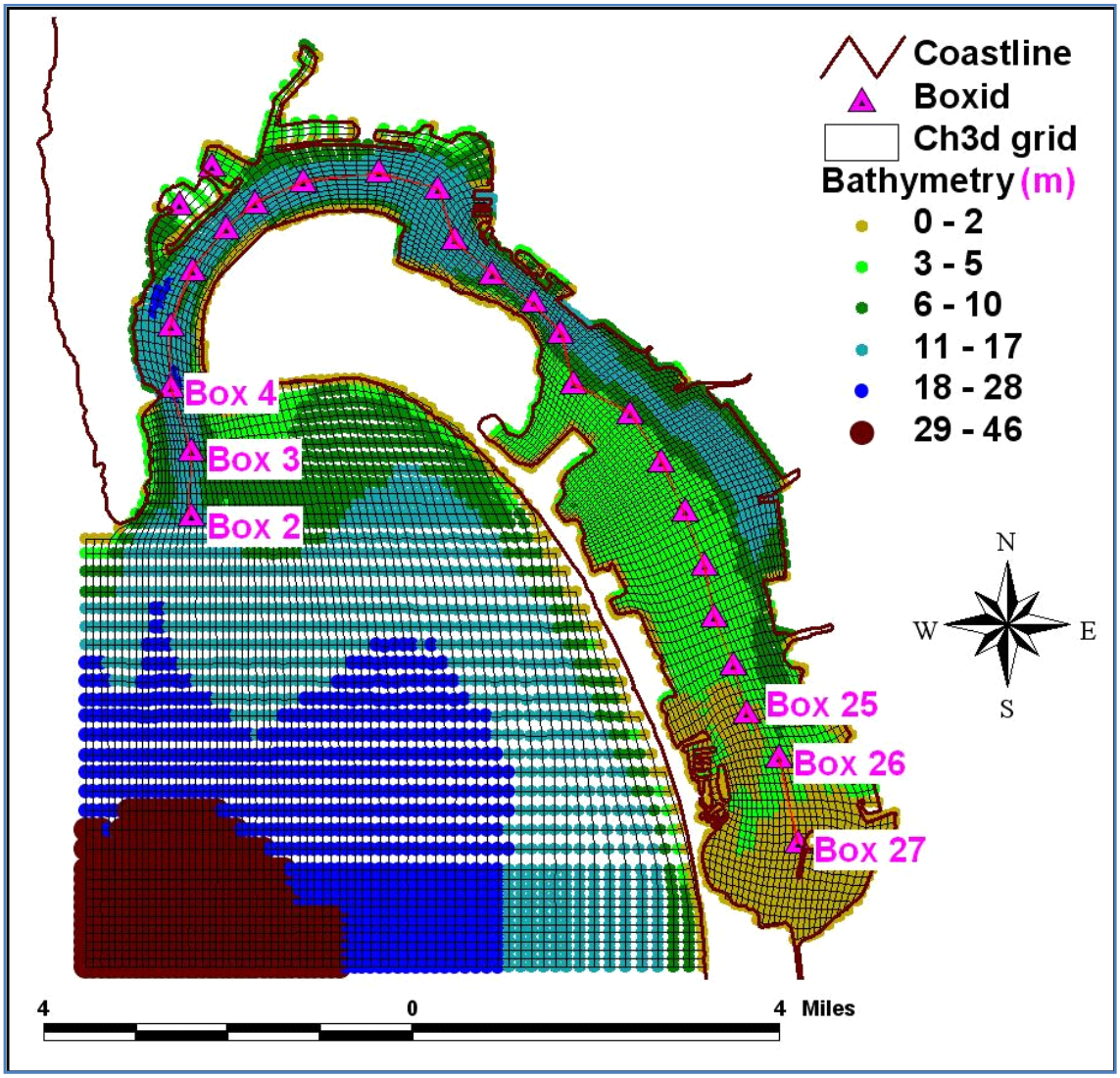


Figure 1. Grid for the Curvilinear Hydrodynamics in Three Dimensions (CH3D) model for San Diego Bay, California.

The CH3D model was implemented to simulate copper and biocide concentrations from hull paint in San Diego Bay (Wang et al. 2010), and concentrations of copper and its species (Chadwick et al. 2008). In these two studies, mean annual copper loads from all the known sources, including Navy and non-Navy sources, were estimated (Johnson et al. 2001), and distributed over the model domain.In order to simulate culvert flows, the CH3D hydrodynamic model was implemented and a new modeling approach was developed to accommodate the addition of the culverts and their effects on hydrodynamics and copper dispersion.

3.0 Model Set-Up and Analysis

In general water flows in San Diego Bay are driven by tides from the Pacific Ocean, which are assigned as the tidal forcing at the model's ocean boundaries. Tides in San DiegoBay are predominantly driven by diurnal (K1) and semi-diurnal (M2) components. Simulated water surface elevations range from ±70 cm during the neap tides to ±100 cm during the spring tides (Figure 2). In response to the principle of mass conservation the ranges of water surface elevation also grow from the mouth toward the inner Bay. Tidal flows enter into the Bay through the mouth, where water is deep (~15-20 meters), as the tidal flow propagates along the Bay's axis, water depth decreases to ~10 meters in mid-Bay and <5 meters in south Bay. Following the conservation of mass, water mass accumulates inducing an increase in surface elevation on the shallower areas. In general, an average difference of ±5 cm exists for water surface elevation between mouth and inner Bay locations, which is consistent with the results of a previous study (Wang et al. 1998).

The CH3D model simulates advection processes due to water currents and tides in San Diego Bay. The effect of tides is driven by tidal harmonic constants, which were obtained by calibration, and are prescribed at the open ocean boundaries (Figure 2, Wang et al. 1998). The sequence for the model simulation starts from quiescent initial conditions (zero water surface level for the entire Bay), with tidal forcing at the model's ocean boundaries starting with the simulation ($t \geq 0$). The water surface elevation and tidal currents at every grid cell is simulated at a time step of two minutes, reaching simulated steady state hydrodynamic conditions within four days. Marine mammal waste is assumed to be released uniformly in the water column at both the existing and future sites. The waste is assumed to be conservative, meaning it does not degrade nor fall out of the water column. Release starts from day 4 with a steady state release rate of 800 kg/year at each site.The absolute release rate is not critical since the focus of the simulation is the relative comparison of resulting water concentrations at each site Simulation of mixing and transport of the waste, which is driven by the hydrodynamics simulation in CH3D, continues for 150 days so that waste concentration and its transport patterns in the Bay reach 'quasi' steady state. Results of simulated waste concentrations are analyzed and compared between the two scenarios.

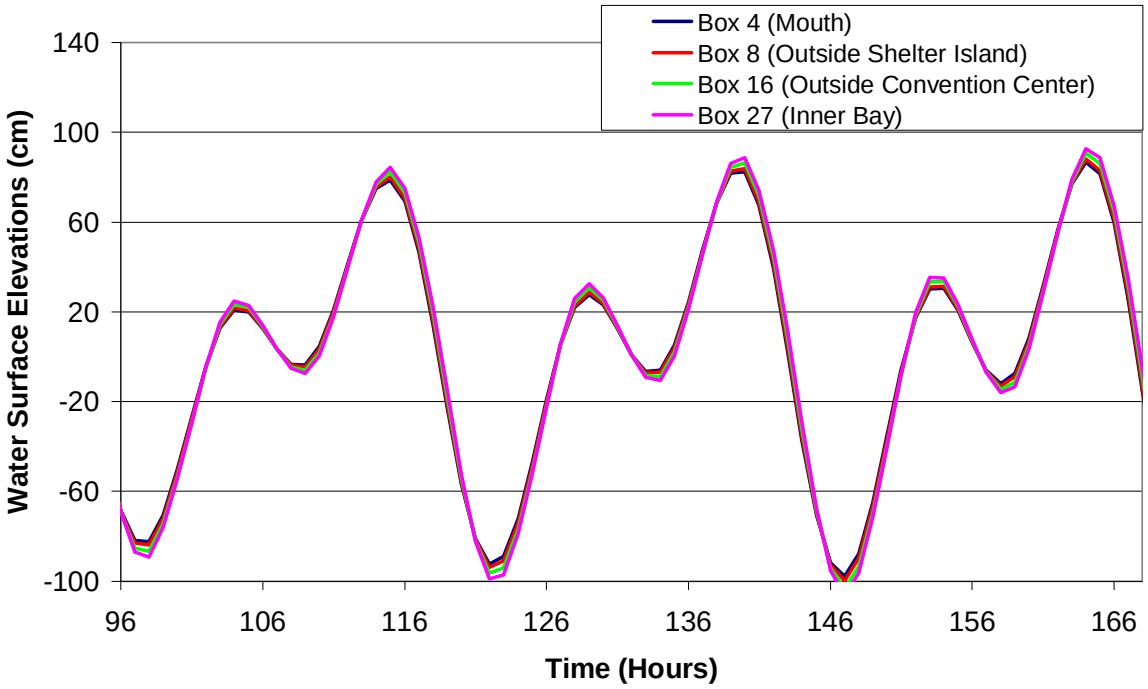


Figure 2. Simulated water surface elevations at several locations within San Diego Bay. The boxes (cells) are those designed in Figure 1.

There is a marked gradient in the magnitude of tidal currents within the Bay. Tidal currents are governed by multiple factors, including bathymetry, geometry (shape) of the Bay, bottom friction, etc. As a result, tidal current distributions differ from location to location in the Bay; but, in general, current directions are restricted and follow the geometry of the Bay. The speeds of the tidal current range from ~15-50 cm s-1 near the mouthto over 65 cms-1 in the channel bends, and to less than 10 cms-1 in the inner Bay (Figure 3). In general the simulated current direction follows the shape of the Bay (Figure 4). Currents near the mouth are bi-directional, pointing north (~360°) and south (~180°) alternately, depending on the tidal stage. The direction of the current is dominated by the geometry of the Bay, and follows the direction of the axis of the Bay. With the calibrated tidal harmonic constants assigned at the model's ocean boundaries, CH3D predicts both water surface elevations and tidal currents (both speed and direction) consistent with the results of Wang et al. (1998).

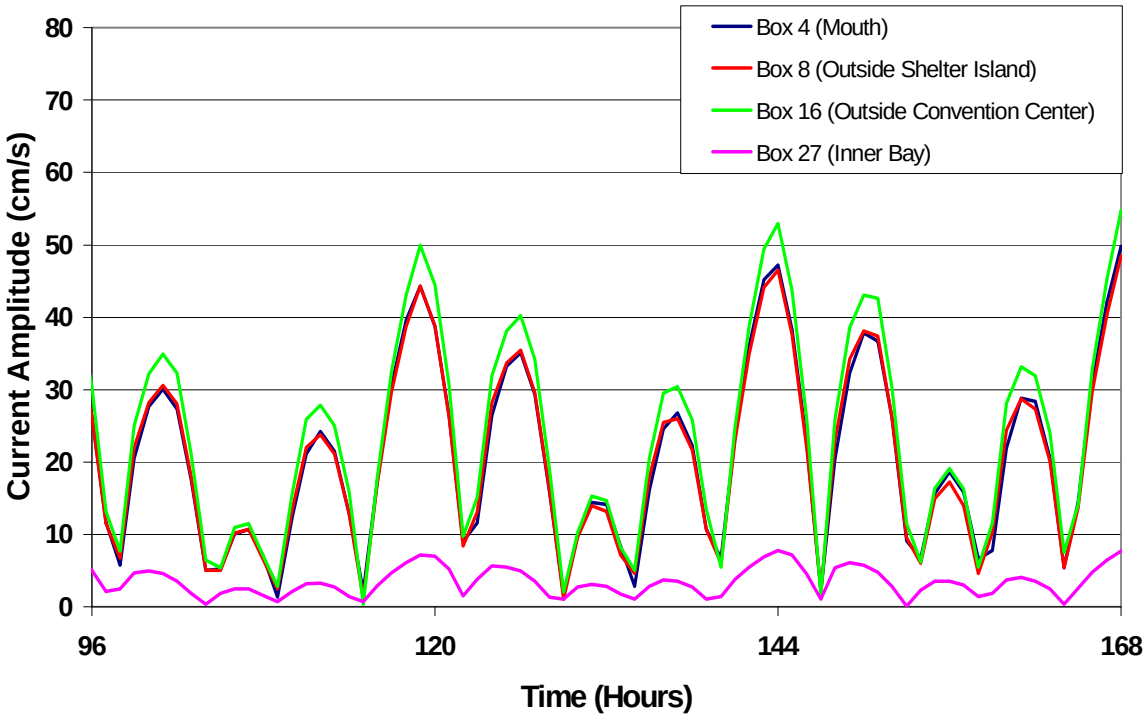


Figure 3. Simulated current amplitudes at four locations in San Diego Bay.

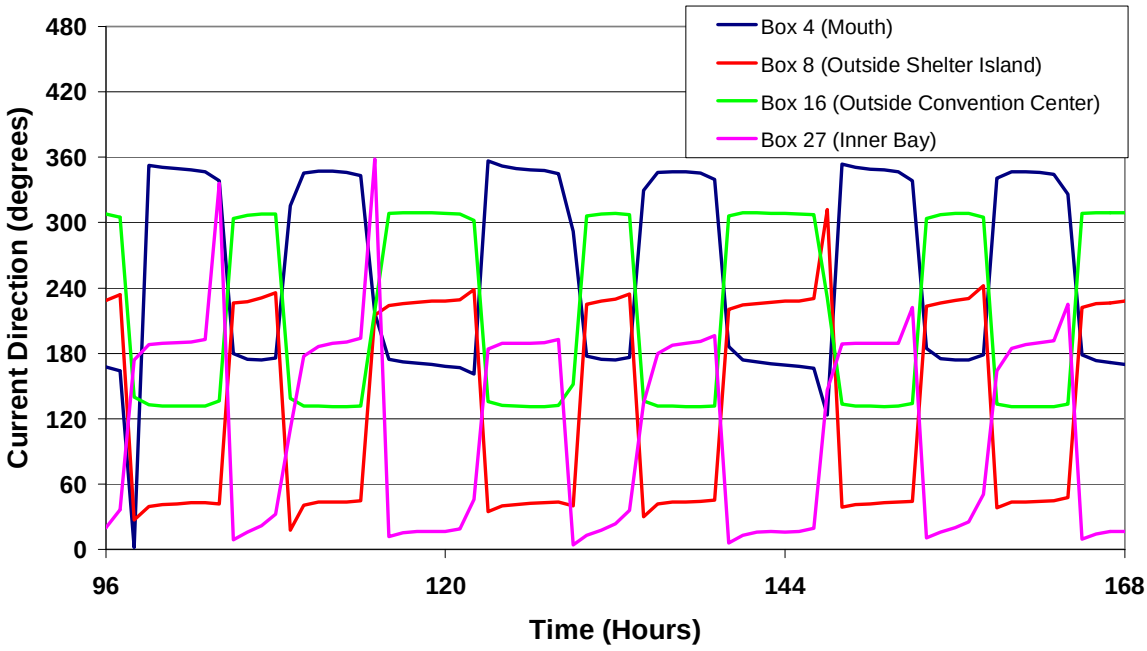


Figure 4. Simulated current direction at four locations in San Diego Bay. The angle is defined clockwise with 0° and 360° indicating North and 90° East.

4.0 Model Results

4.1 Model Results for the Conservative Tracer

Figure 5 shows the locations of the existing (EA) and proposed (RA) sites within the model area. The total areas of these two sites are about the same, encompassing two and four model cells for the existing and proposed sites, respectively. The proposed site has a higher density of model cells to accommodate rapid changes in depth found there.Figure 6 showsthe time series of simulated waste concentrations at the existing and the future sites, assuming a release of 800 kg/yr. Simulated concentrations fluctuate with both the diurnal/semi-diurnal tidal cycle and the spring/neap tidal cycle during simulations of 14 days. At the existing site, concentrations fluctuate between 0.07 and 1.3 ug/L and the diurnal/semi-diurnal fluctuation amplitude is about 0.5 ug/L. At the proposed site, concentrations fluctuate between 0.25 and 2.9 ug/L and the diurnal/semi-diurnal fluctuation amplitude is about 1.3 ug/L. Concentrations result from loading 800 kg/year of some conservative tracer evenly into the model cells representing the marine mammals pens at either site. The absolute concentration is not as important as the difference in concentration at the two sites, due to dispersion. Concentrations are spatially averaged over the two model cells for the existing site and the four model cells for the future site (Figure 7). The averaged concentrations are further averaged over the 14 days and the spatially and temporally averaged concentrations are 0.5 ug/L and 1.7 ug/L for the existing and proposed sites, respectively. This results in concentrations 3.38times higher at the proposed site.As a further exploration of model predictions, the 800 kg load was unevenly distributed into the four model cells representing the marine mammal pens at the proposed site: 70 % of the load was released into the two model cells closest to the navigation channel, where tidal currents are faster, while 30% of the load was released into the two cells closest to the NTC channel. This loading pattern reduced average concentrations by 8%. Graphical depiction of the later model run are not shown since it resulted in little concentration difference.

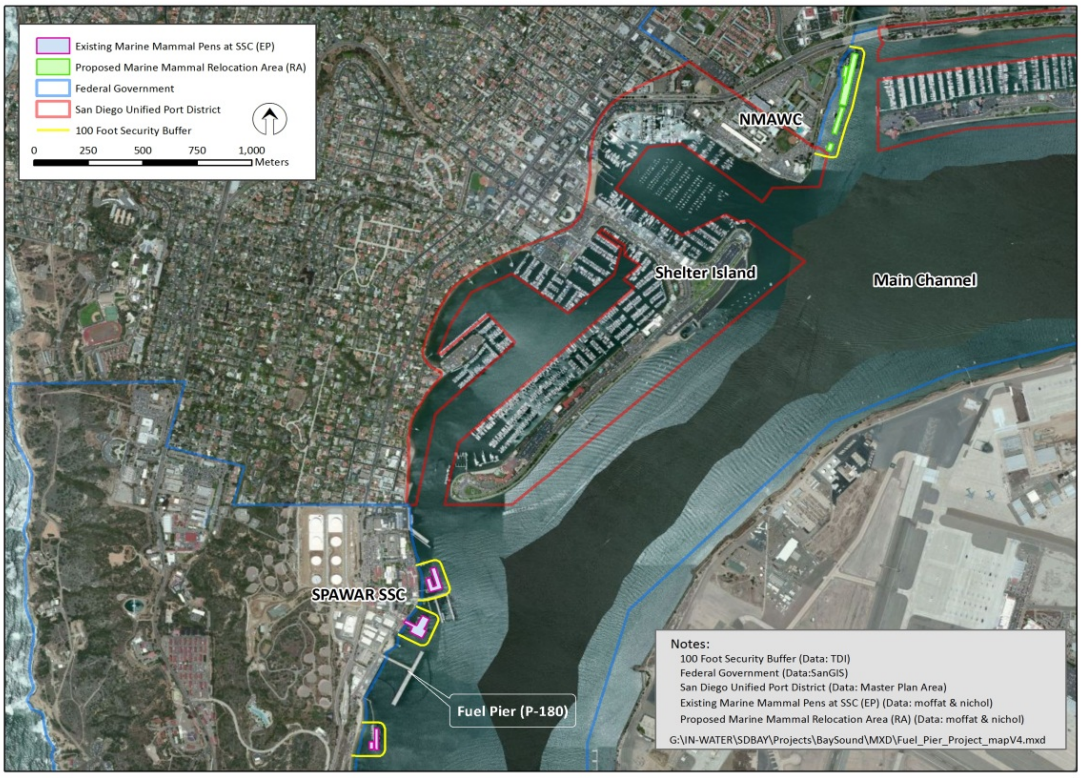


Figure 5. EP and RA sites within North Central San Diego Bay.

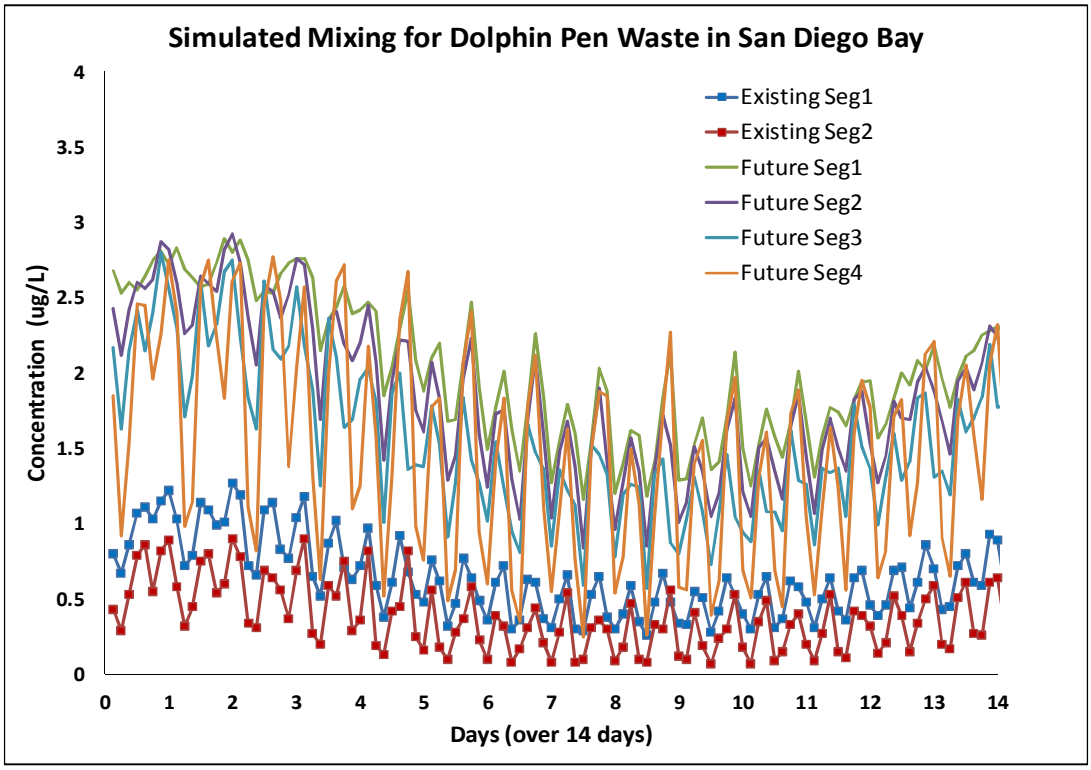


Figure 6. Simulated concentrations at existing and future sites in San Diego Bay.

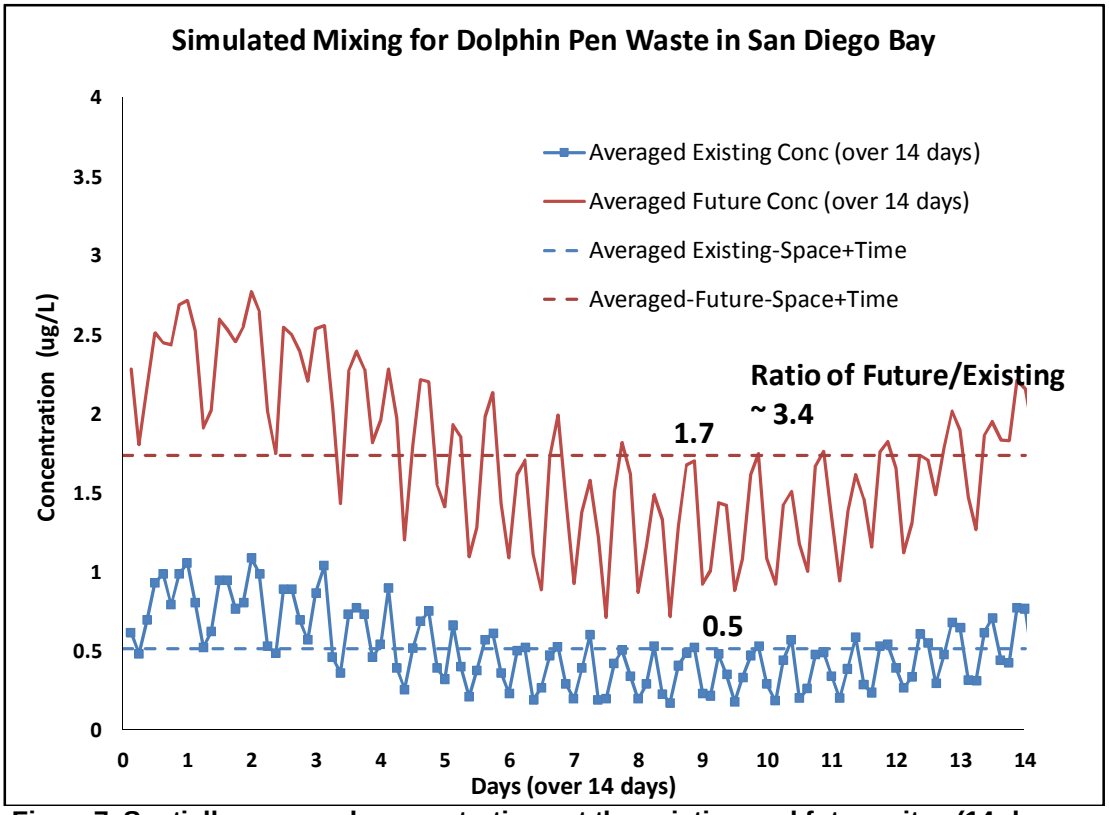


Figure7. Spatially averaged concentrations at the existing and future sites (14-day averages at the two sites are denoted by the dashlines)

4.2 Model Results scaled for Fecal Coliform and Nutrient Release

Subsequent to the model runs shown above, fecal coliform and nutrient loading from individual dolphins and sea lions was substituted for the 800 kg/yrrelease. Data were obtained from an environmental impact study of possibly relocating dolphins and sea lions to Naval Base Kitsap at Bangor, WA as part of a swimmer interdiction security system (XXXXX). The loading data come from Table 2-1 in Appendix F of the report and is reproduced below in Table 1. Resulting model-predicted concentrations were scaled to reflect actual loads and desired units of concentrations (e.g. MPN/100 ml). Actual loads in the model simulations (1) assumed 30 dolphins and 10 sea lions were housed at the current pens at SSC, the population that existed there when fecal coliform concentrations were measured; and (2) assumed 70 dolphins and 30 sea lions would be housed at the proposed pen relocation area near Naval Mine and Anti-Submarine Warfare Command (Mark Xitco, personal comm.). In the values below, dolphin and sea lion feces were assumed to have a density of 1 g/ml.The simulations presented below did not include decay of fecal coliform populations due to light, temperature and salinity (e.g. Mancini, 1978) and thus tend to be conservatively high estimates. Similarly, the simulations do not include nutrient sinks (e.g. plant uptake).

	Dolphins	Sea Lions
Urine production/animal/day (ml/day)	5,000	3,000
urine total nitrogen (mg/l)	33,000	9,840
Urine total phosphorous (mg/l)	349	637
Urine 5-day biochemical oxygen demand (mg/l)	10,800	5,525
Fecal production/animal/day (g/day)	1,500	1,020
Fecal total nitrogen (mg/l)	5,950	14,000
Fecal total phosphorous (sea lions)/phosphate (dolphions) (mg/l)	18,900	29,000
Fecal 5-day biochemical oxygen demand (mg/kg)	37,037	65,400
Fecal coliforms (MPN/g)	4,865	50,000,000

Table 1. Production and constituent concentration of urine and fecal material from Atlantic Bottlenose Dolphin and California Sea Lions.

Figures 8-9 show the temporally averaged (over the 14 days) predicted concentration contours for fecal coliform at the present and proposed sites, respectively.Figures 10-11 show the predicted concentration contours for total nitrogen and phosphorous/phosphate at the proposed site.

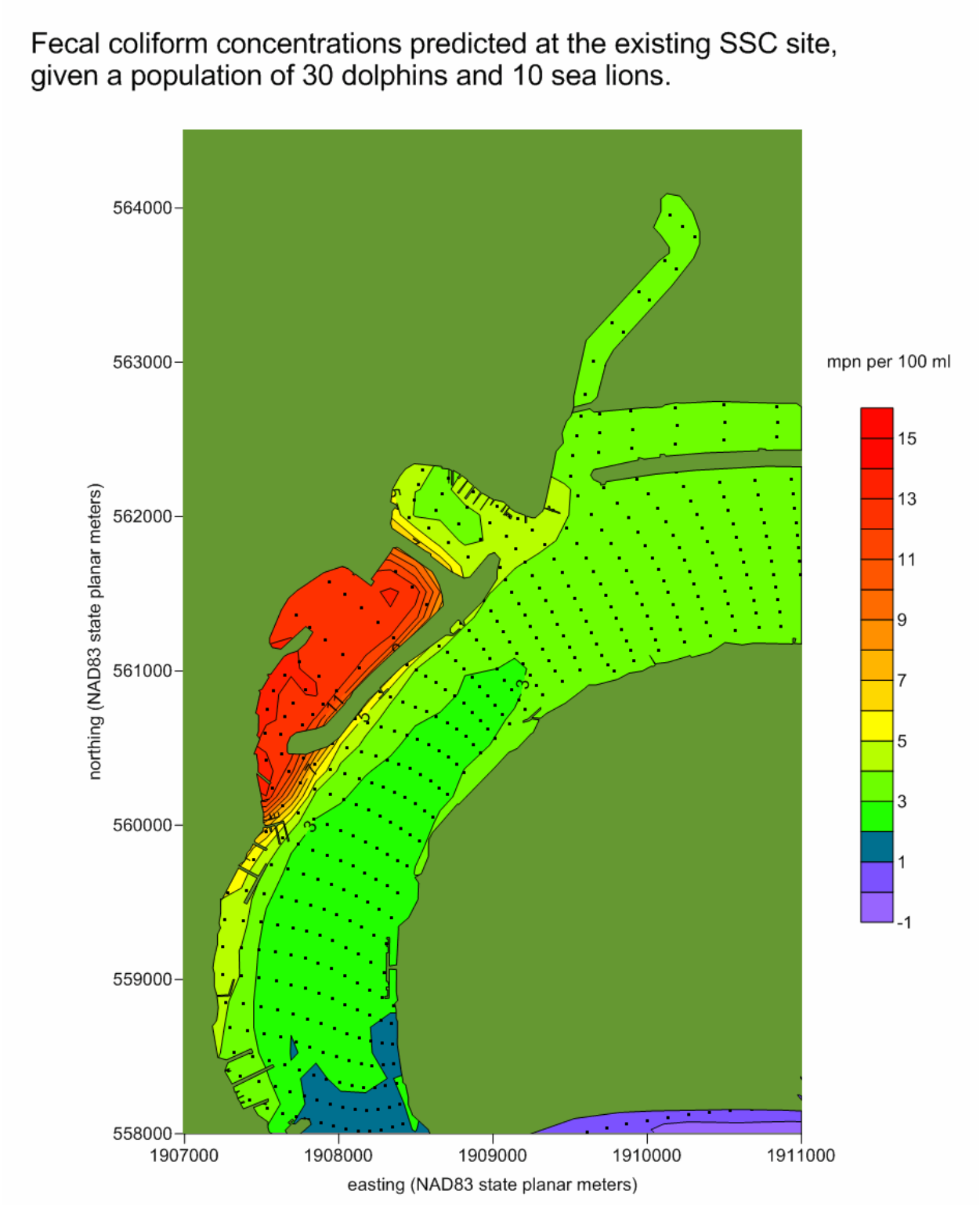


Figure 8. Simulated concentration contours (14-day average) for the existing site, assuming 30 dolphins and 10 sea lions. Black dots represent model nodes.

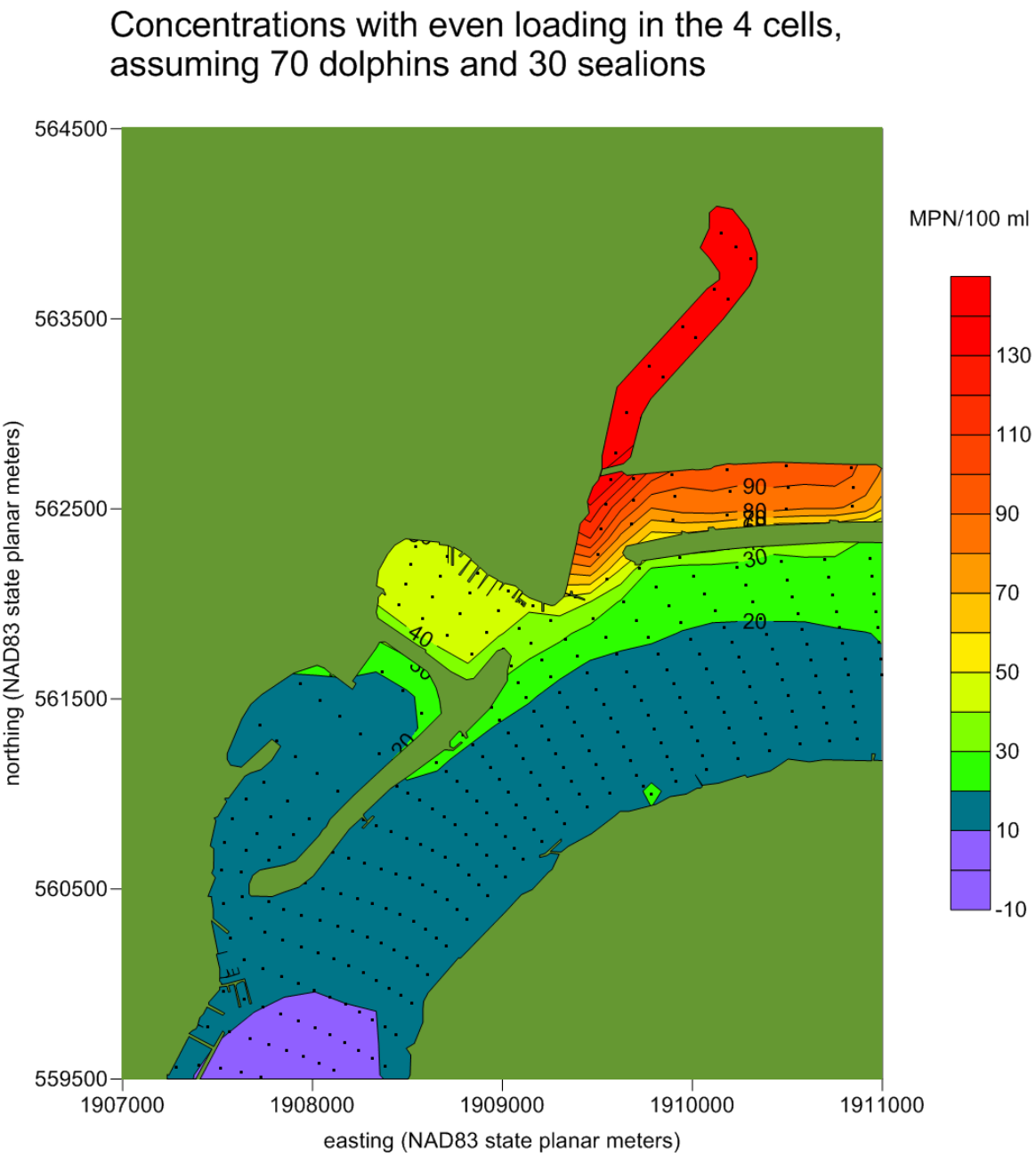


Figure 9. Simulated concentration contours (14-day average) for the future site assuming 70 dolphins and 30 sea lions with fecal loading evenly distributed among the pens.

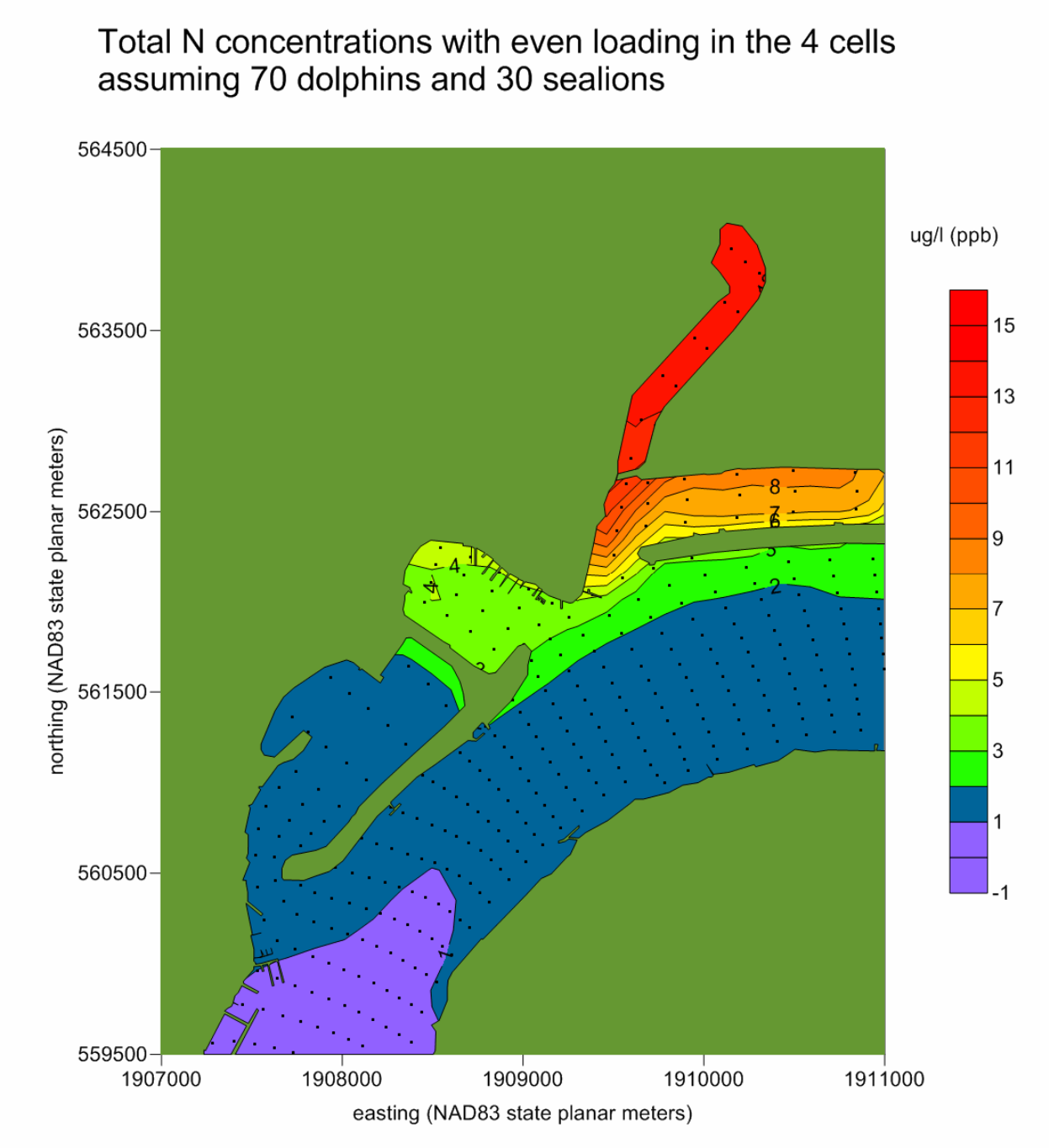


Figure 10. Simulated nitrogen concentration contours (14-day average) for the proposed site.

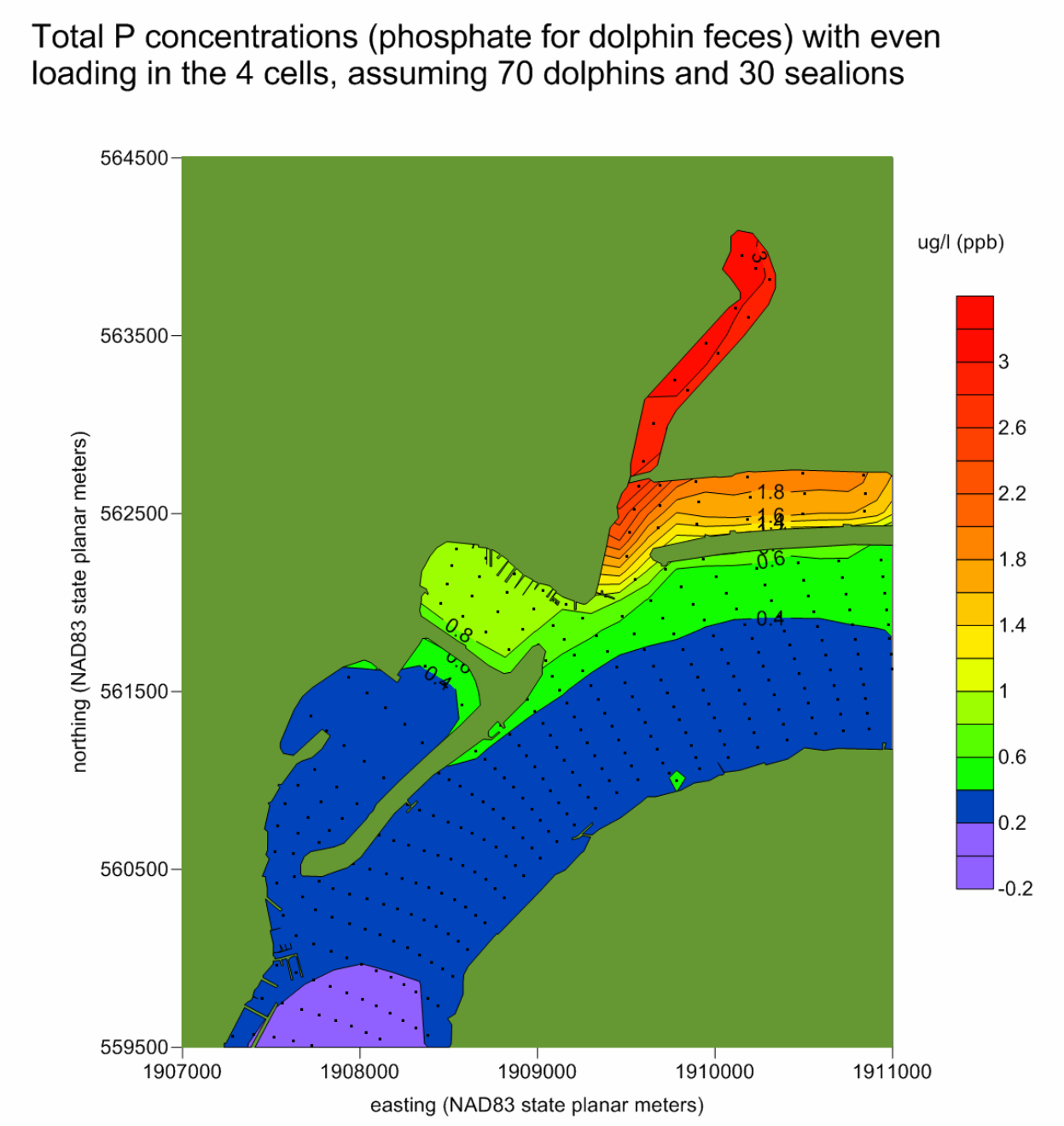


Figure 11. Simulated phosphorous/phosphate concentration contours (14-day average) for the proposed site.

5.0 Conclusions

Tidal currents at the proposed site are less than at existing site and will result in slower dispersal and locally higher concentrations of marine mammal waste. The predicted model concentrations are proportional to the assumed loading term of 800 kg/year and their absolute value is not the focus of this effort; rather the ratio of the concentrations at the current and proposed site.The spatially and temporally-averaged concentrations at the proposed site are predicted to be

approximately 3.4 times higher than at the present site. The highest concentrations will occur in the Naval Training Center boat channel.

The hydrodynamic model is presently not able to predict water quality changes due to fecal coliform loading, primarily because the non-conservative features of bacterial response to sunlight, water temperature and salinity are not calibrated for this site.Similarly, the model is not able to predict realistic nutrient concentrations because loss from plant uptake and nutrient recycling are not included. Ignoring these processes make model predictions of concentrations higher than expected. Regardless, when predicted fecal coliform and nutrient loading are scaled and substituted for the conservative tracer, fecal coliform concentrations are well below recreational water standards and nutrient concentrations are below those in the California Basins Plan for biostimulatory substances (California Water Plan, 2013). Averaged over neap and spring tidal cycles, fecal loading from 70 dolphins and 30 sea lions alone at the proposed site should not lead to adverse water quality.

6.0 References

California Water Plan, 2013 http://www.waterplan.water.ca.gov/waterquality/basin_plan.cfm. In particular see page 3-8 in : http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

Chadwick, D.B., A. Zirino, I. Rivera-Duarte, C.N. Katz, and A.C. Blake. 2004. Modeling the mass balance and fate of copper in San Diego Bay, Limnol. Oceanogr. 49(2).

Chadwick, D.B., I. Rivera-Duarte, G. Rosen, P.F. Wang, R.C. Santore, A.C. Ryan, P.R. Paquin, S.D. Hafner, and W. Choi. 2008. Demonstration of an Integrated Compliance Model for Predicting Copper Fate and Effects in DoD Harbors - Environmental Security Technology Certification Program (ESTCP) Project ER-0523. Technical Report 1973. SSC Pacific, San Diego, CA.

Johnson, B. H., K. W. Kim, R. E. Heath, B. B. Hsieh, and H. L. Butle. 1991. "Development and Verification of a Three-dimensional Numerical Hydrodynamic, Salinity, and Temperature Model of Chesapeake Bay." Technical Report HL-91-7, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Johnson, B. H., H. V. Wang, and K. W. Kim. 1995. "Can Numerical Estuarine Models be Driven at the Estuary Mouth?" Estuarine and Coastal Modeling: Proceedings of the 4thInternational Conference (pp. 255–267), October 26–28, San Diego, CA, M. L. Spauldingand R. T. Cheng, Eds. American Society of Civil Engineers, New York, NY.

Johnson, H. D., J. G. Grovhoug, and A. O. Valkirs. 1998. "Copper Loading to U.S. NavyHarbors." SSC San Diego Technical Document 3052, San Diego, CA.

Katz, C.N. 1998. Seawater Polynuclear Aromatic Hydrocarbons and Copper in San Diego Bay. Technical Report 1768. Space and Naval Systems Center (SPAWAR). San Diego, CA.

Mancini, j. L. 1978. Numerical estimates of coliform mortality rates under various conditions. J. Water Poll. Control Fed. 50:2477-2484

McPherson, T.N. and G.B. Peters. 1995. The Effects of Copper-Based Antifouling Paints on Water Quality in Recreational Boat Marinas in San Diego and Mission Bays. In-water Hull Cleaning Study, Ambient Concentrations Study, and Tidal Influence Study. California Regional Water Quality Control Board, San Diego Region.

RWQCB, 2005. Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay, Resolution No. R9-2005-0019 Basin Plan Amendment andTechnical Report, February 9, 2005.

Sheng, Y.P., 1990. Evolution of a Three-Dimensional Curvilinear-Grid Hydrodynamic Model for Estuaries, Lakes and Coastal Waters: CH3D, In: Spaulding, M.L. (ed.), Estuarine and Coastal Modeling, ASCE, pp. 40-49.

Valkirs, A.O. 2003a. Personal communication with Aldis Valkirs. Space and Naval Systems Center (SPAWAR). San Diego, CA. June 2003.

Wang, P.F., D.B. Chadwick, C. Johnson, and J. Grovhoug. 2006. Modeling Copper and Biocide Concentrations from Hull Paint Leachate in San Diego Bay. Technical Report 1935. SSC San Diego, CA.

Wang, P.F., and J.L. Martin, 1991. "Temperature and Conductivity Modeling for the Buffalo River", Journal of Great Lakes Research, 17(4):495-503.

Wang, P.F. 1992. "Review of Equations of Conservation in Curvilinear Coordinates", Journal of Engineering Mechanics, ASCE, Vol.118, No.11, 2265-2281.

Wang, P.F., and S.C. McCutcheon, 1993. "Note on Estuary-River Models Using Boundary-Fitted Coordinates", Journal of Hydraulic Engineering, ASCE. Vol.119, N0.10, pp1170-1175.

Wang, P.F., T. Mill, J. Martin, and T. Wool, 1997. "Fate and Transport of Metam Spill in the Sacramento River", Journal of Environmental Engineering, ASCE, Vol. 123, 704-712.

Wang, P.F., and K.E. Richter, 1999. A Hydrodynamic Modeling Study Using CH3D for Sinclair Inlet, Draft Report, Space and Naval Warfare Systems Center, San Diego.

Wang P.F., R.T. Cheng, K. Richter; E.S. Gross; D. Sutton; and J.W. Gartner 1998. "Modeling tidal hydrodynamics of San Diego Bay, California", Journal of the American Water Research Association, Vol 34, No.5, pp.1123-1140.

APPENDIX B: MARINE MAMMAL PROGRAM FECAL AND TOTAL COLIFORM DATA

Appendix B. Fecal and Total Coliform Bacteria Concentrations MPN/100 ml Collected by the MMP for EP and RA, 2010-2012.

Existing Marine Mammal Pens at SSC (EP) Fecal Coliforms 2010-2012													
stationID	Year	Month	Date	Parameter	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Geomean	Maximum
SSC	2010	1	1/15/10	FecalColiforms	0	10	0	63	158	20	20	33.11	158
SSC	2010	2	2/15/10	FecalColiforms	20	10	63	.	.	.	.		63
SSC	2010	3	3/15/10	FecalColiforms	97	20	0	0	10	.	.	26.87	97
SSC	2010	4	4/15/10	FecalColiforms	51	20	20	0	0	.	.	27.32	51
SSC	2010	5	5/15/10	FecalColiforms	0	2	31	.	.	.	.		31
SSC	2010	6	6/15/10	FecalColiforms	10	10	0	185	.	.	.		185
SSC	2010	7	7/15/10	FecalColiforms	121	52	0	41	.	.	.		121
SSC	2010	8	8/15/10	FecalColiforms	0	0	10	20	.	.	.		20
SSC	2010	9	9/15/10	FecalColiforms	0	10	0	10	.	.	.		10
SSC	2010	10	10/15/10	FecalColiforms	6	10	10	30	41	.	.	14.91	41
SSC	2010	11	11/15/10	FecalColiforms	20	216	20	20	41	.	.	37.16	216
SSC	2010	12	12/15/10	FecalColiforms	313	30	134	20	.	.	.		313
SSC	2011	1	1/15/11	FecalColiforms	98	20	10	135	30	86	.	43.55	135
SSC	2011	2	2/15/11	FecalColiforms	213	.	.	.	.	.	.		213
SSC	2011	3	3/15/11	FecalColiforms	30	201	75	20	97	.	.	61.47	201
SSC	2011	4	4/15/11	FecalColiforms	30	31	31	20	.	.	.		31
SSC	2011	5	5/15/11	FecalColiforms	331	30	0	10	0	.	.	46.31	331
SSC	2011	6	6/15/11	FecalColiforms	62	10	.	.	.	.	.		62
SSC	2011	7	7/15/11	FecalColiforms	132	30	52	.	.	.	.		132
SSC	2011	8	8/15/11	FecalColiforms	10	0	3	31	84	.	.	16.72	84
SSC	2011	9	9/15/11	FecalColiforms	2	98	16	20	.	.	.		98
SSC	2011	10	10/15/11	FecalColiforms	52	6	63	31	41	.	.	30.17	63
SSC	2011	11	11/15/11	FecalColiforms	41	10	.	.	.	.	.		41
SSC	2011	12	12/15/11	FecalColiforms	173	95	30	.	.	.	.		173
SSC	2012	1	1/15/12	FecalColiforms	187	20	0	20	0	.	.	42.13	187
SSC	2012	2	2/15/12	FecalColiforms	30	10	10	.	.	.	.		30
SSC	2012	3	3/15/12	FecalColiforms	0	10	63	.	.	.	.		63
SSC	2012	4	4/15/12	FecalColiforms	0	10	.	.	.	.	.		10
SSC	2012	5	5/15/12	FecalColiforms	41	.	.	.	.	.	.		41
SSC	2012	6	6/15/12	FecalColiforms	111	0	4	.	.	.	.		111
SSC	2012	8	8/15/12	FecalColiforms	110	10	0	.	.	.	.		110
SSC	2012	9	9/15/12	FecalColiforms	41	120	31	.	.	.	.		120
SSC	2012	10	10/15/12	FecalColiforms	41	.	.	.	.	.	.		41
SSC	2012	11	11/15/12	FecalColiforms	52	.	.	.	.	.	.		52
Notes: **Red** identifies exceedance of REC-1 Standard Objective Levels for Fecal Coliforms (MPN/100 ml)													
										Average Geomean =		34.52	

Marine Mammal Relocatin Area at NMAWC (RA)-Fecal Coliforms 2010-2012													
stationID	Year	Month	Date	Parameter	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Geomean	Maximum
NTC	2010	1	1/15/10	FecalColiforms	1	10	0	420	74	1223	41	49.98	1223
NTC	2010	2	2/15/10	FecalColiforms	0	0	0	.	.	.	.		0
NTC	2010	3	3/15/10	FecalColiforms	20	41	20	0	20	.	.	23.93	41
NTC	2010	4	4/15/10	FecalColiforms	52	20	663	31	10	.	.	46.34	663
NTC	2010	5	5/15/10	FecalColiforms	10	0	10	.	.	.	.		10
NTC	2010	6	6/15/10	FecalColiforms	10	10	20	10	.	.	.		20
NTC	2010	7	7/15/10	FecalColiforms	31	0	10	0	.	.	.		31
NTC	2010	8	8/15/10	FecalColiforms	10	0	20	10	.	.	.		20
NTC	2010	9	9/15/10	FecalColiforms	10	0	31	0	.	.	.		31
NTC	2010	10	10/15/10	FecalColiforms	39	5794	20	2	39	.	.	51.22	5794
NTC	2010	11	11/15/10	FecalColiforms	10	41	10	9804	86	.	.	80.86	9804
NTC	2010	12	12/15/10	FecalColiforms	10	10	160	10	.	.	.		160
NTC	2011	1	1/15/11	FecalColiforms	146	0	0	52	0	10	.	42.34	146
NTC	2011	2	2/15/11	FecalColiforms	10	.	.	.	.	.	.		10
NTC	2011	3	3/15/11	FecalColiforms	0	10	20	41	86	.	.	28.98	86
NTC	2011	4	4/15/11	FecalColiforms	10	0	0	0	.	.	.		10
NTC	2011	5	5/15/11	FecalColiforms	20	74	10	0	20	.	.	23.33	74
NTC	2011	6	6/15/11	FecalColiforms	0	0	.	.	.	.	.		0
NTC	2011	7	7/15/11	FecalColiforms	20	0	0	.	.	.	.		20
NTC	2011	8	8/15/11	FecalColiforms	31	0	1	20	0	.	.	8.53	31
NTC	2011	9	9/15/11	FecalColiforms	61	41	4	10	.	.	.		61
NTC	2011	10	10/15/11	FecalColiforms	20	14	0	31	20	.	.	20.41	31
NTC	2011	11	11/15/11	FecalColiforms	10	0	.	.	.	.	.		10
NTC	2011	12	12/15/11	FecalColiforms	0	168	0	.	.	.	.		168
NTC	2012	1	1/15/12	FecalColiforms	0	0	0	10	10	.	.	10.00	10
NTC	2012	2	2/15/12	FecalColiforms	31	10	10	.	.	.	.		31
NTC	2012	3	3/15/12	FecalColiforms	75	31	109	.	.	.	.		109
NTC	2012	4	4/15/12	FecalColiforms	0	0	.	.	.	.	.		0
NTC	2012	5	5/15/12	FecalColiforms	10	.	.	.	.	.	.		10
NTC	2012	6	6/15/12	FecalColiforms	0	0	3	.	.	.	.		3
NTC	2012	8	8/15/12	FecalColiforms	0	0	10	.	.	.	.		10
NTC	2012	9	9/15/12	FecalColiforms	0	10	10	.	.	.	.		10
NTC	2012	10	10/15/12	FecalColiforms	0	.	.	.	.	.	.		0
NTC	2012	11	11/15/12	FecalColiforms	10	.	.	.	.	.	.		10
Notes: **Red** identifies exceedance of REC-1 Standard Objective Levels for Fecal Coliforms (MPN/100 ml)													
										Average Geomean =		35.08	

Marine Mammal Existing Pens at SSC (EP) - Total Coliforms 2010-2012													
stationID	Year	Month	Date	Parameter	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Maximum	Average
SSC	2010	1	1/15/2010	total_Coliforms	20	75	0	233	573	583	31	583	216.43
SSC	2010	2	2/15/2010	total_Coliforms	75	1	75	.	.	.	.	75	50.33
SSC	2010	3	3/15/2010	total_Coliforms	121	31	75	0	75	.	.	121	60.40
SSC	2010	4	4/15/2010	total_Coliforms	110	63	160	0	0	.	.	160	66.60
SSC	2010	5	5/15/2010	total_Coliforms	20	2	31	.	.	.	.	31	17.67
SSC	2010	6	6/15/2010	total_Coliforms	10	41	20	860	.	.	.	860	232.75
SSC	2010	7	7/15/2010	total_Coliforms	246	132	0	96	.	.	.	246	118.50
SSC	2010	8	8/15/2010	total_Coliforms	10	41	20	31	.	.	.	41	25.50
SSC	2010	9	9/15/2010	total_Coliforms	156	20	0	20	.	.	.	156	49.00
SSC	2010	10	10/15/2010	total_Coliforms	12	175	86	253	63	.	.	253	117.80
SSC	2010	11	11/15/2010	total_Coliforms	246	299	61	183	108	.	.	299	179.40
SSC	2010	12	12/15/2010	total_Coliforms	1210	41	279	86	.	.	.	1210	404.00
SSC	2011	1	1/15/2011	total_Coliforms	259	41	20	135	52	110	.	259	102.83
SSC	2011	2	2/15/2011	total_Coliforms	243	.	.	.	.	.	.	243	243.00
SSC	2011	3	3/15/2011	total_Coliforms	41	216	86	231	402	.	.	402	195.20
SSC	2011	4	4/15/2011	total_Coliforms	52	41	31	307	.	.	.	307	107.75
SSC	2011	5	5/15/2011	total_Coliforms	384	160	0	20	0	.	.	384	112.80
SSC	2011	6	6/15/2011	total_Coliforms	84	52	.	.	.	.	.	84	68.00
SSC	2011	7	7/15/2011	total_Coliforms	226	109	109	.	.	.	.	226	148.00
SSC	2011	8	8/15/2011	total_Coliforms	20	31	9	86	199	.	.	199	69.00
SSC	2011	9	9/15/2011	total_Coliforms	11	148	20	20	.	.	.	148	49.75
SSC	2011	10	10/15/2011	total_Coliforms	86	11	134	75	52	.	.	134	71.60
SSC	2011	11	11/15/2011	total_Coliforms	52	20	.	.	.	.	.	52	36.00
SSC	2011	12	12/15/2011	total_Coliforms	216	602	63	.	.	.	.	602	293.67
SSC	2012	1	1/15/2012	total_Coliforms	216	20	0	63	0	.	.	216	59.80
SSC	2012	2	2/15/2012	total_Coliforms	41	20	41	.	.	.	.	41	34.00
SSC	2012	3	3/15/2012	total_Coliforms	20	20	241	.	.	.	.	241	93.67
SSC	2012	4	4/15/2012	total_Coliforms	0	10	.	.	.	.	.	10	5.00
SSC	2012	5	5/15/2012	total_Coliforms	169	.	.	.	.	.	.	169	169.00
SSC	2012	6	6/15/2012	total_Coliforms	142	10	10	.	.	.	.	142	54.00
SSC	2012	8	8/15/2012	total_Coliforms	369	10	41	.	.	.	.	369	140.00
SSC	2012	9	9/15/2012	total_Coliforms	97	145	41	.	.	.	.	145	94.33
SSC	2012	10	10/15/2012	total_Coliforms	145	.	.	.	.	.	.	145	145.00
SSC	2012	11	11/15/2012	total_Coliforms	63	.	.	.	.	.	.	63	63.00
Notes: **Red** identifies exceedance of REC-1 Standard Objective Levels for Total Coliforms (MPN/100 ml)													
										Monthly Average =			114.52

Marine Mammal Relocation Area at NMAWC (RA) - Total Coliforms 2010-2012													
stationID	Year	Month	Date	Parameter	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Maximum	Average
NTC	2010	1	1/15/2010	total_Coliforms	31	437	10	3275	4106	7556	175	7556	2227.14
NTC	2010	2	2/15/2010	total_Coliforms	41	1	0	.	.	.	.	41	14.00
NTC	2010	3	3/15/2010	total_Coliforms	98	586	504	41	31	.	.	586	252.00
NTC	2010	4	4/15/2010	total_Coliforms	1281	52	6488	256	50	.	.	6488	1625.40
NTC	2010	5	5/15/2010	total_Coliforms	20	1	52	.	.	.	.	52	24.33
NTC	2010	6	6/15/2010	total_Coliforms	63	135	20	110	.	.	.	135	82.00
NTC	2010	7	7/15/2010	total_Coliforms	435	31	63	31	.	.	.	435	140.00
NTC	2010	8	8/15/2010	total_Coliforms	74	31	41	10	.	.	.	74	39.00
NTC	2010	9	9/15/2010	total_Coliforms	121	20	86	20	.	.	.	121	61.75
NTC	2010	10	10/15/2010	total_Coliforms	50	24196	41	2225	1223	.	.	24196	5547.00
NTC	2010	11	11/15/2010	total_Coliforms	435	63	10	24196	1172	.	.	24196	5175.20
NTC	2010	12	12/15/2010	total_Coliforms	63	10	839	189	.	.	.	839	275.25
NTC	2011	1	1/15/2011	total_Coliforms	3282	0	0	259	0	6	.	3282	591.17
NTC	2011	2	2/15/2011	total_Coliforms	20	.	.	.	.	.	.	20	20.00
NTC	2011	3	3/15/2011	total_Coliforms	31	31	86	1250	86	.	.	1250	296.80
NTC	2011	4	4/15/2011	total_Coliforms	52	109	20	0	.	.	.	109	45.25
NTC	2011	5	5/15/2011	total_Coliforms	41	332	52	0	84	.	.	332	101.80
NTC	2011	6	6/15/2011	total_Coliforms	0	20	.	.	.	.	.	20	10.00
NTC	2011	7	7/15/2011	total_Coliforms	410	97	41	.	.	.	.	410	182.67
NTC	2011	8	8/15/2011	total_Coliforms	146	160	2	109	0	.	.	160	83.40
NTC	2011	9	9/15/2011	total_Coliforms	1120	134	18	41	.	.	.	1120	328.25
NTC	2011	10	10/15/2011	total_Coliforms	10	12	31	63	41	.	.	63	31.40
NTC	2011	11	11/15/2011	total_Coliforms	185	31	.	.	.	.	.	185	108.00
NTC	2011	12	12/15/2011	total_Coliforms	0	4352	148	.	.	.	.	4352	1500.00
NTC	2012	1	1/15/2012	total_Coliforms	0	20	10	74	20	.	.	74	24.80
NTC	2012	2	2/15/2012	total_Coliforms	75	52	327	.	.	.	.	327	151.33
NTC	2012	3	3/15/2012	total_Coliforms	110	122	2909	.	.	.	.	2909	1047.00
NTC	2012	4	4/15/2012	total_Coliforms	98	52	.	.	.	.	.	98	75.00
NTC	2012	5	5/15/2012	total_Coliforms	20	.	.	.	.	.	.	20	20.00
NTC	2012	6	6/15/2012	total_Coliforms	40	75	38	.	.	.	.	75	51.00
NTC	2012	8	8/15/2012	total_Coliforms	0	20	74	.	.	.	.	74	31.33
NTC	2012	9	9/15/2012	total_Coliforms	10	30	20	.	.	.	.	30	20.00
NTC	2012	10	10/15/2012	total_Coliforms	109	.	.	.	.	.	.	109	109.00
NTC	2012	11	11/15/2012	total_Coliforms	323	.	.	.	.	.	.	323	323.00
Notes: **Red** identifies exceedance of REC-1 Standard Objective Levels for Total Coliforms (MPN/100 ml) Green identifies cases where not more than 20% of samples exceeded 1000 MPN/100 ml.													
										Monthly Average =			606.30

APPENDIX C: CALSCIENCE ANALYTICAL REPORT

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-01-0179

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Tierra Data Inc.

Client Project Name: Navy Fuel Pier Bac-T

Attention: Brent Mardian
10110 W. Lilac Road
Escondido, CA 92026-5309

Approved for release on 01/10/2013 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: Navy Fuel Pier Bac-T
Work Order Number: 13-01-0179

1 Client Sample Data 3
1.1 SM9221B -TC Total Coliforms (Aqueous) 3
1.2 SM9221B/E - FC Fecal Coliforms (Aqueous) 5

2 Glossary of Terms and Qualifiers 7

3 Chain of Custody/Sample Receipt Form 8

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.		Date Received:	01/04/13
10110 W. Lilac Road		Work Order No:	13-01-0179
Escondido, CA 92026-5309		Preparation:	N/A
		Method:	SM9221B

Project: Navy Fuel Pier Bac-T

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-1	**13-01-0179-1-A**	**01/04/13 11:22**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-2	**13-01-0179-2-A**	**01/04/13 11:26**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-1	**13-01-0179-3-A**	**01/04/13 11:42**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-2	**13-01-0179-4-A**	**01/04/13 11:47**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-2 DUP	**13-01-0179-5-A**	**01/04/13 11:47**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-3	**13-01-0179-6-A**	**01/04/13 11:52**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.		Date Received:	01/04/13
10110 W. Lilac Road		Work Order No:	13-01-0179
Escondido, CA 92026-5309		Preparation:	N/A
		Method:	SM9221B

Project: Navy Fuel Pier Bac-T

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-4	**13-01-0179-7-A**	**01/04/13 11:56**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-5	**13-01-0179-8-A**	**01/04/13 12:09**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-6	**13-01-0179-9-A**	**01/04/13 12:06**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-3	**13-01-0179-10-A**	**01/04/13 11:29**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
Method Blank	**099-15-102-120**	**N/A**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104TCB02**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.
10110 W. Lilac Road
Escondido, CA 92026-5309

Date Received: 01/04/13
Work Order No: 13-01-0179
Preparation: N/A
Method: SM9221B/E

Project: Navy Fuel Pier Bac-T

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-1	**13-01-0179-1-A**	**01/04/13 11:22**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-2	**13-01-0179-2-A**	**01/04/13 11:26**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-1	**13-01-0179-3-A**	**01/04/13 11:42**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-2	**13-01-0179-4-A**	**01/04/13 11:47**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-2 DUP	**13-01-0179-5-A**	**01/04/13 11:47**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-3	**13-01-0179-6-A**	**01/04/13 11:52**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.
10110 W. Lilac Road
Escondido, CA 92026-5309

Date Received: 01/04/13
Work Order No: 13-01-0179
Preparation: N/A
Method: SM9221B/E

Project: Navy Fuel Pier Bac-T

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-4	**13-01-0179-7-A**	**01/04/13 11:56**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-5	**13-01-0179-8-A**	**01/04/13 12:09**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP-6	**13-01-0179-9-A**	**01/04/13 12:06**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA-3	**13-01-0179-10-A**	**01/04/13 11:29**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
Method Blank	**099-15-106-115**	**N/A**	**Aqueous**	**N/A**	**01/04/13 15:46**	**C0104FCB02**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 13-01-0179

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
MPN - Most Probable Number

Return to Contents

Calscience Environmental Laboratories, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1427
Tel: (714) 895-5494 Fax: (714) 894-7501

MICROBIOLOGICAL CHAIN-OF-CUSTODY RECORD

WO # / LAB USE ONLY **13-01-0179**

Date 1/4/13

Page 1 of 1

LABORATORY CLIENT: Tierra Data

ADDRESS: 10110 W. Lilac

TEL: (805) 705-5632 FAX: E-MAIL:

DRINKING WATER COMPLIANCE: ☒ NO ☐ YES (Complete next line)

DRINKING WATER NOTIFICATION CONTACT INFO*
NAME: _____ TEL: _____

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☒ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL INSTRUCTIONS:

CLIENT PROJECT NAME / NUMBER: Navy fuel Pier Bact

PROJECT CONTACT: Brent Mgrdian

SAMPLER(S): (PRINT and SIGNATURE) Chris Clark

P.O. NO.:

QUOTE NO.:

TEMPERATURE UPON RECEIPT: ____.____ °C

REQUESTED ANALYSES

Holding time (Volume) requirements
DW – 30 hrs (100±2.5 ml)
GW – 8 hrs (100 ml)
RW – 6 hrs (100 ml)
SW – 8 hrs (100 ml)
WW – 6 hrs (100 ml)
Heterotrophic Plate Count – 8 hrs
(Samples must be filled to the 100 ml mark only, headspace must be present in container.)

LAB USE ONLY	SAMPLE ID	SAMPLE LOCATION	SAMPLING DATE	SAMPLING TIME	MATRIX** TYPE	NO. OF CONT.	Total	Fecal	Comments
1	RA-1	Relocation	1/4/13	1122	SW	1	X	X	
2	RA-2	↓		1126			X	X	
3	EP-1	Existing Pen		1142			X	X	
4	EP-2			1147			X	X	
5	EP-2 DUP			1147			X	X	
6	EP-3			1152			X	X	
7	EP-4			1156			X	X	
8	EP-5			1209			X	X	
9	EP-6	↓	↓	1206			X	X	
10	P.A-3	Relocation	1/4/13	1129	↓	↓	X	X	

*Notify for: Total or Fecal coliform/E. Coli positive result(s). Negative invalidated Coliform sample result(s).

**Matrix Type: DW (Drinking Water), GW(Ground Water), RW (Recreational Water), SW (Surface Water), WW (Waste Water)

SAMPLE REQUIREMENTS:
Sample(s) must be taken in an appropriate sized sterile container.
Care must be taken not to contaminate the sample(s) or container(s) during storage and sampling.
Sample(s) must be filled to the 100 ml mark only. Sample(s) that are filled with more or less than 100 ml are not acceptable.
Drinking water sample allowable limits is 100 ± 2.5 ml.
Sample container must have headspace.
If sample water is known or suspected to be chlorinated, the sample container must contain adequate sodium thiosulfate to remove the chlorine.
Sample(s) must arrive at the laboratory at <10°C unless they have not had time to cool down.

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 1/4/13	Time: 12:30
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date: 1/4/13	Time: 14:57
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

06/18/12 Revision

Return to Contents

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-01-0179

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Tierra Data

DATE: 01/04/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 2.4 °C - 0.2 °C (CF) = 2.2 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter **Initial:** bL

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A **Initial:** bL

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present **Initial:** bL

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐1PBna ☐500PB ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☑100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** bL

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** PS

Preservative: **h:** HCL **n:** HNO_3 **na_2:**$Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** _____

Return to Contents

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 13-01-1292

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Tierra Data Inc.

Client Project Name: US Navy Fuel Pier

Attention: Brent Mardian
10110 W. Lilac Road
Escondido, CA 92026-5309

Approved for release on 01/31/2013 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: US Navy Fuel Pier
Work Order Number: 13-01-1292

1 Client Sample Data 3
1.1 SM9221B -TC Total Coliforms (Aqueous) 3
1.2 SM9221B/E - FC Fecal Coliforms (Aqueous) 5

2 Glossary of Terms and Qualifiers 7

3 Chain of Custody/Sample Receipt Form 8

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.		Date Received:	01/23/13
10110 W. Lilac Road		Work Order No:	13-01-1292
Escondido, CA 92026-5309		Preparation:	N/A
		Method:	SM9221B

Project: US Navy Fuel Pier

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA1	**13-01-1292-1-A**	**01/23/13 13:07**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA2	**13-01-1292-2-A**	**01/23/13 13:15**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	140		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA3	**13-01-1292-3-A**	**01/23/13 13:18**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA3 DUP	**13-01-1292-4-A**	**01/23/13 13:18**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP1	**13-01-1292-5-A**	**01/23/13 13:25**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP2	**13-01-1292-6-A**	**01/23/13 13:30**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.		Date Received:	01/23/13
10110 W. Lilac Road		Work Order No:	13-01-1292
Escondido, CA 92026-5309		Preparation:	N/A
		Method:	SM9221B

Project: US Navy Fuel Pier

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP3	**13-01-1292-7-A**	**01/23/13 13:37**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP4	**13-01-1292-8-A**	**01/23/13 13:40**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP5	**13-01-1292-9-A**	**01/23/13 13:45**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP6	**13-01-1292-10-A**	**01/23/13 13:55**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
Method Blank	**099-15-102-126**	**N/A**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123TCB01**

Parameter	Result	Qual	Units
Total Coliform	<18		MPN/100ml

Return to Contents

7440 Lincoln Way, Garden Grove, CA 92841-1427 · TEL:(714) 895-5494 · FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.
10110 W. Lilac Road
Escondido, CA 92026-5309

Date Received: 01/23/13
Work Order No: 13-01-1292
Preparation: N/A
Method: SM9221B/E

Project: US Navy Fuel Pier

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA1	**13-01-1292-1-A**	**01/23/13 13:07**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA2	**13-01-1292-2-A**	**01/23/13 13:15**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	68		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA3	**13-01-1292-3-A**	**01/23/13 13:18**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
RA3 DUP	**13-01-1292-4-A**	**01/23/13 13:18**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP1	**13-01-1292-5-A**	**01/23/13 13:25**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP2	**13-01-1292-6-A**	**01/23/13 13:30**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Return to Contents

7440 Lincoln Way, Garden Grove, CA 92841-1427 · TEL:(714) 895-5494 · FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Tierra Data Inc.		Date Received:	01/23/13
10110 W. Lilac Road		Work Order No:	13-01-1292
Escondido, CA 92026-5309		Preparation:	N/A
		Method:	SM9221B/E

Project: US Navy Fuel Pier

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP3	**13-01-1292-7-A**	**01/23/13 13:37**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP4	**13-01-1292-8-A**	**01/23/13 13:40**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP5	**13-01-1292-9-A**	**01/23/13 13:45**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
EP6	**13-01-1292-10-A**	**01/23/13 13:55**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date/Time Started	QC Batch ID
Method Blank	**099-15-106-119**	**N/A**	**Aqueous**	**N/A**	**01/23/13 19:15**	**C0123FCB01**

Parameter	Result	Qual	Units
Fecal Coliform	<18		MPN/100ml

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

ACCREDITED IN ACCORDANCE WITH nelac

Work Order Number: 13-01-1292

Qualifier	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
MPN - Most Probable Number

Return to Contents

Calscience Environmental Laboratories, Inc.

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
Other CA office locations: Concord and San Luis Obispo
For courier service / sample drop off information,
contact sales@calscience.com or call us.

CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY
13-01-1292

Date 1/23/12
Page 1 of 1

LABORATORY CLIENT: Tierra Data
ADDRESS:
CITY: Escondido STATE: CA ZIP:
TEL: 805 705 5632 E-MAIL: mardian@tierra data.com

CLIENT PROJECT NAME / NUMBER: US. Navy fuel Pier
P.O. NO.:
PROJECT CONTACT: Brent Mardian
SAMPLER(S): (PRINT) Chris Clark

TURNAROUND TIME:
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD

☐ COELT EDF GLOBAL ID LOG CODE

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	☐ TPH(g) ☐ GRO	☐ TPH(d) ☐ DRO	TPH ☐ C6-C36 ☐ C6-C44	TPH ____	BTEX / MTBE ☐ 8260 ☐ ____	VOCs (8260)	Oxygenates (8260)	Prep (5035) ☐ En Core ☐ Terra Core	SVOCs (8270)	Pesticides (8081)	PCBs (8082)	PAHs ☐ 8270 ☐ 8270 SIM	T22 Metals ☐ 6010/747X ☐ 6020/747X	Cr(VI) ☐ 7196 ☐ 7199 ☐ 218.6	Total/Fecal			
1	RA 1	1/23/12	1307	SG	1		X																X			
2	RA 2		1315				X																X			
3	RA 3		1318				X																X			
4	RA 3 Dup		1318				X																X			
5	EP 1		1325				X																X			
6	EP 2		1330				X																X			
7	EP 3		1337				X																X			
8	EP 4		1340				X																X			
9	EP 5		1345				X																X			
10	EP 6		1355				X																X			

Relinquished by: (Signature)	Received by: (Signature/Affiliation) ca	Date: 01123113	Time: 1410
Relinquished by: (Signature)	Received by: (Signature/Affiliation) Danny le ca	Date: 1/23/13	Time: 18:15
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

11/01/12 Revision

Return to Contents

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 13-01-1292

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: TIERRA-DATA DATE: 01/23/13

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen except sediment/tissue)

Temperature 1.8 °C - 0.2 °C (CF) = 1.6 °C ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Initial: _____

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: _____

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: _____

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☐	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☑100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Canister **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** HH

Container: C: Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** WL

Preservative: h: HCL **n:** HNO_3 **na$_2$:**$Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** _____

Return to Contents

Finding of No Significant Impact
on Issuance of an Incidental Harassment Authorization to the U.S. Navy for
Take of Marine Mammals Incidental to a Fuel Pier Replacement Project

National Marine Fisheries Service

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.27 state that the significance of an action should be analyzed both in terms of 'context' and 'intensity'. Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The U.S. Navy has finalized an Environmental Assessment (*Naval Base Point Loma Fuel Pier Replacement and Dredging (P-151/DESC1306) Environmental Assessment*), which we have subsequently adopted. We incorporate that document here by reference. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1. *Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson-Stevens Act and identified in FMPs?*

The fuel pier replacement project is of short-term duration and will involve pile extraction and installation. Installation of steel piles will be accomplished primarily by vibratory pile driver. Certain piles may be finished with an impact pile driver to ensure load-bearing capacity or if difficult substrate conditions are encountered. Pile extraction will be accomplished largely by mechanical means, although some piles may be extracted by vibratory hammer.

Within the action area, EFH has been designated for the Pacific Coast Groundfish, and Coastal Pelagic Species Fishery Management Plans. In addition, a Habitat Area of Particular Concern for the Pacific Coast Groundfish FMP (seagrass) occurs within the project area. The Navy engaged in an EFH consultation with NMFS' Southwest Regional Office, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and was provided conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. The effects of the Navy's action will primarily be from increased levels of sound resulting from pile installation, which will temporarily reduce the quality of water column EFH; these effects are temporary and will result in no long-term impacts to the environment. Pile installation and dredging would also locally increase turbidity and the temporary removal of habitat that provides shelter and/or prey resources in the immediate project vicinity. The water column may experience increased sedimentation and turbidity during operational periods. While some disruption to fish and fish habitat is unavoidable as a result of the activity, these impacts will be temporary in duration, with a minimal and localized zone of influence; additionally, the project involves demolition and construction at the site of an existing structure, so much of the work will occur in areas that are previously shaded and do not support aquatic vegetation. Areas of disruption are expected to recover to pre-disruption levels within a single growing season. Most species may already avoid this area due to the large amount of vessel traffic through the area and dredging activities; however, any behavioral avoidance by fish of the disturbed area

would still leave significantly large areas of fish and marine mammal foraging habitat in San Diego Bay and the nearby vicinity.

The above information pertains to the Navy's pile driving activity. The NMFS proposed action, which is the authorization of marine mammal take incidental to the fuel pier replacement project, will result in no damage to ocean and coastal habitats or EFH.

2. *Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?*

The authorization of marine mammal take incidental to the Navy's fuel pier replacement project will not have a substantial impact on biodiversity or ecosystem function. The Navy's fuel pier replacement project may temporarily impact ecosystem function by i) temporarily creating elevated levels of underwater sound, thereby disturbing forage fish; ii) degrading water quality as a result of resuspension of bottom sediments from pile driving and dredging operations; and iii) directly damaging the benthos through pile driving, dredging and anchoring. Bottom disturbance would be temporary over a short-term project period and sediments would settle back in the general vicinity from which they rose, or would be dissipated by the strong tidal currents in the area. The temporary increase in turbidity, as well as direct impact to the benthos, is expected to decrease the light available for marine vegetation and to impact benthic organisms; however, these impacts would be minor and temporary in nature.

3. *Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?*

The proposed action is not expected to result in any impacts related to public health and safety. Construction activities are not likely to release hazardous materials into the environment. Construction crews would follow applicable state and federal laws to ensure a safe working environment. The airborne noise associated with the Navy's proposed action would be no higher than 75 dBA during construction, which is consistent with the City of San Diego construction noise ordinances. The proposed action would not result in significant adverse impacts to health and safety.

4. *Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?*

Endangered or threatened species may occur in the vicinity of the Navy's fuel pier replacement project. The proposed action – NMFS' authorization of incidental marine mammal take – is not expected to have a significant adverse impact on endangered or threatened species. Gray whales belonging to the western North Pacific stock, which is listed as endangered under the Endangered Species Act (ESA) and which had previously been considered geographically isolated from the eastern North Pacific stock, have recently been shown to migrate within the range of ENP whales. However, while it is possible that a gray whale found near San Diego bay could be a WNP whale, the likelihood is extremely low (< 1%). Through consultation with the Navy under section 7 of the ESA, NMFS' Southwest Regional Office determined the likelihood

a WNP gray whale would be adversely affected by the project to be insignificant and discountable. NMFS' Office of Protected Resources concurs with that finding and no incidental take is authorized for WNP gray whales. No other ESA-listed marine mammals may occur in the project area.

5. *Are significant social or economic impacts interrelated with natural or physical environmental effects?*

The proposed action will not have any social or environmental impacts. The impacts resulting from NMFS' authorization of marine mammal take incidental to the Navy's fuel pier replacement project will be limited to, at most, temporary behavioral harassment of small numbers of marine mammals. No social or economic impacts will be associated with this authorization.

6. *Are the effects on the quality of the human environment likely to be highly controversial?*

NMFS' issuance of an incidental harassment authorization (IHA) will not have effects on the human environment that are likely to be highly controversial. There is not substantial debate over the proposed action's size, nature, or effect, nor is there such debate over the underlying action (the Navy's fuel pier replacement project). Due to the limited duration and intensity of the project, and the implementation of appropriate mitigation and monitoring measures, there will not be significant impacts to natural resources in the project area. During the public comment period in the proposed IHA, NMFS only received comments from the Marine Mammal Commission, which did not indicate that any aspects of NMFS' action or its effects on the environment were likely to be highly controversial.

7. *Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?*

Access to Naval Base Point Loma, including the project site, is controlled by the Navy and is restricted to authorized military personnel, civilians, and contractors. Since no public recreational uses occur at the project site, the proposed action would have no direct impact to recreational uses or access in the surrounding community. Traditional resources would not be impacted. The fuel pier replacement project will occur in a shoreline area that already contains multiple built structures, and will not significantly degrade the existing environment. No other unique characteristics of the geographic area are known. NMFS' issuance of an IHA would not result in substantial impacts to any such places.

8. *Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

The effects of the Navy's proposed action are primarily related to the input of sound, resulting from pile driving, into the environment. Pile driving is a relatively well-studied action, and wildlife and the environment in San Diego Bay are relatively well understood. The implementation of mitigation and monitoring measures included in NMFS' IHA will ensure that

no marine mammals are injured or killed, and that impacts to marine mammals are limited to, at most, temporary behavioral harassment. Monitoring of marine mammals that are behaviorally harassed, as well as numerous documented accounts of marine mammal behavior before, during, and after behavioral harassment, demonstrates that behavioral harassment of limited duration will not result in any permanent changes to the manner in which marine mammals utilize the vicinity of the Navy's fuel pier replacement project. While NMFS' judgments on impact thresholds are based on somewhat limited data, enough is known for NMFS and the regulated entity (here the Navy) to develop precautionary monitoring and mitigation measures to minimize the potential for significant impacts on biological resources. As such, the effects of NMFS' issuance of an IHA are not highly uncertain, and the action does not involve unique or unknown risks.

9. *Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?*

NMFS' issuance of an IHA is not related to other actions that may have cumulatively significant impacts. NMFS has no other proposed or current actions in the project area. The Navy considered cumulative impacts from its proposed action and other past, present, and reasonably foreseeable projects and found that they were not significant.

10. *Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?*

No structures eligible for the NRHP will be affected by the proposed action. No submerged archaeological sites are expected to occur in the project area. Traditional resources would not be impacted. Cultural resources were not carried forward for detailed analysis in the Navy's EA, as potential impacts were considered to be negligible or non-existent.

11. *Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?*

Neither the proposed action nor the underlying Navy action is expected to result in the spread of any nonindigenous species. Sufficient precautionary measures will be taken by the Navy to ensure that no introduction or spread of such species occurs.

12. *Is the proposed action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

The Navy is planning other projects in San Diego Bay that involve pile driving, including subsequent years of construction for the fuel pier replacement. However, subsequent applications for incidental take authorizations will be independently analyzed on the basis of the best scientific information available. A finding of no significant impact for the fuel pier replacement project, and for NMFS' issuance of an IHA, may inform the environmental review for future projects but would not establish a precedent or represent a decision in principle about a future consideration.

13. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for the protection of the environment?

The proposed action – NMFS' issuance of an IHA – is conducted in conformance with the MMPA. NMFS has made all appropriate determinations under other applicable statutes, and NMFS' action will not violate any laws or requirements. The Navy's fuel pier replacement project requires issuance of multiple permits. The Navy is pursuing all required permits; each agency will review the Navy action as appropriate to ensure that no federal, state, or local laws or requirements will be violated.

14. Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

NMFS' issuance of an IHA is specifically designed to reduce the effects of the Navy's fuel pier replacement project to the least practicable impact to marine mammals, through the inclusion of appropriate mitigation and monitoring measures. NMFS has no other proposed or current actions in the project area, and the issuance of an IHA does not result in significant cumulative impacts when considered with all other past, present, and reasonably foreseeable projects. Similarly, despite temporal overlap and the potential for limited spatial overlap, the cumulative effects of the Navy's fuel pier replacement project and other past, present, and reasonably foreseeable projects are not considered cumulatively significant. The Cumulative Impacts section of Environmental Assessment (EA) addresses this topic in greater detail. Implementation of the proposed action, in conjunction with other past, present, and reasonably foreseeable future actions, would not be expected to result in significant cumulative impacts to the environment. As such, the proposed action will not result in cumulative adverse effects that could have a substantial effect on species in the action area.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting EA prepared for the Navy's fuel pier replacement project and application for an IHA, it is hereby determined that NMFS' issuance of an IHA will not significantly impact the quality of the human environment as described above and in the supporting documents. The proposed IHA was published in the *Federal Register*, and all public comments were considered and addressed. These public comments presented no new information that affects this determination. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an environmental impact statement for this action is not necessary.

JUL 0 8 2013

Donna S. Wieting, Director
Office of Protected Resources

Date