DRAFT
ENVIRONMENTAL ASSESSMENT

FOR

LOWER NEWPORT BAY MAINTENANCE DREDGING PROJECT
Orange County, California

PREPARED BY

U.S. ARMY CORPS OF ENGINEERS
SOUTH PACIFIC DIVISION
LOS ANGELES DISTRICT

March 2022

FINDING OF NO SIGNIFICANT IMPACT

LOWER NEWPORT BAY MAINTENANCE DREDGING PROJECT
ORANGE COUNTY, CALIFORNIA

The U.S. Army Corps of Engineers, Los Angeles District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The Final Environmental Assessment (EA) dated March 2022, for the Lower Newport Bay Maintenance Dredging Project addresses the need to remove shoals in the Lower Newport Bay federal navigation channels (Harbor Island Reach, Lido Island Reach, Yacht Anchorage, Newport Channel, and a small portion of the Entrance Channel) in Orange County, California. The removal of shoals will provide continued safe and reliable commercial and recreational navigation in Lower Newport Bay.

The Final EA, incorporated herein by reference, evaluates three alternatives: The No Action Alternative, under which no maintenance dredging or dredged material disposal would occur; Alternative 1 (Proposed Action), in which dredging would occur using either a clamshell and scow or barge-mounted excavator and scow with nearshore placement of all dredged materials from the Entrance Channel in the Newport Beach Nearshore Placement Site and ocean disposal for all dredged materials suitable for ocean disposal from the remaining reaches at the LA-3 Ocean Dredged Material Disposal Site (ODMDS) and confined aquatic disposal (CAD) placement for unsuitable materials, if available; and Alternative 2 in which dredging would occur with ocean disposal for all suitable materials (including the Entrance Channel) and CAD placement for unsuitable materials, if available. Alternative 1 is the recommended plan and includes:

- Mechanically dredge (clamshell and scow or barge-mounted excavator and scow) approximately 7,000 cubic yards of material from the Entrance Channel with nearshore placement at Newport Beach Nearshore Placement Site.

- Mechanically dredge (clamshell and scow or barge-mounted excavator and scow) approximately 803,000 cubic yards from the federal channels in Lower Newport Bay with ocean disposal at the LA-3 ODMDS of approximately 793,000 cubic yards; approximately 10,000 cubic yards of this material would be used as an interim cap for the proposed CAD site to isolate the unsuitable material from the bay waters, if available. If the CAD site is not available in time to be used for this purpose, this material would be disposed of at the LA-3 ODMDS.

- Mechanically dredge (clamshell and scow or barge-mounted excavator and scow) approximately 98,000 cubic yards of sediments determined to be unsuitable for ocean disposal from the federal channels in Lower Newport Bay with placement at the CAD site, if available. If the CAD site is not available in time to be used for this purpose, this material would not be dredged and would remain in place.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the recommended plan are listed in Table S-1:

Table S-1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics	☒	☐	☐
Air quality	☒	☐	☐
Aquatic resources/wetlands	☒	☐	☐
Invasive species	☒	☐	☐
Fish and wildlife habitat	☐	☒	☐
Threatened/Endangered species/critical habitat	☐	☐	☒
Historic properties	☐	☒	☐
Other cultural resources	☐	☐	☒
Floodplains	☐	☐	☒
Hazardous, toxic & radioactive waste	☐	☐	☒
Hydrology	☒	☐	☐
Land use	☐	☐	☒
Navigation	☐	☒	☐
Noise levels	☐	☒	☐
Public infrastructure	☐	☐	☒
Socio-economics	☐	☐	☒
Environmental justice	☐	☐	☒
Soils	☐	☐	☒
Tribal trust resources	☐	☐	☒
Water quality	☐	☒	☐
Climate change	☐	☐	☒

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan, which include the environmental commitments listed in Section 6.2 of the EA.

Public review of the draft EA and FONSI was completed on April __, 2022. Comments were received from the _____. All comments submitted during the public review period were responded to in the Final EA. Copies of all comments received and responses to those comments can be found in Appendix G.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the Corps determined that the recommended plan would have no effect on federally listed species or their designated critical habitat.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the Corps determined that the recommended plan would not have an adverse effect on the Lower Newport Bay harbor and no other historic properties would be affected by the undertaking. SHPO concurred with the Corps' finding on _____, 2022. Correspondence can be found in Appendix C. In the event that previously unknown cultural resources are discovered during the project, all ground disturbing activities shall cease until the Corps has met the requirement of 36 CFR 800.13 regarding post-review discoveries.

Corps' regulations at 33 CFR 323.2(d)(3) exclude from the coverage of Clean Water Act (CWA) Section 404 the movement of sediments caused by navigational dredging, with the following provision: “(3) Section 404 authorization is not required for the following: ... (ii) incidental movement of dredged material occurring during normal dredging operations, defined as dredging for navigation in navigable waters of the United States, as that term is defined in 33 CFR part 329, with proper authorization from the Congress or the Corps pursuant to 33 CFR part 322; however, this exception is not applicable to dredging activities in wetlands, as that term is defined at Section 328.3 of this Chapter.” The recommended plan proposes to dredge material using a clamshell dredge or barge-mounted excavator. Dredged material discharged into navigable waters associated with clamshell and dredge-mounted excavator dredging is considered to be "incidental movement of dredged material occurring during normal dredging operations" and are excluded from coverage of the CWA section 404.

The discharge of dredged material at the Newport Beach Nearshore Placement Site and at the CAD site are subject to compliance with section 404 of the CWA. The discharges of dredged or fill material associated with the recommended plan have been found to be compliant with the section 404(b)(1) Guidelines (40 CFR 230). The 404(b)(1) Guidelines evaluation can be found in Appendix E of the EA.

A water quality certification pursuant to section 401 of the CWA has been obtained from the Santa Ana Regional Water Quality Control Board on ____, 2022. All conditions of the final water quality certification shall be implemented in order to minimize adverse impacts to water quality. A copy of the water quality certification can be found in Appendix G.

In accordance with the Coastal Zone Management Act, a negative determination has been prepared by the Corps and the California Coastal Commission concurred on April __, 2022. A copy of the concurrence can be found in Appendix G.

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act, the Corps prepared an Essential Fish Habitat (EFH) assessment for the proposed project. The Corps concluded that this project would not result in a substantial, adverse impact to EFH. The Corps used the NEPA process to initiate EFH consultation with the National Marine Fisheries Service (NMFS). On March __, 2022, NMFS completed its analysis and provided EFH conservation recommendations. Results of consultation with the NMFS can be found in Appendix G, including the Corps’ response to the NMFS conservation recommendations dated March __, 2022.

The United States Environmental Protection Agency (USEPA) provided conditional approval of the recommended plan’s use of LA-3 ODMDS on _____, 2022. The LA-3 ODMDS site conditions are included as environmental commitments in Section 6.2 of the EA. disposal Therefore, the Corps is in compliance with section 103 of the Marine Protection, Research, and Sanctuaries Act. The USEPA’s conditional approval is included in Appendix G.

The general conformity regulations do not apply to maintenance dredging and disposal where no new depths are required, and disposal will be at an approved disposal site per 40 CFR 93.153(c)(2)(ix). Therefore, a conformity determination is not required for the proposed project. The proposed project meets the requirements of Section 176(c) of the Clean Air Act.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed as documented in Section 6 and Table 1 of the EA.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on the Final EA, the reviews by other Federal, State and local agencies, and the review by my staff, it is my determination that the recommended plan would not have a significant effect on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

DATE

Julie A. Balten
Colonel, EN
Commander

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

SECTION 1 - INTRODUCTION

1.1 PROPOSED PROJECT

1.1.1 Location. The proposed project is located in Orange County, California (Figure 1) and consists of maintenance dredging the portions of the federal navigation channels in Lower Newport Bay (Figure 2).

1.1.2 Proposed Action. The Los Angeles District of the U.S. Army Corps of Engineers (Corps), as part of its Operations and Maintenance Program, is proposing to perform maintenance dredging in the Harbor Island Reach, Lido Island Reach, Yacht Anchorage, Newport Channel, and a small portion of the Entrance Channel in Lower Newport Bay to re-establish authorized channel depths.

Material would be dredged from the outer portion of the Entrance Channel to maintain authorized navigational depths (Figure 3) of -20 feet (ft) Mean Lower Low Water (MLLW0. An overdepth allowance of 2 ft is included in the dredge prism to account for inaccuracies in the dredging methodology. A minimum channel depth of -20 ft MLLW is required. Dredging is allowed to a depth of -22 ft MLLW to ensure that all areas meet the minimum depth. Estimated dredge volumes include the entire overdepth allowance, although removal of the entire overdepth volume is not expected. This maintenance dredging would remove approximately 7,000 cubic yards from this area. These dredged materials are expected to be put in the Newport Beach Nearshore Placement Site (Figure 4). Sediments in this area were not dredged in 2021 along with the rest of the Entrance Channel due to adverse wave conditions that prevented the dredge from operating. This portion of the project is a minor cleanup from the dredging accomplished in 2021.

Material would be dredged from within the Harbor Island Reach, Lido Island Reach, Yacht Anchorage, and Newport Channel (Figure 2) to maintain authorized navigational depths as defined in Table 1. An overdepth allowance of 2 ft is included in the dredge prism to account for inaccuracies in the dredging methodology. Dredging is allowed to overdepth to ensure that all areas meet the minimum depth. Estimated dredge volumes include the entire overdepth allowance, although removal of the entire overdepth volume is not expected. This maintenance dredging would remove approximately 901,000 cubic yards of material from the federal channels. Of this volume, approximately 793,000 cubic yards (Figure 2, blue areas) are expected to be disposed at the U.S. Environmental Protection Agency (USEPA)-designated LA-3 Ocean Dredged Material Disposal Site (ODMDS). Approximately 10,000 cubic yards of this material would be used as an interim cap for a confined aquatic disposal (CAD) site (described in Section 3.1.4 and shown in Figure 2) to isolate the unsuitable material from the bay waters, if available. If the CAD site is not available in time to be used for this purpose, this material would also be disposed at the LA-3 ODMDS. The remaining 98,000 cubic yards (Figure 2, yellow areas) were determined to be unsuitable for ocean disposal. Those sediments would be placed within the CAD site, if available. If the CAD site is not available in time to be used for this purpose, this material would not be dredged and would remain in place. Beneficial reuse options are not available for these sediments. The sediments are too fine to be suitable for beach or nearshore placement

Table 1 Estimated Dredge Volumes and Authorized Channel Depths

		Suitable for ocean disposal		Unsuitable for ocean disposal		Nearshore compatible		
Federal Channel	**Design Depth (feet MLLW)**	**Estimated Volume to Design Depth (KCY)**	**2-Foot Overdepth Volume (KCY)**	**Estimated Volume to Design Depth (KCY)**	**2-Foot Overdepth Volume (KCY)**	**Estimated Volume to Design Depth (KCY)**	**2-Foot Overdepth Volume (KCY)**	**Total Volume (KCY)**
Entrance Channel	-20					2	5	7
Lido Isle Reach	-20	106	77	19	17			219
Harbor Island Reach	-20	25	28					53
Balboa Reach	-20							0
Turning Basin	-19			5	17			22
Yacht Anchorage	-15	229	140					369
Newport Channel	-15	136	62	22	18			238
	TOTAL	496	307	46	52			
	TOTAL		**803**		**98**		**7**	**908**
			10 KCY for interim cap					

1.1.3 Project Authorization. The project was authorized by the Rivers and Harbors Acts of 1937 (Public Law 75-392) and 1945 (P.L. 79-14).

1.1.4 Timing of Project. Construction is scheduled to begin in October 2022. Dredging would be conducted six days per week as detailed in Section 4.4.2. Construction activities associated with dredging in Lower Newport Bay would take approximately 52 weeks for a clamshell dredge and approximately 102 weeks for a barge-mounted excavator. Dredging activities shall be restricted to the hours of:
Monday thru Friday 7:00 a.m. to 6:30 p.m.
Saturday 8:00 a.m. to 6:00 p.m.
Sunday/Holidays Not permitted.

1.1.5 Staging Areas. The area normally used for staging is located in the Upper Newport Bay just north of the Pacific Coast Highway Bridge at Dover Drive (Figure 2). This area would be used for the proposed project for landside equipment, trailers, and vehicles. Vessels would be provided anchorages/berths by the city of Newport Beach.

1.1.6 Construction Equipment. Dredging would be performed by clamshell dredge or a barge-mounted excavator. Dredged material transport and disposal would be in a split-hull scow. Auxiliary equipment in the form of a tugboat for moving the dredge about on site and for towing the scow to the placement/disposal site and a crew boat for the transfer of crew and supplies would also be used during dredging.

Clamshell Dredge. This method consists of a derrick mounted on a barge outfitted with a clamshell bucket. Dredged materials are placed on a scow for transport to the placement/ disposal site. This method can remove an average of approximately 3,000 cubic yards per day.

Excavator. This method consists of a barge-mounted excavator outfitted with a backhoe. Dredged materials are placed on a scow for transport to the placement/disposal site. This method can remove an average of approximately 1,500 cubic yards per day.

1.2 ENVIRONMENTAL ASSESSMENT PROCESS

This Environmental Assessment (EA) addresses potential impacts associated with implementing its discretionary actions as they relate to Corps policies, and those of other entities.

The Corps is the lead agency for this project. This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508); and the Corps' NEPA regulations (33 CFR Part 230).

The EA process follows a series of prescribed steps. The draft EA is being circulated for a 30-day public review period; during which interested parties can submit written comments concerning the project. A Final EA will be prepared that incorporates and responds to comments received during that public review period. The Final EA will be furnished to all who commented on the draft EA and will be made available to others upon request.

If it is determined the project will have a significant effect on the human environment, an environmental impact statement (EIS) must be prepared. If it is determined the project will not have a significant impact on the human environment, the final step is preparing a Finding of No Significant Impact (FONSI). This is a concise summary of the decision made by the Corps from among the alternatives presented in the Final EA.

1.3 RELATIONSHIP TO ENVIRONMENTAL PROTECTION STATUTES, PLANS, AND OTHER REQUIREMENTS

The Corps is required to comply with all pertinent federal and state policies; project (recommended plan) compliance is summarized in Table 2.

Table 2. Summary of Environmental Compliance

Statute and Regulation	Status of Compliance
National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321, et seq., as amended; Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR 1500-1508*); and Corps NEPA implementing regulations at 33 CFR Part 230 and associated guidance	The draft EA is submitted for public review and responses to comments on the draft EA will be incorporated into the Final EA. Upon review of the Final EA, the District Engineer will issue a FONSI or require preparation of an EIS and a ROD will be issued for this project.
Clean Air Act, 42 U.S.C. 7401, et. seq. 40 CFR 93.152, et seq.	A permit to construct will be obtained by contractor, if necessary. The general conformity regulations do not apply to maintenance dredging and disposal where no new depths are required, and disposal will be at an approved disposal site per 40 CFR 93.153(c)(2)(ix). Therefore, a conformity determination is not required for the proposed project.
Section 404 of the Clean Water Act (CWA), 33 U.S.C. 1344; Corps regulations at 33 CFR Part 336, and USEPA's 404(b)(1) Guidelines at 40 CFR Part 230	A section 404(b)(1) analysis (Appendix E) was prepared for the recommended placement of dredged or fill material at the Newport Beach Nearshore Placement site and the CAD site, waters of the U.S. The discharges were found to be compliant with the 404(b)(1) Guidelines. The disposal of dredge material to LA-3 ODMDS is not subject to CWA section 404 and the 404(b)(1) Guidelines because LA-3 ODMDS is not within a water of the U.S. Pursuant to Corps regulations at 33 CFR 323.2(d)(3), the dredging activities associated with this project are excluded from coverage under CWA section 404 and the 404(b)(1) Guidelines.
Section 401 of the Clean Water Act, 33 U.S.C. 1341	The Santa Ana California Regional Water Quality Control Board is expected to issue a Section 401 Water Quality Certification for discharges of dredged material to the nearshore disposal site.
Rivers and Harbors Act of 1899, 33 U.S.C. 403	Not applicable.
Section 103 of the Marine Protection, Research and Sanctuaries Act, 33 U.S.C. 1413	The USEPA has concurred with use of LA-3 ODMDS for disposal of material dredged from the proposed project (Appendix B).
Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1855(b) and implementing regulations at 50 CFR 600.905-930	In its EFH assessment, the Corps determined that the recommended plan may adversely affect EFH in the project area but would not result in substantial adverse impacts to EFH. The Corps is using the NEPA process to initiate consultation with NMFS.
Coastal Zone Management Act of 1972, 16 U.S.C. 1456, et seq., and National Oceanic and Atmospheric Administration Federal Consistency Regulation With Approved Coastal Management Program Regulations at 15 CFR Part 930	The Draft EA serves as a Negative Determination for concurrence by the California Coastal Commission.
Section 7 of the Endangered Species Act of 1973, 16 U.S.C. 1536, and implementing regulations at 50 CFR Part 402	The Corps has determined that consultation pursuant to section 7 of the Endangered Species Act is not required as the project would have no effect on any listed species or their designated critical habitat.
Fish and Wildlife Coordination Act, 16 U.S.C. 661-666c	Not applicable
Migratory Bird Treaty Act, 16 U.S.C. 703-711	The Corps has determined that the project is in compliance with the Migratory Bird

Marine Mammal Protection Act, 16 U.S.C. 1361 et seq	Treaty Act. The Corps has determined that no species of marine mammal would be impacted.
Section 106 of the National Historic Preservation Act, 54 U.S.C. 306108 and its implementing regulations at 36 CFR Part 800 Executive Order 11593: Protection and Enhancement of the Cultural Environment, May 13, 1971 Executive Order 12898, Environmental Justice (EJ) in Minority and Low-Income Populations and Executive Order 14008	Consultation is being conducted with the SHPO and affected tribes. Results will be included in the Final EA. Not applicable The affected area does not constitute an EJ community. Therefore, the federal action would not result in disproportionately high and adverse impacts to minority or low-income populations.

SECTION 2 – HISTORY, PURPOSE, AND NEED

2.1 BACKGROUND

The project area encompasses approximately 150 acres in Lower Newport Bay. Lower Newport Bay is a small craft harbor located in Orange County, California. Lower Newport Bay represents a significant recreational resource offering a wide range of boating recreation ranging from single person rowboats to large sailing and motor vessels capable of trans-ocean navigation. Local beachfront communities support water-use recreational services.

Dredging of the Lower Newport Bay has been conducted under the Corps' Operations and Maintenance program since 1937. The last federal maintenance dredging in Lower Newport Bay, excluding the Entrance Channel and Main Channel Balboa Reach, occurred from May 2012 to February 2013. Approximately 490,350 cubic yards of sediment dredged from the federal channels were disposed of at the LA-3 ODMDS. An additional 112,196 cy of unsuitable sediments were placed in the Middle Harbor Slip 1 Fill Site at the Port of Long Beach (POLB). Dredging in the Entrance Channel and Main Channel Balboa Reach were completed in 2021. Approximately 129,000 cubic yards of material was removed from both the Entrance Channel and Main Channel Balboa Beach. Material from Balboa Reach was placed at the USEPA-designated LA-3 ODMDS. Material from the Entrance Channel was placed nearshore off Balboa Beach for beneficial reuse.

2.2 PROJECT PURPOSE AND NEED

The purpose of the proposed project is to perform maintenance dredging to provide for the need of continued, safe navigation for recreational and commercial boats in Lower Newport Bay.

2.3 NEPA SCOPE OF ANALYSIS

The Corps' scope of analysis encompasses the Entrance Channel, Harbor Island Reach, Lido Island Reach, Yacht Anchorage, Newport Channel federal navigation channels, Newport Beach Nearshore Placement Site, the LA-3 ODMDS, and the proposed CAD site.

SECTION 3 – PROJECT ALTERNATIVES

3.1 ALTERNATIVES

The Corps formulated a set of alternative plans for maintenance dredging in Lower Newport Bay. Alternatives considered but eliminated from further consideration are discussed in section 3.1.1. The no action alternative is discussed in section 3.1.2 and the two action alternatives are discussed in section 3.1.3. More information concerning the dredge material disposal sites is provided in section 3.1.4. Environmental commitments incorporated in the project description to avoid or minimize adverse impacts are listed in the applicable resource in Section 4.

3.1.1 Alternatives Considered but Eliminated from Further Consideration. Because navigational safety requires the entire channel to be at its authorized depth, alternative dredge footprints are generally not considered. However, in this case small areas were removed from the dredge footprint for a variety of environmental concerns. These were areas that would not impact navigational safety in the Entrance Channel, Harbor Island Reach, Lido Island Reach, Yacht Anchorage, and Newport Channel if left undredged. Alternative disposal/placement sites are not available within the time frame required for this project. Potential disposal alternatives are limited to harbor fills associated with port development (e.g., Middle Harbor Slip 1 Fill Site at the POLB used in 2013). There are no harbor fill projects available at this time. Therefore, no other alternative disposal sites are analyzed in detail.

3.1.2 No Action Alternative. The No Action Alternative is no maintenance dredging within Lower Newport Bay. The No Action Alternative would allow the channels to shoal, which would eventually result in unsafe or impossible navigation conditions.

3.1.3 Action Alternatives Considered

Alternative 1: Proposed Project (Recommended Plan). Material would be dredged from the Entrance Channel and the remaining federal navigation channels with the exception of the Main Channel Balboa Reach that was dredged in 2021 to maintain authorized navigational depths (Table 1, Figure 2). An overdepth allowance of 2 ft is included in the dredge prism to account for inaccuracies in the dredging methodology. Estimated dredge volumes include the entire overdepth allowance, although removal of the entire overdepth volume is not expected. The proposed project includes 1) maintenance dredging approximately 7,000 cubic yards (cy) from the Entrance Channel and placing the dredged material at the Newport Beach Nearshore Placement Site; and 2) maintenance dredging approximately 893,000 cy from the federal channels and transporting approximately 793,000 cy of suitable material for disposal at the LA-3 ODMDS (Figure 1), 98,000 cy of unsuitable material to the CAD site for placement (Figure 2), if available, and placement of an interim cap on the CAD site, if available, with approximately 10,000 cy of suitable material from the federal channels. If the CAD Site is unavailable to be used for this purpose, the sediments found to be unsuitable for ocean disposal, would not be dredged and would remain in place; the 10,000 cy of suitable material proposed for an interim cap would be disposed at the LA-3 ODMDS. Dredging activities for Alternative 1 would take approximately 52 weeks with a clamshell and 102 weeks with an excavator.

Alternative 2: Ocean Disposal. This alternative includes 1) maintenance dredging approximately 7,000 cy from the Entrance Channel and disposing the dredged material at the LA-3 ODMDS; and 2) maintenance dredging approximately 893,000 cy from the federal channels and transporting approximately 793,000 cy of suitable material for disposal at the LA-3 ODMDS (Figure 1), 98,000 cy of unsuitable material to the CAD site, if available, for placement (Figure 2), and placement of an interim cap on the CAD site, if available, with approximately 10,000 cy of suitable material from the federal channels. If the CAD Site is unavailable to be used for this purpose, the sediments found to be unsuitable for ocean disposal, would not be dredged and would remain in place; the 10,000 cy of suitable material proposed for an interim cap would be disposed of at the LA-3 ODMDS. Dredging activities under Alternative 2 would take approximately 52 weeks with a clamshell and 102 weeks with an excavator.

3.1.4 Placement/Disposal Sites

Newport Beach Nearshore Placement Site: The proposed Newport Beach Nearshore Placement Site is located southeast of Balboa Pier (Figure 4). Coordinates for the Newport Beach Nearshore Placement Site are provided on Figure 4. This placement site is a subset of the site approved for use by the city of Newport Beach in placing suitable dredged sediments from Lower Newport Bay by the Corps' Regional General Permit 54 (RGP 54). RGP 54 was issued to the city of Newport Beach to cover individual dredging actions by resident dock owners for recreational vessels only. The site protects and nourishes Newport Beach and placement here is considered a beneficial reuse of dredged materials. The location of the site is shown on Figure 4. The site is approximately 35 acres in size with depths ranging from -25 ft MLLW to -40 ft MLLW.

LA-3 ODMDS: LA-3 ODMDS is located on the continental slope of Newport Submarine Canyon at a depth of about 490 meters (m; 1,600 feet [ft]), approximately 8 kilometers (km; 4.3 nautical miles [nmi]) southwest of the entrance of Newport Harbor (Figure 1). The circular boundary of the permanently designated LA-3 ODMDS is centered at 33º31'00" N and 117º53'30" W and has a 915-meter (3,000-foot) radius. However, disposal vessels must be fully within the smaller 1,000 ft (305 m) radius Surface Disposal Zone (SDZ), centered at the same coordinates, when discharging dredged material. LA-3 ODMDS was officially designated as a permanent disposal site by the USEPA Region IX in 2005.

CAD Site: The city of Newport Beach is proposing to construct a CAD site in Lower Newport Bay (Figure 2). The estimated size of the CAD site would be approximately 590 ft by 590 ft at the assumed top of the CAD site footprint and would require dredging of approximately 282,400 cy of sediment from the existing mudline to the 1-foot overdredge limit (-46 ft MLLW). Sediments would be placed at the nearshore placement site under contract by the city of Newport Beach.

SECTION 4 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the existing condition of the physical and human environment within the scope of analysis and provides an assessment of potential impacts associated with each alternative.

Affected environment at the LA-3 ODMDS were addressed as part of the site designation process (USEPA/USACE, 2005). Those affected environment descriptions are incorporated herein by reference.

4.1 Oceanography and Water Quality

4.1.1 Affected Environment. The tides in southern California are mixed, semi-diurnal tides with two unequal high tides and low tides roughly per day. Tidal variations are caused by the passage of two harmonic tidal waves; one with a period of 12.5 hours and one with a period of 25 hours. This causes a difference in height between successive high and low waters. The result is two high waters and two low waters each day, consisting of a higher high water and a lower high water, and a higher low water and a lower low water. Respectively referred to as HHW, LHW, HLW, and LLW.

A greater than average tidal range between HHW and LLW occurs when the moon, sun, and earth are aligned with each other to create a large gravitational effect. This spring tide corresponds to the appearance of a new or full moon. Neap tides, which occur during the first and third quarters of the moon, have a narrower range between HHW and LLW. In this situation, the moon, sun, and earth are perpendicular to each other, thereby reducing the gravitational effects on water levels.

The mean tidal range for the project site is 5.4 feet at the harbor entrance. The extreme range is about 9.5 feet. Tidal conditions are slightly muted in the interior bay, but not sufficiently to cause significant effects.

Water quality is typically characterized by salinity, pH, temperature, clarity, and dissolved oxygen (DO). Table 3 characterizes the overall water quality parameters for the project site.

Table 3 Water Quality Characteristics

Parameters	**Project Site**
Salinity (ppt)	32.9 to 34.4
Surface Temperature (F)	55.8 to 62.5
pH	7.4 to 7.6
Clarity (ft.)	13 to 15
D.O. (mg/l)	8.9

Lower Newport Bay is on the 303(d) list of water quality limited waterbodies for chlordane, copper, DDT, indicator bacteria, nutrients, PCB's, pesticides, chlorpyrifos, and sediment toxicity. Total Maximum Daily Loads (TMDLs) have been implemented by the Santa Ana Regional Water Quality Control Board for nutrients, fecal coliform, organochlorine compounds,

and siltation. USEPA established a "technical" TMDL for copper, lead, and zinc. The Santa Ana Regional Water Quality Control Board is currently evaluating whether Lower Newport Bay is meeting water quality standards for copper, lead, and zinc. Conditions at the CAD Site are the same as for the federal channels.

Sediments to be dredged were tested in 2018 for ocean disposal and nearshore placement in accordance with the applicable USEPA-USACE testing manuals (Green Book for ocean disposal and the Inland Testing Manual for nearshore placement). Sediment test results were determined to be still valid by the USACE in consultation with the Southern California Dredged Material Management Team (SC-DMMT) until January 2023. Retesting is not required unless dredging cannot be initiated by January 2023.

The nearshore placement site is representative of the open ocean but is adjacent to area beaches and is relatively shallow. The LA-3 ODMDS is representative of open ocean conditions located outside the direct influence of runoff from land.

4.1.2 Environmental Consequences.

Criteria

An impact to Oceanography and Water Quality will be considered significant if: the project results in the release of toxic substances that would be deleterious to human, fish, or plant life; or discharges create a pollution, contamination, or nuisance.

Environmental Commitments.

The following measures would be implemented under both Alternatives 1 and 2:

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

The Contractor shall prepare and implement a Water Quality Monitoring Plan at the dredge and Newport Beach Nearshore Placement Site. The Water Quality Monitoring Plan will include weekly monitoring at the dredge, CAD Site, and Newport Beach Nearshore Placement Sites for pH, temperature, dissolved oxygen, and turbidity for the first week. Dredging will be controlled to keep water quality impacts to acceptable levels, controls will include modifying the dredging operation and the use of silt curtains (if feasible). Light transmittance will be limited to a 40% maximum decrease between the control station and a reference station located 300 ft downstream. Dissolved oxygen will be maintained at a minimum of 5 mg/l. Increases in turbidity that result from controllable water quality factors shall comply with the following: where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases shall not exceed 20 percent; where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU; and where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent. The pH of bay or estuary waters shall not be raised above 8.6 or depressed below 7.0 as a result of water quality factors; ambient pH levels shall not be changed by more than 0.2 unit.

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

Conditions of the Santa Ana RWQCB 401 Water Quality Certification will be adhered to.

4.1.2.1 Alternative 1

Dredge Impacts.

Water quality would be temporarily affected during the dredging process. Decreases in DO; increases in nutrients, suspended and dissolved contaminants, and turbidity could occur. Turbidity from dredging has the potential to decrease DO in the immediate vicinity (within about 100 feet) of the dredge. The dredging would occur in Lower Newport Bay, a coastal lagoon over six kilometers (four miles) in length. Dredging impacts would be the same for all action alternatives. Water quality impacts are expected to be confined to the immediate vicinity of the dredge and are not expected to significantly impact Lower Newport Bay. Sediments were tested and determined to contain less than trace amounts of contaminants. A release of toxic substances would not be expected to occur during dredging. There would be no discharge creating a pollution, contamination, or nuisance.

Accidents resulting in spills of fuel, lubricants, or hydraulic fluid from the equipment used during dredging could occur during the project. These indirect impacts would depend on the amount and type of material spilled as well as specific conditions (i.e., currents, wind, temperature, waves, tidal stage, and vessel activity). In such cases, to minimize the impacts from any such spills, per the Environmental Commitments in Section 6.2, spills would be cleaned up immediately. Standard dredge specifications include a Spill Prevention and Cleanup Plan that includes measures to prevent spills, employee training, the staging of materials on site to clean up accidental spills, and a list of appropriate agencies to call in the event of a spill. The contractor responsible for operating the dredging equipment would be responsible for ensuring that such measures are adhered to. Any floating debris would be removed from the water and disposed of properly. A larger spill that could have significant impacts on water quality is not expected to occur, even under reasonable worst-case conditions.

Water quality monitoring would be performed during dredging for all action alternatives. Weekly monitoring would be done for salinity, pH, temperature, dissolved oxygen, turbidity and light transmissivity. Monthly water samples would be taken and analyzed for total dissolved solids and TRPH. Dredging will be controlled to keep water quality impacts to within acceptable levels for clarity and dissolved oxygen. Controls include modifying the dredging operation and the use of silt curtains (if warranted). Controls include modifications to the operations of the clamshell such as slowing any or all of the processes to reduce chances of excess sediment entering the water column. These controls would be dependent on the nature and observed cause of any turbidity or other water quality problems observed. Turbidity would be limited to a 40% decrease in light transmittance, DO would be maintained at a minimum of 5 mg/l. Increases in turbidity that result from controllable water quality factors shall comply with the following: where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases shall not exceed 20 percent; where natural turbidity is between 50 and 100 NTU, increases shall

not exceed 10 NTU; and where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent. The pH of bay or estuary waters shall not be raised above 8.6 or depressed below 7.0 as a result of water quality factors; ambient pH levels shall not be changed by more than 0.2 unit.

Disposal /Placement Impacts.

Nearshore Placement (Entrance Channel Sediments)

Water quality would be temporarily affected during the placement process. Decreases in DO; increases in nutrients, suspended and dissolved contaminants, and turbidity could occur. Water quality impacts are expected to be confined to the immediate vicinity of the placement site and are not expected to significantly impact the coastal waters off Newport Beach. Sediments proposed for nearshore placement were tested and determined to contain less than trace amounts of contaminants. A release of toxic substances would not be expected to occur during placement, and there would be no discharge creating a pollution, contamination, or nuisance as a result of placement activities. The spill prevention and clean up measures discussed above also pertain to the nearshore placement operations.

Water quality monitoring would be performed during placement at the Newport Beach Nearshore Placement Site. Weekly monitoring would be done for salinity, pH, temperature, dissolved oxygen, turbidity and light transmissivity. Monthly water samples would be taken and analyzed for total dissolved solids and TRPH. Placement will be controlled to keep water quality impacts to within acceptable levels for clarity and DO. Turbidity would be limited to a 40% decrease in light transmittance, DO would be maintained at a minimum of 5 mg/l. Increases in turbidity that result from controllable water quality factors shall comply with the following: where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20 percent; where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU; and where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent. The pH of bay or estuary waters shall not be raised above 8.6 or depressed below 7.0 as a result of water quality factors; ambient pH levels shall not be changed by more than 0.2 unit.

Ocean Disposal

The disposal of dredged material at LA-3 ODMDS would create direct local turbidity impacts during disposal operations. Turbidity plumes would be expected to migrate up to 500 ft down current. As the sediments proposed for ocean disposal have been found to be clean, contaminants would not be introduced or biologically available for consumption. Impacts of ocean disposal of dredge materials on water quality would be similar to impacts discussed in the USEPA authorization of the LA-3 ODMDS. Per the Environmental Commitments in Section 6.2, disposal limitations and control measures specified in the USEPA LA-3 Site Use Conditions would be adhered to during disposal operations. Vessels would be operated in compliance with all applicable regulations related to the prevention of water pollution by fuel, harmful substances, and accidental discharges. For mechanical dredging, the dredged material would be secured during transport, with precautions in place to minimize any risk of spills. The spill prevention

and clean up measures discussed above also pertain to the LA-3 ODMDS ocean disposal operations.

Conclusion: Oceanographic and water quality impacts of Alternative 1 are considered insignificant. It would not result in the release of toxic substances that would be deleterious to human, fish, or plant life, or discharges that create a pollution, contamination, or nuisance.

4.1.2.2 Alternative 2

Dredging and Disposal Impacts.

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature but would occur over a longer time period as all dredged sediments would be disposed of at the site resulting in an increase from 793,000 to 800,000 cy of sediments.

Conclusion: Oceanographic and water quality impacts of Alternative 2 are considered insignificant. Alternative 2 would not results in the release of toxic substances that would be deleterious to human, fish, or plant life, or discharges that create a pollution, contamination, or nuisance.

4.1.2.3 No action alternative. Under the No Action alternative, no dredging or disposal construction impacts would occur to oceanography or water quality would occur. The federal channels would continue to fill with sediments eventually resulting in impacts to recreational and commercial boating and the creation of unsafe conditions that could lead to boat groundings.

Conclusion: Oceanographic and water quality impacts of the no action alternative would be considered insignificant.

4.2 Marine Resources

4.2.1 Affected Environment. Marine life in the dredging areas is expected to consist of sandy benthic communities. This habitat is dominated by polychaetous annelids. Annelids are numerically dominant with crustaceans, molluscs, minor phyla, and echinoderms following in decreasing order of abundance. Benthic marine organisms are also important food sources for fish, crabs, and other benthic organisms. The federal channels in Lower Newport Bay are not known to harbor the invasive alga *Caulerpa taxifolia* or other species of the genus.

In April 2021, federal, state, and local agencies were notified that an invasive algae species, *Caulerpa prolifera*, was discovered in Newport Bay, California. As a result, Lower Newport Bay is currently considered to be an infected system as defined by the *Caulerpa* Control Protocol. As a result, any *Caulerpa* surveys performed in Newport Bay should adhere to the more stringent survey level requirements for an infected system until it has been re-designated as

a “Caulerpa-Free System.” The infected site is located outside federal channels and would not be directly impacted by bottom-disturbing activities associated with the proposed project.

The only marine mammals expected in the dredging area would be California sea lions (*Zalophus caliornianus*) and harbor seals (*Phoca vitulina*). Harbor seals and sea lions are expected to forage in the harbor and rest on the breakwater jetties, and navigational buoys.

Marine resources at the LA-3 ODMDS are discussed in the USEPA authorization of the LA-3 ODMDS and are hereby incorporated by reference (EPA and USACE 2005). Marine resources at the Newport Beach Nearshore Placement Site are typical open coast, sandy bottom habitat. Marine resources at the CAD Site are the same as for the federal channels described above.

Special Aquatic Sites. Eelgrass beds are considered a special aquatic site, vegetated shallows, under 40 CFR Part 230. Eelgrass is also considered to be habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish Fishery Management Plan (FMP). Eelgrass is a highly productive species and is considered to be a "foundation" or habitat forming species. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl, and spawning surfaces for invertebrates and fish. The city of Newport Beach completed surveys in 2016, 2018 (shallow water only), and 2020 of Lower Newport Bay. The 2020 surveys were used to map the extent of eelgrass (*Zostera marina* and *Zostera pacifica*) beds in the bay (see Figure 5). Eelgrass beds, primarily *Zostera pacifica,* were shown to be located in the Entrance Channel to Lower Newport Bay. The Entrance Channel was surveyed twice in 2021. The proposed dredge area is located in an area with no eelgrass. There are no eelgrass beds located within the remaining federal channels.

The area immediately south of the entrance is designated as a State Marine Conservation Area (SMCA). It is the Crystal Cove SMCA. None of the activities would take place within the SMCA and the presence of the jetties will serve to eliminate any indirect impacts to the SMCA from the proposed dredging.

Threatened and endangered species. The only threatened or endangered species which may occur at the project site are the California least tern (*Sternula antillarum browni*) and green sea turtle (*Chelonia mydas*).

The California least tern is present in small numbers from mid-April to mid-September. The California least tern forage throughout the Upper Bay, primarily on surface fishes such as topsmelt and anchovies, occasionally entering the Lower Bay. A nesting colony is located in the Upper Newport Bay Ecological Reserve approximately 3-1/2 miles from the dredging areas. The approximate location of the nest site is shown on Figure 1. The latest year for which monitoring data is available is 2017 (CDFW, 2018). There were approximately 16 pair of California least tern nesting in the upper bay. There were an estimated thirteen fledglings from this site in 2017. In 2016 (CDFW, 2017) the numbers were 20 pair and 2 fledglings.

Green sea turtles data within Newport Bay have recently been provided to the USACE (Chesney, personal communication). Sightings are limited to the following:

- Dead turtle stranded at China Cove in Newport Bay December 2021
- Live sightings in Newport Bay (back bay) in September 2020, May 2021
- Dead turtle stranded in Newport Bay (harbor) 2020
- Live turtle hooked by fisher in Newport Bay (back bay) in 2017

Green turtles are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets (NMFS, undated). Green sea turtles only rarely occur in Newport Bay. If green sea turtle were present more frequently, the high levels of commercial and recreational boat traffic would lead to more sightings than have occurred. The upper bay is a state nature preserve that is closely monitored and used frequently as a teaching lab for local schools. Green sea turtles in this area would have been sighted more often if they occurred there frequently. Due to the depths of the dredging footprint, and the lack of submerged aquatic vegetation needed for foraging, green sea turtles are unlikely to be present in any of the proposed dredge areas. This also applies to the proposed CAD Site. Due to the depths of the nearshore placement area, and the lack of submerged aquatic vegetation needed for foraging, green sea turtles are unlikely to be present in the nearshore placement area.

The LA-3 ODMDS is located several miles offshore and in very deep water. LA-3 is approximately 5-1/4 miles from the entrance to Newport Bay and is approximately 4-3/4 miles from the nearest coast. The depth of the center of the LA-3 site would be approximately 1,600 ft. Chances of green sea turtles occurring at the LA-3 ODMDS is unlikely.

Essential Fish Habitat (EFH). In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) has been conducted for the proposed project. The proposed project occurs within EFH for various federally managed fish species within the Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species FMP. Many of the species federally managed under these plans are known to occur in the area and could be affected by the proposed project. Eelgrass is considered to be a Habitat Area of Particular Concern (HAPC) within the Pacific groundfish FMP as well as an Area of Special Biological Significance (ASBS).

Eelgrass (*Zostera pacifica*) is found in the Entrance Channel. This is a broad leaf species of eelgrass capable of surviving in deeper water, where clarity is good. This allows the species to survive at depth in the Entrance Channel being found in depths of -18 ft to -24 ft MLLW. While eelgrass (*Zostera marina*) is present within the harbor, there is no eelgrass present within proposed dredge areas.

4.2.3 Environmental Consequences

Criteria.

An impact to Marine Resources will be considered significant if: the population of a threatened, endangered, or candidate species is directly affected or its habitat lost or disturbed; if there is a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or ASBS; if the movement or migration of fish is impeded; and/or if there is a substantial loss in the population or habitat of any native fish, wildlife, or

vegetation (a substantial loss is defined as any change in a population which is detectable over natural variability for a period of 5 years or longer).

Environmental Commitments.

The proposed commitments would be implemented as part of Alternatives 1 and 2:

A monitoring and avoidance plan would be prepared, in coordination with the NMFS, to ensure that green sea turtles are not affected including the following measures.

• During dredging, a 100-foot (visually estimated) monitoring zone around the dredge shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal sites.

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

• The visual monitor shall maintain a written log containing all observations of green sea turtles including:

1) Observer name and title;
2) Type of activity (dredging, etc.);
3) Date and time animal first observed (for each observation);
4) Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation;
5)Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle;
6) Nature and duration of equipment shutdown.

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

• The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles.

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

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

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

Anchoring in eelgrass beds shall be prohibited.

Prior to the start of dredging, the Corps would conduct surveys for Caulerpa spp.. Surveys shall be completed not earlier than 90 days prior to the commencement of dredging and not later than 30 days prior to the onset of work. Surveys would be conducted in consultation with the Southern California Caulerpa Action Team (SCCAT) to assure that occurrences of Caulerpa spp. would be identified if present. The Corps would submit survey results in standard format to NMFS/CDFW within 15 days of completion. If Caulerpa spp. is identified during the surveys, the Corps would contact NMFS/CDFW within 24 hours of first noting the occurrence. In the event that Caulerpa spp. is detected, maintenance dredging would be delayed until such time as the infestation has been isolated, treated and the risk of spread from the proposed action eliminated.

Adhere to standard site use conditions for material disposal at the LA-3 ODMDS.

4.2.3.1 Alternative 1

Dredge Impacts.

Temporary increase in turbidity and suspended solids may decrease the amount of DO near the dredge site, thus affecting fish and other marine life within the area. Mobile species are expected to relocate out of the area until dredging activities are finished. Some marine populations, particularly benthic organisms, would be destroyed by dredging, but are expected to recolonize the area once dredging has ceased. Dredging impacts would be the same for all action alternatives. Movement of fish would be temporarily impacted and there would be minor, short-term impacts to benthic populations that are expected to recover fully within one year.

Noise from operations may also impact marine life. The noise associated with dredging activities may disturb fishes, seabirds, and marine mammals. Although data on effects of noise on fishes are limited, the data suggest that fish would be more likely to be startled by sudden staccato noises than by steady noises (i.e., engine noise). Moreover, the noise of the proposed operations would occur against a background area with large amounts of vessel traffic. The sudden staccato noises of the bucket coming into contact with the sediment would likely temporarily deter many organisms from entering the dredging areas, although, not impede the movement or migration of fish species given the size of the dredge template in relation to the surrounding harbor and available area for the fish species to utilize.

The only marine mammals expected to occur in the dredge areas are California sea lions and harbor seals. These species are highly mobile and would be able to avoid the dredge areas. The

noise generated by the dredge is unlikely to impact these species given the noisy background resulting from existing commercial, recreational, and safety vessels. Dredging activities would not adversely affect marine mammals. Furthermore, the dredge areas would represent a small percentage of available resources, and project activities are considered short-term and localized. No marine mammal haul out sites, breeding area, or seabird rookery are located within the immediate vicinity of the dredging areas. Dredging would not cause a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or ASBS.

The USACE has determined that the proposed project would not affect any listed species or their critical habitat (refer to discussion below for details).

Nearshore Placement (Entrance Channel Sediments)

Temporary increase in turbidity and suspended solids may decrease the amount of DO near the Newport Beach Nearshore Placement Site, thus affecting fish and other marine life within the area. Mobile species are expected to relocate out of the area until placement activities are finished. Some marine populations, particularly benthic organisms, would be destroyed by placement activities, but are expected to recolonize the area once placement has ceased. Marine mammals may occur at the Newport Beach Nearshore Placement Site (although due to the short durations of disposal events this is considered to be improbable), however, they are likely to deviate their migratory course just enough to avoid ships at the site so that disposal activities would not affect marine mammals or cause a net loss in value of a sensitive biological habitat.

Ocean Disposal

The material discharged at LA-3 ODMDS would remain in suspension longer than at the dredge sites and some may drift as far as 1,000 yards from the disposal site. As discussed above, there may be some minor turbidity impacts from disposal on planktonic organisms, benthic organisms, and fishes. These impacts would be localized to the area and are expected to be adverse but not significant. The proposed disposal at LA-3 ODMDS would not cause a substantial loss in population or habitat of any native fish or wildlife. Marine mammals may occur at the LA-3 ODMDS (although due to the short durations of disposal events this is considered to be improbable), however, they are likely to deviate their migratory course just enough to avoid ships at the site so that disposal activities would not affect marine mammals or cause a net loss in value of a sensitive biological habitat.

CAD Site Placement

The CAD Site occurs in the Yacht Anchorage portion of the federal channel. Placement there would affect the same resources as are located in the federal channels.

Threatened and endangered species.

The Corps has determined that the proposed project will have no effect on any federal listed threatened or endangered species.

The dredging project is not expected to start until October 2022. California least terns would have migrated south and would not be present during initial dredging operations. During dredging that would occur during the nesting season (April 15 – September 15) California least terns may be present in the harbor. Dredge impacts would be confined to a relatively small area in the immediate vicinity of the dredge. Loss of this area is considered negligible compared to the remaining areas that will still be available for foraging. Dredge areas are also outside the primary foraging areas for the nest sites located in the upper bay. Dredge areas are approximately 3-1/2 miles from the nearest nest site.

California least terns may be present in the harbor during placement/disposal operations during the nesting season (April 15 – September 15). The Newport Beach Nearshore Placement Site is outside the primary foraging areas for the nest sites located in the upper bay; approximately 3-3/4 miles from the nearest nest site. There would also be no effect at the LA-3 ODMDS due to distance from the nearest nest site and the un-impacted areas still available for foraging. The proposed maintenance activities would not affect California least terns in Lower Newport Bay.

The proposed project uses mechanical dredging only with no hydraulic dredging. Mechanical dredging has minimal risk to green sea turtle impact due to its sporadic and easily avoidable nature. Transportation of dredged material in towed barges entails low risk of collisions with green sea turtles due to the slow speed of the towed array (6 knots loaded, 8 knots empty) and the relatively small size of the vessels involved and their restriction to the deeper navigational channels within the bay. The USACE has included monitoring and avoidance measures that would ensure a 'no effect' determination for green sea turtle during the proposed maintenance dredging in Lower Newport Bay. With the inclusion of the monitoring and avoidance measures, the proposed maintenance activities would not affect green sea turtles in Lower Newport Bay.

Essential Fish Habitat (EFH).

Resident fishes would likely avoid disturbance areas. Lethal effects of suspended sediment on fishes are not anticipated. It is likely that local tidal and current mixing, and flushing would dilute suspended sediment levels below lethal or even sublethal concentrations. Turbidity would likely be localized in time and space. As construction occurs, it is expected that bottom and pelagic fishes will temporarily relocate to avoid potential water quality impacts (i.e., turbidity plumes). It is expected that recolonization will occur quickly in the dredged areas by local fishes temporarily displaced due to construction activities.

The Corps has determined that the proposed action would have an adverse effect on essential fish habitat, but not a substantial adverse effect.

Caulerpa spp.

In accordance with the Environmental Commitments above, pre-construction surveys for *Caulerpa spp.* would be conducted at the dredge and nearshore placement sites (surveys of the CAD site would be conducted separately by the city of Newport Beach). *Caulerpa spp.* surveys performed in Newport Bay should adhere to the more stringent survey level requirements for an infected system until it has been re-designated as a "Caulerpa-Free System". Proposed survey

requirements are under discussion with the relevant federal and a proposed survey methodology is included in Appendix G. In the event that *Caulerpa spp.* is detected, maintenance dredging in the immediate area would be delayed until such time as the infestation has been isolated, treated and the risk of spread from the proposed action eliminated.

Conclusion: With the inclusion of Environmental Commitments cited above, marine resource impacts resulting from Alternative 1 would be less than significant. Alternative 1 would not, as discussed above, result in the loss or destruction of endangered, threatened, or candidate species or their habit; a net loss in value of a sensitive biological habitat, including eelgrass beds; the impediment of fish migration; or a substantial loss in the population or habitat of any native fish, wildlife, or vegetation.

4.2.3.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature but would occur over a longer time period as all dredged sediments would be disposed of the site resulting in an increase from 793,000 to 800,000 cy of sediments. The increased volume would result in in an increased deposition at the site and increased impacts to the benthic habitat at the site. Increased impacts would not result in a substantial loss in the population or habitat of any native fish, wildlife, or vegetation.

Essential Fish Habitat (EFH)

The evaluation for EFH would be identical to those identified and discussed above for Alternative 1.

Conclusion: Like for Alternative 1, the Alternative 2's impacts to marine resource are considered insignificant with the inclusion of the Environmental Commitments cited above to minimize impacts to marine resources.

4.2.3.3 No action alternative.

Construction impacts would not occur.

Conclusion: Marine resource impacts of the no action alternatives would be insignificant.

4.3 Air Quality and Greenhouse Gases

4.3.1 Affected Environment. Newport Bay is located on the Pacific Ocean about 45 miles south of Los Angeles. Newport Bay is located in the southwestern coastal area of the South Coast Air Basin (SCAB). The climate of the SCAB is classified as Mediterranean, characterized

by cool, dry summers and mild, wet winters. The project area is protected from the worst of the SCAB's air pollution problems by the daily sea breeze that brings in clean air and blows pollutants inland, but recirculation of polluted air and incomplete ventilation of the SCAB can cause smog alerts even in coastal communities. With on-going emissions reduction programs, air quality has improved markedly within the last two decades.

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

The USEPA, California Air Resources Board (CARB), and local air districts classify an area as attainment, unclassified, or nonattainment depending on whether the monitored ambient air quality data show compliance, lack of data, or noncompliance with the ambient air quality standards, respectively. The national ambient air quality standards (NAAQS) relevant to the project are provided in Table 4. Table 4 summarizes the federal attainment status of criteria pollutants in the SCAB based on the NAAQS.

The Clean Air Act requires the USEPA to set NAAQS for six common air pollutants (also known as "criteria air pollutants". The criteria pollutants are ozone (O3), carbon monoxide (CO), suspended particulate matter (PM), sulfur dioxide (SO2), nitrogen dioxide (NO2), and lead (Pb). PM emissions are regulated in two size classes: Particulates up to 10 microns in diameter (PM10) and particulates up to 2.5 microns in diameter (PM2.5). O3 is unique among the criteria pollutants because it is not directly emitted from No Action and action alternative sources. Rather, O3 is a secondary pollutant, formed from precursor pollutants volatile organic compounds (VOC) and nitrogen oxides (NOX) which photochemically react to form O3 in the presence of sunlight. As a result, unlike inert pollutants, O3 levels usually peak several hours after the precursors are emitted and many miles downwind of the source.

General Conformity. General conformity requires that all federal actions conform to the State Implementation Plan (SIP) as approved or promulgated by the USEPA by determining that the action is either exempt from the General Conformity Rule requirements or subject to a formal conformity determination. In accordance with 40 CFR § 93.153(c)(2)(ix), Corps has determined the proposed agency action is exempt from the requirement to prepare a conformity determination because the project consists of maintenance dredging, no new depths are required, and placement would be at approved placement sites.

Greenhouse Gases (GHG).

GHGs trap heat in the atmosphere and are emitted from both natural processes and human activities. Examples of GHGs produced both by natural processes and human activity include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs emitted through human activities alone include fluorinated gases and sulfur hexafluoride (SF_6). The natural balance of GHGs in the atmosphere regulates the Earth's temperature; without this

natural greenhouse effect, the earth's surface would be approximately 60 degrees Fahrenheit (°F) cooler (USGCRP 2018).

USEPA has identified six GHGs generated by human activity that are believed to be the primary contributors to global warming: CO_2, CH_4, N_2O, hydrofluorocarbons (HFC), perfluorocarbons (PFC), and SF_6. Of these, CO_2, CH_4, and N_2O are GHGs of interest in this analysis, as only minor amounts of HFC, PFC, and SF_6 would be emitted by proposed activities.
Numerous studies document the recent trend of rising atmospheric concentrations of CO_2. The longest continuous record of CO_2 monitoring extends back to 1958 (Keeling 1960, Scripps Institution of Oceanography 2019). These data show that atmospheric CO_2 levels have risen an average of 1.6 parts per million (ppm) per year over the last 60 years (NOAA 2019). As of 2018, CO_2 levels are approximately 40 percent higher than the highest levels estimated for the 800,000 years preceding the industrial revolution, as determined from CO_2 concentrations analyzed from air bubbles in Antarctic ice core samples (USGCRP 2018).

Each GHG has a global warming potential (GWP), which is its ability to trap heat in the atmosphere. By convention, CO_2 is assigned a GWP of one. In comparison, CH_4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO_2 on an equal-mass basis over a 100-year time horizon. N_2O has a GWP of 298. To account for GWP, GHG emissions are often reported as carbon dioxide equivalent (CO_2e). CO_2e is calculated by multiplying each GHG emission by its GWP and adding the results to produce a single, combined emission rate representing all GHG emissions. CO_2e emissions are commonly presented in units of metric tons (MT). One MT equals 1,000 kilograms or 1.1 short tons. Currently, there are no Federal standards for GHG emissions, and no Federal regulations have been set at this time.

Table 4. National Ambient Air Quality Standards (NAAQS) Attainment Status for South Coast Air Basin

Criteria Pollutant	AVERAGING TIME	DESIGNATION [a]	ATTAINMENT DATE[b]
1-Hour Ozone	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023 Originally 11/15/2010 (not attained)[c]
8-hour Ozone[d]	1997 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	2015 8-Hour (0.070 ppm)	Nonattainment (Extreme)	8/3/2038
CO	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
NO_2[e]	1-Hour (0.10 ppm)	Unclassified/Attainment	N/A (attained)
	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
SO_2[f]	1-Hour (75 ppb)	Designations Pending (expect Uncl/Attainment)	N/A (attained)
	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassified/Attainment	3/19/1979 (attained)
PM10	1987 24-Hour (150 µg/m^3)	Attainment (Maintenance)[g]	7/26/2013 (attained)
PM2.5[h]	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019
	1997 Annual (15.0 µg/m^3)	Nonattainment (Moderate)	8/24/2016
	2012 Annual (12.0 µg/m^3)	Nonattainment (Moderate)	12/31/2025
Lead	3 Months Rolling (0.15 µg/m^3)	Nonattainment (Partial) [i]	12/31/2015

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration

c) 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005 ; however, the Basin has not attained this standard based on 2008-2010 data and is still subject to anti-backsliding requirements

d) 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the revoked 1997 O_3 standard is still subject to anti-backslidingrequirements

e) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO_2 standard retained

f) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.

g) Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for attainment redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.

h) Attainment deadline for the 2006 24-Hour PM2.5 NAAQS (designation effective December 14, 2009) is December 31, 2019 (end of the 10th calendar year after effective date of designations for Serious nonattainment areas). Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 µg/m3. Designations effective April 15, 2015, so Serious area attainment deadline is December 31, 2025. The LA County portion of the SCAB is in serious nonattainment for the 24 hour standard (2006 standard).

i) Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect redesignation to attainment based on current monitoring data.

4.3.2 Environmental Consequences

Criteria

Air Quality - Although the proposed maintenance action is exempt from the General Conformity Rule, the applicability rates associated with the rule are used evaluate significance of impacts for the purpose of disclosure of the impact under NEPA. An impact to Air Quality would be considered significant if the project meets or exceeds the applicability rates for the SCAB provided in Table 5.

Table 5. General Conformity Applicability Rates

Pollutant	Attainment Status	Applicability Rate (tons/year)
O_3 (VOC or NOx precursors)	Extreme Nonattainment	10
CO	Maintenance	100
NO_2	Maintenance	100
$PM_{2.5}$	Serious Nonattainment	70
PM_{10}	Maintenance	100

Source: USEPA green book and 40 CFR 93.153

GHGs - In the absence of an adopted GHG standard, the Corps will not propose a new GHG standard or make a NEPA impact determination for GHG emissions anticipated to result from any of the action alternatives. Rather, in compliance with the NEPA implementing regulations, the anticipated GHG emissions will be disclosed without expressing a judgment as to their significance.

Environmental Commitments.

The following measures would be implemented for both Alternatives 1 and 2:

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

The Contractor shall use ARB reformulated diesel fuel in off-road equipment during construction.

Retarding injection timing of diesel-powered equipment to reduce NOx emissions will be implemented where practicable. Use reformulated diesel fuel to reduce reactive organic compounds and SO2.

The Contractor shall properly maintain all construction equipment.

4.3.2.1 Alternative 1

Dredge Impacts.

Dredge operations would be conducted by a clamshell or barge-mounted excavator. Split-hull scows would be used to collect and transport sediment with the assistance of a tug. A crew boat would be used to ferry crew out to the tug and for miscellaneous transport of personnel and equipment on an as-needed basis.

Emissions associated with the proposed dredging activities would come mainly from the dredge motor drive. The motor drive on a clamshell dredge and a barge-mounted excavator are approximately the same size. Emissions estimates were made for both types of dredge machinery. Estimates were made based on emissions factors for diesel fuel usage and are provided in Appendix D.

In accordance with the Environmental Commitments cited above, the contractor would be required to obtain all necessary air quality permits, construction equipment would be properly maintained to reduce emissions, retarding injection timing of diesel-powered equipment for nitrogen oxide (NOx) control, and using reformulated diesel fuel to reduce reactive organic compounds and SO2.

Nearshore Placement

Distance from the dredge site to the Newport Beach Nearshore Placement Site is approximately 1-1/2 miles. Sediments would be transported from the dredge site to disposal sites by assistance of a tug. The tug would be the primary source of emissions related to material transport and disposal. The number of trips to the placement area is limited to the capacity of the dredge, which is assumed to be 1,500 cy per day for the clamshell and 1,500 cy per day for the excavator. The number of trips to the disposal area is limited to the capacity of the dredge.

CAD Placement

Distance from the dredge site to the CAD Site is similar to the nearshore placement site described above and emissions were calculated using the same assumptions.

Ocean Disposal

Distance from the dredge site to the LA-3 ODMDS is approximately 5 miles. The number of trips to the disposal area is limited to the capacity of the dredge, which is assumed to be 3,000 cy per day for the clamshell and 1,500 cy per day for the excavator.

Table 6. Estimated Emissions from Construction Activities

	Tons per Year*					
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Clamshell Dredge						
Alternative 1	0.5/1.7	0.4/1.3	2.3/7.3	0.7/2.2	0.3/1.0	0.2/0.9
Alternative 2	0.5/1.7	0.4/1.3	2.3/7.3	0.7/2.2	0.3/1.0	0.2/0.9
Excavator Dredge***						
Alternative 1	2.2	1.8	9.7	2.9	1.3	1.1
Alternative 2	2.2	1.8	9.7	2.9	1.3	1.1
Applicability Rates	**10**	**100**	**10**		**100**	**70**

* NOTE: Dredging is scheduled to start in October 2022 with an estimated duration of 52 weeks for a clamshell and 102 weeks for an excavator. Values are reported as CY2022/CY2023.
** NOTE: NOx and NO_2 emissions are assumed to be equal; the Applicability Rate for NO2 is 100 tons per year.
*** NOTE: Excavator would work an estimated 66 days in CY2022, 312 days in CY 2023, and 229 days in CY 2024. Values reported are for 2023, the highest level of emissions for any CY.

Conclusion: Total estimated emissions of criteria air pollutants for Alternative 1 (including dredging) do not exceed the applicability rates for the SCAB. Air quality impacts are considered insignificant; therefore, mitigation measures are not required. Total estimated emissions would be lower if the CAD Site was not used. An estimate was not prepared as this is considered unlikely.

4.3.2.2 Alternative 2

Dredging and Disposal Impacts

Air quality impacts from Alternative 2 would be similar to those identified and discussed above for Alternative 1.

Conclusion: Total estimated emissions of criteria air pollutants for Alternative 2 (including dredging) do not exceed the applicability rates for the SCAB. Air quality impacts are considered insignificant; therefore, mitigation measures are not required.

4.3.2.3 GHG Emissions. GHG emissions were estimated for the project under each Alternative. GHG emissions are provided in Table 7. Calculations are shown in Appendix D.

Table 7. Total GHG Emissions

	Total Equivalent CO_2	
	Alternative 1	Alternative 2
Total project emissions (tons)	3.8	3.8

4.3.2.4 No action alternative.

Under the no action alternative, project emissions would not occur, and applicability rates would not be exceeded GHG emissions associated with the project would not occur.

Conclusion. Air quality impacts would be insignificant.

4.4 Noise

4.4.1 Affected Environment. Dominant noise sources include waves, beach recreation activities, commercial and recreational vessels, and vehicle noise on adjacent roads. The sound of wave action will vary with factors including wave height, period, frequency, angle of attack, season, and wind conditions. Based on similar close coastal cities such as Marina del Rey, ambient noise levels in harbors have been measured at between Leq 56.5 and 75.5 dBA depending on the time of day and day of the week.

Noise from dredging and placement activities has the potential to effect aquatic receptors. Sensitive aquatic receptors can include species of fish and marine mammals. Ambient underwater noise levels in harbors with vessel traffic generally range around 130 decibels (dB)peak referenced to 1 micro-Pascal (re 1 μPa) (SAIC, 2007). Fish and marine mammals that occur in the Harbor are mobile but may occasionally be found in the vicinity of project dredging and placement areas. Dredge operations using either a clamshell dredge or an excavator produce a discontinuous and cyclic sound produced by winches and derrick movement, bucket contact with the substrate, digging into substrate, bucket closing, and emptying of material into a barge or scow. The sounds are repeated approximately every minute, with intermittent interruptions due to barge maneuvering and maintenance activities (USACE, 2019).

4.4.2 Environmental Consequences

Criteria

Project noise impacts would be considered significant if noise resulting from the project results in an increase of 10 dBA above background during the day or a night-time increase of 5 dBA above background or if fish and/or marine mammals are adversely affected. This is a short-term project and a perceived daytime doubling of noise levels is considered to be significant. A lower threshold is used for nighttime noise to reflect the increased sensitivity of people to nighttime sources of noise.

Environmental Commitments.

Dredging activities shall be restricted to the hours of: Monday thru Friday 7:00 a.m. to 6:30 p.m.; Saturday 8:00 a.m. to 6:00 p.m. Dredging activities on Sunday and Holidays are not permitted.

Contractor shall post at the staging area a description of the project, including expected durations and the name and telephone number of a noise coordinator for use by the public to make noise complaints.

4.4.2.1 Alternative 1

Dredge Impacts.

In accordance with the Environmental Commitments cited above, dredging activities would be restricted to the hours of:
Monday thru Friday 7:00 a.m. to 6:30 p.m.
Saturday 8:00 a.m. to 6:00 p.m.
Sunday/Holidays Not permitted.

Project noise sources are limited to the dredge and its supporting vessels. The type of dredge that would most likely be used generates a Leq of 71.5 dBA at 50 feet. The closest residence along the federal channels is approximately 50 feet from the dredge in the inside portion of the Entrance Channel that does not require a substantial volume of dredging. Most residential areas are considerably farther away and would likely experience noise levels closer to approximately 65.5 dBA or less. Based on similar close coastal cities such as Marina del Rey, ambient noise levels in harbors have been measured at between Leq 56.5 and 75.5 dBA depending on the time of day and day of the week. With dredging activities limited to daytime hours, no increase in nighttime background noise would occur. Daytime dredging is not expected to exceed the 10 dBA limitation on increased background noise. Dredging activities would result in increases in background dBA far below the doubling threshold. Therefore, noise impacts associated with dredging are not expected to have a significant impact on the area.

Although data on effects of noise on fishes are limited, the data suggest that fish would be more likely to be startled by sudden staccato noises than by steady noises (i.e., engine noise). Moreover, the noise of the proposed operations would occur against a background area with large amounts of vessel traffic. The sudden staccato noises of the bucket coming into contact with the sediment would likely temporarily deter many organisms from entering the dredging areas, although, not impede the movement or migration of fish species given the size of the dredge template in relation to the surrounding harbor and available area for the fish species to utilize. Based on the data available for mammal responses to other anthropogenic underwater sounds, risks associated with dredging are likely limited to masking and behavioral effects (USACE, 2019). Based on observational studies, pinnipeds (seals) did not exhibit avoidance or altered behavior near dredging activities (USACE, 2019). The proposed dredging would not adversely affect fish or marine mammals.

Nearshore Placement (Entrance Channel Sediments).

The Newport Beach Nearshore Placement Site is located ¼ mile from the nearest residence. The only noise generated would be the tug's propulsion plant, which is not expected to be audible at this distance. The minimal noise associated with discharge would not impact aquatic life.

CAD Placement

The CAD Site is located adjacent to residential areas, similarly to the federal channels. The only noise generated would be the tug's propulsion plant, which is not expected to be audible at this distance. The minimal noise associated with discharge would not impact aquatic life.

Ocean Disposal

The LA-3 ODMDS is located 5-1/2 mile from the nearest residence. The only noise generated would be the tug's propulsion plant, which is not expected to be audible at this distance. The minimal noise associated with discharge would not impact aquatic life.

Conclusion: Noise impacts under Alternative 1 are considered insignificant; therefore, mitigation measures are not required.

4.4.2.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature.

Conclusion: Noise impacts associated with Alternative 2 are considered insignificant; therefore, mitigation measures are not required.

4.4.2.3 No action alternative. No noise impacts associated with the project would occur.

Conclusion. Noise impacts under the no action alternative are considered insignificant.

4.5 Cultural Resources

Cultural resources are locations of past human activities on the landscape. The term generally includes any material remains that are at least 50 years old and are of archaeological or historical interest. Examples include archaeological sites such as lithic scatters, villages, procurement areas, resource extractions sites, rock shelters, rock art, shell middens; and historic era sites such as trash scatters, homesteads, railroads, ranches, and any structures that are over 50 years old. Under Section 106 of the National Historic Preservation Act, federal agencies must consider the effects of federal undertakings on cultural resources that are listed or eligible for listing in the National Register of Historic Places (NRHP). Cultural resources that are listed or eligible for listing in the NRHP are referred to as historic properties.

4.5.1 Affected Environment. The project area is limited to the confines of the federal navigation channels, which includes the proposed CAD Site, an area that has been periodically

dredged since 1937, and the two possible sediment disposal/placement sites, LA-3 ODMDS or the Newport Beach Nearshore Placement Site. The navigation channels, except for the Entrance Channel and Main Channel Balboa Reach, were last dredged in 2012/2013. Ground disturbance in the channels were limited to sediments that have deposited in the channels in the past seven years. Portions of the Entrance Channel and the Main Channel Balboa Reach were dredged in 2021; however, sediments to be dredged from the Entrance Channel were not dredged in 2021 along with the rest of the Entrance Channel due to adverse wave conditions that prevented the dredge from operating. USACE has determined that excavation of the federal channels would pose no potential to affect the National Register eligibility of the LNBH; as well as a finding under 36 CFR § 800.4(c)(1) that no other historic properties would be affected by excavation in the federal channels. Refer to Appendix C for correspondence.

4.5.2 Environmental Consequences

Criterion.

The project would have a significant effect on cultural resources if it would result in a substantial adverse effect to a historic property such that the implementation of the alternative would result in the destruction of a historic property or the loss of a property's eligibility.

Environmental Commitment.

In the event that previously unknown cultural resources are discovered during the project, all ground disturbing activities shall immediately cease within 100 feet of the discovery until the Corps has met the requirement of 36 CFR 800.13 regarding post-review discoveries. The Corps shall evaluate the eligibility of such resources for listing on the National Register of Historic Places and propose actions to resolve any anticipated adverse effects. Work shall not resume in the area surrounding the potential historic property until the Corps re-authorizes project construction.

4.5.2.1 Alternative 1

Dredge Impacts

USACE has determined that excavation of the federal channels would pose no potential to affect the National Register eligibility of the LNBH; as well as a finding under 36 CFR § 800.4(c)(1) that no other historic properties would be affected by excavation in the federal channels. The undertaking is routine maintenance that has occurred on a semi regular basis since it was authorized in 1937.

Nearshore Placement

The Newport Beach Nearshore Placement Site was separately evaluated and authorized for local dredging projects under a Corps issued Regional General Permit (RGP) 54 in 2019 which included a separate analysis under Section 106. The continued use of a designated nearshore placement site does not have the potential to cause effects to historic properties.

CAD Placement

The CAD Site is located within the federal navigation channels. Ground disturbance associated with this undertaking would be limited to soils deposited in the last ten to twenty years with no potential to contain historic properties.

Ocean Disposal

LA-3 ODMDS is one of the USEPA's designated and managed regional ODMDS. It is a major disposal area for the region and its impacts to historic properties have previously been analyzed (USEPA/USACE 2005). The continued use of a designated ODMDS does not have the potential to cause effects to historic properties.

Conclusion: Alternative 1 would not result in a substantial adverse effect to a historic property such that the implementation of the alternative would result in the destruction of a historic property or the loss of a property's eligibility. Cultural resources impacts are considered insignificant; therefore, mitigation measures are not required.

4.5.2.2 Alternative 2

Dredge and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature. Like under Alternative 1, USACE has determined that excavation of the federal channels would pose no potential to affect the National Register eligibility of the LNBH; as well as a finding under 36 CFR § 800.4(c)(1) that no other historic properties would be affected by excavation in the federal channels.

Conclusion: Alternative 2 would not result in a substantial adverse effect to a historic property such that the implementation of the alternative would result in the destruction of a historic property or the loss of a property's eligibility. Cultural resources impacts are considered insignificant; therefore, mitigation measures are not required.

4.5.2.3 No action alternative. Under the no action alternative, no undertaking would occur. Therefore, no effect would occur. Continued deposition of sediments would not affect historic properties. However, the project's beneficial effects would be lost.

Conclusion: The no action alternative would not result in a substantial adverse effect to a historic property. Cultural resource impacts of the no action alternative are insignificant.

4.6 Vessel Transportation and Safety

4.6.1 Affected Environment. Lower Newport Bay is a heavily used recreational and small commercial vessel waterbody. Boat traffic, including commercial vessels, fishing vessels, and recreational vessels, often traverse the proposed project site. Safe navigation is maintained by well-marked channels and the presence and activity of various law enforcement agencies (i.e., County Lifeguards, U.S. Coast Guard, California Department of Fish and Wildlife).

4.6.2 Environmental Consequences

Criteria.

A significant impact would occur if the proposed project results in a substantial reduction of current safety levels for vessels in the Bay, if activities present a navigational hazard to boat traffic, or interfere with any emergency response or evacuation plans.

Environmental Commitments.

The following measures would be implemented under Alternatives 1 and 2:

The contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard regulations. The contractor must contact the U.S. Coast Guard two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation. Notices shall be published in Local Notice to Mariners warning boat users about times, durations, and locations of construction activities.

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

4.6.2.1 Alternative 1

Dredge and Placement/Disposal Impacts.

Given the general background of vessel traffic levels, project impacts are not expected to significantly increase vessel traffic levels. The proposed project would be taking place near the end of the tourist season. All vessels would be marked and lighted in accordance with U.S. Coast Guard regulations and notices will be published in Local Notice to Mariners warning boat users about times, durations, and locations of construction activities. Vessel traffic should be able to easily navigate around any short-term obstacles created by construction traffic. Construction would not impede access to any channels or entranceways. The presence of the dredge would not reduce current safety levels in the bay, present a navigation hazard, or interfere with emergency response or evacuation plans. The dredge is required to move on request of police authorities in case of need for public safety. Therefore, impacts to vessel traffic are considered insignificant.

Transport of dredged material to the Newport Beach Nearshore Placement Site and CAD Site would add vessel movement within the placement area; however, this increase would be negligible considering the existing volume of vessel movement in the project area. Transport of dredged material to the LA-3 ODMDS would add vessel movement within the disposal area; however, this increase would be negligible considering the existing volume of vessel movement in the project area.

Conclusion: Alternative 1 would not result in a substantial reduction of current safety levels for vessels in the Bay, present a navigational hazard to boat traffic, or materially interfere with any emergency response or evacuation plan. Vessel transportation and safety impacts are considered insignificant; therefore, mitigation measures are not required.

4.6.2.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature.

Conclusion: Alternative 2 would not result in a substantial reduction of current safety levels for vessels in the Bay, present a navigational hazard to boat traffic, or materially interfere with any emergency response or evacuation plan. Vessel transportation and safety impacts are considered insignificant; therefore, mitigation measures are not required.

4.6.2.3 No action alternative

Additional construction vessel traffic associated with the project would not occur. However, the project's beneficial effects in terms of maintaining navigation safety would be lost.

Conclusion: The no action alternative would not immediately result in any impacts to vessel transportation and safety. However, the no action alternative could eventually result in a reduction of current safety levels for vessels in the Bay, present a navigational hazard to boat traffic, or materially interfere with any emergency response or evacuation plan.

4.7 Recreation Uses

4.7.1 Affected Environment. The project area is a mix of public and private recreational boating and commercial uses. The coastal waters provide for recreational boating and fishing. Water contact recreation (swimming/wading) occurs at small, pocket beaches located in the Lower Bay. Recreational use of LA-3 ODMDS would be limited to boating traffic transiting through the area, there is no hard substrate or reef structure at LA-3 ODMDS to support fishing and it is unlikely to be utilized as a fishing spot given the soft bottom substrate, depth and level of disturbance to the site.

4.7.2 Environmental Consequences

Criterion.

Impacts will be considered significant if the project results in a permanent loss of existing recreational uses.

4.7.2.1 Alternative 1

Dredge Impacts.

Impacts to recreational boaters would be negligible (see Section 4.6 above). Long-term impacts would be beneficial. The dredging would maintain, sustain, and support recreational and commercial boating by keeping the approaches and entrance channels open and free of navigational hazards. Dredging activities would be physically separated from the water contact recreational uses. These activities take place primarily along the edges and remain outside the federal navigational channels. Dredging at any single location would be of short duration enabling waders to move to nearby locations should the dredge be a discouraging factor in waders/swimmers decision.

Placement/Disposal Impacts

Traffic to the Newport Beach Nearshore Placement Site and CAD Site would average 1-2 barges per day, which is a negligible impact on local recreational vessels. No material would be placed directly on to the beach, so there would be no impacts to the beach from the proposed project. Recreational activities are not expected to occur at the LA-3 ODMDS, therefore there would be no impacts to recreational use at LA-3 ODMDS.

Conclusion: Overall, the proposed project will support the recreational opportunities currently afforded to the area. Alternative 1 would not result in permanent closures or loss of existing recreational uses. Therefore, recreational impacts are considered insignificant.

4.7.2.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature.

Conclusion: Overall, the proposed project will support the recreational opportunities currently afforded to the area. Alternative 2 would not result in permanent closures or loss of existing recreational uses. Therefore, recreational impacts are considered insignificant.

4.7.2.3 No action alternative.

Under the no action alternative, dredging to maintain authorized channel depths would not occur. Therefore, the project's recreational benefits to boating and beach use would not occur.

Conclusion: The no action alternative would have no immediate effect on recreational uses. However, under the no action alternative the authorized channel would not be maintained and recreational uses of Lower Newport Bay may eventually be impeded.

4.8 Aesthetics

4.8.1 Affected Environment. The overall aesthetic character of the project area is composed of a mix of residential and water-oriented facilities. The beaches further add to the overall impression of a recreational-oriented visual setting. The area is well maintained. The natural resources in the area provide a visually attractive setting and relaxing atmosphere for residents and tourists. LA-3 ODMDS is located 4.8 miles offshore, thus it is not visible from shore.

4.8.2 Environmental Consequences

Criterion.

The project would significantly impact the aesthetics if a landscape is changed in a manner that permanently and significantly degrades an existing viewshed or alters the character of a viewshed by adding incompatible structures.

4.8.2.1 Alternative 1

Dredge Impacts

The presence of dredging would result in mixed impacts depending on the opinion of the viewer. Many viewers would consider the presence of the dredge to be an adverse impact, interrupting viewpoints from local land points and from boats. Many other viewers would consider the presence of the dredge to be a beneficial impact providing an interesting feature to the existing view. Given that the dredging would be a short-term impact, aesthetic impacts would be insignificant.

Nearshore Placement (Entrance Channel Sediments)

Traffic to the Newport Beach Nearshore Placement Site would average 1-2 barges per day with the barge being on site for approximately 15-30 minutes. Given that the disposal would be a short-term impact, aesthetic impacts would be insignificant.

Ocean Disposal

Traffic to the LA-3 ODMDS would average 1-2 barges per day with the barge being on site for approximately 15-30 minutes at a site far enough out to sea to not be visible from the shore,

which is a negligible impact on aesthetics.

CAD Site

Traffic to the CAD Site would average 1-2 barges per day with the barge being on site for approximately 15-30 minutes. Given that the disposal would be a short-term impact, aesthetic impacts would be insignificant.

Conclusion: Given that the dredging and placement/disposal activities would be a short-term impact, aesthetic impacts of Alternative 1 would be insignificant. The landscape would not be changed in a manner that permanently and significantly degrades an existing viewshed or alters the character of a viewshed by adding incompatible structures.

4.8.2.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Site would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature.

Conclusion: Given that the dredging and placement/disposal activities would be a short-term impact, aesthetic impacts of Alternative 2 would be insignificant. The landscape would not be changed in a manner that permanently and significantly degrades an existing viewshed or alters the character of a viewshed by adding incompatible structures.

4.8.2.3 No action alternative.

Aesthetics of the area would remain unchanged.

Conclusion: The no action alternative would have no immediate effect on aesthetics. The landscape would not be changed in a manner that permanently and significantly degrades an existing viewshed or alters the character of a viewshed by adding incompatible structures.

4.9 Land/Water Uses

4.9.1 Affected Environment. Lower Newport Bay is primarily characterized by the marina catering to recreational boaters and sports fishing operations. Boat rentals, a public launch ramp, and a U.S. Coast Guard Station are located in the Bay.

4.9.2 Environmental Consequences

Criterion.

Impacts would be considered significant if access to existing uses is substantially restricted or is eliminated.

4.9.2.1 Alternative 1

Dredge Impacts.

The presence of the dredge and its supporting vessels would restrict vessel traffic during dredging in the immediate 25 feet from the dredge. Boat access would be maintained throughout all stages of construction.

Placement/Disposal Impacts

Placement of sediments at the Newport Beach Nearshore Placement Site, CAD Site, or LA-3 ODMDS would have no impact on land uses/water uses. Both of these sites are marine, open ocean sites with potential impacts limited to recreational boating. Impacts to recreational boating are discussed above in section 4.7.

Conclusion: Impacts to land/water uses during placement/disposal activities are expected to result in insignificant impacts.

4.9.2.2 Alternative 2

Dredging and Disposal Impacts

Impacts from dredging would be identical to those identified and discussed above for Alternative 1. Impacts for placement/disposal would be similar to Alternative 1 but would differ in the following ways. Impacts to the Newport Beach Nearshore Placement Area would not occur as there would be no nearshore placement associated with this alternative. Impacts to the LA-3 ODMDS would be similar in nature.

Conclusion: Impacts to land/water uses during placement/disposal activities are expected to result in insignificant impacts.

4.9.2.3 No action alternative. No impacts to land and water uses would result, including the beneficial impacts discussed above.

Conclusion: The no action alternative would have no immediate effect on land/water uses. Access to existing uses would not be substantially restricted or eliminated.

4.10 Ground Transportation

4.10.1 Affected Environment. Lower Newport Bay and Newport beach are accessed by several major routes. Seasonal variations can result in large differences in road use. Summer is the peak season and it is the basis for design of road capacity.

4.10.2 Environmental Consequences

Criteria.

A significant impact would occur if the proposed project results in: 1) inadequate parking facilities, 2) an inadequate access or on-site circulation system, or 3) the creation of hazardous traffic conditions.

4.10.2.1 Alternatives 1 and 2

Dredge and Placement/Disposal.

Construction would require the use of heavy equipment that requires manpower. A total construction crew of 15 people is anticipated for the proposed project. The proposed project therefore, is expected to have minor adverse impacts on local traffic not adding substantially to existing traffic in the area nor creating hazardous traffic conditions. All of the large equipment would come by sea and would not impact local roads.

Conclusion: Under Alternatives 1 and 2 the project would have minor, short-term impacts to parking due to crew parking near the site and the use of the staging area. It would not create hazardous traffic conditions as the majority of the equipment would arrive via ships and would not require large trucks impacting local surface streets.

4.10.2.2 No action alternative

No impacts would occur to ground transportation resources.

Conclusion: The no action alternative would have no immediate effect on ground transportation. There would be no impacts to parking due to crew parking near the site and the use of the Corona del Mar Beach parking lot as staging area. It would not create hazardous traffic conditions as there would be no need to bring in the equipment and large trucks impacting local surface streets.

4.11 Utilities

4.11.1 Affected Environment.

The Entrance Channel and federal channels contain a small number of facilities, including a cast iron waterline, an AT&T armored submarine cable, and abandoned Southern California Edison (SCE) utility cables. This cable is outside the dredge footprint. There are two abandoned SCE

cables (Figure 6, Sites 1 & 2) located within the dredging area. These cables could be impacted by dredging operations due to their shallow nature. The remaining utilities are located outside the federal channels to be dredged.

4.11.2 Environmental Consequences

Criteria.

Significant impacts to public utilities would occur if any of the alternatives result in:

• Substantial and long-term interruption of utility service; and/or
• Substantial alteration to existing public utilities.

Because an increase in service demand would not occur with the proposed action, this analysis focuses on displacement or disruption of services and utilities.

4.11.2.1. Alternatives 1 and 2

Dredge and Placement/Disposal Impacts.

No active utilities are within the placement/disposal areas. Two abandoned cables would be removed during dredging. Consequently, no impacts to active SCE power lines would occur. No impacts to the remainder of the utilities are expected because they are buried substantially deeper than dredging would be authorized. The project would not result in any interruptions of utility services, alteration to public utilities, or increased need for public utilities for any of the alternatives.

Conclusion: Under Alternatives 1 and 2 the project would not result in any interruptions of utility services, alteration to public utilities, or increased need for public utilities. Project impacts would, therefore, be less than significant.

4.11.2.2. No action alternative

The no action alternative would not result in any interruptions of utility services, alteration to public utilities, or increased need for public utilities.

Conclusion: The no action alternative would not result in significant impacts to utilities.

SECTION 5 - CUMULATIVE IMPACTS ANALYSIS

NEPA requires that cumulative impacts of the proposed action be analyzed and disclosed. Cumulative impacts are impacts on the environment which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Minor maintenance dredging of individual boat docks has been permitted in the Lower Newport Bay. This work was authorized by the regional general permit 54 issued by the Corps for maintenance dredging in Newport Bay. Disposal would be at the LA-3 ODMDS. Total dredging for these projects is not expected to exceed 5,000 cubic yards per project. Specific boat docks and/or timing have not been identified at this time. Dredging up to the maximum allowed by the RGP is a worst-case assumption for this cumulative impact analysis. More likely some dredging would be taking place concurrent with the proposed project.

Past activities, such as dredging, placement of fill material, and construction of Harbor and marina facilities, have reduced the physical and biological aquatic resource functions present in this area, as compared to natural undisturbed areas. Elevated noise levels and vessel traffic cause ongoing disturbances in the project vicinity. Past impacts within and adjacent to the Harbor also include negative impacts to air quality. Thus, the project area has been affected by past marina activities and continues to be similarly disturbed.

The Corps has concluded that when considering the impacts of the proposed project, in relation to the overall impacts from past, present, and reasonably foreseeable future activities (including maintenance, reconstruction, and upgrade activities), the incremental contribution of the proposed project to cumulative impacts in the area are not significant.

SECTION 6 - ENVIRONMENTAL COMPLIANCE AND COMMITMENTS

6.1 COMPLIANCE

6.1.1 National Environmental Compliance Act of 1969 (Public Law (PL) 91-190); National Environmental Policy Act (NEPA) of 1969 (42USC4321 et seq., PL 91-190); Council on Environmental Quality Regulations for Implementing NEPA, 40 CFR Parts 1500 to 1508; USACE Regulations for Implementing NEPA, 33 CFR Part 220.

Under NEPA, federal agencies must consider the environmental consequences of proposed federal actions. The spirit and intent of NEPA is to protect and enhance the environment through well-informed federal decisions, based on sound science. When it is determined that a proposed action could result in significant environmental effects, an EIS is prepared. NEPA is premised on the assumption that providing timely information to the decision maker and the public about the potential environmental consequences of proposed actions would improve the quality of federal decisions.

This EA has been prepared to address impacts associated with the proposed project. The Draft EA is being circulated for public review and to appropriate resource agencies, environmental groups and other interested parties. Comments received during the public review period will be considered during preparation of the Final EA.

6.1.2 Clean Water Act of 1972 (33 USC 1251 et seq.)

The Clean Water Act (CWA) was passed to restore and maintain chemical, physical, and biological integrity of the Nation's waters. Specific sections of the CWA control the discharge of pollutants and wastes into aquatic and marine environments. The major sections of the CWA that applies to the proposed project are Section 401, which requires certification that the permitted project complies with the State Water Quality Standards for actions within state waters; and Section 404, which addresses the discharge of dredged or fill materials into waters of the US.

Pursuant to Corps regulations at 33 CFR 323.2(d)(3), the dredging activities associated with this project are excluded from coverage under CWA. The disposal of dredge material to LA-3 ODMDS is not subject to the CWA. The Corps' disposal of dredged material to the nearshore placement site and CAD Site are subject to the CWA.

A section 404(b)(1) analysis (Appendix E) was prepared for the recommended placement of dredged or fill material at the Newport Beach Nearshore Placement Site and CAD site, waters of the U.S. The discharges were found to be compliant with the 404(b)(1) Guidelines. The Corps has applied for a section 401 water quality certification from the Santa Ana California Regional Water Quality Control Board for this proposed project. All conditions of the 401 Water Quality Certification will be implemented in order to minimize adverse impacts to water quality.

6.1.3 Section 103 of the Marine Protection, Research and Sanctuaries Act (33 U.S.C. 1413)

Section 103 of the MPRSA of 1972, or Ocean Dumping Act, regulates the transportation of dredged material for the purpose of dumping it into ocean waters, where the Corps determines that the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities. Ocean disposal of dredged material associated with Alternative 1 would be at LA-3 ODMDS. The Corps has formally requested the USEPA's concurrence to use LA-3 ODMDS.

6.1.4 Endangered Species Act of 1973 (16 USC 1531 et seq.)

Under ESA Section 7(a)(2), each federal agency must ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the species' designated critical habitat (16 U.S.C. § 1536(a)(2)). If an agency determines that its actions "may affect" a listed species or its critical habitat, the agency must conduct informal or formal consultation, as appropriate, with either the USFWS or the NMFS, depending on the species at issue (50 C.F.R. §§ 402.01, 402.14(a)–(b)). If, however, the action agency independently determines that the action would have "no effect" on listed species or critical habitat, the agency has no further obligations under the ESA.

Under the proposed action, construction impacts would not affect the Federally listed California least tern. With the inclusion of the monitoring and avoidance measures, the proposed maintenance activities would not affect green sea turtles in Lower Newport Bay. The project would not affect any designated critical habitat. The project would, therefore, not affect any listed species or their designated critical habitat. Consultation under section 7 of the ESA is not required.

6.1.5 Section 307(c) of the Coastal Zone Management Act of 1976 (16 USC 1456 et seq.)

Section 307 of the CZMA states that Federal activities within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. The California Coastal Act is this state's approved coastal management program applicable to the proposed Federal action. If a Federal agency determines there will not be coastal effects, the Federal agency shall provide the California Coastal Commission (CCC) with a negative determination.

The Corps' draft EA serves as the negative determination for the proposed project. The Corps has requested concurrence with the Corps' negative determination on the project as described in this Draft EA.

6.1.6 Clean Air Act (42 USC 7401 et seq.); General Conformity Regulations at 40 CFR 93.152, et seq.

The general conformity rule implements the CAA conformity provision, which requires federal agencies to identify, analyze, and quantify emission impacts of an action and mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved CAA implementation plan. The general conformity regulations do not apply to maintenance dredging and disposal where no new depths are required, and disposal will be at an approved disposal site per 40 CFR 93.153(c)(2)(ix). Therefore, a conformity determination is not required for the proposed project.

6.1.7 Section 106 of the National Historic Preservation Act (54 U.S.C. 306108)

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertaking on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to the undertaking. The Section 106 implementing regulations are codified in 36 CFR Part 800, which describe the procedures that federal agencies follow to consult with the State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation, Native American tribes, and interested parties.

In accordance with Section 106 of the NHPA, the Corps has determined that the proposed maintenance dredging of the Lower Newport Bay Navigation Channels meets the definition of an undertaking as defined at 36 CFR 800.16(y). USACE has determined that excavation of the federal channels would pose no potential to affect the National Register eligibility of the LNBH; as well as a finding under 36 CFR § 800.4(c)(1) that no other historic properties would be affected by excavation in the federal channels.

6.1.7 Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1855(b)

This Draft EA assesses EFH as required by the Magnuson-Stevens Act. Although construction would occur within EFH, the Corps has determined that the proposed project would not result in a substantial, adverse impact. In compliance with the coordination and consultation requirements of the Magnuson-Stevens Act, this Draft EA includes the Corps' EFH Assessment.

6.1.8 Executive Order 12898, Environmental Justice in Minority and Low-Income Populations and Executive Order 14008

Executive Order 12898 focuses Federal attention on the environment and human health conditions of minority and low-income communities and calls on agencies to achieve environmental justice (EJ) as part of its mission. The order requires the USEPA and all other Federal agencies (as well as state agencies receiving Federal funds) to develop strategies to address this issue as part of the NEPA process. The agencies are required to identify and address, as appropriate, any disproportionately high and adverse human health or environmental impacts of their programs, policies, and activities on minority and low-income populations. The order makes clear that its provisions apply fully to programs involving Native Americans. The CEQ

has oversight responsibility for the Federal government's compliance with E.O. 12898 and NEPA. The CEQ, in consultation with the USEPA and other agencies, has developed guidance to assist Federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. According to the CEQ's Environmental Justice Guidance under the National Environmental Policy Act, agencies should consider the composition of the affected area to determine whether minority populations or low-income populations are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse human health or environmental impacts (CEQ 1997).

An analysis of demographic data was conducted to derive information on the approximate locations of low-income and minority populations in the community of concern. Since the analysis considers disproportionate impacts, two areas must be defined to facilitate comparison between the area actually affected and a larger regional area that serves as a basis for comparison and includes the area actually affected. The larger regional area is defined as the smallest political unit that includes the affected area and is called the community of comparison. For purposes of this analysis, the affected area is a one-mile radius around the project area, and the city of Newport Beach is the community of comparison. LA-3 ODMDS, being 5-1/2 miles off the coast, is not included in the analysis.

Minority populations: EO 12898 defines a minority as an individual belonging to one of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of this environmental justice analysis, is identified when the minority population of the potentially affected area is greater than 50% or the minority population is meaningfully greater than the general population or other appropriate unit of geographic analysis. USEPA's EJScreen tool was used to obtain the study area demographics. Table 8 provides a summary of the study area demographics, complete EJScreen Reports can be found in Appendix F.

Poverty Rates: The EO does not provide criteria to determine if an affected area consists of a low-income population. For purposes of this assessment, the CEQ criterion for defining low-income population has been adapted to identify whether or not the population in an affected area constitutes a low-income population. An affected geographic area is considered to consist of a low-income population (i.e., below the poverty level, for purposes of this analysis) where the percentage of low-income persons: 1) is greater than 50%, or 2) is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis. The United States Census Bureau poverty assessment weighs income before taxes and excludes capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). Table 8 provides a summary of the income and poverty status for the study area.

Table 8 Study Area Demographics

Demographic	Affected Area	State	City
Minority Population	18%	62%	21%
Low-income Population	16%	33%	14%

As shown in the table above, the aggregate minority population percentage in the affected area does not exceed 50%. In addition, the minority population in the affected area is not greater than the minority population in the city, which is 21%. Therefore, the affected area does not contain a high concentration of minority population.

As shown in the table above, 16% of the individuals in the affected area are considered below the poverty level. This percentage in the affected area does not exceed 50%. In addition, the affected area low-income population percentage is roughly equivalent to the low-income population in the city, which is 14%, the affected area is not greater than the state of California which is 33%. Therefore, the affected area does not contain a high concentration of a low-income population.

These findings reflect that the project area does not constitute an EJ community. Therefore, there would be no impacts resulting from the proposed project that would result in disproportionately high and adverse impacts to minority and low-income communities.

6.2 ENVIRONMENTAL COMMITMENTS

The proposed project includes the following environmental commitments that would be included in contract specifications:

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

2. The Contractor shall use ARB reformulated diesel fuel in off-road equipment during construction.

3. Retarding injection timing of diesel-powered equipment to reduce NOx emissions will be implemented where practicable. Use reformulated diesel fuel to reduce reactive organic compounds and SO2.

4. The Contractor shall properly maintain all construction equipment.

5. In the event that previously unknown cultural resources are discovered during the project, all ground disturbing activities shall immediately cease within 100 feet of the discovery until the Corps has met the requirement of 36 CFR 800.13 regarding post-review discoveries. The Corps shall evaluate the eligibility of such resources for listing on the National Register of Historic Places and propose actions to resolve any anticipated adverse effects. Work shall not resume in

the area surrounding the potential historic property until the Corps re-authorizes project construction.

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

7. The Contractor shall prepare and implement a Water Quality Monitoring Plan at the dredge and Newport Beach Nearshore Placement Site. The Water Quality Monitoring Plan will include weekly monitoring at the dredge, CAD Site, and Newport Beach Nearshore Placement Sites for pH, temperature, dissolved oxygen, and turbidity for the first week. Dredging will be controlled to keep water quality impacts to acceptable levels, controls will include modifying the dredging operation and the use of silt curtains (if feasible). Light transmittance will be limited to a 40% maximum decrease between the control station and a reference station located 300 ft downstream. Dissolved oxygen will be maintained at a minimum of 5 mg/l. Increases in turbidity that result from controllable water quality factors shall comply with the following: where natural turbidity is between 0 and 50 Nephelometric Turbidity Units (NTU), increases shall not exceed 20 percent; where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU; and where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent. The pH of bay or estuary waters shall not be raised above 8.6 or depressed below 7.0 as a result of water quality factors; ambient pH levels shall not be changed by more than 0.2 unit.

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

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

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

11. The contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard regulations. The contractor must contact the U.S. Coast Guard two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation. Notices shall be published in Local Notice to Mariners warning boat users about times, durations, and locations of construction activities.

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

13. Anchoring in eelgrass beds shall be prohibited.

14. Prior to the start of dredging, the Corps would conduct surveys for *Caulerpa spp.*. Surveys shall be completed not earlier than 90 days prior to the commencement of dredging and not later than 30 days prior to the onset of work. Surveys would be conducted in consultation with the Southern California Caulerpa Action Team (SCCAT) to assure that occurrences of *Caulerpa spp.* would be identified if present. The Corps would submit survey results in standard format to NMFS/CDFW within 15 days of completion. If *Caulerpa spp.* is identified during the surveys, the Corps would contact NMFS/CDFW within 24 hours of first noting the occurrence. In the event that *Caulerpa spp.* is detected, maintenance dredging would be delayed until such time as the infestation has been isolated, treated and the risk of spread from the proposed action eliminated.

15. Dredging activities shall be restricted to the hours of: Monday thru Friday 7:00 a.m. to 6:30 p.m.; Saturday 8:00 a.m. to 6:00 p.m. Dredging activities on Sunday and Holidays are not permitted.

16. Adhere to standard site use conditions for material disposal at the LA-3 ODMDS.

17. Contractor shall post at the staging area a description of the project, including expected durations and the name and telephone number of a noise coordinator for use by the public to make noise complaints.

18. Conditions of the final Santa Ana RWQCB 401 Certification will be adhered to (Appendix G).

19. A monitoring and avoidance plan will be prepared, in coordination with the NMFS, to ensure that green sea turtles are not affected including the following measures:

• During dredging, a 100-foot (visually estimated) monitoring zone around the dredge shall be implemented. Green sea turtle monitoring is not required for the transportation of material between dredging and disposal/placement sites.

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

• The visual monitor shall maintain a written log containing all observations of green sea turtles including:
1) Observer name and title;
2) Type of activity (dredging, etc.);
3) Date and time animal first observed (for each observation);

4) Date and time observation ended (for each observation), including if the green sea turtle was observed exiting the monitoring zone or was assumed to have exited following a 15-minute period of no observation;
5)Location of observer (latitude/longitude), direction, and estimated distance to green sea turtle;
6) Nature and duration of equipment shutdown.

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

• The visual monitor will be trained in how to conduct visual monitoring and in the identification of green sea turtles.

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

6.3 Public Involvement

The Draft EA is being distributed for a 30-day public and agency review. The Draft EA will be posted to the Corps' public notice and notices mailed to the recipients in Section 8 and on the mailing list provided in Appendix A. All comments will be documented and addressed in the Final EA. Comments received and responses to those comments will be located in Appendix G.

6.4 Coordination

The principal agencies with which this project has been, and will continue to be coordinated, include SC-DMMT, USEPA, NMFS, the Santa Ana RWQCB, the CCC, and the SCCAT.

Southern California Dredged Material Management Team (SC-DMMT). The SC-DMMT is a multi-agency management team set up jointly by the Corps and the USEPA. The SC-DMMT initially consisted of the Corps and USEPA but has expanded to include participation by the various Regional Water Quality Control Boards and the CCC, as well as by staff from the NMFS and CDFW. The SC-DMMT currently meets monthly.

The Sampling and Analysis Plan (SAP) was discussed at a joint meeting of the SC-DMMT/Contaminated Sediments Task Force (CSTF) held on December 2017. Sediment core sampling was completed in 2018. Initial test results were presented at the SC-DMMT in February 2019. The Corps' suitability determination and the full Sampling and Analysis Plan Report (SAPR, Appendix B; Anchor QEA, 2019) were submitted to the SC-DMMT in May 2019. Member agencies of the SC-DMMT concurred that sediments in the federal channels are suitable for nearshore placement, are suitable for ocean disposal at the LA-3 ODMDS or are unsuitable for either and require placement in the CAD. The EPA also issued a formal suitability determination on June 6, 2019. The results of the Sampling and Analysis Program were

extended for a period of five years by the SC-DMMT on February 24, 2021. Dredging must begin by January 2023, to avoid retest of the proposed dredge sediments.

U.S. Environmental Protection Agency. The USEPA, in consultation with the Corps, reviewed and approved the SAP used in 2018-2019 to conduct sediment sampling and analysis from the federal channels, including the Entrance Channel. Results were provided to them for review. The USEPA provided a suitability determination for all federal channels on June 6, 2019. A copy of this concurrence is included in Appendix G.

National Marine Fisheries Service. The Draft EA includes an EFH assessment. The NMFS will be asked in the Draft EA cover letter to review the Draft EA and that we are using the NEPA process to initiate EFH consultation.

Santa Ana Regional Water Quality Control Board. A copy of the Draft EA will be provided to the SA RWQCB during the 30-day review period. In addition, the SA RWQCB is a member agency in the SC-DMMT and participated in meetings at which the proposed project was discussed. Please refer to Section 6.1 of this EA for a discussion of project compliance with the Clean Water Act. An application for Water Quality Certification has been sent under separate cover to the SA RWQCB.

California Coastal Commission. The Corps will provide a copy of the Draft EA to the CCC staff during the 30-day NEPA review period. The CCC will be requested to concur with the USCAE's negative determination.

Southern California Caulerpa Action Team. The Southern California Caulerpa Action Team (SCCAT) is a multi-agency group reformed to evaluate and eradicate the recent infestation by *Caulerpa prolifera* in Lower Newport Bay. USACE is coordinating with this group regarding performance of surveys for *Caulerpa spp.* in what is an infected system.

SECTION 7 REFERENCES

Anchor QEA, LLC. Lower Newport Bay Sampling and Analysis Report. Prepared for the city of Newport Beach. May.

California Department of Fish and Wildlife (CDFW). 2017. California Least Tern Breeding Survey 2016 Season. 22 June 2017.

CDFW. 2018. California Least Tern Breeding Survey 2017 Season. Undated.

NMFS. 2008 Caulerpa Control Protocol. (Version 5 – October 20, 2021)

NMFS. 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. October 2014

USACE (U. S. Army Corps of Engineers). 2003. Lower Newport Bay Maintenance Dredging Project, Orange County, California. September 2003.

USACE. 2019. Evaluating Effects of Dredging-Induced Underwater Sound on Aquatic Species: A Literature Review. ERDC/EL TR-19-18. September 2019.

USEPA/USACE (U. S. Environmental Protection Agency & U. S. Army Corps of Engineers). 1991. Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual. EPA 503/8-91/001.

USEPA/USACE. (U. S. Environmental Protection Agency & U. S. Army Corps of Engineers). 2005. Final Environmental Impact Statement for the Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay Orange County, California. July.

SECTION 8 - DISTRIBUTION LIST

Federal Agencies:
U.S. Environmental Protection Agency, Region IX
U.S. Fish and Wildlife Service
National Marine Fisheries Service
U.S. Coast Guard

State Agencies:
California Coastal Commission
California Department of Fish and Wildlife
Regional Water Quality Control Board, Santa Ana Region
Clearinghouse/Association of Governments
Department of Boating and Waterways
Resources Agency
South Coast Air Quality Management District

SECTION 9 - ACRONYMS

ACHP.....Advisory Council on Historic Preservation
APE.....Area of Potential Effects
ARB .....Air Resources Board
ASBS.....Area of Special Biological Significance
CAA .....Clean Air Act
CDF&G.....California Department of Fish and Game
CEQ.....Council on Environmental Quality
CO.....Carbon monoxide
Corps.....U.S. Army Corps of Engineers, Los Angeles District
CWA .....Clean Water Act
DO.....Dissolved oxygen
EA .....Environmental Assessment
EFH.....Essential Fish Habitat
EPA.....U.S. Environmental Protection Agency
ESA.....Endangered Species Act
FEA.....Final Environmental Assessment
FMP.....Fishery Management Plan
FONSI.....Finding of No Significant Impact
FWCA.....Fish and Wildlife Coordination Act
LAD .....Los Angeles District
MLLW .....Mean Lower Low Water
MPRSA.....Marine Protection Research and Sanctuaries Act
NEPA.....National Environmental Policy Act
NHPA.....National Historic Preservation Act
NMFS.....National Marine Fisheries Service
NO2.....Nitrogen dioxide
ODMDS.....Ocean Dredged Material Disposal Site
PL.....Public Law
RWQCB.....Regional Water Quality Control Board
SCAQMD .....South Coast Air Quality Management District
SCCAT.....Southern California Caulerpa Action Team
SC-DMMT.....Southern California Dredged Material Management Team
SHPO .....State Historic Preservation Officer
SIP.....State Implementation Plan
USACE .....U.S. Army Corps of Engineers
USFWS .....U.S. Fish and Wildlife Service

SECTION 10 - PREPARERS/REVIEWERS

10.1 Preparers

Larry Smith CORPS LAD, Ecologist, Environmental Policy Group

10.2 Reviewers

Tiffany Bostwick	CORPS LAD, Chief, Environmental Resources Branch
Christopher Hayward	Coastal Engineering
Mark Golay	Programs and Project Management Division
Kymberly Lyons	DQC, Ecosystem Planning Section

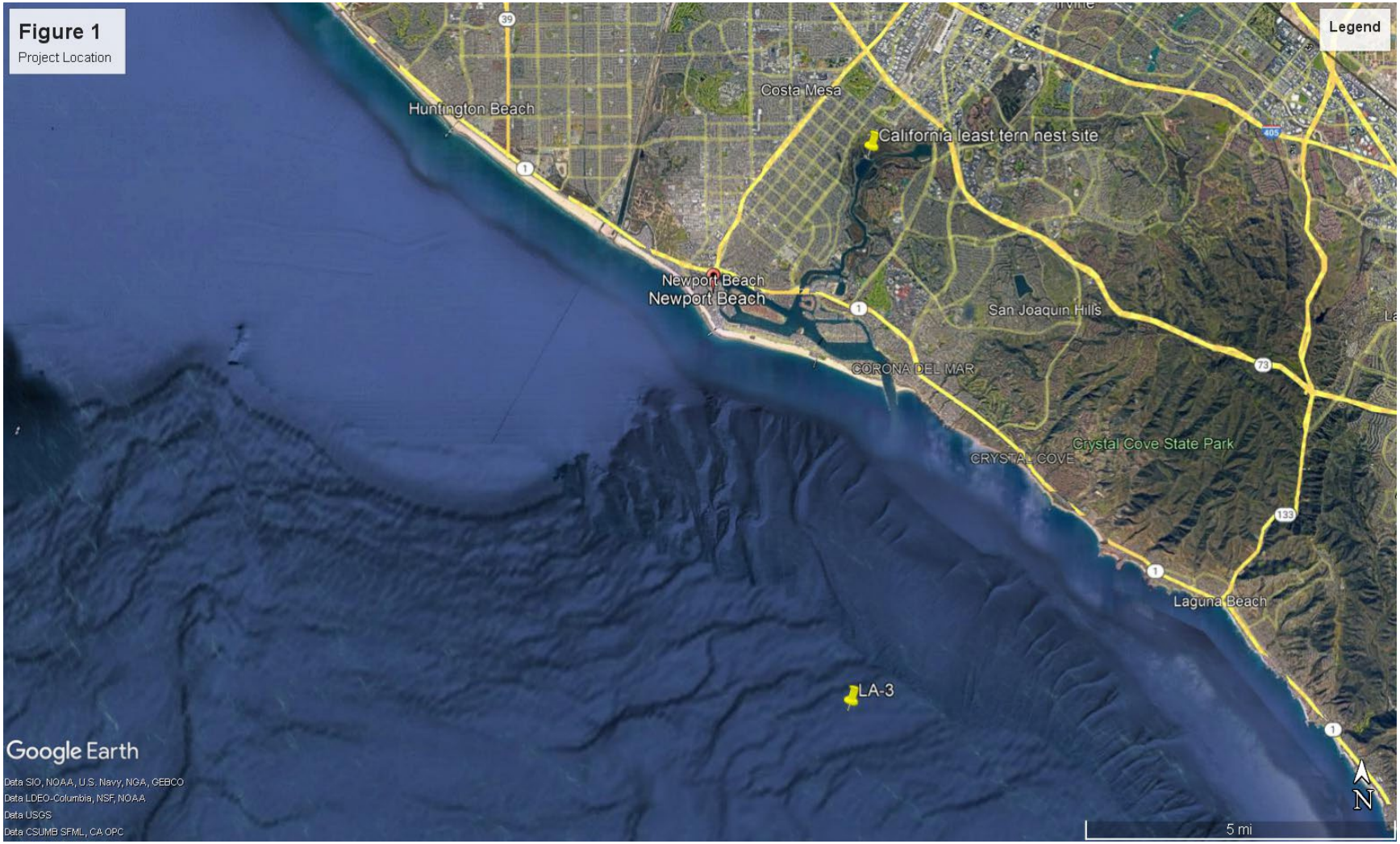


Figure 1
Project Location
Legend
Huntington Beach
Costa Mesa
California least tern nest site
Newport Beach
Newport Beach
San Joaquin Hills
CORONA DEL MAR
Crystal Cove State Park
CRYSTAL COVE
Laguna Beach
LA-3
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Data LDEO-Columbia, NSF, NOAA
Data USGS
Data CSUMB SFML, CA OPC
N
5 mi

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated September 2021. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83
VERTICAL DATUM: Mean Lower Low Water (MLLW)

LEGEND:

- Authorized Federal Channel Limits and Dredge Unit Boundaries
- (-20) Authorized Depth
- —-10— Existing Bathymetry
- Dredged Material Not Suitable for Open Ocean or Nearshore Disposal
- Dredged Material Suitable for Open Ocean or Nearshore Disposal
- Proposed Confined Aquatic Disposal Facility
- Nearshore Placement Area

0 1,800
Feet

Publish Date: 2022/01/13 6:19 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Federal Channel\0243-RP-036 2021 DREDGE SUITABILITY.dwg Figure J-3

Figure 2
Federal Channels Maintenance Dredging Sediment Suitability Map

NOTES:

1. DREDGE AREA BASED OF 20-FT CONTOUR OF EXISTING BOTTOM AND CHANNEL TOE
2. CONTOURS BASED ON SEPTEMBER 2021 BATHYMETRIC SURVEY BY U.S. ARMY CORPS OF ENGINEERS
3. COORDINATES ARE NAD 1983 EPOCH 2003.5 CALIFORNIA ZONE VI, US SURVEY FEET.
4. ALL STRUCTURES SHOWN ARE APPROXIMATE.

LEGEND

EXISTING UTILITY CROSSING (PROVIDED BY DUDEK)

EXISTING UTILITY CROSSING (PROVIDED BY SO CAL EDISON)

DREDGE AREA

PLAN NORTH

0 200' 400'

A1 ENTRANCE CHANNEL DREDGE AREA LIMITS

SCALE: 1"=300'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. HAYWARD
DRAWN BY: C. HAYWARD
CHECKED BY:
ISSUE DATE:
SOLICITATION NO.:
CONTRACT NO.:
SUBMITTED BY:
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BLVD
LOS ANGELES, CA 90017

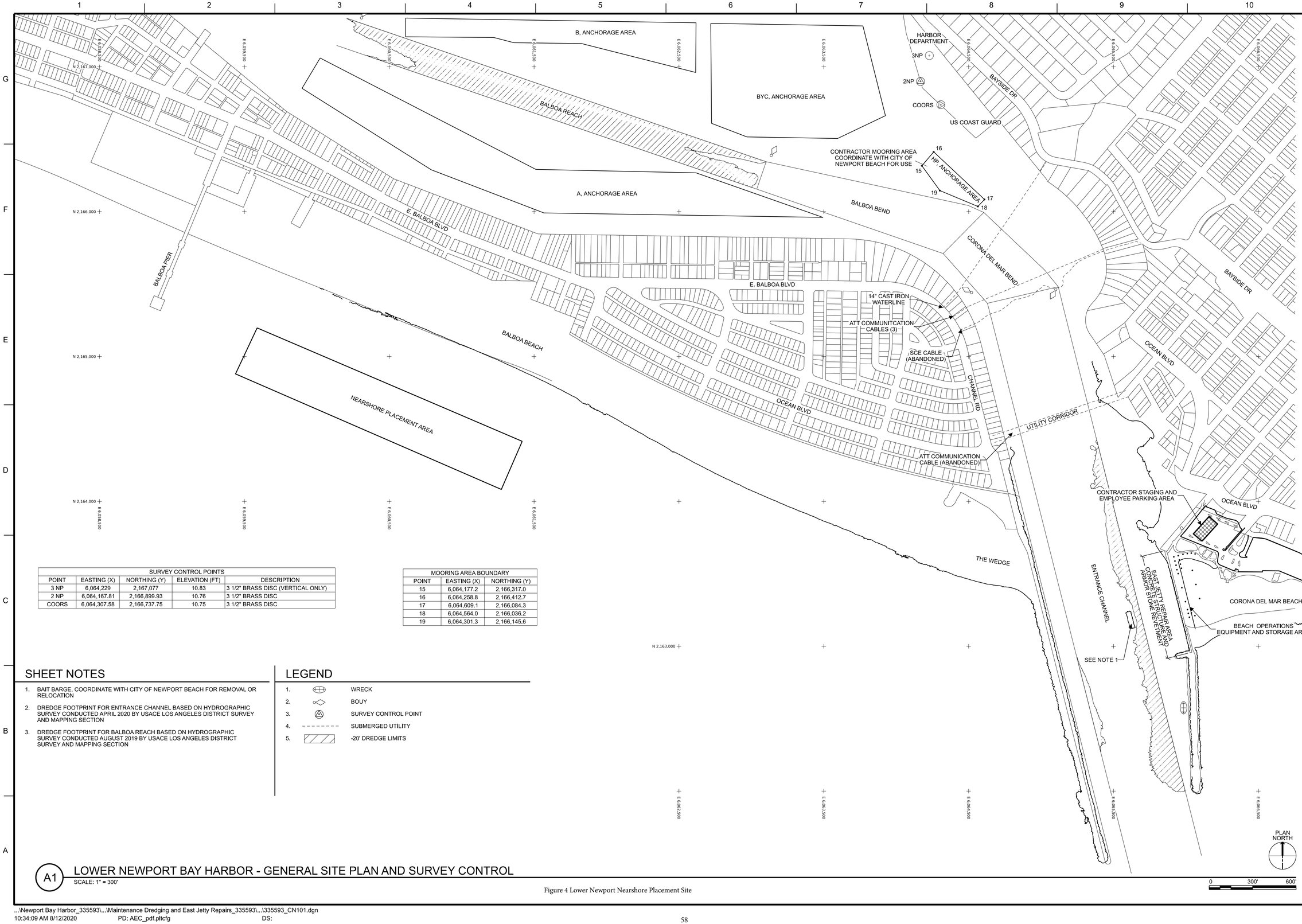
ORANGE COUNTY, CALIFORNIA
NEWPORT BAY HARBOR
MAINTENANCE DREDGING
AND CONFINED AQUATIC DISPOSAL FACILITY

DREDGE AREA LIMITS
ENTRANCE CHANNEL

SHEET ID

FIG 3

30% DESIGN-NOT FOR CONSTRUCTION



SURVEY CONTROL POINTS				
POINT	EASTING (X)	NORTHING (Y)	ELEVATION (FT)	DESCRIPTION
3 NP	6,064,229	2,167,077	10.83	3 1/2" BRASS DISC (VERTICAL ONLY)
2 NP	6,064,167.81	2,166,899.93	10.76	3 1/2" BRASS DISC
COORS	6,064,307.58	2,166,737.75	10.75	3 1/2" BRASS DISC

MOORING AREA BOUNDARY		
POINT	EASTING (X)	NORTHING (Y)
15	6,064,177.2	2,166,317.0
16	6,064,258.8	2,166,412.7
17	6,064,609.1	2,166,084.3
18	6,064,564.0	2,166,036.2
19	6,064,301.3	2,166,145.6

SHEET NOTES

1. BAIT BARGE, COORDINATE WITH CITY OF NEWPORT BEACH FOR REMOVAL OR RELOCATION
2. DREDGE FOOTPRINT FOR ENTRANCE CHANNEL BASED ON HYDROGRAPHIC SURVEY CONDUCTED APRIL 2020 BY USACE LOS ANGELES DISTRICT SURVEY AND MAPPING SECTION
3. DREDGE FOOTPRINT FOR BALBOA REACH BASED ON HYDROGRAPHIC SURVEY CONDUCTED AUGUST 2019 BY USACE LOS ANGELES DISTRICT SURVEY AND MAPPING SECTION

LEGEND

1. WRECK
2. BOUY
3. SURVEY CONTROL POINT
4. SUBMERGED UTILITY
5. -20' DREDGE LIMITS

A1 LOWER NEWPORT BAY HARBOR - GENERAL SITE PLAN AND SURVEY CONTROL
SCALE: 1" = 300'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. HAYWARD	ISSUE DATE: AUGUST 2020
DRAWN BY: J.T. GOERTZ	SOLICITATION NO.: W912PL20B0011
CHECKED BY: J. RYAN	CONTRACT NO.:
SUBMITTED BY: RONALD K. ARACHI, P.E.	FILE NAME 4823
SCALE: ANSI D	335593_CN101.dgn

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
LOS ANGELES, CALIFORNIA

ORANGE COUNTY, CALIFORNIA
NEWPORT BAY HARBOR
MAINTENANCE DREDGING AND EAST JETTY REPAIRS

GENERAL SITE PLAN AND SURVEY CONTROL

SHEET ID

CN101

Figure 4 Lower Newport Nearshore Placement Site

Figure 5. Map of eelgrass coverage observed during the 2020 survey.

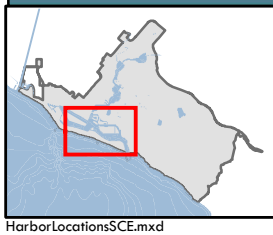


Figure 6 SCE Cable Locations

(Newport Harbor)

City of Newport Beach
GIS Division
November 01, 2021

HarborLocationsSCE.mxd

APPENDIX A

MAILING LIST

California Department of Boating & Waterways
2000 Evergreen Street, Suite 100
Sacramento, CA 94615-3888

Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

The Resources Agency of California
1416 Ninth Street
Sacramento, CA 95814

South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

State Clearing House
1400 Tenth Street, Room 121
Sacramento, CA 95814

State Lands Commission
100 Howe Avenue, #100S
Sacramento, CA 95852-8202

State of California Department of Transportation
120 S. Spring Street
Los Angeles, CA 90012

Julianne Polanco
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

John Ainsworth
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105

Loni Adams
CA Dept of Fish & Game
3883 Ruffin Road
San Diego, CA 92123

Jon Avery
U.S. Fish & Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Melissa Scianni
U.S. Environmental Protection Agency
600 Wilshire Boulevard, Suite 1460
Los Angeles, CA 90017

Hope Smythe
Executive Officer
Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Eric Chavez
National Marine Fisheries Service
501 W. Ocean Blvd., Suite 4200
Long Beach, CA 92802

U.S. Coast Guard
Marine Safety Office Group
1001 South Seaside Avenue, #20
San Pedro, CA 90731-7350

Chris Miller
Marine Environmental Division
City of Newport Beach
3300 Newport Boulevard
Newport Beach, CA 92658-8915

County of Orange
34551 Puerto Place
Dana Point, CA 92629

APPENDIX B

SAMPLING AND ANALYSIS PLAN REPORT/USEPA CORRESPONDENCE

Final Notes for May 22, 2019
Southern California Dredged Material Management Team (SC-DMMT) Meeting
US Army Corps of Engineers - Los Angeles District

Attendees (*phone):
Gerry Salas (Corps Regulatory South Coast Branch)
Mark Cooke (Corps Navigation Branch)
Joe Ryan (Corps Coastal Engineering Design Branch)
Chris Miller, City of Newport Beach
Adam Gale, Anchor QEA
*Larry Smith (Corps Planning Environmental Resources Branch)
*Robert Smith (Corps Regulatory South Coast Branch)
*Allan Ota, Melissa Scianni, Brian Ross (USEPA)
*Carol Roberts (USFWS)
*Loni Adams (CDFW)
*Jason Freshwater (Santa Ana Waterboard)
*Cris Morris (Los Angeles Waterboard)

Announcements:
Larry Smith: Larry Smith requested a revision to the Port Hueneme Suitability study; approximately 2000 CY going to nears shore area. This sediment is an area with historic piles for a wharf that was removed. Based on historical drawings and on Oxnard Harbor District maintenance dredging in the area, the Corps now believes that no pilings remain in the area. The sediment would be dredged by clamshell and screened as it is placed in barges to catch any unexpected piling remnants. The Los Angeles Waterboard expressed appreciation for additional information that was provided on the subject and would follow EPA's lead on the issue. EPA understands there is no piling debris, would review the additional information that was provided, and would reply by Tuesday May 28, 2019.

Project #1: 10:05 – 10:50 AM
1) Project name: City of Newport Beach Federal Channel Dredging
2) Applicant's NAME & affiliation: Chris Miller, City of Newport Beach
3) Project type (Regulatory/Navigation): Navigation
4) Corps Project Manager who will attend: Larry Smith and Mark Cooke.

Notes:
A brief presentation was made on the results of the sediment testing program, including the additional testing conducted in the Newport Channel. Following this the Corps recommended finding all sediments suitable for ocean disposal based on all composite samples passing effects-based testing in accordance with the Ocean Testing Manual. EPA indicated that they would not be finding sediments in the Turning Basin and Newport Channel 1 suitable for ocean disposal based on elevated levels of mercury and PCB found in those sediments. Newport Channel 1 was excluded from the Corps' suitability recommendation as elevated levels of mercury lead it to be excluded from the full effects-based test program. EPA expressed concerns over individual cores in the North Channel 1 & 2 composites. EPA indicated that some flexibility could be used when evaluating cutoff levels for ocean disposal for mercury and PCB if additional monitoring were to

be conducted at the LA-3 ODMDS following disposal to ensure that methylation of mercury was not occurring at the disposal site. The Corps responded that policy and funding limitations meant that we could not fund such an effort, but would discuss with the city to see if they were willing to consider those costs. The Corps requested a written suitability determination in writing and EPA agree to do so. The Waterboard indicated that they would follow EPA's lead in making a suitability determination.

It should be noted EPA advocated for a regional (i.e., bay-wide) approach to dealing with the contamination in Lower Newport Bay. The Regional Board and USFWS supported that approach.

Project #2: 10:50-11:20 AM
1) Project name: Pier G, Berths G235 and 236
2) Applicant's NAME & affiliation: Port of Long Beach
3) Project type (Regulatory/Navigation): Regulatory
4) Corps Project Manager who will attend: Antal Szijj and Emma Ross

Notes: Review of SAPR results for proposed extension of Pier G. Approx. 5,000 CY of material would be dredged to -62 MLLW from an area near Berths 235 and 236 to provide foundation for rock dike. Dredged material would eventually be placed behind the rock dike as fill for 2-acre pier extension. 6 cores collected from 3 locations and composited for physical and chemical analysis. Water also collected for elutriate analysis.

Results: Physical analysis showed predominantly silts and clays. Some analytes (Cu, Ni, DDT, and chlordane) above effects range low but none over effects range medium. No elutriate results were above any applicable criteria. Requesting concurrence material is suitable for placement in Pier G wharf extension fill.

EPA: No concerns. Agree material is suitable.
LARWQCB: Concur
CCC: not present, but later concurred via email (Larry Simon, 5/23/2019 email).
No other agency representatives expressed concerns over the proposed placement. One participant asked if other fill was proposed. POLB responded additional fill would consist of quarry run rock placement and for rock revetment work. Hope to get a supplemental EA out this year.

From:	Scianni, Melissa
To:	Smith, Lawrence J Jr CIV USARMY CESPL (US)
Cc:	Ross, Brian; Regulatory, SPL SCDMMT@usace.army.mil; Ziegler, Sam; Siu, Jennifer
Subject:	[Non-DoD Source] EPA Ocean Disposal Suitability Determination Newport Federal Channels
Date:	Thursday, June 6, 2019 9:31:13 AM

Larry,

As a follow up to the DMMT meeting last month I am sending EPA's suitability determination for the Newport Bay Federal Channels dredged material. Our determination is based on our review of the May 15, 2019 Sediment Analysis Report and April 12, 2019 "Data Compilation Report" memo both prepared by Anchor QEA, and on discussions about the data at a meeting held at EPA's offices on April 30, 2019. This suitability determination does not constitute final concurrence for use of the LA-3 site. We will transmit our final concurrence with the current site use conditions once we have reviewed the draft decision document. Please coordinate that review with either me or Allan Ota when the draft decision document is ready.

EPA finds that the results of the physical, chemical, and biological testing show Composite Areas EC, BIS, BIMW, BIME, BIN, MCN5, MCN4, MCN3 (cores 03 and 04 only), NC3, and NC2 (cores NC1-03, NC1-04, NC2-01, NC2-04 only) are suitable for unconfined aquatic disposal at the LA-3 ocean disposal site. These suitable sediments represent approximately 850,000 cy, or just over 79% of the 1.1 million cy project. EPA's determination is based on the sediments in these areas passing the Ocean Testing Manual (OTM) suspended and solid phase toxicity bioassays, the sediment mercury (Hg) concentrations being below 1 ppm (a contaminant threshold that has been applied regionally for some time), and the tissue results showing Hg, DDT, and PCBs did not bioaccumulate to levels of concern. EPA also concurs that the sediments from Composite Area EC are suitable for nearshore placement for beach nourishment based on the above criteria as well as the grain size compatibility analysis for potential receiver sites.

At this time, for the reasons summarized below, EPA finds the sediments from Composite Areas TB, MCN1, MCN 2, MCN3 (cores 01 and 02 only), NC1, and NC2 (cores NC2-02 and NC2-03 only) not suitable for unconfined aquatic disposal at the LA-3 ocean disposal site. These unsuitable sediments represent 262,558 cy, or less than 21% of the total project volume.

The Composite Area NC1 sediment was not subjected to the required biological testing and is therefore not eligible for ocean disposal at this time. EPA's determination for the other Composite Areas listed here is based on elevated sediment Hg concentrations substantially exceeding 1 ppm, the large Hg and PCB mass loading associated with the large sediment volume in these Composite Areas, and the possibility for methylation of this large Hg mass, which the standard Tier III tests do not address. While these Composite Areas passed toxicity testing, individual core Hg concentrations exceeded 1 ppm with many exceeding 2 ppm and one being as high as 5 ppm. Many of these areas also have elevated PCB concentrations. Combined these areas contain over 725 pounds of Hg (approximately 65% of the Hg mass from the project) and approximately 30 pounds of PCBs (50% of the project's PCB mass). In addition, while the Hg and PCBs did not accumulate above relevant TRV concentrations, the tissue concentrations for both were statistically significantly higher than the control tissues (mean up to 9.1x higher for Hg, and up to 65.2x higher for PCBs). The cumulative effect of placing this large volume of sediment with a large mass of Hg at the ocean disposal site may result in degradation of the site and its environs, which currently have ambient Hg concentrations around 0.16 ppm, and 0.01 ppm, respectively. Finally, sediments in Newport Bay with Hg concentrations above 1 ppm have not routinely undergone biological testing for ocean disposal. Therefore, we do not have a robust testing history regarding the biological effects of these sediments. In this situation, the standard

tier III testing does not provide the necessary information to adequately evaluate the impacts of placing this highly contaminated material in the ocean.

During our April 30, 2019 meeting at EPA, we discussed options for managing the areas with elevated Hg, including the construction of a confined disposal site in the Bay and conducting additional monitoring at the ocean disposal site. Specifically, EPA is willing to consider placement of sediment with Hg concentrations somewhat above 1 ppm, if a contaminated sediment management plan were in development and if the Corps or City conducts additional confirmatory monitoring at the disposal site to evaluate the effects of these sediments following disposal. For example, if sediment composite areas with Hg concentrations as high as 1.5. ppm were ocean disposed, that would represent approximately 120,000 cy of additional material, or approximately 11 % more of the overall project volume. This would still exclude the highest Hg and PCB concentration areas, including 50% of the Hg mass and 38% of the PCB mass. The additional confirmatory monitoring would focus mainly on whether methylation is occurring and could be conducted in conjunction with EPA's standard site monitoring survey (tentatively planned for no later than 2024, but this date could be advanced depending on how the Newport Bay channels project proceeds). At your convenience, we are available to discuss these and other options for the material determined to be unsuitable for ocean disposal based on the current tier III testing.

Please contact me or Allan Ota if there are any questions about EPA's determination.

Regards,

Melissa

Melissa Scianni

Wetlands Office

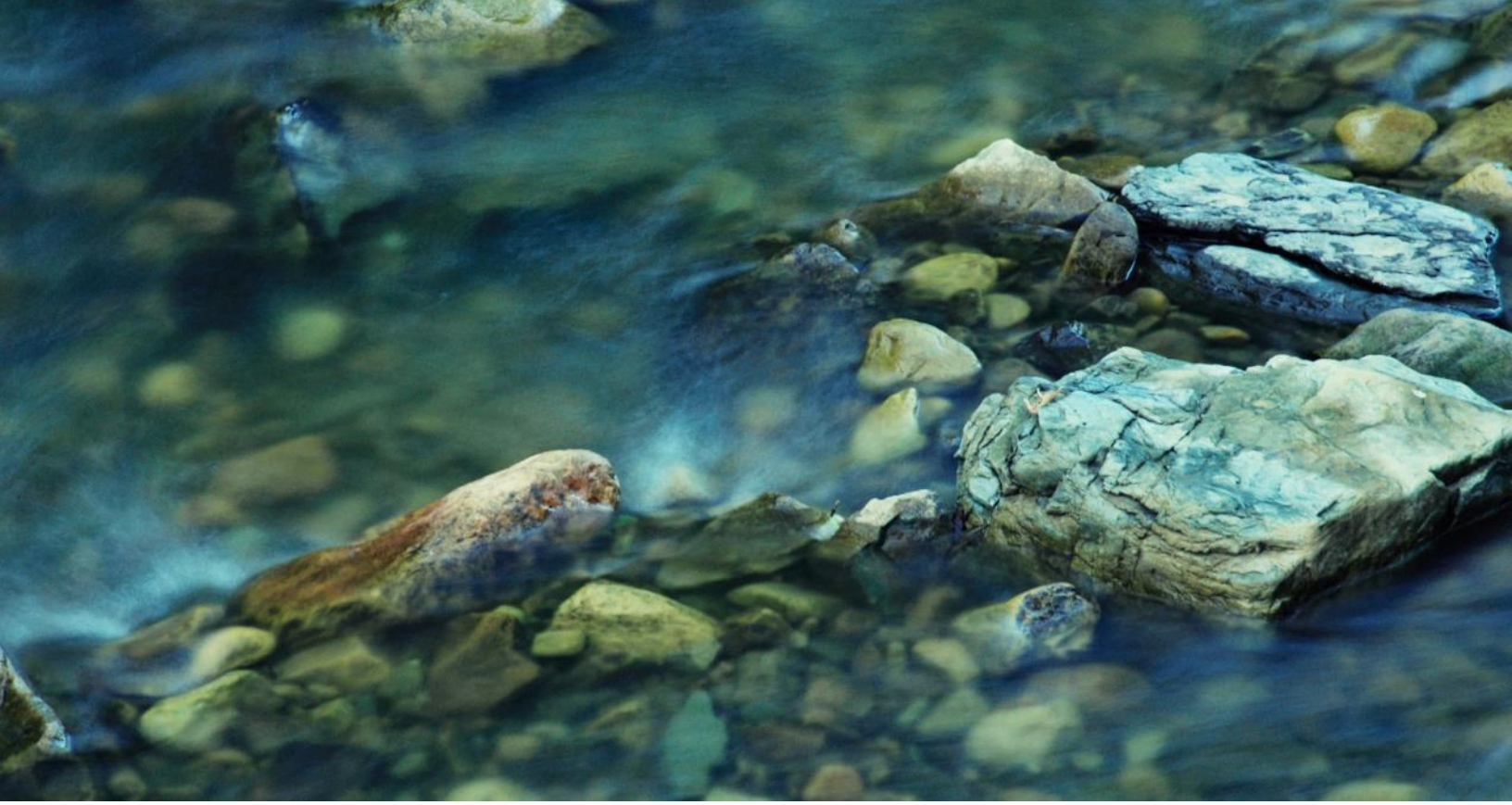
US EPA, Region IX, Southern CA Field Office

600 Wilshire Blvd, Suite 940

Los Angeles, CA 90017

(213) 244-1817

scianni.melissa@epa.gov <mailto:scianni.melissa@epa.gov>



Updated May 2019
Lower Newport Bay Federal Channels Dredging

ANCHOR QEA

Sampling and Analysis Program Report

Prepared for City of Newport Beach

Updated May 2019
Lower Newport Bay Federal Channels Dredging

Sampling and Analysis Program Report

Prepared for
City of Newport Beach
100 Civic Center Drive
Newport Beach, California 92660

Prepared by
Anchor QEA, LLC
9700 Research Drive
Irvine, California 92618

Project Number: 180243-02.01

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

ABBREVIATIONS

µg/kg	microgram per kilogram
µg/L	microgram per liter
ANOVA	analysis of variance
BP	bioaccumulation potential
City	City of Newport Beach
cy	cubic yard
DU	dredge unit
EC_{50}	median effective concentration
ERED	Environmental Residue-Effects Database
ERL	effects range low
ERM	effects range median
FDA	U.S. Food and Drug Administration
ITM	*Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual*
LC_{50}	median lethal concentration
LCS	laboratory control sample
LNB	Lower Newport Bay
LPC	limiting permissible concentration
MDL	method detection limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
MLLW	mean lower low water
MS	matrix spike
MSD	matrix spike duplicate
NOEC	no observed effect concentration
ODMDS	Ocean Dredged Material Disposal Site
OTM	*Evaluation for Dredged Material Proposed for Ocean Disposal – Testing Manual*
QA/QC	quality assurance/quality control
R/V	research vessel
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SAPR	Sampling and Analysis Program Report
SC-DMMT	Southern California Dredged Material Management Team
SP	solid phase
SPP	suspended particulate phase

SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TOC	total organic carbon
TRV	toxicity reference value
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1 Introduction

The City of Newport Beach (City) and U.S. Army Corps of Engineers (USACE) are proposing to conduct dredging within the federal channels in Lower Newport Bay (LNB), California (Figures 1 and 2). Dredging is needed in areas of increased shoaling to improve navigation and maintain federal authorized design depths. The federal channels were most recently dredged between May 2012 and January 2013, at which time dredging to depths of -10 to -17 feet mean lower low water (MLLW) was performed throughout large areas of LNB. Contaminated material was placed at the Port of Long Beach's Middle Harbor Fill Site, and clean material was placed at the U.S. Environmental Protection Agency (USEPA)-designated LA-3 Ocean Dredged Material Disposal Site (ODMDS) (Figure 1). Based on the most recent USACE harbor-wide bathymetric surveys, sedimentation has occurred in many areas of LNB such that dredging is needed within the federal channels to maintain safe navigation. The City is pursuing this program—in partnership with the USACE—to dredge the LNB federal channels to the currently authorized design depths. Sediment from LNB federal channels was characterized to determine suitability for ocean disposal at LA-3 ODMDS (Figure 1). Sediment from the Entrance Channel was also evaluated to determine compatibility for nearshore placement.

Sediment core sampling was conducted within the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel in January 2018. The Sampling and Analysis Program Report (SAPR) was presented to the Southern California Dredged Material Management Team (SC-DMMT) in July 2018. At this meeting, USEPA requested supplemental information to support a suitability determination, including mass loading calculations and a compilation of historical data from Newport Bay. Mass loading calculations and a compilation of historical data were provided to USEPA in April 2019 and are included as part of this updated SAPR.

Newport Channel was not initially included in this sediment characterization program or the previous federal channels investigation in 2009 (Newfields 2009) due to historical contamination and amphipod toxicity in 2003 and 2006 (Weston 2007). During the federal channels sampling in January 2018, exploratory sampling was conducted within Newport Channel and results were cleaner than expected. Based on these results, the City expanded the federal channels characterization to include Newport Channel. The sampling and analysis approach for Newport Channel was presented to the SC-DMMT in June 2018 (Anchor QEA 2018a), and additional sampling was conducted in January 2019. This SAPR summarizes both sediment sampling events and evaluates data results for LNB federal channels, including Newport Channel.

1.1 Project Summary

The July 2018 USACE harbor-wide bathymetry data from LNB shows that dredging is required in multiple areas to achieve authorized design depths (Figure 3). Areas that require the most dredging include the Entrance Channel, Main Channel North, Bay Island, Turning Basin, West Lido, and

Newport Channel. West Lido was not included as part of this sediment characterization or the previous federals channels investigation in 2009 (Newfields 2009) due to historical contamination and amphipod toxicity in 2003 and 2006 (Weston 2007). As previously described, Newport Channel was also not initially included as part of this sediment characterization program. Eleven dredge units (DUs) were identified within the Entrance Channel, Main Channel North, Bay Island, and Turning Basin for sampling and analysis activities (Anchor QEA 2017a). Three DUs were identified within Newport Channel for sampling and analysis activities (Anchor QEA 2018b). For Newport Channel, DU boundaries were finalized in coordination with USEPA based on the results of individual core chemistry. DU boundaries and existing bathymetry are shown in Figure 4.

Dredging is planned within LNB federal channels to design depths ranging from -15 to -20 feet MLLW, plus 2 feet of overdepth allowance (1 foot paid and 1 foot unpaid). The total volume of material proposed for dredging is estimated to be 1,224,300 cubic yards (cy), consisting of 716,430 cy above design depth and 507,870 cy of allowable overdepth. Table 1 summarizes the proposed dredging volumes for LNB federal channels. Proposed dredged material volume estimates were slightly updated from those presented in the Sampling and Analysis Plan (SAP; Anchor QEA 2017a) and sampling and analysis approach for Newport Channel (Anchor QEA 2018a) based on new condition surveys completed by USACE in June 2018, plus 10% contingency to account for sediment accumulation prior to dredging. In addition, some DU boundaries were slightly refined (i.e., removed marina in northwest corner of Turning Basin). Overall, the updated total volume of dredged material is within 10% of the original estimates (1,116,200 cy) presented in the SAP (Anchor QEA 2017a) and sampling and analysis approach for Newport Channel (Anchor QEA 2018a).

Table 1
Proposed Dredging Volumes

Dredge Unit	Dredge Unit Code	Design Depth (feet MLLW)	Estimated Volume to Design Depth (cy)	2-Foot Overdepth Allowance Volume (cy)	Total Volume (cy)	Dredge Unit Area (acres)
Turning Basin	TB	-20	23,100	68,800	91,900[1]	26.5
Main Channel North 1	MCN1	-20	36,600	26,600	63,200	8.2
Main Channel North 2	MCN2	-20	37,600	23,200	60,800	7.2
Main Channel North 3	MCN3	-20	44,600	38,800	83,400	13.8
Main Channel North 4	MCN4	-20	28,300	26,700	55,000	8.9
Main Channel North 5	MCN5	-20	50,200	39,600	89,800	12.9
Bay Island North	BIN	-15	77,900	55,800	133,700	18.5
Bay Island Middle East	BIME	-15	41,500	25,500	67,000	8.6
Bay Island Middle West	BIMW	-15	41,200	24,300	65,500	7.7
Bay Island South	BIS	-15	50,300	30,300	80,600	9.5
Entrance Channel	EC	-20	51,700	19,200	70,900	7.2

Dredge Unit	Dredge Unit Code	Design Depth (feet MLLW)	Estimated Volume to Design Depth (cy)	2-Foot Overdepth Allowance Volume (cy)	Total Volume (cy)	Dredge Unit Area (acres)
Newport Channel 1	NC1	-15	28,300	18,700	47,000	7.3
Newport Channel 2	NC2	-15	85,800	39,600	125,400	12.3
Newport Channel 3	NC3	-15	54,200	24,600	78,800	7.6
Total	**--**	**--**	**651,300**	**461,700**	**1,113,000**	**156**
Total (with 10% Contingency)	**--**	**--**	**716,430**	**507,870**	**1,224,300**	**--**

Note:

1. The majority of volume within the Turning Basin consists of overdepth. Actual construction will focus on high spots versus thin veneer. Focusing on material above -19 feet MLLW within the Turning Basin results in a total volume of 19,500 cy (includes 2 feet of overdepth).

1.2 Objectives

The purpose of this sediment investigation was to determine the suitability of the proposed dredged material for ocean disposal. If suitable, dredged material will be placed at LA-3 ODMDS. In addition, sediment from the Entrance Channel was evaluated to determine compatibility of the proposed dredged material for nearshore placement. If compatible, dredged material will be placed at a nearshore placement site along beaches north of the harbor entrance and up to the Santa Ana River. Testing for ocean disposal included physical, chemical, and biological analyses in accordance with guidelines specified in the *Evaluation for Dredged Material Proposed for Ocean Disposal – Testing Manual* (OTM; USEPA/USACE 1991). The evaluation for nearshore placement followed guidance provided in the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual: Inland Testing Manual* (ITM; USEPA/USACE 1998), the Sand Compatibility Opportunistic Use Program (Moffatt & Nichol 2006), and *Requirements for Sampling, Testing and Data Analysis of Dredged Material* (USACE 1989).

2 Methods

This section presents a summary of methods and procedures used to characterize sediments from LNB federal channels. Sampling and analysis for the federal channels was implemented in accordance with the SAP (Anchor QEA 2017a). The SAP was presented to the SC-DMMT on December 13, 2017. The SAP was revised based on comments received at this meeting and subsequently approved by USEPA on January 3, 2018. The sampling and analysis approach for Newport Channel, including exploratory sampling results, was presented to and approved by the SC-DMMT on June 27, 2018 (Anchor QEA 2018a).

2.1 Sample Collection and Handling

All sample collection, handling, and processing procedures were implemented in accordance with the SAP (Anchor QEA 2017a) and sampling and analysis approach for Newport Channel (Anchor QEA 2018a).

2.1.1 Sediment Core Sampling

Sediment cores were collected using an electrically powered vibracore during two distinct sampling events, including January 2018 and January 2019. Station coordinates, mudline elevation, estimated penetration, retrieved core lengths, and sample intervals for each station are summarized in Table 2. Field logs and core photographs are provided in Appendix A.

2.1.1.1 January 2018 Sampling Event

The first sampling event was conducted from January 8 to 19, 2018, and included the Turning Basin, Main Channel North, Bay Island, and Entrance Channel. Sediment cores were collected at 48 stations within 11 DUs. Core sampling locations are shown in Figures 5 through 15. Sampling was performed from the research vessel (R/V) *Leviathan*, operated by Leviathan Environmental Services, LLC. The vessel is 28 feet long and equipped with an A-frame, moonpool, and winch for sample collection. The vibracore was deployed and recovered through the moonpool. Two to four cores were required from each station to obtain sufficient volume for analysis. Sediment cores were collected to the authorized dredge depth plus 2 feet of overdepth allowance and the Z-layer, unless refusal was encountered. Within the Entrance Channel, refusal was encountered at all stations due to dense sand throughout the area, which resulted in bent core tubes and low sample recovery. After three attempts, the longest cores were retained for analysis. Only station EC-04 from this DU was sampled to the target sampling depth. Within the other DUs, all stations were sampled to the project depth plus overdepth and Z-layer.

Sediment cores were processed as summarized in Table 3. Composite samples were created for each DU (to the design depth plus overdepth allowance) for physical and chemical analyses and biological testing. For Bay Island Middle East and West, two vertical composites were created based on

historical mercury concentrations in lower depth intervals (Newfields 2009) and comments received at the SC-DMMT meeting on December 13, 2017. The upper composite consisted of sediment from the mudline to 3 feet below the mudline, and the lower composite consisted of sediment from 3 feet below the mudline to the design depth plus overdepth allowance. Based on sediment chemistry results, the two vertical composites were combined for biological testing. Sediment from each core (to the authorized dredge depth) and the Z-layer were archived to allow for additional chemical analysis, if necessary. For the Entrance Channel, a subsample of each core or core interval, if stratification observed, was collected for grain size sieve analysis to support the evaluation for nearshore placement. All cores within the Entrance Channel were predominantly sand; therefore, subsamples were not collected for Atterberg limits or hydrometer analysis.

2.1.1.2 January 2019 Sampling Event

The second sampling event was conducted from January 8 to 19, 2018, and included only Newport Channel. Sediment cores were collected at 12 stations within three DUs. Core sampling locations are shown in Figure 16. Sampling was performed from the R/V *Innovation*, operated by Marine Taxonomic Services, LTD. The vessel is 30 feet long and equipped with an A-frame, moonpool, and winch for sample collection. The vibracore was deployed and recovered through the moonpool. Two cores were required from each station to obtain sufficient volume for analysis. Sediment cores were collected to the authorized dredge depth plus 2 feet of overdepth allowance and the Z-layer, unless refusal was encountered. Within Newport Channel, refusal was encountered at most stations due to dense sand underneath the overlying silt layer, which resulted in bent core tubes and low sample recovery. After three attempts, the longest cores were retained for analysis. Only stations NC1-02 and NC3-02 achieved the target sampling depth. However, station NC1-02 was inadvertently sampled 0.5 feet beyond the target depth. Because this station was later eliminated from the sediment characterization for ocean disposal due to elevated mercury, this deviation does not affect the overall results of this sampling program.

Sediment cores were processed as summarized in Table 4. Sediment from each core (to the authorized dredge depth and overdepth) was submitted for physical and chemical analyses. The Z-layer from each core was archived to allow for additional chemical analysis, if necessary. If the Z-layer depth was not achieved, the bottom 0.5 foot of the core was archived. Based on individual core sediment chemistry results, two composite samples (NC2-COMP and NC3-COMP) were created in coordination with USEPA (Appendix B) for physical and chemical analyses and biological testing. Stations NC1-01 and NC1-02 were eliminated from the sediment characterization due to elevated mercury, and no further testing for ocean disposal was performed.

Table 2
Station Coordinates, Mudline Elevations, Estimated Penetration, Retrieved Core Lengths, and Sample Intervals for Each Station

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
January 2018 Sampling Event												
TB-01	1	33° 37.201'	117° 55.694'	-17.8	-22	6.2	5.8	-22.0	TB-01-011218	0 to 4.2	Archive, composite	N/A
									TB-01-Z-011218	4.2 to 4.7	Z layer archive	
	2	33° 37.201'	117° 55.694'	-17.8	-22	6.2	4.5	-22.0	TB-01-011218	0 to 4.2	Composite	N/A
TB-02	1	33° 37.222'	117° 55.634'	-18.0	-22	6.0	5.7	-22.0	TB-02-011218	0 to 4.0	Archive, composite	N/A
									TB-02-Z-011218	4.0 to 4.5	Z layer archive	
	2	33° 37.221'	117° 55.631'	-18.0	-22	5.8	4.9	-22.0	TB-02-011218	0 to 4.0	Composite	N/A
TB-03	1	33° 37.148'	117° 55.476'	-18.4	-22	5.6	5.1	-22.0	TB-03-011218	0 to 3.6	Archive, composite	N/A
									TB-03-Z-011218	3.6 to 4.1	Z layer archive	
	2	33° 37.148'	117° 55.476'	-18.4	-22	5.0	3.6	-22.0	TB-03-011218	0 to 3.6	Composite	N/A
TB-04	1	33° 37.026'	117° 55.592'	-18.9	-22	5.1	4.6	-22.0	TB-04-011218	0 to 3.1	Archive, composite	N/A
									TB-04-Z-011218	3.1 to 3.6	Z layer archive	
	2	33° 37.026'	117° 55.592'	-18.9	-22	5.1	4.2	-22.0	TB-04-011218	0 to 3.1	Composite	N/A
TB-05	1	33° 37.088'	117° 55.351'	-19.2	-22	4.8	4.2	-22.0	TB-05-011218	0 to 2.8	Archive, composite	N/A
									TB-05-Z-011218	2.8 to 3.3	Z layer archive	
	2	33° 37.089'	117° 55.350'	-19.0	-22	4.5	4.0	-22.0	TB-05-011218	0 to 3.0	Composite	N/A
TB-06	1	33° 37.098'	117° 55.636'	-19.3	-22	4.8	4.6	-22.0	TB-06-011218	0 to 2.7	Archive, composite	N/A
									TB-06-Z-011218	2.7 to 3.2	Z layer archive	
	2	33° 37.098'	117° 55.636'	-19.3	-22	2.0	1.7	N/A	N/A	N/A	N/A	Refusal; sample discarded
	3	33° 37.098'	117° 55.637'	-20.1	-22	4.1	3.3	-22.0	TB-06-011218	0 to 1.9	Composite	Slightly moved
MCN1-01	1	33° 37.040'	117° 55.245'	-18.0	-22	7.5	6.2	-22.0	MCN1-01-T-011518	0 to 4.0	Archive, composite	N/A
									MCN1-01-Z-011518	4.0 to 4.5	Z layer archive	
	2	33° 37.040'	117° 55.245'	-18.0	-22	6.0	4.1	-22.0	MCN1-01-T-011518	0 to 4.0	Composite	N/A
MCN1-02	1	33° 36.994'	117° 55.189'	-17.4	-22	6.1	5.1	-22.0	MCN1-02-T-011518	0 to 4.6	Archive, composite	Refusal
									MCN1-02-Z-011518	4.6 to 5.1	Z layer archive	
	2	33° 36.994'	117° 55.189'	-17.4	-22	6.1	5.1	-22.0	MCN1-02-T-011518	0 to 4.6	Composite	Refusal
MCN1-03	1	33° 36.975'	117° 55.109'	-17.9	-22	7.0	6.1	-22.0	MCN1-03-T-011518	0 to 4.1	Archive, composite	Refusal
									MCN1-03-Z-011518	4.1 to 4.6	Z layer archive	
	2	33° 36.975'	117° 55.109'	-17.9	-22	6.1	5.3	-22.0	MCN1-03-T-011518	0 to 4.1	Composite	N/A
MCN1-04	1	33° 36.934'	117° 55.061'	-16.1	-22	8.9	7.0	-22.0	MCN1-04-T-011518	0 to 5.9	Archive, composite	Refusal
									MCN1-04-Z-011518	5.9 to 6.4	Z layer archive	
	2	33° 36.934'	117° 55.061'	-16.1	-22	9.4	7.6	-22.0	MCN1-04-T-011518	0 to 5.9	Composite	Refusal
MCN2-01	1	33° 36.919'	117° 55.003'	-18.0	-22	5.3	5.0	-22.0	MCN2-01-T-011518	0 to 4.0	Archive, composite	Refusal
									MCN2-01-Z-011518	4.0 to 4.5	Z layer archive	
	2	33° 36.919'	117° 55.003'	-18.0	-22	5.2	5.0	-22.0	MCN2-01-T-011518	0 to 4.0	Composite	Refusal
MCN2-02	1	33° 36.884'	117° 54.939'	-16.6	-22	7.3	5.5	-22.0	MCN2-02-T-011518	0 to 5.4	Archive, composite	Refusal
									MCN2-02-Z-011518	5.4 to 5.5	Z layer archive	
	2	33° 36.884'	117° 54.939'	-16.6	-22	6.9	5.4	-22.0	MCN2-02-T-011518	0 to 5.4	Composite	Refusal
MCN2-03	1	33° 36.861'	117° 54.860'	-17.0	-22	8.0	6.4	-22.0	MCN2-03-T-011518	0 to 5.0	Archive, composite	Refusal
									MCN2-03-Z-011518	5.0 to 5.5	Z layer archive	
	2	33° 36.861'	117° 54.860'	-17.0	-22	8.2	6.3	-22.0	MCN2-03-T-011518	0 to 5.0	Composite	Refusal
MCN2-04	1	33° 36.816'	117° 54.791'	-17.6	-22	7.9	6.4	-22.0	MCN2-04-T-011618	0 to 4.4	Archive, composite	N/A
									MCN2-04-Z-011618	4.4 to 4.9	Z layer archive	
	2	33° 36.816'	117° 54.791'	-17.6	-22	6.9	6.0	-22.0	MCN2-04-T-011618	0 to 4.4	Composite	N/A

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
MCN3-01	1	33° 36.788'	117° 54.711'	-17.6	-22	6.9	6.4	-22.0	MCN3-01-011918	0 to 4.4	Archive, composite	N/A
									MCN3-01-Z-011918	4.4 to 4.9	Z layer archive	
	2	33° 36.789'	117° 54.711'	-18.0	-22	5.5	5.1	-22.0	MCN3-01-011918	0 to 4.0	Composite	N/A
MCN3-02	1	33° 36.730'	117° 54.610'	-18.0	-22	6.0	5.6	-22.0	MCN3-02-011918	0 to 4.0	Archive, composite	N/A
									MCN3-02-Z-011918	4.0 to 4.5	Z layer archive	
	2	33° 36.730'	117° 54.610'	-18.4	22	5.0	4.9	-22.0	MCN3-02-011918	0 to 3.6	Composite	N/A
MCN3-03	1	33° 36.683'	117° 54.487'	-18.1	-22	5.9	5.9	-22.0	MCN3-03-011918	0 to 3.9	Archive, composite	N/A
									MCN3-03-Z-011918	3.9 to 4.4	Z layer archive	
	2	33° 36.682'	117° 54.487'	-18.0	-22	5.5	3.8	-22.0	MCN3-03-011918	0 to 3.8	Composite	N/A
MCN3-04	1	33° 36.598'	117° 54.392'	-18.0	-22	5.1	4.1	-22.0	MCN3-04-011918	0 to 4.0	Archive, composite	Refusal
	2	33° 36.598'	117° 54.392'	-17.9	-22	5.6	5.1	-22.0	MCN3-04-011918	0 to 4.1	Composite	Refusal
									MCN3-04-Z-011918	4.1 to 4.6	Z layer archive	
MCN4-01	1	33° 36.436'	117° 54.120'	-16.9	-22	7.1	5.6	-22.0	MCN4-01-011918	0 to 5.1	Archive, composite	N/A
									MCN4-01-Z-011918	5.1 to 5.6	Z layer archive	
	2	33° 36.435'	117° 54.119'	-17.7	-22	6.6	5.6	-22.0	MCN4-01-011918	0 to 4.3	Composite	N/A
MCN4-02	1	33° 36.390'	117° 54.063'	-17.9	-22	6.1	5.6	-22.0	MCN4-02-011818	0 to 4.1	Archive, composite	N/A
									MCN4-02-Z-011818	4.1 to 4.6	Z layer archive	
	2	33° 36.390'	117° 54.063'	-17.9	-22	5.6	5.3	-22.0	MCN4-02-011818	0 to 4.1	Composite	N/A
MCN4-03	1	33° 36.351'	117° 54.001'	-18.1	-22	NR	4.9	-22.0	MCN4-03-011818	0 to 3.9	Archive, composite	N/A
									MCN4-03-Z-011818	3.9 to 4.4	Z layer archive	
	2	33° 36.351'	117° 54.001'	-18.1	-22	6.0	4.2	-22.0	MCN4-03-011818	0 to 3.9	Composite	N/A
MCN4-04	1	33° 36.314'	117° 53.941'	-18.0	-22	7.0	5.8	-22.0	MCN4-04-011818	0 to 4.0	Archive, composite	N/A
									MCN4-04-Z-011818	4.0 to 4.5	Z layer archive	
	2	33° 36.314'	117° 53.941'	-18.0	-22	5.6	4.5	-22.0	MCN4-04-011818	0 to 4.0	Composite	N/A
MCN5-01	1	33° 36.198'	117° 53.711'	-18.5	-22	5.5	5.2	-22.0	MCN5-01-011818	0 to 3.5	Archive, composite	N/A
									MCN5-01-Z-011818	3.5 to 4.0	Z layer archive	
	2	33° 36.198'	117° 53.711'	-18.5	-22	5.5	4.4	-22.0	MCN5-01-011818	0 to 3.5	Composite	N/A
MCN5-02	1	33° 36.158'	117° 53.551'	-18.1	-22	5.9	5.6	-22.0	MCN5-02-011818	0 to 3.9	Archive, composite	N/A
									MCN5-02-Z-011818	3.9 to 4.4	Z layer archive	
	2	33° 36.158'	117° 53.551'	-18.1	-22	5.9	5.8	-22.0	MCN5-02-011818	0 to 3.9	Composite	N/A
MCN5-03	1	33° 36.134'	117° 53.470'	-18.3	-22	5.7	5.4	-22.0	MCN5-03-011818	0 to 3.7	Archive, composite	N/A
									MCN5-03-Z-011818	3.7 to 4.2	Z layer archive	
	2	33° 36.134'	117° 53.470'	-18.3	-22	5.0	4.2	-22.0	MCN5-03-011818	0 to 3.7	Composite	N/A
MCN5-04	1	33° 36.103'	117° 53.359'	-18.8	-22	5.2	4.8	-22.0	MCN5-04-011818	0 to 3.2	Archive, composite	N/A
									MCN5-04-Z-011818	3.2 to 3.7	Z layer archive	
	2	33° 36.103'	117° 53.359'	-18.8	-22	5.0	3.8	-22.0	MCN5-04-011818	0 to 3.2	Composite	N/A
BIN-01	1	33° 36.610'	117° 54.480'	-11.8	-17	9.4	6.6	-17.0	BIN-01-T-011618	0 to 5.2	Archive, composite	Refusal
									BIN-01-Z-011618	5.2 to 5.7	Z layer archive	
	2	33° 36.610'	117° 54.480'	-11.8	-17	9.5	8.1	-17.0	BIN-01-T-011618	0 to 5.2	Composite	Refusal
BIN-02	1	33° 36.555'	117° 54.418'	-12.1	-17	7.0	6.5	-17.0	BIN-02-T-011618	0 to 4.9	Archive, composite	Refusal
									BIN-02-Z-011618	4.9 to 5.4	Z layer archive	
	2	33° 36.555'	117° 54.418'	-12.1	-17	6.4	5.2	-17.0	BIN-02-T-011618	0 to 4.9	Composite	Refusal
BIN-03	1	33° 36.522'	117° 54.352'	-11.9	-17	7.8	6.8	-17.0	BIN-03-T-011618	0 to 5.1	Archive, composite	Refusal
									BIN-03-Z-011618	5.1 to 5.6	Z layer archive	
	2	33° 36.522'	117° 54.352'	-11.9	-17	6.5	5.1	-17.0	BIN-03-T-011618	0 to 5.1	Composite	Refusal
BIN-04	1	33° 36.501'	117° 54.544'	-11.4	-17	9.8	8.5	-17.0	BIN-04-T-011618	0 to 5.6	Archive, composite	Refusal
									BIN-04-Z-011618	5.6 to 6.1	Z layer archive	

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
	2	33˚ 36.501'	117˚ 54.544'	-11.4	-17	7.6	7.2	-17.0	BIN-04-T-011618	0 to 5.6	Composite	N/A
BIN-05	1	33˚ 36.520'	117˚ 54.442'	-11.8	-17	9.2	7.3	-17.0	BIN-05-T-011618	0 to 5.2	Archive, composite	Refusal
									BIN-05-Z-011618	5.2 to 5.7	Z layer archive	
	2	33˚ 36.520'	117˚ 54.442'	-11.8	-17	7.6	6.7	-17.0	BIN-05-T-011618	0 to 5.2	Composite	N/A
BIN-06	1	33˚ 36.563'	117˚ 54.512'	-11.9	-17	9.1	8.1	-17.0	BIN-06-T-011718	0 to 5.1	Archive, composite	Refusal
									BIN-06-Z-011718	5.1 to 5.6	Z layer archive	
	2	33˚ 36.563'	117˚ 54.512'	-11.9	-17	6.9	3.1	N/A	N/A	N/A	N/A	Sample discarded
	3	33˚ 36.563'	117˚ 54.512'	-11.9	-17	6.6	6.3	-17.0	BIN-06-T-011718	0 to 5.1	Composite	N/A
BIME-01	1	33˚ 36.461'	117˚ 54.409'	-11.3	-17	9.2	8.6	-17.0	BIME-01-T-011018	0 to 3.0	Archive, upper composite	Refusal
									BIME-01-M-011018	3.0 to 5.7	Archive, lower composite	
									BIME-01-Z-011018	5.7 to 6.2	Z layer archive	
	2	33˚ 36.461'	117˚ 54.409'	-11.3	-17	7.2	6.5	-17.0	BIME-01-T-011018	0 to 3.0	Upper composite	N/A
									BIME-01-M-011018	3.0 to 5.7	Lower composite	
	3	33˚ 36.461'	117˚ 54.409'	-11.3	-17	7.2	6.2	-17.0	BIME-01-T-011018	0 to 3.0	Upper composite	N/A
									BIME-01-M-011018	3.0 to 5.7	Lower composite	
	4	33˚ 36.461'	117˚ 54.409'	-11.3	-17	7.2	6.9	-17.0	BIME-01-T-011018	0 to 3.0	Upper composite	N/A
									BIME-01-M-011018	3.0 to 5.7	Lower composite	
BIME-02	1	33˚ 36.479'	117˚ 54.331'	-12.0	-17	7.7	7.0	-17.0	BIME-02-T-011018	0 to 3.0	Archive, upper composite	N/A
									BIME-02-M-011018	3.0 to 5.0	Archive, lower composite	
									BIME-02-Z-011018	5.0 to 5.5	Z layer archive	
	2	33˚ 36.479'	117˚ 54.331'	-12.0	-17	6.5	5.5	-17.0	BIME-02-T-011018	0 to 3.0	Upper composite	N/A
									BIME-02-0M-011018	3.0 to 5.0	Lower composite	
	3	33˚ 36.479'	117˚ 54.331'	-12.0	-17	6.5	3.1	N/A	N/A	N/A	N/A	Sample discarded
	4	33˚ 36.479'	117˚ 54.331'	-12.0	-17	6.5	5.9	-17.0	BIME-02-T-011018	0 to 3.0	Upper composite	N/A
									BIME-02-0M-011018	3.0 to 5.0	Lower composite	
	5	33˚ 36.479'	117˚ 54.331'	-12.0	-17	6.5	6.0	-17.0	BIME-02-T-011018	0 to 3.0	Upper composite	N/A
									BIME-02-0M-011018	3.0 to 5.0	Lower composite	
BIME-03	1	33˚ 36.409'	117˚ 54.434'	-11.5	-17	9.0	7.7	-17.0	BIME-03-T-011118	0 to 3.0	Archive, upper composite	N/A
									BIME-03-M-011118	3.0 to 5.5	Archive, lower composite	
									BIME-03-Z-011118	5.5 to 6.0	Z layer archive	
	2	33˚ 36.409'	117˚ 54.434'	-11.5	-17	7.0	6.6	-17.0	BIME-03-T-011118	0 to 3.0	Upper composite	N/A
									BIME-03-M-011118	3.0 to 5.5	Lower composite	
	3	33˚ 36.409'	117˚ 54.434'	-11.5	-17	7.0	6.3	-17.0	BIME-03-T-011118	0 to 3.0	Upper composite	N/A
									BIME-03-M-011118	3.0 to 5.5	Lower composite	
	4	33˚ 36.409'	117˚ 54.434'	-11.5	-17	7.0	6.6	-17.0	BIME-03-T-011118	0 to 3.0	Upper composite	N/A
									BIME-03-M-011118	3.0 to 5.5	Lower composite	
BIME-04	1	33˚ 36.453'	117˚ 54.375'	-11.5	-17	7.7	7.5	-17.0	BIME-04-T-011118	0 to 3.0	Archive, upper composite	Refusal
									BIME-04-M-011118	3.0 to 5.5	Archive, lower composite	
									BIME-04-Z-011118	5.5 to 6.0	Z layer archive	
	2	33˚ 36.453'	117˚ 54.375'	-11.5	-17	7.0	6.5	-17.0	BIME-04-T-011118	0 to 3.0	Upper composite	N/A
									BIME-04-M-011118	3.0 to 5.5	Lower composite	
	3	33˚ 36.453'	117˚ 54.375'	-11.5	-17	7.0	6.5	-17.0	BIME-04-T-011118	0 to 3.0	Upper composite	N/A
									BIME-04-M-011118	3.0 to 5.5	Lower composite	
	4	33˚ 36.453'	117˚ 54.375'	-11.5	-17	7.0	6.6	-17.0	BIME-04-T-011118	0 to 3.0	Upper composite	N/A
									BIME-04-M-011118	3.0 to 5.5	Lower composite	
BIMW-01	1	33˚ 36.457'	117˚ 54.541'	-11.8	-17	8.7	7.6	-17.0	BIMW-01-T-010818	0 to 3.0	Archive, upper composite	N/A
									BIMW-01-M-010818	3.0 to 5.2	Archive, lower composite	
									BIMW-01-Z-010818	5.2 to 5.7	Z layer archive	

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
	2	33˚ 36.457'	117˚ 54.541'	-11.8	-17	6.2	5.5	-17.0	BIMW-01-T-010818	0 to 3.0	Upper composite	N/A
									BIMW-01-M-010818	3.0 to 5.2	Lower composite	
	3	33˚ 36.457'	117˚ 54.541'	-11.8	-17	6.2	5.2	-17.0	BIMW-01-T-010818	0 to 3.0	Upper composite	N/A
									BIMW-01-M-010818	3.0 to 5.2	Lower composite	
	4	33˚ 36.457'	117˚ 54.541'	-11.8	-17	6.2	5.7	-17.0	BIMW-01-T-010818	0 to 3.0	Upper composite	N/A
									BIMW-01-M-010818	3.0 to 5.2	Lower composite	
BIMW-02	1	33˚ 36.473'	117˚ 54.458'	-11.6	-17	7.8	7.4	-17.0	BIMW-02-T-010918	0 to 3.0	Archive, upper composite	N/A
									BIMW-02-M-010918	3.0 to 5.4	Archive, lower composite	
									BIMW-02-Z-010918	5.4 to 5.9	Z layer archive	
	2	33˚ 36.473'	117˚ 54.458'	-11.6	-17	7.0	5.0	-16.6	BIMW-02-T-010918	0 to 3.0	Upper composite	N/A
									BIMW-02-M-010918	3.0 to 5.0	Lower composite	
	3	33˚ 36.473'	117˚ 54.458'	-11.6	-17	6.4	6.2	-17.0	BIMW-02-T-010918	0 to 3.0	Upper composite	N/A
									BIMW-02-M-010918	3.0 to 5.4	Lower composite	
	4	33˚ 36.473'	117˚ 54.458'	-11.6	-17	6.4	5.3	-16.9	BIMW-02-T-010918	0 to 3.0	Upper composite	N/A
									BIMW-02-M-010918	3.0 to 5.3	Lower composite	
BIMW-03	1	33˚ 36.447'	117˚ 54.567'	-11.9	-17	8.1	7.1	-17.0	BIMW-03-T-011018	0 to 3.0	Archive, upper composite	N/A
									BIMW-03-M-011018	3.0 to 5.1	Archive, lower composite	
									BIMW-03-Z-011018	5.1 to 5.6	Z layer archive	
	2	33˚ 36.447'	117˚ 54.567'	-11.9	-17	6.1	5.9	-17.0	BIMW-03-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-03-M-011018	3.0 to 5.1	Lower composite	
	3	33˚ 36.447'	117˚ 54.567'	-11.9	-17	6.1	5.9	-17.0	BIMW-03-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-03-M-011018	3.0 to 5.1	Lower composite	
	4	33˚ 36.447'	117˚ 54.567'	-11.9	-17	6.1	4.9	-16.8	BIMW-03-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-03-M-011018	3.0 to 4.9	Lower composite	
BIMW-04	1	33˚ 36.433'	117˚ 54.471'	-12.1	-17	8.4	6.5	-17.0	BIMW-04-T-011018	0 to 3.0	Archive, upper composite	Refusal
									BIMW-04-M-011018	3.0 to 4.9	Archive, lower composite	
									BIMW-04-Z-011018	4.9 to 5.4	Z layer archive	
	2	33˚ 36.433'	117˚ 54.471'	-12.1	-17	8.1	6.9	-17.0	BIMW-04-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-04-M-011018	3.0 to 4.9	Lower composite	
	3	33˚ 36.433'	117˚ 54.471'	-12.1	-17	6.5	5.7	-17.0	BIMW-04-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-04-M-011018	3.0 to 4.9	Lower composite	
	4	33˚ 36.433'	117˚ 54.471'	-12.1	-17	6.4	5.5	-17.0	BIMW-04-T-011018	0 to 3.0	Upper composite	N/A
									BIMW-04-M-011018	3.0 to 4.9	Lower composite	
BIS-01	1	33˚ 36.398'	117˚ 54.568'	-11.8	-17	6.7	6.0	-17.0	BIS-01-011118	0 to 5.2	Archive, composite	Refusal
									BIS-01-Z-011118	5.2 to 5.7	Z layer archive	
	2	33˚ 36.398'	117˚ 54.568'	-11.8	-17	6.2	5.8	-17.0	BIS-01-011118	0 to 5.2	Composite	N/A
BIS-02	1	33˚ 36.385'	117˚ 54.481'	-11.9	-17	7.1	6.9	-17.0	BIS-02-011118	0 to 5.1	Archive, composite	N/A
									BIS-02-Z-011118	5.1 to 5.6	Z layer archive	
	2	33˚ 36.385'	117˚ 54.481'	-11.9	-17	6.6	5.1	-17.0	BIS-02-011118	0 to 5.1	Composite	N/A
BIS-03	1	33˚ 36.376'	117˚ 54.602'	-11.6	-17	7.4	6.6	-17.0	BIS-03-011118	0 to 5.4	Archive, composite	N/A
									BIS-03-Z-011118	5.4 to 5.9	Z layer archive	
	2	33˚ 36.376'	117˚ 54.602'	-11.6	-17	6.9	6.1	-17.0	BIS-03-011118	0 to 5.4	Composite	N/A
BIS-04	1	33˚ 36.357'	117˚ 54.532'	-11.8	-17	7.2	6.8	-17.0	BIS-04-011118	0 to 5.2	Archive, composite	N/A
									BIS-04-Z-011118	5.2 to 5.7	Z layer archive	
	2	33˚ 36.357'	117˚ 54.532'	-11.8	-17	6.7	5.4	-17.0	BIS-04-011118	0 to 5.2	Composite	N/A
EC-01	1	33˚ 35.737'	117˚ 52.786'	-18.0	-22	3.0	2.7	-20.7	EC-01-011718	0 to 2.7	Archive, grain size, composite	Refusal
	2	33˚ 35.737'	117˚ 52.786'	-18.0	-22	3.7	3.3	-21.3	EC-01-011718	0 to 3.3	Composite	Refusal
	3	33˚ 35.737'	117˚ 52.786'	-18.0	-22	4.3	3.3	-21.3	EC-01-011718	0 to 3.3	Composite	Refusal

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
EC-02	1	33˚ 35.638'	117˚ 52.752'	-10.1	-22	1.0	0.0	N/A	N/A	N/A	N/A	Refusal; sample washed out
	2	33˚ 35.638'	117˚ 52.752'	-10.1	-22	2.0	1.8	-11.9	EC-02-011718	0 to 1.8	Composite	Refusal
	3	33˚ 35.638'	117˚ 52.752'	-10.1	-22	2.0	1.6	-11.7	EC-02-011718	0 to 1.6	Composite	Refusal
	4	33˚ 35.638'	117˚ 52.752'	-10.1	-22	2.5	2.2	-12.3	EC-02-011718	0 to 2.2	Archive, grain size, composite	Refusal
EC-03	1	33˚ 35.535'	117˚ 52.715'	-14.9	-22	3.5	2.5	-17.4	EC-03-11718	0 to 2.5	Archive, grain size, composite	Refusal; core tube bent
	2	33˚ 35.535'	117˚ 52.715'	-14.9	-22	2.5	1.6	-16.5	EC-03-11718	0 to 1.6	Composite	Refusal; core tube cracked (liner intact)
	3	33˚ 35.535'	117˚ 52.715'	-14.9	-22	2.5	1.6	-16.5	EC-03-11718	0 to 1.6	Composite	Refusal
EC-04	1	33˚ 35.430'	117˚ 52.687'	-16.6	-22	NR	6.1	-22.0	EC-04-011718	0 to 5.4	Archive, grain size, composite	Refusal; core tube bent
									EC-04-Z-011718	5.4 to 5.9	Z layer archive	
	2	33˚ 35.430'	117˚ 52.687'	-16.6	-22	3.0	1.5	-18.1	EC-04-011718	0 to 1.5	Composite	Refusal
	3	33˚ 35.430'	117˚ 52.687'	-16.6	-22	3.0	1.6	-18.2	EC-04-011718	0 to 1.6	Composite	Refusal
January 2019 Sampling Event												
NC1-01	1	33° 36.547'	117° 55.450'	-12.3	-17	3.3	2.2	N/A	N/A	N/A	N/A	Refusal; core tube bent; sample discarded
	2	33° 36.550'	117° 55.458'	-12.3	-17	2.8	2.4	N/A	N/A	N/A	N/A	Refusal; sample discarded
	3	33° 36.549'	117° 55.451'	-12.7	-17	10.0	3.2	-15.9	NC1-01-012319	0 to 3.2	Chemistry	Refusal
									NC1-01-Z-012319	2.6 to 3.2	Archive of bottom 0.5 feet[2]	
NC1-02	1	33° 36.537'	117° 55.371'	-12.4	-17	10.0	6.6	-17.5[3]	NC1-02-012319	0 to 5.1[3]	Chemistry	N/A
									NC1-02-Z-012319	5.1 to 5.6[4]	Z layer archive	
	2	33° 36.548'	117° 55.371'	-12.9	-17	10.0	4.8	N/A	N/A	N/A	N/A	Sample discarded
NC1-03	1	33° 36.526'	117° 55.277'	-11.4	-17	5.0	3.4	-14.8	NC1-03-012319	0 to 3.4	Composite	Refusal
	2	33° 36.527'	117° 55.277'	-11.2	-17	5.0	2.6	N/A	N/A	N/A	N/A	Refusal; sample discarded
	3	33° 36.527'	117° 55.278'	-11.2	-17	5.0	3.6	-14.8	NC1-03-012319	0 to 3.6	Chemistry, composite	Refusal
									NC1-03-Z-012319	3.1 to 3.6	Archive of bottom 0.5 feet[2]	
NC1-04	1	33° 36.512'	117° 55.171'	-11.2	-17	6.0	3.8	-15.0	NC1-04-012319	0 to 3.8	Chemistry, composite	Refusal
									NC1-04-Z-012319	3.3 to 3.8	Archive of bottom 0.5 feet[2]	
	2	33° 36.513'	117° 55.173'	-11.3	-17	6.0	3.6	-14.9	NC1-04-012319	0 to 3.6	Composite	N/A
NC2-01	1	33° 36.496'	117° 55.076'	-10.0	-17	4.9	2.6	-12.6	NC2-01-012419	0 to 2.6	Composite	Refusal
	2	33° 36.496'	117° 55.077'	-10.4	-17	5.3	2.5	-12.9	NC2-01-012419	0 to 2.5	Chemistry, composite	Refusal; core tube bent
									NC2-01-Z-012419	2.0 to 2.5	Archive of bottom 0.5 feet[2]	
	3	33° 36.495'	117° 55.078'	-10.3	-17	4.4	2.3	N/A	N/A	N/A	N/A	Refusal; core tube bent; sample discarded
NC2-02	1	33° 36.490'	117° 55.013'	-11.1	-17	6.6	3.7	-14.8	NC2-02-012419	0 to 3.7	Composite	Refusal
	2	33° 36.490'	117° 55.013'	-11.0	-17	7.8	3.7	-14.7	NC2-02-012419	0 to 3.7	Chemistry, composite	Refusal
									NC2-02-Z-012419	3.2 to 3.7	Archive of bottom 0.5 feet[2]	
	3	33° 36.491'	117° 55.014'	-11.0	-17	7.2	3.0	N/A	N/A	N/A	N/A	Refusal; sample discarded
NC2-03	1	33° 36.473'	117° 54.972'	-11.6	-17	6.7	3.3	-14.9	NC2-03-012419	0 to 3.3	Composite	Refusal
	2	33° 36.474'	117° 54.972'	-11.4	-17	8.6	3.0	N/A	N/A	N/A	N/A	Refusal; sample discarded
	3	33° 36.474'	117° 54.972'	-11.2	-17	7.3	4.7	-15.9	NC2-03-012419	0 to 4.7	Chemistry, composite	Refusal
									NC2-03-Z-012419	4.2 to 4.7	Archive of bottom 0.5 feet[2]	
NC2-04	1	33° 36.480'	117° 54.904'	-10.7	-17	7.2	4.5	-15.2	NC2-04-012219	0 to 4.5	Chemistry, composite	Refusal; slightly moved due to vessel
									NC2-04-Z-012219	4.0 to 4.5	Archive of bottom 0.5 feet[2]	
	2	33° 36.481'	117° 54.904'	-10.6	-17	8.0	4.0	N/A	N/A	N/A	N/A	Sample discarded
	3	33° 36.481'	117° 54.904'	-10.5	-17	8.0	4.3	-14.8	NC2-04-012219	0 to 4.3	Composite	Refusal

Station ID	Attempt	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Project Depth Plus Allowable Overdepth (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Depth Analyzed in Composite (feet MLLW)	Sample ID	Sample Interval (feet)	Analysis	Notes
NC3-01	1	33° 36.485'	117° 54.835'	-10.7	-17	7.8	3.4	N/A	N/A	N/A	N/A	Refusal; sample discarded
	2	33° 36.485'	117° 54.836'	-10.8	-17	7.6	4.9	-15.7	NC3-01-012219	0 to 4.9	Chemistry, composite	Refusal
									NC3-01-Z-012219	4.4 to 4.9	Archive of bottom 0.5 feet[2]	
	3	33° 36.486'	117° 54.835'	-10.8	-17	8.0	4.1	-14.9	NC3-01-012219	0 to 4.1	Composite	Refusal
NC3-02	1	33° 36.478'	117° 54.763'	-10.9	-17	8.6	6.3	-17.0	NC3-02-012219	0 to 6.1	Chemistry, composite	N/A
									NC3-02-Z-012219	6.1 to 6.3	Z layer archive	
	2	33° 36.479'	117° 54.764'	-10.9	-17	9.0	6.1	-17.0	NC3-02-012219	0 to 6.1	Composite	N/A
NC3-03	1	33° 36.494'	117° 54.685'	-10.1	-17	7.6	2.8	N/A	N/A	N/A	N/A	Refusal; sample discarded
	2	33° 36.494'	117° 54.685'	-10.1	-17	7.6	5.6	-15.7	NC3-03-012219	0 to 5.6	Chemistry, composite	Refusal
									NC3-03-Z-012219	5.1 to 5.6	Archive of bottom 0.5 feet[2]	
	3	33° 36.494'	117° 54.686'	-10.1	-17	7.8	4.4	-14.5	NC3-03-012219	0 to 4.4	Composite	Refusal
NC3-04	1	33° 36.499'	117° 54.596'	-10.6	-17	4.9	0.0	N/A	N/A	N/A	N/A	Refusal; core tube bent; no recovery
	2	33° 36.499'	117° 54.596'	-11.1	-17	7.6	4.5	-15.6	NC3-04-012319	0 to 4.5	Chemistry, composite	Refusal
									NC3-04-Z-012319	4.0 to 4.5	Archive of bottom 0.5 feet[2]	
	3	33° 36.499'	117° 54.597'	-11.2	-17	8	3.6	-14.8	NC3-04-012319	0 to 3.6	Composite	Refusal
	4	33° 36.499'	117° 54.597'	-11.1	-17	7.8	3.4	N/A	N/A	N/A	N/A	Sample discarded

Notes:
1. Based on North American Datum 1983
2. Z layer depth was not achieved; archived bottom 0.5 foot.
3. Additional 0.5 foot beyond overdepth inadvertently retained in composite sample.
4. Z-layer sample inadvertently collected 0.5 foot below actual Z-layer.

Table 3
Sediment Sample Compositing Scheme and Testing Strategy for Sediment Cores from January 2018 Sampling Event

Dredge Unit	Composite Sample ID	Core ID	Archive	Grain Size Sieve Analysis, Hydrometer Analysis, and Atterberg Limits[1]	Sediment Chemistry	Tier III Biological Testing[2]
Turning Basin	TB-COMP	TB-01 TB-02 TB-03 TB-04 TB-05	Individual cores and Z-layers	N/A	Composite	Composite
Main Channel North 1	MCN1-COMP-T	MCN1-01-T MCN1-02-T MCN1-03-T MCN1-04-T	Individual cores and Z-layers	N/A	Composite	Composite
Main Channel North 2	MCN2-COMP-T	MCN2-01-T MCN2-02-T MCN2-03-T MCN2-04-T	Individual cores and Z-layers	N/A	Composite	Composite
Main Channel North 3	MCN3-COMP	MCN3-01 MCN3-02 MCN3-03 MCN3-04	Individual cores and Z-layers	N/A	Composite	Composite
Main Channel North 4	MCN4-COMP	MCN4-01 MCN4-02 MCN4-03 MCN4-04	Individual cores and Z layers	N/A	Composite	Composite
Main Channel North 5	MCN5-COMP	MCN5-01 MCN5-02 MCN5-03 MCN5-04	Individual cores and Z-layers	N/A	Composite	Composite
Bay Island North	BIN-COMP-T	BIN-01-T BIN-02-T BIN-03-T BIN-04-T BIN-05-T	Individual cores and Z-layers	N/A	Composite	Composite

Dredge Unit	Composite Sample ID	Core ID	Archive	Grain Size Sieve Analysis, Hydrometer Analysis, and Atterberg Limits[1]	Sediment Chemistry	Tier III Biological Testing[2]
Bay Island Middle East	BIME-COMP-T (upper interval)	BIME-01-T BIME-02-T BIME-03-T BIME-04-T	Upper core intervals (mudline to 3 feet below the mudline)	N/A	Upper composite	Based on sediment chemistry results, upper and lower composites were combined for biological testing
	BIME-COMP-M (lower interval)	BIME-01-M BIME-02-M BIME-03-M BIME-04-M	Lower core intervals (3 feet below the mudline to design depth plus overdepth allowance) and Z-layers	N/A	Lower composite	
Bay Island Middle West	BIMW-COMP-T (upper interval	BIMW-01-T BIMW-02-T BIMW-03-T BIMW-04-T	Upper core intervals (mudline to 3 feet below the mudline)	N/A	Upper composite	Based on sediment chemistry results, upper and lower composites were combined for biological testing
	BIMW-COMP-M (lower interval)	BIMW-01-M BIMW-02-M BIMW-03-M BIMW-04-M	Lower core intervals (3 feet below the mudline to design depth plus overdepth allowance) and Z-layers	N/A	Lower composite	
Bay Island South	BIS-COMP	BIS-01 BIS-02 BIS-03 BIS-04	Individual cores and Z-layers	N/A	Composite	Composite
Entrance Channel	EC-COMP	EC-01 EC-02 EC-03 EC-04	Individual cores and Z-layers	Grain size on individual cores or core intervals if stratification observed; Atterberg limits and hydrometer analysis on fine-grained intervals	Composite	Composite
N/A	LA-3 ODMDS Reference	N/A	N/A	N/A	Yes	Yes (SP and BP testing only)

Notes:
1. Compatibility analysis for nearshore placement
2. Biological testing for ocean disposal

Table 4
Sediment Sample Compositing Scheme and Testing Strategy for Sediment Cores from January 2019 Sampling Event

Dredge Unit	Composite Sample ID	Core ID	Archive	Sediment Chemistry	Tier III Biological Testing[1]
Newport Channel 1	N/A	NC1-01 NC1-02	Individual Z-layers	Individual cores	N/A
Newport Channel 2	NC2-COMP	NC1-03 NC1-04 NC2-01 NC2-02 NC2-03 NC2-04	Individual Z-layers	Individual cores and composite	Composite
Newport Channel 3	NC3-COMP	NC3-01 NC3-02 NC3-03 NC3-04	Individual Z-layers	Individual cores and composite	Composite
N/A	LA-3 ODMDS Reference	N/A	N/A	Yes	Yes (SP and BP testing only)

Note:
1. Biological testing for ocean disposal

2.1.1.3 Sediment Core Sampling and Handling

All sediment samples were placed into jars appropriate for physical and chemical analyses. Biological testing samples were placed into clean food-grade polyethylene bags. Physical, chemical, and biological samples were stored in coolers with ice and delivered to the appropriate laboratories for analysis. Chemistry samples were delivered to Eurofins Calscience, Inc., located in Garden Grove, California. Biological testing samples were delivered to Enthalpy Analytical (formerly Nautilus Environmental), in San Diego, California. Grain size sieve analysis samples were stored at ambient temperatures and delivered to Smith-Emery Laboratories in Los Angeles, California. Proper chain-of-custody procedures were followed.

2.1.2 Reference and Site Water Sampling

Reference sediment and site water was collected for both sediment core sampling events. Reference sediment was collected on January 6, 2018, and February 12, 2019. Site water was collected on January 8 and 17, 2018, and January 24, 2019. Reference material was collected by Seaventures Inc., at the LA-3 ODMDS reference site using a pipe dredge. Site water was collected from LNB using a Van Dorn bottle and transferred to low-density polyethylene cubitainers.

2.1.3 Nearshore Receiver Site Grab Sampling

Nearshore receiver site surface sediment grab samples were collected as part of the City's Regional General Permit 54 sediment characterization program on February 2 and March 8, 2018 (Anchor QEA 2018b). Grab samples were collected at 32 stations along four transects perpendicular to the shore. Stations were positioned at 6-foot increments in elevation from 12 to -30 feet MLLW. Based on a request from the City, four additional stations were sampled at an elevation of -36 feet MLLW. The deeper sampling locations were included due to potential health and safety concerns with material placement near existing piers.[1] Grab sampling locations are shown in Figure 17. Station coordinates and mudline elevation for each station are summarized in Table 5. Field logs are provided in Appendix A.

Grab samples above the water line were collected using a stainless-steel scoop. Grab samples below the water line were collected using a stainless-steel scoop by wading out into the water or using a petite Ponar grab sampler deployed from Anchor QEA's sampling vessel. A 1-liter subsample of each grab was collected for grain size analysis and placed in a zip-top bag. Grain size samples were stored in coolers at ambient temperature and delivered to Smith-Emery Laboratories, located in Los Angeles, California. Proper chain-of-custody procedures were followed.

Table 5
Station Coordinates and Mudline Elevations for Each Station from Nearshore Receiver Site

Transect	Station ID	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Sample ID	Analysis
A	A-01	33˚ 36.386'	117˚ 55.610'	12	A-01-020218	Grain size
	A-02	33˚ 36.358'	117˚ 55.622'	6	A-02-020218	Grain size
	A-03	33˚ 36.338'	117˚ 55.630'	0	A-03-020218	Grain size
	A-04	33˚ 36.329'	117˚ 55.633'	-6	A-04-020218	Grain size
	A-05	33˚ 36.250'	117˚ 55.680'	-12	A-05-030718	Grain size
	A-06	33˚ 36.232'	117˚ 55.676'	-18	A-06-030718	Grain size
	A-07	33˚ 36.201'	117˚ 55.686'	-24	A-07-030718	Grain size
	A-08	33˚ 36.179'	117˚ 55.703'	-30	A-08-030718	Grain size
	A-09	33˚ 36.148'	117˚ 55.71'	-36	A-09-030718	Grain size
B	B-01	33˚ 36.228'	117˚ 54.934'	12	B-01-020218	Grain size
	B-02	33˚ 36.224'	117˚ 54.935'	6	B-02-020218	Grain size
	B-03	33˚ 36.206'	117˚ 54.935'	0	B-03-020218	Grain size
	B-04	33˚ 36.198'	117˚ 54.948'	-6	B-04-020218	Grain size

[1] Percent fines of deeper stations were within the range of the other elevations and, therefore, did not affect the overall grain size envelope.

Transect	Station ID	Latitude (Degrees, Decimal Minutes)[1]	Longitude (Degrees Decimal Minutes)[1]	Mudline Elevation (feet MLLW)	Sample ID	Analysis
B	B-05	33˚ 36.172'	117˚ 54.995'	-12	B-05-030718	Grain size
	B-06	33˚ 36.157'	117˚ 54.994'	-18	B-06-030718	Grain size
	B-07	33˚ 36.130'	117˚ 55.004'	-24	B-07-030718	Grain size
	B-08	33˚ 36.113'	117˚ 55.012'	-30	B-08-030718	Grain size
	B-09	33˚ 36.068'	117˚ 55.018'	-36	B-09-030718	Grain size
C	C-01	33˚ 36.054'	117˚ 54.160'	12	C-01-020218	Grain size
	C-02	33˚ 36.049'	117˚ 54.164'	6	C-02-020218	Grain size
	C-03	33˚ 36.038'	117˚ 54.170'	0	C-03-020218	Grain size
	C-04	33˚ 36.032'	117˚ 54.171'	-6	C-04-020218	Grain size
	C-05	33˚ 35.998'	117˚ 54.182'	-12	C-05-020219	Grain size
	C-06	33˚ 35.974'	117˚ 54.190'	-18	C-06-020220	Grain size
	C-07	33˚ 35.946'	117˚ 54.205'	-24	C-07-020221	Grain size
	C-08	33˚ 35.922'	117˚ 54.215'	-30	C-08-020222	Grain size
	C-09	33˚ 35.893'	117˚ 54.222'	-36	C-09-030718	Grain size
D	D-01	33˚ 35.839'	117˚ 53.516'	12	D-01-020218	Grain size
	D-02	33˚ 36.831'	117˚ 53.519'	6	D-02-020218	Grain size
	D-03	33˚ 35.823'	117˚ 53.523'	0	D-03-020218	Grain size
	D-04	33˚ 35.818'	117˚ 53. 525'	-6	D-04-020218	Grain size
	D-05	33˚ 35.775'	117˚ 53.546'	-12	D-05-030718	Grain size
	D-06	33˚ 35.748'	117˚ 53.550'	-18	D-06-030718	Grain size
	D-07	33˚ 35.737'	117˚ 53.559'	-24	D-07-030718	Grain size
	D-08	33˚ 35.700'	117˚ 53.563'	-30	D-08-030718	Grain size
	D-09	33˚ 35.664'	117˚ 53.569'	-36	D-09-030718	Grain size

Note:
1. Based on North American Datum 1983

2.2 Physical and Chemical Analyses of Sediment

Physical and chemical analyses of sediment in this testing program were selected to determine the suitability of proposed dredged material for ocean disposal or nearshore placement. Composite samples, individual cores from Newport Channel, and reference sediment were submitted for analysis of total solids, grain size, total organic carbon (TOC), metals, PAHs, PCB congeners, organochlorine pesticides, organotins, and pyrethroids. Based on composite sample results, archives from individual cores were analyzed for mercury, PCB, and DDTs to further delineate the extent of contamination (Table 6). Based on individual core sample results from Newport Channel, composite samples were created for physical and chemical analyses and biological testing. PCBs included the Southern

California Coastal Water Research Project list of 41 congeners used for the Bight '13 Regional Monitoring Program, which is the same list used in Southern California Total Maximum Daily Loads and recommended by USEPA for dredge material evaluations in Southern California.

All analytical methods used followed USEPA, Standard Method, or ASTM International protocols. Analytical methods and target method detection limits (MDLs) and reporting limits (RLs) are presented in Table 7 of the SAP (Anchor QEA 2017a). Results of chemical analyses were compared to effects range low (ERL) and effects range median (ERM) values developed by Long et al. (1995). In addition, mercury concentrations were compared to the USEPA-recommended threshold of 1 milligram per kilogram (mg/kg).

Table 6
Summary of Analysis Performed on Individual Core Archive Samples

Dredge Unit	Individual Core Chemistry
Turning Basin	Mercury, PCBs
Main Channel North 1	Mercury, DDTs
Main Channel North 2	Mercury, DDTs,
Main Channel North 3	Mercury, DDTs
Main Channel North 4	DDTs
Main Channel North 5	N/A
Bay Island North	DDTs
Bay Island Middle East	DDTs
Bay Island Middle West	DDTs
Bay Island South	DDTs
Entrance Channel	N/A

2.3 Biological Testing

Biological testing was conducted to determine suitability of proposed dredged material for ocean disposal at the USEPA-designated LA-3 ODMDS. Testing included two solid phase (SP), three suspended particulate phase (SPP), and two bioaccumulation potential (BP) tests, as specified in Table 7. All testing was performed by Enthalpy Analytical (formerly Nautilus Environmental). In January 2018, reference sediment and 11 composite samples from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel were submitted for testing. In January 2019, reference sediment and two composite samples from Newport Channel were submitted for testing. Control samples were tested with each species to evaluate test acceptability. All testing was performed in accordance with OTM (USEPA/USACE 1991) guidelines. Test methods, conditions, and acceptability criteria are presented in the SAP (Anchor QEA 2017a).

Table 7
Summary of Biological Testing Performed on Composite Sediment Samples

Test Type	Organism		Reference Sediment	Control Material	Reference Toxicant Test
	Type	Taxon			
SP	Amphipod	*Ampelisca abdita*	LA-3 ODMDS	Native or clean sediment	Cadmium chloride and ammonium chloride
	Polychaete	*Neanthes arenaceodentata*	LA-3 ODMDS	Native or clean sediment	Cadmium chloride
SPP	Bivalve larvae	*Mytilus galloprovincialis*	N/A	Filtered seawater	Ammonium chloride
	Inland silverside fish	*Menidia beryllina*	N/A	Filtered seawater	Copper chloride
	Mysid shrimp	*Americamysis bahia*	N/A	Filtered seawater	Copper chloride
BP	Clam	*Macoma nasuta*	LA-3 ODMDS	Native or clean sediment	N/A
	Polychaete	*Nereis virens*	LA-3 ODMDS	Native or clean sediment	NA

Interstitial ammonia concentrations were measured on project sediments prior to testing. Ammonia concentrations in composite samples from Bay Island North (21.7 milligrams per liter [mg/L]), Bay Island Middle East (26.1 mg/L), Bay Island Middle West (27.8 mg/L), and Bay Island South (26.1 mg/L) were at levels of potential concern for the amphipod SP test (greater than 15 mg/L; USACE et al. 2001). Test sediments were purged to reduce the ammonia concentrations prior to testing by performing daily seawater exchanges per ITM guidance (USEPA/USACE 1998). The test was initiated following 5 days of acclimation when interstitial ammonia concentrations were reduced to 14.0, 17.2, 18.2, and 19.2 mg/L, respectively. In addition, a water-only ammonia reference toxicant test was conducted with the amphipod test to evaluate the contribution of elevated ammonia concentrations on test organism survival. An ammonia reference toxicant test was also run with the bivalve larval development bioassay due to the sensitivity of *Mytilus galloprovincialis* to elevated ammonia concentrations.

2.4 Chemical Analysis of Tissue Residues

Chemical analysis of tissue residues was conducted to determine the bioaccumulation of sediment contaminants. Based on results of sediment chemistry, a subset of chemicals was approved by USEPA for analysis (Appendix B). Tissue samples were analyzed for lipids, mercury, dibutyltin, DDTs, and PCBs (Table 8). Due to the high percentage of sand (98.12%) and low concentrations of contaminants (all concentrations less than the ERL), tissue analysis was not required for the Entrance Channel. Composite samples from each replicate were analyzed separately. Analytical methods and target MDLs and RLs for tissues (reported in wet weight) are presented in Table 7 of the SAP (Anchor QEA 2017a).

Table 8
Summary of Analysis Performed on Tissue Samples

Dredge Unit	Tissue Analysis
Time Zero (T0)	Lipids, Mercury, Dibutyltin, DDTs, PCBs
LA3-REF	Lipids, Mercury, Dibutyltin, DDTs, PCBs
Turning Basin	Lipids, Mercury, Dibutyltin, DDTs, PCBs
Main Channel North 1	Lipids, Mercury, DDTs, PCBs
Main Channel North 2	Lipids, Mercury, DDTs, PCBs
Main Channel North 3	Lipids, Mercury, DDTs, PCBs
Main Channel North 4	Lipids, Mercury, DDTs, PCBs
Main Channel North 5	Lipids, Mercury, DDTs, PCBs
Bay Island North	Lipids, Mercury, DDTs, PCBs
Bay Island Middle East	Lipids, Mercury, DDTs, PCBs
Bay Island Middle West	Lipids, Mercury, DDTs, PCBs
Bay Island South	Lipids, Mercury, DDTs
Entrance Channel	N/A
Newport Channel 2	Lipids, Mercury
Newport Channel 3	Lipids, Mercury

Results of chemical analysis of tissue residues were initially compared against applicable U.S. Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, when such levels have been set. In the absence of action levels, or if tissue contaminant concentrations were less than action levels, results were statistically compared to tissue concentrations of organisms exposed to reference sediment in accordance with Section 13.3 of the OTM (USEPA/USACE 1991). Tissue organic chemical concentrations were normalized to lipid concentrations prior to analysis. Data were log-transformed if necessary and assessed for normality using the Shapiro-Wilk test. Homogeneity of variance was assessed using Levene's test. Normally or log-normally distributed data were evaluated using analysis of variance (ANOVA) and Dunnett's multiple comparison tests (if applicable). Non-normally distributed data were assessed using the non-parametric Wilcoxon/Kruskal-Wallis tests and non-parametric Wilcoxon multiple comparisons method (if applicable).

No statistical analysis was performed on chemistry data if both project area data and reference data were non-detects or if the mean concentration of the project area sample was less than the mean concentration in the reference sample or the time zero sample. For situations in which all replicates from the reference area were non-detect and detection limits were identical for each replicate within an analyte group, estimated data values were calculated based on a symmetrical breakdown of the

data range and in such a way that the mean of the estimates centered around a value one-half of the detection limit. This statistical manipulation of data was required to generate means and variances needed to compare project area data to reference data.

If tissue concentrations of organisms exposed to test sediment were statistically elevated compared to organisms exposed to reference sediment, a weight-of-evidence approach was used. This approach included a comparison to toxicity reference values (TRVs) provided in the Environmental Residue-Effects Database (ERED; 2018). TRV selection followed guidelines described in *Support for Sediment Bioaccumulation Evaluation: Toxicity Reference Values for San Francisco Bay* (Lin and Davis 2018). When available, TRVs identified in this document were used. In general, criteria used to select TRVs were as follows:

- Tissue residue effects concentrations for marine invertebrates.
- Ecologically relevant effects (reproduction, survival, development, and growth).
- Lowest concentrations in ERED with endpoint of lowest observable effect dose (LOED), where possible; other endpoints also considered. Where LOEDs were not available, an uncertainty factor was used to estimate the LOED (USACHPPM 2000).
- Measured concentrations in whole organisms, where possible; measurements in specific tissues of the organisms also considered.

3 Results

3.1 Physical and Chemical Analyses of Sediment

In January 2018, reference and composite sediment samples from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel were analyzed for the physical and chemical parameters specified in Table 7 of the SAP (Anchor QEA 2017a). Based on composite sample results, individual core archive samples were analyzed for mercury, PCB, and DDTs, as shown in Table 6. In January 2019, individual core samples from Newport Channel were analyzed for the full suite of physical and chemical parameters. Based on individual core sample results, composite samples were created in coordination with USEPA for ocean disposal testing. Results of physical and chemical analyses of sediment samples are presented below. MDLs, RLs, and raw data for the analyses are presented in the laboratory reports in Appendix C.

3.1.1 Reference and Composite Sediment from January 2018 Sampling Event

Results of physical and chemical analyses of reference and composite sediment samples from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel are presented in Table 9. All results are expressed in dry weight unless otherwise indicated.

3.1.1.1 LA-3 ODMDS Reference

Grain size of reference sediment consisted primarily of fines (silt and clay), totaling 76.8%. TOC was measured at a concentration of 2.7%.

Metals, PAHs, pesticides, and PCBs were detected in reference sediment. All metals concentrations were less than ERL values, except nickel. All PAH and PCB concentrations were less than ERL values. One DDT derivative (4,4'-DDE) and total DDTs exceeded ERL values. All concentrations were less than ERM values. Organotins and pyrethroids were not detected in reference sediment.

3.1.1.2 Composite Sediment

Composite sediment from the Turning Basin, Main Channel North, and Bay Island consisted primarily of fines (68.6% to 98.2% silt and clay). Composite sediment from the Entrance Channel consisted primarily of sand (98.1%). TOC ranged from non-detect to 1.9%.

Metals, organotins, pyrethroids, PAHs, pesticides, and PCBs were detected in composite sediment. Mercury exceeded the ERM value in four samples (Turning Basin, and Main Channel North 1, 2, and 3). Dibutyltin and/or tributyltin were detected in all samples, except the Bay Island Middle East (lower depth interval) and Entrance Channel. Dibutyltin ranged from non-detect to 40 micrograms per kilogram (µg/kg), with the highest concentration measured in the Turning Basin. Tributyltin concentrations were lower, ranging from non- detect to 6.8 µg/kg. Bifenthrin, cyfluthrin,

cypermethrin, fluvalinate, and permethrin were measured in at least one composite sample. Several PAHs were detected in composite samples at low concentrations (less than ERL values). Total DDTs exceeded the ERM value in all samples, except the Entrance Channel. Total chlordane exceeded the ERM value in all samples, except the Entrance Channel and Main Channel North 1. Total PCBs exceeded the ERM in the Turning Basin.

Table 9
Results of Physical and Chemical Analyses for Composite Samples from January 2018 Sampling Event

Chemical	Sample ID / Sample Date / Matrix	ERL	ERM	LA3-REF-010618 1/6/2018 SE	TB-COMP-011218 1/12/2018 SE	MCN1-COMP-T-011518 1/15/2018 SE	MCN2-COMP-T-011618 1/16/2018 SE	MCN3-COMP-011918 1/19/2018 SE	MCN4-COMP-011918 1/19/2018 SE	MCN5-COMP-011818 1/18/2018 SE	BIN-COMP-T-011718 1/17/2018 SE	BIME-COMP-T-011218 1/12/2018 SE	BIME-COMP-M-011218 1/12/2018 SE	BIMW-COMP-T-011018 1/10/2018 SE	BIMW-COMP-M-011018 1/10/2018 SE	BIS-COMP-011218 1/12/2018 SE	EC-COMP-011718 1/18/2018 SE
Conventional Parameters (%)																	
Total organic carbon		--	--	**2.7**	**1.9**	0.038 U	**0.98**	**1.1 J**	0.032 U	**1.1 J**	**0.66 J**	**1.7**	**1.4**	**1.5**	**1.2**	**1.7**	**0.089 J**
Total solids		--	--	**52.3**	**45.1**	**45.5**	**48.8**	**52.3**	**54.8**	**54.7**	**51.9**	**49.2**	**53.7**	**48.9**	**52.9**	**47.5**	**82.4**
Grain Size (%)																	
Gravel (>2 mm)		--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Sand (2.00 mm - 1.00 mm)		--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.27**
Sand, coarse		--	--	**2.28**	0.01 U	0.01 U	0.01 U	**2.8**	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**3.94**
Sand, medium		--	--	**2.44**	0.01 U	0.01 U	**0.22**	**14.85**	**0.64**	**0.092**	**4.14**	**0.01**	0.01 U	0.01 U	**0.02**	0.01 U	**28.92**
Sand, fine		--	--	**5.91**	**7.18**	**4.88**	**6.69**	**6.59**	**10.91**	**5.53**	**13.35**	**1.38**	0.01 U	**2.42**	**5.35**	**0.05**	**56.93**
Sand, very fine		--	--	**12.59**	**10.5**	**3.27**	**7.24**	**7.18**	**14.36**	**9.87**	**8.91**	**10.9**	**1.8**	**7.45**	**8.97**	**8.91**	**8.06**
Silt		--	--	**67.65**	**56.62**	**65.9**	**61.09**	**49.46**	**54.86**	**64.18**	**53.67**	**63.19**	**71.53**	**66.83**	**62.2**	**65.65**	**1.32**
Clay, <5 micron		--	--	**9.14**	**25.7**	**25.94**	**24.76**	**19.12**	**19.23**	**20.33**	**19.98**	**24.53**	**26.67**	**23.29**	**23.47**	**25.4**	**0.55**
Metals (mg/kg)																	
Arsenic		8.2	70	**5.27**	**10**	**10.6**	**9.58**	**8.07**	**7.04**	**8.17**	**7.28**	**8.95**	**9.42**	**8.82**	**8.46**	**10.2**	**1.8**
Cadmium		1.2	9.6	**0.824**	**1.41**	**1.7**	**1.94**	**1.74**	**1.85**	**2**	**1.71**	**2.19**	**2.67**	**2.21**	**2.09**	**2.31**	**0.274**
Chromium		81	370	**38.5**	**45.2**	**47.6**	**42.5**	**39.3**	**37.3**	**39.6**	**34.3**	**41.7**	**43**	**43.1**	**41.7**	**41.7**	**6.41**
Copper		34	270	**21**	**127**	**83.7**	**64.1**	**52.1**	**39.9**	**48**	**46.3**	**55.2**	**45.3**	**54.1**	**51.4**	**55.2**	**3.22**
Lead		46.7	218	**9.54**	**85.8**	**50**	**46.8**	**37.3**	**40.4**	**41.6**	**38.9**	**40.2**	**45.2**	**44.4**	**55.5**	**41.3**	**2.47**
Mercury		0.15	0.71	**0.0494**	**3.64**	**1.18**	**1.04**	**0.797**	**0.181**	**0.205**	**0.431**	**0.142**	**0.69**	**0.153**	**0.658**	**0.233**	**0.0125 J**
Nickel		20.9	51.6	**21.6**	**26.6**	**30.3**	**27.5**	**23.7**	**23.5**	**25.4**	**22.8**	**27**	**29.7**	**28.3**	**26.9**	**28.8**	**3.87**
Selenium		--	--	**1.42**	**0.798**	**2.02**	**1.5**	**1.1**	**1.13**	**1.58**	**0.695**	**1.35**	**1.27**	**1.53**	**1.19**	**1.65**	**0.205**
Silver		1	3.7	**0.245**	**0.301**	**0.317**	**0.43**	**0.299**	**0.267**	**0.324**	**0.275**	**0.299**	**0.358**	**0.335**	**0.375**	**0.295**	0.038 U
Zinc		150	410	**82.9**	**208**	**251**	**169**	**143**	**132**	**155**	**144**	**173**	**149**	**174**	**165**	**171**	**17.1**
Organometallic Compounds (µg/kg)																	
Butyltin (n-Butyltin)		--	--	2.6 U	3 U	2.9 U	2.8 U	2.6 U	2.4 U	2.5 U	2.7 U	2.8 U	2.6 U	2.8 U	2.6 U	2.9 U	0.83 U
Dibutyltin		--	--	1.4 U	**40**	**22**	**26**	**16**	**22**	**31**	**21**	**3.1 J**	1.4 U	**8.1**	**6.7**	**16**	0.44 U
Tetrabutyltin		--	--	1.4 U	1.6 U	1.6 U	1.5 U	1.4 U	1.3 U	1.3 U	1.4 U	1.5 U	1.4 U	1.5 U	1.4 U	1.6 U	0.45 U
Tributyltin		--	--	2.8 U	**6.8**	3.2 U	3 U	2.8 U	2.6 U	2.6 U	2.9 U	3 U	2.8 U	3 UJ	2.8 U	3.1 U	0.89 U
PAHs (µg/kg)																	
1-Methylnaphthalene		--	--	4.4 U	5.2 U	5.1 U	4.7 U	4.4 U	4.2 U	4.2 U	4.4 U	4.7 U	4.3 U	4.8 U	4.4 U	4.9 U	2.8 U
2-Methylnaphthalene		70	670	4.4 U	5.2 U	5.1 U	4.7 U	4.4 U	4.2 U	4.2 U	4.4 U	4.7 U	4.3 U	4.8 U	4.4 U	4.9 U	2.8 U
Acenaphthene		16	500	4.5 U	5.2 U	5.1 U	4.8 U	4.5 U	4.3 U	4.3 U	4.5 U	4.8 U	4.3 U	4.8 U	4.4 U	5 U	2.8 U
Acenaphthylene		44	640	3.4 U	**8.1 J**	3.9 U	3.6 U	3.4 U	3.2 U	3.2 U	3.4 U	3.6 U	3.3 U	3.7 U	3.4 U	3.8 U	2.1 U
Anthracene		85.3	1,100	6.6 U	**19 J**	7.6 U	**7.6 J**	6.6 U	6.3 U	6.3 U	6.6 U	7 U	6.4 U	7.1 U	6.5 U	7.3 U	4.2 U
Benzo(a)anthracene		261	1,600	**7.4 J**	**50**	**17 J**	**16 J**	**14 J**	**17 J**	**18 J**	**16 J**	**16 J**	**14 J**	**16 J**	**17 J**	**22**	2.6 U
Benzo(a)pyrene		430	1,600	**7.9 J**	**130**	**32**	**31**	**24**	**28**	**30**	**25**	**25**	**19**	**25**	**26**	**33**	2.2 U
Benzo(b)fluoranthene		--	--	**8.7 J**	**180**	**43**	**37**	**31**	**34**	**38**	**30**	**33**	**28**	**30**	**35**	**43**	3.3 U
Benzo(g,h,i)perylene		--	--	**11 J**	**120**	**39**	**33**	**22**	**26**	**29**	**30**	**32**	**23**	**34**	**31**	**38**	1.8 U
Benzo(k)fluoranthene		--	--	**6.2 J**	**140**	**30**	**31**	**25**	**31**	**31**	**27**	**23**	**20**	**28**	**28**	**36**	3.3 U
Chrysene		384	2,800	**7.4 J**	**74**	**23**	**21**	**19 J**	**24**	**26**	**22**	**23**	**18 J**	**23**	**22**	**29**	2.7 U
Dibenzo(a,h)anthracene		63.4	260	3.7 U	**32**	**12 J**	**5.7 J**	**7.1 J**	**7 J**	**7.4 J**	**7.7 J**	**8.2 J**	**4.6 J**	**8.1 J**	**7.7 J**	**11 J**	2.3 U
Fluoranthene		600	5,100	**14 J**	**77**	**25**	**25**	**20**	**30**	**29**	**25**	**25**	**20**	**25**	**25**	**34**	2.2 U
Fluorene		19	540	5.9 U	6.9 U	6.8 U	6.4 U	5.9 U	5.6 U	5.7 U	5.9 U	6.3 U	5.8 U	6.4 U	5.9 U	6.6 U	3.7 U

Chemical	ERL	ERM	LA3-REF-010618 1/6/2018 SE	TB-COMP-011218 1/12/2018 SE	MCN1-COMP-T-011518 1/15/2018 SE	MCN2-COMP-T-011618 1/16/2018 SE	MCN3-COMP-011918 1/19/2018 SE	MCN4-COMP-011918 1/19/2018 SE	MCN5-COMP-011818 1/18/2018 SE	BIN-COMP-T-011718 1/17/2018 SE	BIME-COMP-T-011218 1/12/2018 SE	BIME-COMP-M-011218 1/12/2018 SE	BIMW-COMP-T-011018 1/10/2018 SE	BIMW-COMP-M-011018 1/10/2018 SE	BIS-COMP-011218 1/12/2018 SE	EC-COMP-011718 1/18/2018 SE
Indeno(1,2,3-c,d)pyrene	--	--	**7.7 J**	**96**	**29**	**25**	**18 J**	**21**	**24**	**23**	**25**	**18 J**	**26**	**24**	**30**	1.9 U
Naphthalene	160	2,100	6.6 U	7.7 U	7.6 U	7.1 U	6.6 U	6.3 U	6.3 U	6.6 U	7 U	6.4 U	7.1 U	6.5 U	7.3 U	4.2 U
Phenanthrene	240	1,500	**6.7 J**	**30**	**9.7 J**	**9.7 J**	**7.7 J**	**11 J**	**11 J**	**9.7 J**	**9 J**	**7.9 J**	**9.8 J**	**12 J**	**12 J**	2.7 U
Pyrene	665	2,600	**16 J**	**95**	**36**	**34**	**34**	**42**	**46**	**40**	**41**	**45**	**48**	**54**	**61**	2.7 U
Total HPAH (9 of 17) (U = 0)	1,700	9,600	**86.3 J**	**994**	**286 J**	**258.7 J**	**214.1 J**	**260 J**	**278.4 J**	**245.7 J**	**251.2 J**	**209.6 J**	**263.1 J**	**269.7 J**	**337 J**	3.3 U
Total LPAH (8 of 17) (U = 0)	552	3,160	**6.7 J**	**57.1 J**	**9.7 J**	**17.3 J**	**7.7 J**	**11 J**	**11 J**	**9.7 J**	**9 J**	**7.9 J**	**9.8 J**	**12 J**	**12 J**	4.2 U
Total PAH (17) (U = 0)	4,022	44,792	**93 J**	**1,051 J**	**295.7 J**	**276 J**	**221.8 J**	**271 J**	**289.4 J**	**255.4 J**	**260.2 J**	**217.5 J**	**272.9 J**	**281.7 J**	**349 J**	4.2 U
Pesticides (µg/kg)																
2,4'-DDD (o,p'-DDD)	--	--	0.54 U	0.63 U	**5.8**	**6.4**	**5.4**	**4.9**	**2.5**	**5.3**	**3.3**	**12**	**4.6**	**6.9**	**3.6**	0.34 U
2,4'-DDE (o,p'-DDE)	--	--	**2.7 J**	**5.2**	**7.8**	**9.5**	**7.3**	**7.9**	**6**	**7.1**	**5.3**	**12**	**6**	**9.9**	**7.4**	1.2 U
2,4'-DDT (o,p'-DDT)	--	--	0.6 U	0.69 U	0.68 U	0.64 U	0.59 U	0.57 U	0.57 U	0.6 U	0.63 U	0.58 U	0.64 U	0.59 U	**0.71 J**	0.38 U
4,4'-DDD (p,p'-DDD)	2	20	**1.2 J**	**12**	**32**	**37**	**36**	**30**	**14**	**27 J**	**20 J**	**100**	**31**	**51**	**27**	0.6 U
4,4'-DDE (p,p'-DDE)	2.2	27	**9.3**	**37**	**54**	**66**	**52**	**75**	**70**	**76**	**90**	**79**	**120**	**90**	**110**	**0.88 J**
4,4'-DDT (p,p'-DDT)	1	7	0.83 UJ	**5.6**	**3**	**2.2**	**2.3**	**3.4**	**4.3**	**5.4**	**6.6**	**4.6**	**3.5**	**1.9**	**6.5**	0.53 U
Aldrin	--	--	0.83 U	0.96 U	0.95 U	0.9 U	0.83 U	0.79 U	0.8 U	0.84 U	0.88 U	0.81 U	0.89 U	0.83 U	0.91 U	0.53 U
Chlordane, alpha- (Chlordane, cis-)	--	--	0.77 U	**1.4 J**	**1.1 J**	**1.4 J**	**2.2**	**1.9**	**1.3 J**	**2.3**	**3.1**	**2**	**2.8**	**1.6 J**	**1.5 J**	0.49 U
Chlordane, gamma- (Chlordane, trans-)	--	--	1.7 U	**2.1 J**	1.9 U	**2.2 J**	**2.1 J**	**4.5**	**3.4 J**	**3.9**	**4.9**	**6.9**	**4.8**	**5.7**	**2.8 J**	1.1 U
Dieldrin	0.02	8	*0.83 U*	**1.9 J**	**1.1 J**	**1.3 J**	**0.97 J**	**2**	*0.8 U*	**1.4 J**	**1.1 J**	**1.8 J**	**0.95 J**	**1.2 J**	*0.91 U*	*0.53 U*
Endosulfan sulfate	--	--	0.99 U	1.1 U	1.1 U	1.1 U	0.98 U	0.94 U	0.95 U	1 U	1 U	0.96 U	1.1 U	0.99 U	1.1 U	0.63 U
Endosulfan, alpha- (I)	--	--	0.75 U	0.87 U	0.86 U	0.81 U	0.75 U	0.72 U	0.72 U	0.76 U	0.79 U	0.73 U	0.81 U	0.75 U	0.83 U	0.48 U
Endosulfan, beta (II)	--	--	0.9 U	1 U	1 U	0.96 U	0.89 U	0.85 U	0.86 U	0.9 U	0.94 U	0.87 U	0.96 U	0.89 U	0.98 U	0.57 U
Endrin	--	--	0.92 U	1.1 U	1 U	0.99 U	0.91 U	0.87 U	0.88 U	0.92 U	0.96 U	0.89 U	0.98 U	0.91 U	1 U	0.58 U
Endrin aldehyde	--	--	1.2 U	1.3 U	1.3 U	1.2 U	1.1 U	1.1 U	1.1 U	1.2 U	1.2 U	1.1 U	1.2 U	1.1 U	**-- R**	0.73 U
Endrin ketone	--	--	0.96 U	1.1 U	1.1 U	1 U	0.95 U	0.91 U	0.91 U	0.96 U	1 U	0.93 U	1 U	0.95 U	1 U	0.6 U
Heptachlor	--	--	0.82 U	0.95 U	0.94 U	0.89 U	0.81 U	0.78 U	0.79 U	0.82 U	0.87 U	0.8 U	0.88 U	0.82 U	0.9 U	0.52 U
Heptachlor epoxide	--	--	**1.9 J**	**3.6 J**	**1.7 J**	**1.8 J**	1.4 U	1.3 U	1.3 U	1.4 U	1.5 U	1.4 U	1.5 U	1.4 U	1.5 U	0.89 U
Hexachlorocyclohexane (BHC), alpha-	--	--	1.4 U	1.6 U	1.6 U	1.5 U	1.4 U	1.3 U	1.3 U	1.4 U	1.5 U	1.4 U	1.5 U	1.4 U	1.5 U	0.89 U
Hexachlorocyclohexane (BHC), beta-	--	--	0.95 U	1.1 U	1.1 U	1 U	0.94 U	0.9 U	0.9 U	0.95 U	0.99 U	0.92 U	1 U	0.94 U	1 U	0.6 U
Hexachlorocyclohexane (BHC), delta-	--	--	1.7 U	1.9 U	1.9 U	1.8 U	1.7 U	1.6 U	1.6 U	1.7 U	1.8 U	1.6 U	1.8 U	1.7 U	1.8 U	1.1 U
Hexachlorocyclohexane (BHC), gamma- (Lindane)	--	--	0.85 U	0.98 U	0.97 U	0.91 U	0.84 U	0.81 U	0.81 U	0.85 U	0.89 U	0.82 U	0.91 U	0.84 U	0.93 U	0.54 U
Methoxychlor	--	--	1.1 UJ	1.2 U	1.2 U	1.1 U	1 U	1 U	1 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U	1.2 U	0.67 U
Nonachlor, cis-	--	--	0.49 U	0.57 U	0.56 U	0.53 U	0.49 U	0.47 U	**1.2 J**	0.49 U	**1.4 J**	0.48 U	**2.3**	**2.1**	**1.3 J**	0.31 U
Nonachlor, trans-	--	--	0.52 U	**2.8**	**2.1 J**	**2.5**	**2.1**	**3.1**	**2.4**	**4.7**	**3.6**	**3.7**	**4.7**	**3.4**	**3.4**	0.33 U
Oxychlordane	--	--	0.51 U	0.59 U	0.59 U	0.55 U	0.51 U	0.49 U	0.49 U	0.51 U	0.54 U	0.5 U	0.55 U	0.51 U	0.56 U	0.32 U
Total Chlordane (U = 0)	0.5	6	*1.7 U*	**6.3 J**	**3.2 J**	**6.1 J**	**6.4 J**	**9.5**	**8.3 J**	**10.9**	**13 J**	**12.6**	**14.6**	**12.8 J**	**9 J**	*1.1 U*
Total DDx (U = 0)	1.58	46.1	**13.2 J**	**59.8**	**103**	**121**	**103**	**121**	**96.8**	**121 J**	**125 J**	**208**	**165**	**160**	**155 J**	**0.88 J**
Toxaphene	--	--	17 U	20 U	20 U	18 U	17 U	16 U	16 U	17 U	18 U	17 U	18 U	17 U	19 U	11 U
Pyrethroids (µg/kg)																
Allethrin	--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Bifenthrin	--	--	0.57 U	**2.6**	**3.1**	**2.2**	**2.7**	0.55 U	0.54 U	0.57 UJ	**4.5**	0.56 U	0.61 U	0.56 U	0.63 U	0.36 U
Cyfluthrin	--	--	0.48 U	**1.4**	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	**0.63 J**	0.3 U
Cypermethrin	--	--	0.48 U	**1 J**	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Deltamethrin/Tralomethrin	--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Fenpropathrin	--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Fenvalerate	--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U

Chemical	Sample ID Sample Date Matrix	ERL	ERM	LA3-REF-010618 1/6/2018 SE	TB-COMP-011218 1/12/2018 SE	MCN1-COMP-T-011518 1/15/2018 SE	MCN2-COMP-T-011618 1/16/2018 SE	MCN3-COMP-011918 1/19/2018 SE	MCN4-COMP-011918 1/19/2018 SE	MCN5-COMP-011818 1/18/2018 SE	BIN-COMP-T-011718 1/17/2018 SE	BIME-COMP-T-011218 1/12/2018 SE	BIME-COMP-M-011218 1/12/2018 SE	BIMW-COMP-T-011018 1/10/2018 SE	BIMW-COMP-M-011018 1/10/2018 SE	BIS-COMP-011218 1/12/2018 SE	EC-COMP-011718 1/18/2018 SE
Fluvalinate		--	--	0.48 U	**1.2**	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	**0.82 J**	0.3 UJ
Lambda-cyhalothrin		--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Permethrin		--	--	0.96 U	**1.5 J**	1.1 U	1 U	0.95 U	0.91 U	0.9 U	0.95 UJ	1 U	0.93 U	1 U	0.94 U	1.1 U	**0.94 J**
Phenothrin		--	--	0.48 U	0.55 U	0.55 U	0.51 U	0.48 U	0.46 U	0.45 U	0.48 UJ	0.51 U	0.47 U	0.51 U	0.47 U	0.53 U	0.3 U
Resmethrin/Bioresmethrin		--	--	0.81 U	0.94 U	0.93 U	0.87 U	0.81 U	0.78 U	0.77 U	0.81 UJ	0.86 U	0.79 U	0.86 U	0.8 U	0.89 U	0.51 U
Tetramethrin		--	--	0.57 U	0.67 U	0.66 U	0.61 U	0.57 U	0.55 U	0.54 U	0.57 UJ	0.61 U	0.56 U	0.61 U	0.56 U	0.63 U	0.36 U
PCB Congeners (µg/kg)																	
PCB-018		--	--	0.12 U	**6.8**	0.14 U	0.13 U	**0.75**	0.12 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.14 U	0.078 U
PCB-028		--	--	0.13 U	**8.2**	0.15 U	0.14 U	**1.5**	0.13 U	0.13 U	0.13 U	0.14 U	**1.1**	0.14 U	**1.2**	0.15 U	0.083 U
PCB-037		--	--	0.11 U	0.13 U	0.13 U	0.12 U	0.12 U	0.11 U	0.11 U	0.12 U	0.12 U	0.11 U	0.12 U	0.11 U	0.13 U	0.072 U
PCB-044		--	--	0.29 U	**8**	**2.1**	**1.5**	**1.3**	0.27 U	**1.2**	0.29 U	**0.73**	**1.8**	0.31 U	**1.4**	**1.1**	0.18 U
PCB-049		--	--	0.094 U	**7.9**	**1.5**	**1.5**	**1.2**	**0.63**	**0.98**	**0.66**	**0.49**	**1.3**	0.1 U	**1.1**	**0.69**	0.059 U
PCB-052		--	--	0.36 U	**10**	**1.8**	**2**	**1.7**	**1.2**	**1.2**	**1.1**	**0.89**	**1.7**	**0.8**	**1.5**	**1.3**	0.23 U
PCB-066		--	--	0.23 U	**14**	**2.5**	**2.7**	**2.3**	**1.4**	**1.3**	**1.5**	**0.94**	**2.2**	**0.95**	**2**	**0.91**	0.15 U
PCB-070		--	--	0.14 U	**10**	**1.6**	**2**	**1.8**	**1.3**	**1**	**1.2**	**0.61**	**1.7**	**0.54**	**1.2**	**0.84**	0.086 U
PCB-074		--	--	0.17 U	**5.3**	**0.99**	**1.3**	**1**	**0.54**	0.16 U	**0.96**	0.18 U	**1.1**	0.18 U	**1.1**	0.19 U	0.11 U
PCB-077		--	--	0.22 U	**2.6**	0.25 U	0.24 U	0.22 U	0.21 U	0.21 U	0.22 U	0.23 U	**0.48**	0.24 U	0.22 U	0.24 U	0.14 U
PCB-081		--	--	0.17 U	0.2 U	0.2 U	0.18 U	0.17 U	0.16 U	0.16 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.19 U	0.11 U
PCB-087		--	--	0.21 U	**3.9**	0.24 U	0.23 U	**1.8**	**1.4**	**2.2**	**2.2**	**1.8**	**1.8**	**2.3**	**1.7**	**1.6**	0.13 U
PCB-099		--	--	0.09 U	**8.2**	**2.2**	**2.3**	**1.7**	**1**	**1.5**	**1.7**	**0.84**	**1.6**	**1.1**	**1.4**	**0.95**	0.057 U
PCB-101		--	--	0.084 U	**13**	**3.2**	**3.6**	**3**	**2.1**	**2.2**	**2.2**	**1.7**	**2.7**	**1.6**	**2.6**	**1.7**	0.053 U
PCB-105		--	--	0.1 U	**5.1**	0.12 U	0.11 U	0.1 U	0.097 U	0.097 U	0.1 U	0.11 U	**2.1**	0.11 U	**1.7**	0.11 U	0.064 U
PCB-110		--	--	0.064 U	**12**	**2.7**	**3.4**	**2.8**	**2.1**	**2.2**	**1.9**	**1.5**	**2.5**	**1.7**	**2.8**	**1.8**	0.04 U
PCB-114		--	--	0.14 U	0.16 U	0.16 U	0.15 U	0.14 U	0.13 U	0.13 U	0.14 U	0.15 U	0.14 U	0.15 U	0.14 U	0.16 U	0.089 U
PCB-118		--	--	**0.65**	**12**	**3.1**	**3.7**	**3**	**1.7**	**1.7**	**1.7**	**1.3**	**2**	**1.2**	**2.4**	**1.1**	0.041 U
PCB-119		--	--	0.12 U	0.14 U	0.14 U	0.13 U	0.12 U	0.11 U	0.11 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.13 U	0.075 U
PCB-123		--	--	0.14 U	0.16 U	0.16 U	0.15 U	0.14 U	0.13 U	0.13 U	0.14 U	0.15 U	0.13 U	**1.2**	0.14 U	0.15 U	0.087 U
PCB-126		--	--	0.1 U	0.12 U	0.12 U	0.11 U	0.1 U	0.099 U	0.099 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.12 U	0.066 U
PCB-128		--	--	0.23 U	0.27 U	0.26 U	0.24 U	0.23 U	0.22 U	0.22 U	0.23 U	0.24 U	0.22 U	0.25 U	0.23 U	0.25 U	0.14 U
PCB-132/153		--	--	**0.62 J**	**14**	**4.9**	**6.2**	**4.6**	**3.4**	**3.4**	**3.6**	**2.3**	**3.7**	**2.8**	**3.8**	**2.6**	0.19 U
PCB-138/158		--	--	0.67 U	**12**	**4.6**	**5.2**	**3.9**	**3.2**	**3.2**	**3.4**	**2.7**	**3.3**	**2.5**	**3.6**	**2.6**	0.42 U
PCB-149		--	--	**0.46**	**8.2**	**3.3**	**4.1**	**3.1**	**2.1**	**2.2**	**2.2**	**1.7**	**2.9**	**1.6**	**2.5**	**1.9**	0.14 U
PCB-151		--	--	0.17 U	**3.2**	0.19 U	**2**	**0.92**	**1**	**0.66**	**0.85**	**0.74**	**0.93**	**0.57**	**0.84**	0.18 U	0.1 U
PCB-156		--	--	0.15 U	0.17 U	0.17 U	0.16 U	0.15 U	0.14 U	0.14 U	0.15 U	0.16 U	0.14 U	0.16 U	0.15 U	0.16 U	0.092 U
PCB-157		--	--	0.16 U	0.19 U	0.19 U	0.17 U	0.16 U	0.15 U	0.15 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.1 U
PCB-167		--	--	0.25 U	0.29 U	0.29 U	0.27 U	0.25 U	0.24 U	0.24 U	0.25 U	0.27 U	0.25 U	0.27 U	0.25 U	0.28 U	0.16 U
PCB-168		--	--	0.27 U	0.32 U	0.31 U	0.29 U	0.27 U	0.26 U	0.26 U	0.27 U	0.29 U	0.26 U	0.29 U	0.27 U	0.3 U	0.17 U
PCB-169		--	--	0.12 U	**0.61**	0.14 U	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.14 U	0.078 U
PCB-170		--	--	0.21 U	**3.8**	0.24 U	**2.4**	**1.5**	**1.3**	**1**	0.21 U	**0.92**	0.2 U	**0.91**	**1.3**	0.23 U	0.13 U
PCB-177		--	--	0.22 U	**2.5**	0.26 U	**1.1**	**1.1**	**0.61**	**0.89**	**0.7**	**0.48**	**0.65**	**0.41**	**0.78**	0.25 U	0.14 U
PCB-180		--	--	0.17 U	**9.2**	**3.6**	**4.5**	**2.8**	**2.1**	**1.9**	**2.5**	**1.8**	**2.6**	**2**	**2.7**	**1.7**	0.11 U
PCB-183		--	--	0.18 U	**2.3**	**1.2**	**1.2**	**0.86**	**0.52**	**0.63**	**0.62**	**0.59**	**0.73**	**0.49**	**0.78**	**0.63**	0.11 U
PCB-187		--	--	0.19 U	**5.8**	**2.4**	**2.7**	**1.5**	**1.4**	**1.2**	**1.4**	**0.94**	**1.5**	**1.4**	**1.5**	**1.3**	0.12 U
PCB-189		--	--	0.12 U	0.14 U	0.14 U	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.14 U	0.077 U
PCB-194		--	--	0.14 U	**3**	0.16 U	0.15 U	0.14 U	0.13 U	0.13 U	0.14 U	0.15 U	0.14 U	0.15 U	**1.1**	0.16 U	0.088 U

Chemical	Sample ID Sample Date Matrix	ERL	ERM	LA3-REF-010618 1/6/2018 SE	TB-COMP-011218 1/12/2018 SE	MCN1-COMP-T-011518 1/15/2018 SE	MCN2-COMP-T-011618 1/16/2018 SE	MCN3-COMP-011918 1/19/2018 SE	MCN4-COMP-011918 1/19/2018 SE	MCN5-COMP-011818 1/18/2018 SE	BIN-COMP-T-011718 1/17/2018 SE	BIME-COMP-T-011218 1/12/2018 SE	BIME-COMP-M-011218 1/12/2018 SE	BIMW-COMP-T-011018 1/10/2018 SE	BIMW-COMP-M-011018 1/10/2018 SE	BIS-COMP-011218 1/12/2018 SE	EC-COMP-011718 1/18/2018 SE
PCB-201		--	--	0.064 U	**0.64**	0.074 U	0.069 U	0.065 U	0.061 U	0.062 U	0.065 U	0.069 U	0.063 U	0.07 U	0.064 U	0.072 U	0.041 U
PCB-206		--	--	0.22 U	**2.6**	0.25 U	0.24 U	0.22 U	0.21 U	0.21 U	0.22 U	0.23 U	0.21 U	0.24 U	0.22 U	0.24 U	0.14 U
Total PCB Congener (U = 0)		22.7	180	**1.73 J**	**195**	**41.7**	**53.4**	**44.1**	**29**	**30.6**	**30.4**	**23.0**	**40.4**	**24.1**	**41**	**22.7**	0.42 U

Notes:
All non-detect results are reported at the MDL.
Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum.
Gamma chlordane and trans-chlordane are synonymous and refer to CAS RN 5103-74-2.
Total chlordane is the sum of cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor, and oxychlordane.
Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total HPAH (9 of 17) is the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthenes, benzo(k)fluoranthenes, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene (if analyzed).
Total LPAH (8 of 17) is the sum of 1-methylnaphthalene, 2-methylnapthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene (if analyzed).
Total PCB congeners is the sum of all PCB congeners listed in this table.
Detected concentration is greater than ERL screening level
Detected concentration is greater than ERM screening level
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
R: rejected
U: compound analyzed but not detected above detection limit

3.1.2 Individual Core Archive Samples from January 2018 Sampling Event

Based on composite sample results, individual core samples were analyzed for mercury, PCBs, and DDTs, as requested by USEPA (Table 6). Mercury, PCB, and DDT results for individual core samples are presented in Table 10. All results are expressed in dry weight unless otherwise indicated.

Within individual core samples, mercury ranged from 0.088 to 5 mg/kg. Mercury exceeded the ERM value in 13 samples. Total PCBs ranged from 74.5 to 403 µg/kg. Total PCBs exceeded the ERM value in three samples. Total DDTs ranged from 25.9 to 299 µg/kg. Total DDTs exceeded the ERM value in all samples, except two (MCN3-04 and BIN-03). Mercury, total DDT, and total PCB concentrations for individual core samples are shown in Figures 18, 19, and 20, respectively.

Table 10
Results of Mercury, DDT, and PCB Analysis for Individual Core Archive Samples from January 2018 Sampling Event

Chemical	Sample ID / Sample Date / Matrix	ERL	ERM	TB-01-011218 1/12/2018 SE	TB-02-011218 1/12/2018 SE	TB-03-011218 1/12/2018 SE	TB-04-011218 1/12/2018 SE	TB-05-011218 1/12/2018 SE	TB-06-011218 1/12/2018 SE	MCN1-01-T-011518 1/15/2018 SE	MCN1-02-T-011518 1/15/2018 SE	MCN1-03-T-011518 1/15/2018 SE	MCN1-04-T-011518 1/15/2018 SE	MCN2-01-T-011518 1/15/2018 SE	MCN2-02-T-011518 1/15/2018 SE	MCN2-03-T-011518 1/15/2018 SE	MCN2-04-T-011618 1/16/2018 SE	MCN3-01-011918 1/19/2018 SE	MCN3-02-011918 1/19/2018 SE	MCN3-03-011918 1/19/2018 SE	MCN3-04-011918 1/19/2018 SE	MCN4-01-011918 1/19/2018 SE	MCN4-02-011818 1/18/2018 SE	MCN4-03-011818 1/18/2018 SE
Conventional Parameters (%)																								
Total solids		--	--	57.2	57.3	51.7	43.1	44.2	52.3	43	51.1	42.8	46.6	40.4	44.7	50.6	48.1	52.1	51.4	50	63.7	58.8	55.3	54.8
Metals (mg/kg)																								
Mercury		0.15	0.71	2.54	2.72	5	0.776	1.4	3.37	1.66	1.41	0.525	0.547	1.67	0.603	2.2	0.775	1.15	1.57	0.4	0.088	--	--	--
Pesticides (µg/kg)																								
2,4'-DDD (o,p'-DDD)		--	--	--	--	--	--	--	--	2.2 J	5.9	3.1	4.1	7.4	4.4	2.5	4.6	7.1	4.8	4.2	1.4 J	5.3	4.3	3.2
2,4'-DDE (o,p'-DDE)		--	--	--	--	--	--	--	--	3.3 J	5.2	4.7	6.5	9.2	6.6	3.5 J	9.5	8.7	8.5	9.4	1.7 J	6.6	10	4.1
2,4'-DDT (o,p'-DDT)		--	--	--	--	--	--	--	--	0.73 U	0.62 U	0.73 U	0.68 U	0.77 U	0.7 U	0.62 U	0.65 U	0.6 U	0.61 U	0.62 U	0.49 U	0.54 U	0.57 U	0.57 U
4,4'-DDD (p,p'-DDD)		2	20	--	--	--	--	--	--	6.9	35	15	18	40	17 J	14	22	37	30	16 J	3.7	27	15 J	12 J
4,4'-DDE (p,p'-DDE)		2.2	27	--	--	--	--	--	--	50	34	63	64	54	81	24	97	57	55	66	18	85	76	67
4,4'-DDT (p,p'-DDT)		1	7	--	--	--	--	--	--	8.2	4.7	5.1 J	5	7.7	6.1	4.4	7.4	5	5.7	5.4	1.1 J	4.5	2.4	1.8
Total DDx (U = 0)		1.58	46.1	--	--	--	--	--	--	70.6 J	84.8	90.9 J	97.6	118	115.1 J	48.4 J	141	115	104	101 J	25.9 J	128	107.7 J	88.1 J
PCB Congeners (µg/kg)																								
PCB-018		--	--	5.1	3	25	1.2	2.8	2.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-028		--	--	5.7	4.6	29	3.1	3	5.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-037		--	--	0.11 U	0.11 U	4.2	0.14 U	0.14 U	0.12 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-044		--	--	7	5.2	24	2.3	3	5.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-049		--	--	4.3	3.5	24	2.8	2.6	5.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-052		--	--	9.4	6.3	32	3.7	4.4	6.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-066		--	--	9.7	8.8	43	5.2	4.8	9.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-070		--	--	9.7	6	31	2.8	3.3	6.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-074		--	--	4.8	3.9	15	2.1	1.9	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-077		--	--	1.5	0.2 U	3.2	1.6	0.26 U	1.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-081		--	--	0.16 U	0.16 U	0.17 U	0.21 U	0.2 U	0.17 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-087		--	--	7.4	4	5.2	2.6	2.2	4.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-099		--	--	7.2	5.5	16	4.4	3.9	6.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-101		--	--	16	9.6	23	7.2	5.6	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-105		--	--	8	3.9	7.8	2.4	1.8	5.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-110		--	--	15	9.3	21	6.5	5	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-114		--	--	0.13 U	0.13 U	0.14 U	0.17 U	0.17 U	0.14 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-118		--	--	15	9.7	20	5.9	4	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-119		--	--	0.11 U	0.11 U	0.12 U	0.14 U	0.14 U	0.12 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-123		--	--	0.13 U	0.13 U	0.14 U	0.17 U	0.16 U	0.14 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-126		--	--	0.096 U	0.095 U	0.11 U	0.13 U	0.12 U	0.1 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-128		--	--	3.8	0.21 U	2	1.7	0.27 U	2.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-132/153		--	--	17	10	18	9.8	6.4	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-138/158		--	--	18	10	14	8.9	5.7	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-149		--	--	11	7.2	9.9	6	3.6	9.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-151		--	--	4.2	2.7	3.5	2.5	1.4	3.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-156		--	--	2.1	1.2	1.8	0.18 U	0.17 U	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-157		--	--	0.15 U	0.15 U	0.16 U	0.2 U	0.19 U	0.16 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-167		--	--	0.23 U	0.23 U	0.26 U	0.31 U	0.3 U	0.25 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-168		--	--	0.25 U	0.25 U	0.28 U	0.33 U	0.32 U	0.27 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-169		--	--	2	1	0.95	0.15 U	0.15 U	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-170		--	--	6.1	3.8	4.1	3.1	1.9	5.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-177		--	--	2.7	2	2.6	2.2	0.26 U	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-180		--	--	15	6.5	8.8	6.6	3.7	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-183		--	--	3.7	1.6	2	2.1	0.93	2.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-187		--	--	9.3	4.1	6	4.8	2.6	6.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-189		--	--	0.11 U	0.11 U	0.12 U	0.15 U	0.14 U	0.12 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-194		--	--	7.1	2.5	2.8	2.3	0.17 U	4.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-201		--	--	1.8	0.059 U	0.066 U	0.079 U	0.077 U	0.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-206		--	--	9.6	2.1	3	1.7	0.26 U	3.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCB Congener (U = 0)		22.7	180	239	138	403	106	74.5	187	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Chemical	Sample ID Sample Date Matrix		MCN4-04-011818 1/18/2018 SE	BIME-01-TM-030518 3/5/2018 SE	BIME-02-TM-030518 3/5/2018 SE	BIME-03-TM-030518 3/5/2018 SE	BIME-04-TM-030518 3/5/2018 SE	BIMW-01-TM-030518 3/5/2018 SE	BIMW-02-TM-030518 3/5/2018 SE	BIMW-03-TM-030518 3/5/2018 SE	BIMW-04-TM-030518 3/5/2018 SE	BIN-01-T-011618 1/16/2018 SE	BIN-02-T-011618 1/16/2018 SE	BIN-03-T-011618 1/16/2018 SE	BIN-04-T-011618 1/16/2018 SE	BIN-05-T-011618 1/16/2018 SE	BIN-06-T-011618 1/17/2018 SE	BIS-01-011118 1/11/2018 SE	BIS-02-011118 1/11/2018 SE	BIS-03-011118 1/11/2018 SE	BIS-04-011118 1/11/2018 SE
	ERL	ERM																				
Conventional Parameters (%)																						
Total solids	--	--	**53.7**	**50**	**52.2**	**49.4**	**49.6**	**49.7**	**52**	**48**	**48.1**	**53.1**	**57.3**	**57.7**	**49.8**	**49.3**	**58.6**	**52.2**	**48.1**	**46.6**	**47.5**
Metals (mg/kg)																						
Mercury	0.15	0.71	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																						
2,4'-DDD (o,p'-DDD)	--	--	**4**	**3.9**	**4.7**	**3.5**	**3.7**	**5.3**	**8.6**	**3.9**	**5.2**	**11**	**3.4**	**1.1 J**	**4.6**	**5.3**	**5**	**4.5**	**9.5**	**2.6**	**2.6**
2,4'-DDE (o,p'-DDE)	--	--	**6**	**4.9**	**5**	**7.1**	**4.6**	**12**	**7.3**	**5.4**	2 U	**12**	**5.3**	**1.7 J**	**6.6**	**8.6**	**6.8**	**5.4**	**7.8**	**2.7 J**	**3.6 J**
2,4'-DDT (o,p'-DDT)	--	--	0.59 U	0.62 U	0.6 U	0.64 U	0.64 U	0.63 U	0.6 U	0.65 U	0.65 U	0.59 U	0.55 U	0.55 U	0.63 U	0.63 U	0.53 U	0.61 U	0.65 U	0.67 U	0.66 U
4,4'-DDD (p,p'-DDD)	2	20	**20**	**32 J**	**35**	**21**	**29**	**41**	**56**	**24**	**41**	**80**	**24**	**5.8**	**33**	**41**	**31**	**33**	**77**	**14**	**17 J**
4,4'-DDE (p,p'-DDE)	2.2	27	**87**	**130**	**83**	**91**	**120**	**140**	**100**	**110**	**210**	**91**	**120**	**33**	**110**	**140**	**250**	**100**	**130**	**84**	**100**
4,4'-DDT (p,p'-DDT)	1	7	**4**	**3.9**	**3.7**	**4.9**	**3.8**	**7.2**	**5.5**	**5**	**4.3**	**5**	**4.4**	**1.9**	**6.9**	**5.2**	**6.2**	**6.7**	**7.5**	**4.5 J**	**4.7**
Total DDx (U = 0)	1.58	46.1	**121**	**174.7 J**	**131**	**128**	**161**	**206**	**177**	**148**	**261**	**199**	**157**	**43.5 J**	**161**	**200**	**299**	**150**	**232**	**107.8 J**	**127.9 J**
PCB Congeners (µg/kg)																						
PCB-018	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-028	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-037	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-044	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-049	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-052	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-066	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-070	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-074	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-077	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-081	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-087	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-099	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-101	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-114	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-118	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-119	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-123	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-126	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-128	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-132/153	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-138/158	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-151	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-156	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-157	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-167	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-169	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-170	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-177	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-180	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-183	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-187	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-189	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-194	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-201	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB-206	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCB Congener (U = 0)	22.7	180	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
All non-detect results are reported at the MDL.

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum. Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total PCB congeners is the sum of all PCB congeners listed in this table.
Detected concentration is greater than ERL screening level
Detected concentration is greater than ERM screening level
Bold: detected result
J: estimated value
U: compound analyzed but not detected above detection limit

3.1.3 Individual Core Samples from January 2019 Sampling Event

Results of physical and chemical analyses of individual core samples from Newport Channel are presented in Table 11. All results are expressed in dry weight unless otherwise indicated.

Metals, organotins, pyrethroids, PAHs, pesticides, and PCBs were detected in individual core samples from Newport Channel. Mercury exceeded the ERM value in five samples. Butyltin, dibutyltin, and/or tributyltin were detected in all samples. Several PAHs were detected at low concentrations (total PAHs less than the ERL value in all samples). Total DDTs exceeded the ERM value in one sample (NC2-02). Total chlordane was less than the ERM value in all samples. Total PCBs were less than the ERM in all samples.

Based on individual core sample results, potential contaminants of concern within Newport Channel included mercury. Mercury ranged from 0.0905 to 2.49 mg/kg. Highest concentrations were measured at stations NC1-01 and NC1-02, in the western portion of Newport Channel near Rhine Channel. This is consistent with the exploratory sampling performed in January 2018. Mercury concentrations for individual core samples within Newport Channel are shown in Figure 21.

Based on individual core sample results, composite samples were created in coordination with USEPA for ocean disposal testing. The compositing scheme is presented in Table 4. Stations NC1-01 and NC1-02 were eliminated from further testing due to elevated mercury concentrations. Composite sediment chemistry results for Newport Channel are presented in Section 3.1.4.

Table 11
Results of Physical and Chemical Analyses for Individual Core Samples from January 2019 Sampling Event

Chemical	ERL	ERM	NC1-01-012319 1/23/2019 SE	NC1-02-012319 1/23/2019 SE	NC1-03-012319 1/23/2019 SE	NC1-04-012319 1/23/2019 SE	NC2-01-012419 1/24/2019 SE	NC2-02-012419 1/24/2019 SE	NC2-03-012419 1/24/2019 SE	NC2-04-012219 1/22/2019 SE	NC3-01-012219 1/22/2019 SE	NC3-02-012219 1/22/2019 SE	NC3-03-012219 1/22/2019 SE	NC3-04-012319 1/23/2019 SE
Conventional Parameters (%)														
Total organic carbon	--	--	**0.75**	**0.91**	**0.41**	**0.42**	**0.42**	**0.84**	**0.27**	**0.5**	**0.3**	**0.39**	**0.025 J**	**0.63**
Total solids	--	--	**56.3**	**58.9**	**65.2**	**59.8**	**62.4**	**57.8**	**70.1**	**58.3**	**68.5**	**62.7**	**76.8**	**78.7**
Grain Size (%)														
Gravel (>2 mm)	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**2.23**
Sand (2.00 mm - 1.00 mm)	--	--	0.01 U	0.01 U	**2.24**	0.01 U	**1.63**	0.01 U	**1.59**	0.01 U	**4.53**	**2.63**	**2.77**	**15.7**
Sand, coarse	--	--	**9.47**	0.01 U	**6.08**	**0.68**	**13.89**	**1.87**	**25.1**	**0.94**	**18.09**	**12.92**	**14.98**	**32.3**
Sand, medium	--	--	**19.59**	**1.36**	**17.24**	**10.44**	**26.95**	**4.74**	**24.21**	**13.11**	**33.79**	**35.17**	**31.61**	**31.67**
Sand, fine	--	--	**8.2**	**10.96**	**23.84**	**29.24**	**12.24**	**17.59**	**8.73**	**31.85**	**11.68**	**18.14**	**18.29**	**14.09**
Sand, very fine	--	--	**1.91**	**3.13**	**5.72**	**7.06**	**2.36**	**7.98**	**2.3**	**5.84**	**2.14**	**2.98**	**2.78**	**1.65**
Silt	--	--	**40.19**	**55.79**	**29.78**	**36.68**	**29.81**	**46.71**	**27.23**	**34.01**	**21.03**	**19.43**	**20.59**	**1.68**
Clay (<4 micron)	--	--	**20.62**	**28.76**	**15.11**	**15.91**	**13.12**	**21.1**	**10.84**	**14.25**	**8.74**	**8.73**	**8.98**	**0.69**
Metals (mg/kg)														
Arsenic	8.2	70	**8.11**	**9.72**	**5.84**	**6.26**	**5.7**	**7.29**	**3.46**	**6.03**	**4.33**	**4.08**	**3.01**	**2.75**
Cadmium	1.2	9.6	**0.515**	**0.568**	**0.309**	**0.461**	**0.444**	**0.884**	**0.324**	**0.487**	**0.387**	**0.423**	**0.179**	**0.148**
Chromium	81	370	**23.3**	**26.7**	**14.6**	**18.3**	**13.7**	**22**	**8.91**	**19.2**	**11.4**	**11.8**	**6.74**	**6.33**
Copper	34	270	**130**	**85.4**	**47.6**	**50.5**	**56.5**	**47.7**	**25.7**	**42.4**	**23.3**	**16.8**	**8.88**	**9.01**
Lead	46.7	218	**38.4**	**36.5**	**19.2**	**20.8**	**19.9**	**29.4**	**11.8**	**15.6**	**12.4**	**12.5**	**6.38**	**5.77**
Mercury	0.15	0.71	**2**	**2.49**	**0.708**	**0.81**	**0.402**	**1.52**	**1.26**	**0.267**	**0.245**	**0.19**	**0.144**	**0.0905**
Nickel	20.9	51.6	**13.7**	**16.6**	**9.18**	**11.8**	**9.48**	**16**	**5.94**	**12.3**	**7.44**	**7.68**	**4.24**	**3.87**
Selenium	--	--	**5.78**	**4.02**	**2.34**	**2.41**	**2.87**	**2.74**	**1.36**	**2.02**	**0.931**	**1.03**	**0.429**	**0.559**
Silver	1	3.7	**0.398**	**0.359**	**0.26**	**0.315**	**0.783**	**1.39**	**0.624**	**0.364**	**0.206**	**0.234**	**0.116 J**	**0.114 J**
Zinc	150	410	**151 J**	**130 J**	**95.8 J**	**92.3 J**	**87.4 J**	**102 J**	**48.2 J**	**100 J**	**59.8 J**	**49.5 J**	**25.3 J**	**23.5 J**
Organometallic Compounds (µg/kg)														
Butyltin (n-Butyltin)	--	--	2.4 U	2.3 U	**3.7 J**	2.2 U	2.2 U	2.3 U	2 U	2.3 U	2 U	2.1 U	1.7 U	1.8 U
Dibutyltin	--	--	**44**	**20**	**34**	**24**	**33**	**27**	**15**	**9**	**6.8**	**14**	**7.6**	**11**
Tetrabutyltin	--	--	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.3 U	1 U	1.2 U	1.1 U	1.2 U	0.94 U	0.94 U
Tributyltin	--	--	**3.8 J**	2.5 UJ	**2.8 J**	**3.9 J**	**7 J**	2.5 UJ	2.1 UJ	2.5 UJ	2.1 UJ	2.3 UJ	1.9 UJ	1.9 UJ
PAHs (µg/kg)														
1-Methylnaphthalene	--	--	4.1 UJ	3.9 UJ	3.5 UJ	**81 J**	3.7 UJ	4 UJ	3.3 UJ	3.9 U	3.4 U	3.7 U	3 U	2.9 UJ
2-Methylnaphthalene	70	670	4.1 U	3.9 U	3.5 U	**92**	3.7 U	4 U	3.3 U	3.9 U	3.4 U	3.7 U	3 U	2.9 UJ
Acenaphthene	16	500	4.2 U	3.9 U	**42**	**86**	3.7 U	4.1 U	3.3 U	4 U	3.4 U	3.8 U	3 U	2.9 U
Acenaphthylene	44	640	3.2 U	3 U	2.7 U	**91**	2.8 U	3.1 U	2.5 U	3 U	2.6 U	2.8 U	2.3 U	2.2 U
Anthracene	85.3	1,100	6.2 U	5.8 U	5.2 U	**88**	5.5 U	6 U	4.9 U	5.9 U	5 U	5.6 U	4.5 U	4.3 U
Benzo(a)anthracene	261	1,600	**8.7 J**	**11 J**	**4.5 J**	**98**	**7.5 J**	3.7 U	**3.8 J**	**8.1 J**	**6.9 J**	3.4 U	2.8 U	**5.3 J**
Benzo(a)pyrene	430	1,600	**18 J**	**24**	2.8 U	**110**	2.9 U	3.2 U	2.6 U	**14 J**	**10 J**	**6.7 J**	**4.2 J**	**5.5 J**
Benzo(b)fluoranthene	--	--	4.8 U	**27**	4.1 U	**97**	4.3 U	4.7 U	3.9 U	**8.7 J**	**8.5 J**	**6.1 J**	3.5 U	**5.2 J**
Benzo(g,h,i)perylene	--	--	**7.8 J**	**12 J**	2.3 U	**110**	**7.8 J**	2.7 U	2.2 U	**15 J**	**10 J**	**7.8 J**	**3.9 J**	**3.9 J**
Benzo(k)fluoranthene	--	--	**15 J**	**20 J**	4.2 UJ	**89 J**	4.4 UJ	4.8 UJ	3.9 UJ	**9.5 J**	**11 J**	**5 J**	3.6 U	**4.8 J**

Chemical	Sample ID Sample Date Matrix ERL	ERM	NC1-01-012319 1/23/2019 SE	NC1-02-012319 1/23/2019 SE	NC1-03-012319 1/23/2019 SE	NC1-04-012319 1/23/2019 SE	NC2-01-012419 1/24/2019 SE	NC2-02-012419 1/24/2019 SE	NC2-03-012419 1/24/2019 SE	NC2-04-012219 1/22/2019 SE	NC3-01-012219 1/22/2019 SE	NC3-02-012219 1/22/2019 SE	NC3-03-012219 1/22/2019 SE	NC3-04-012319 1/23/2019 SE
Chrysene	384	2,800	**11 J**	**14 J**	**3.9 J**	**93**	**8.8 J**	**4.4 J**	**5 J**	**12 J**	**9 J**	**5.2 J**	2.9 U	**4.4 J**
Dibenzo(a,h)anthracene	63.4	260	3.4 U	3.3 U	2.9 U	**110**	3.1 U	3.4 U	2.8 U	3.3 U	2.8 U	3.1 U	2.5 U	2.4 UJ
Fluoranthene	600	5,100	**14 J**	**21**	**6.5 J**	**87**	**10 J**	**6.5 J**	**5.9 J**	**11 J**	**8.8 J**	**5.3 J**	**2.7 J**	**5.9 J**
Fluorene	19	540	5.5 U	5.2 U	4.7 U	**97**	4.9 U	5.4 U	4.4 U	5.3 U	4.5 U	5 U	4 U	3.9 U
Indeno(1,2,3-c,d)pyrene	--	--	**7.1 J**	**10 J**	2.4 U	**100**	**6.7 J**	2.7 U	2.2 U	**12 J**	**7.1 J**	**4.1 J**	**2.7 J**	**3.5 J**
Naphthalene	160	2,100	6.1 U	5.8 U	5.2 U	**86**	5.5 U	6 U	4.9 U	5.9 UJ	5 U	5.5 U	4.5 U	4.3 UJ
Phenanthrene	240	1,500	**6.3 J**	**8.4 J**	**4.3 J**	**90**	**3.9 J**	3.8 U	3.1 U	3.8 U	**3.5 J**	3.6 U	2.9 U	**3.3 J**
Pyrene	665	2,600	**15 J**	**25 J**	**11 J**	**87 J**	**13 J**	**7.4 J**	**6.4 J**	**16 J**	**12 J**	**9.2 J**	**3.5 J**	**6.4 J**
Total HPAH (9 of 17) (U = 0)	1,700	9,600	**96.6 J**	**164 J**	**25.9 J**	**981 J**	**53.8 J**	**18.3 J**	**21.1 J**	**106.3 J**	**83.3 J**	**49.4 J**	**17 J**	**44.9 J**
Total LPAH (8 of 17) (U = 0)	552	3,160	**6.3 J**	**8.4 J**	**46.3 J**	**630**	**3.9 J**	6 U	4.9 U	5.9 UJ	**3.5 J**	5.6 U	4.5 U	**3.3 J**
Total PAH (17) (U = 0)	4,022	44,792	**102.9 J**	**172.4 J**	**72.2 J**	**1611 J**	**57.7 J**	**18.3 J**	**21.1 J**	**106.3 J**	**86.8 J**	**49.4 J**	**17 J**	**48.2 J**
Pesticides (µg/kg)														
2,4'-DDD (o,p'-DDD)	--	--	0.5 U	0.48 U	0.43 U	0.47 U	0.46 U	0.49 U	0.41 U	0.48 U	0.41 U	0.45 U	0.36 U	0.36 U
2,4'-DDE (o,p'-DDE)	--	--	1.7 U	1.6 U	1.5 U	1.6 U	1.6 U	**3.5**	**1.5 J**	1.7 U	1.4 U	**2.4 J**	1.3 U	1.2 U
2,4'-DDT (o,p'-DDT)	--	--	0.55 U	0.52 U	0.47 U	0.52 U	0.5 U	0.54 U	0.45 U	0.53 U	0.45 U	0.49 U	0.4 U	0.4 U
4,4'-DDD (p,p'-DDD)	2	20	0.88 U	0.83 U	0.76 U	**5.5**	**1.3 J**	**19**	**8**	**2.2**	**6.3**	**11**	**2**	0.63 U
4,4'-DDE (p,p'-DDE)	2.2	27	**14**	**8.8**	**11**	**13**	**17**	**30**	**12**	**19**	**12**	**22**	**10**	**6.4 J**
4,4'-DDT (p,p'-DDT)	1	7	0.77 U	0.73 U	0.66 U	0.72 U	0.7 U	0.75 U	0.62 U	0.74 U	0.63 U	0.69 U	0.56 U	0.55 U
Aldrin	--	--	0.77 U	0.73 U	0.66 U	0.72 U	0.7 U	0.75 U	0.62 U	0.74 U	0.63 U	0.69 U	0.56 U	0.55 UJ
Chlordane, alpha- (Chlordane, cis-)	--	--	0.71 U	0.67 U	0.61 U	0.67 U	0.65 U	0.69 U	0.58 U	0.69 U	0.59 U	0.64 U	0.52 U	0.51 U
Chlordane, gamma- (Chlordane, trans-)	--	--	1.6 U	1.5 U	**1.7 J**	**2 J**	**2.3 J**	**2.2 J**	**2.3 J**	**2.2 J**	**1.5 J**	**2.6 J**	**1.7 J**	1.1 U
Dieldrin	0.02	8	*0.77 U*	*0.73 U*	*0.66 U*	*0.72 U*	*0.7 U*	*0.75 U*	*0.62 U*	*0.74 U*	*0.63 U*	*0.69 U*	*0.56 U*	*0.55 U*
Endosulfan sulfate	--	--	0.92 U	0.87 U	0.79 U	0.86 U	0.84 U	0.89 U	0.74 U	0.88 U	0.75 U	0.82 U	0.67 U	0.66 U
Endosulfan, alpha- (I)	--	--	0.7 U	0.66 U	0.6 U	0.65 U	0.64 U	0.68 U	0.56 U	0.67 U	0.57 U	0.62 U	0.51 U	0.5 U
Endosulfan, beta (II)	--	--	0.83 U	0.78 U	0.71 U	0.78 U	0.75 U	0.8 U	0.67 U	0.8 U	0.68 U	0.74 U	0.6 U	0.59 U
Endrin	--	--	0.85 U	0.8 U	0.73 U	0.79 U	0.77 U	0.82 U	0.68 U	0.81 U	0.7 U	0.76 U	0.61 U	0.61 U
Endrin aldehyde	--	--	1.1 U	1 U	0.91 U	1 U	0.97 U	1 U	0.86 U	1 U	0.87 U	0.95 U	0.77 U	0.76 U
Endrin ketone	--	--	0.88 U	0.84 U	0.76 U	0.83 U	0.81 U	0.86 U	0.71 U	0.85 U	0.73 U	0.79 U	0.64 U	0.63 U
Heptachlor	--	--	0.76 U	0.72 U	0.65 U	0.71 U	0.69 U	0.74 U	0.61 U	0.73 U	0.62 U	0.68 U	0.55 U	0.54 U
Heptachlor epoxide	--	--	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.3 U	1 U	1.2 U	1.1 U	1.2 U	0.94 U	0.93 U
Hexachlorocyclohexane (BHC), alpha-	--	--	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.3 U	1.1 U	1.3 U	1.1 U	1.2 U	0.94 U	0.93 U
Hexachlorocyclohexane (BHC), beta-	--	--	0.87 U	0.83 U	0.75 U	0.82 U	0.8 U	0.85 U	0.71 U	0.84 U	0.72 U	0.78 U	0.63 U	0.62 U
Hexachlorocyclohexane (BHC), delta-	--	--	1.5 U	1.5 U	1.3 U	1.4 U	1.4 U	1.5 U	1.2 U	1.5 U	1.3 U	1.4 U	1.1 U	1.1 U
Hexachlorocyclohexane (BHC), gamma- (Lindane)	--	--	0.78 U	0.74 U	0.67 U	0.73 U	0.71 U	0.76 U	0.63 U	0.75 U	0.64 U	0.7 U	0.57 U	0.56 U
Methoxychlor	--	--	0.98 U	0.93 U	0.84 U	0.92 U	0.89 U	0.95 U	0.79 U	0.94 U	0.81 U	0.88 U	0.71 U	0.7 U
Nonachlor, cis-	--	--	0.46 U	0.43 U	0.39 U	0.43 U	0.42 U	0.44 U	0.37 U	0.44 U	0.37 U	0.41 U	0.33 U	0.33 U
Nonachlor, trans-	--	--	0.48 U	0.45 U	0.41 U	0.45 U	0.43 U	0.46 U	0.38 U	0.46 U	0.39 U	0.43 U	0.35 U	0.34 U
Oxychlordane	--	--	0.47 U	0.45 U	0.41 U	0.44 U	0.43 U	0.46 U	0.38 U	0.46 U	0.39 U	0.42 U	0.34 U	0.34 U
Toxaphene	--	--	16 U	15 U	14 U	15 U	14 U	15 U	13 U	15 U	13 U	14 U	11 U	11 U
Total Chlordane (U = 0)	0.5	6	*1.6 U*	*1.5 U*	**1.7 J**	**2 J**	**2.3 J**	**2.2 J**	**2.3 J**	**2.2 J**	**1.5 J**	**2.6 J**	**1.7 J**	*1.1 U*
Total DDx (U = 0)	1.58	46.1	**14**	**8.8**	**11**	**18.5**	**18.3 J**	**52.5**	**21.5 J**	**21.2**	**18.3**	**35.4 J**	**12**	**6.4 J**
Pyrethroids (µg/kg)														

Chemical	Sample ID Sample Date Matrix ERL	ERM	NC1-01-012319 1/23/2019 SE	NC1-02-012319 1/23/2019 SE	NC1-03-012319 1/23/2019 SE	NC1-04-012319 1/23/2019 SE	NC2-01-012419 1/24/2019 SE	NC2-02-012419 1/24/2019 SE	NC2-03-012419 1/24/2019 SE	NC2-04-012219 1/22/2019 SE	NC3-01-012219 1/22/2019 SE	NC3-02-012219 1/22/2019 SE	NC3-03-012219 1/22/2019 SE	NC3-04-012319 1/23/2019 SE
Allethrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Bifenthrin	--	--	**1.4**	**0.63 J**	**0.48 J**	**0.9**	**1.3**	0.52 U	**0.85**	**1.6**	**0.9**	**0.75 J**	**0.41 J**	0.38 U
Cyfluthrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Cypermethrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Deltamethrin/Tralomethrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Fenpropathrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Fenvalerate	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Fluvalinate	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Lambda-cyhalothrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Permethrin	--	--	0.89 U	0.84 U	0.77 U	0.84 U	0.8 U	0.87 U	0.71 U	0.84 U	0.72 U	0.79 U	0.64 U	0.63 U
Phenothrin	--	--	0.44 U	0.42 U	0.38 U	0.42 U	0.4 U	0.43 U	0.35 U	0.42 U	0.36 U	0.4 U	0.32 U	0.32 U
Resmethrin/Bioresmethrin	--	--	0.75 U	0.72 U	0.65 U	0.71 U	0.68 U	0.74 U	0.6 U	0.72 U	0.61 U	0.67 U	0.55 U	0.54 U
Tetramethrin	--	--	0.53 U	0.51 U	0.46 U	0.5 U	0.48 U	0.52 U	0.43 U	0.51 U	0.43 U	0.48 U	0.38 U	0.38 U
PCB Congeners (µg/kg)														
PCB-018	--	--	0.11 U	**1.4**	0.098 U	0.11 U	0.1 U	0.11 U	0.092 U	0.11 U	0.094 U	0.1 U	0.084 U	0.081 U
PCB-028	--	--	**1.2**	**1.3**	0.1 U	0.12 U	0.11 U	**1.6**	0.098 U	0.12 U	0.1 U	0.11 U	0.089 U	0.086 U
PCB-037	--	--	0.11 U	0.1 U	0.091 U	0.1 U	0.096 U	0.1 U	0.086 U	0.1 U	0.088 U	0.097 U	0.078 U	0.076 U
PCB-044	--	--	**1.3**	**1.3**	0.23 U	0.25 U	0.24 U	0.26 U	0.21 U	0.26 U	0.22 U	0.24 U	0.2 U	0.19 U
PCB-049	--	--	**2.5**	0.083 U	0.075 U	0.083 U	0.078 U	0.085 U	0.07 U	0.084 U	0.072 U	0.079 U	0.064 U	0.062 U
PCB-052	--	--	**2.3**	**1.5**	0.29 U	0.32 U	0.3 U	0.33 U	0.27 U	0.32 U	0.27 U	0.3 U	0.25 U	0.24 U
PCB-066	--	--	**3.6**	**2.2**	**1.2**	0.21 U	0.19 U	0.21 U	0.17 U	0.21 U	**0.67**	0.2 U	0.16 U	0.15 U
PCB-070	--	--	0.13 U	**0.76**	0.11 U	0.12 U	0.11 U	0.12 U	0.1 U	0.12 U	**0.34**	0.11 U	0.092 U	0.089 U
PCB-074	--	--	**1.1**	**0.83**	0.14 U	0.15 U	0.14 U	0.16 U	0.13 U	0.15 U	**0.25 J**	0.14 U	0.12 U	0.11 U
PCB-077	--	--	0.2 U	0.19 U	0.17 U	0.19 U	0.18 U	0.2 U	0.16 U	0.2 U	0.17 U	0.18 U	0.15 U	0.14 U
PCB-081	--	--	0.16 U	0.15 U	0.14 U	0.15 U	0.14 U	0.16 U	0.13 U	0.15 U	0.13 U	0.14 U	0.12 U	0.11 U
PCB-087	--	--	**0.87**	0.19 U	0.17 U	0.19 U	0.18 U	0.19 U	0.16 U	0.19 U	0.16 U	0.18 U	0.14 U	0.14 U
PCB-099	--	--	**2.7**	**1.6**	**0.68**	0.079 U	0.075 U	0.082 U	0.067 U	**0.37**	0.069 U	0.076 U	0.061 U	**0.21 J**
PCB-101	--	--	**3.3**	**2.1**	0.067 U	**2.4**	0.07 U	0.076 U	0.063 U	0.075 U	0.064 U	0.071 U	0.057 U	0.055 U
PCB-105	--	--	0.094 U	0.089 U	0.08 U	0.089 U	0.084 U	0.092 U	0.075 U	0.09 U	0.077 U	0.085 U	0.069 U	0.067 U
PCB-110	--	--	**2.8**	**1.7**	**0.93**	0.057 U	0.053 U	**2.1**	0.048 U	**0.54**	**0.62**	**0.49**	0.044 U	**0.33**
PCB-114	--	--	0.13 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U	0.1 U	0.13 U	0.11 U	0.12 U	0.096 U	0.092 U
PCB-118	--	--	**2.8**	**1.6**	**1**	0.058 U	**2.2**	**2.4**	**1.7**	0.058 U	**0.58**	0.055 U	0.045 U	0.043 U
PCB-119	--	--	0.11 U	0.1 U	0.094 U	0.1 U	0.099 U	0.11 U	0.088 U	0.11 U	0.09 U	0.1 U	0.081 U	0.078 U
PCB-123	--	--	0.13 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U	0.1 U	0.12 U	0.11 U	0.12 U	0.094 U	0.091 U
PCB-126	--	--	0.097 U	0.092 U	0.083 U	0.092 U	0.087 U	0.095 U	0.078 U	0.093 U	0.079 U	0.088 U	0.071 U	0.068 U
PCB-128	--	--	0.21 U	0.2 U	0.18 U	0.2 U	0.19 U	0.21 U	0.17 U	0.2 U	0.17 U	0.19 U	0.15 U	0.15 U
PCB-132/153	--	--	**4.7**	**2.9**	**1.6**	0.27 U	0.26 U	0.28 U	0.23 U	**1.2**	**1.3**	**1.4**	**0.64**	**0.53**
PCB-138/158	--	--	**3.1**	**2.3**	**1.3**	0.59 U	**4.1**	0.61 U	0.5 U	**0.91**	**0.96**	**1.1**	0.45 U	0.44 U
PCB-149	--	--	**2.4**	**1.5**	**0.83**	0.2 U	0.19 U	0.2 U	0.17 U	**0.53**	**0.69**	**0.78**	**0.43**	**0.38**
PCB-151	--	--	**0.73**	0.15 U	0.13 U	0.15 U	0.14 U	0.15 U	0.12 U	0.15 U	0.13 U	0.14 U	0.11 U	0.11 U
PCB-156	--	--	0.14 U	0.13 U	0.12 U	0.13 U	0.12 U	0.13 U	0.11 U	0.13 U	0.11 U	0.12 U	0.1 U	0.096 U
PCB-157	--	--	0.15 U	0.14 U	0.13 U	0.14 U	0.13 U	0.15 U	0.12 U	0.14 U	0.12 U	0.14 U	0.11 U	0.11 U

Chemical	Sample ID Sample Date Matrix		NC1-01-012319 1/23/2019 SE	NC1-02-012319 1/23/2019 SE	NC1-03-012319 1/23/2019 SE	NC1-04-012319 1/23/2019 SE	NC2-01-012419 1/24/2019 SE	NC2-02-012419 1/24/2019 SE	NC2-03-012419 1/24/2019 SE	NC2-04-012219 1/22/2019 SE	NC3-01-012219 1/22/2019 SE	NC3-02-012219 1/22/2019 SE	NC3-03-012219 1/22/2019 SE	NC3-04-012319 1/23/2019 SE
	ERL	ERM												
PCB-167	--	--	0.23 U	0.22 U	0.2 U	0.22 U	0.21 U	0.23 U	0.19 U	0.22 U	0.19 U	0.21 U	0.17 U	0.17 U
PCB-168	--	--	0.25 U	0.24 U	0.21 U	0.24 U	**3.7**	**5.6**	**3.3**	0.24 U	0.21 U	0.23 U	0.18 U	0.18 U
PCB-169	--	--	0.12 U	0.11 U	0.098 U	0.11 U	0.1 U	0.11 U	0.092 U	0.11 U	0.094 U	0.1 U	0.084 U	0.081 U
PCB-170	--	--	**0.86**	0.19 U	0.17 U	0.19 U	0.18 U	0.19 U	0.16 U	0.19 U	0.16 U	0.18 U	0.14 U	0.14 U
PCB-177	--	--	**0.8**	0.2 U	0.18 U	0.2 U	0.19 U	**1.2**	0.17 U	0.2 U	0.17 U	0.19 U	0.15 U	0.15 U
PCB-180	--	--	**2.2**	**1.7**	**1.7**	0.15 U	**1.8**	**4.2**	**1.6**	0.16 U	**0.66**	0.15 U	0.12 U	0.11 U
PCB-183	--	--	**0.62**	**0.36**	0.14 U	0.16 U	0.15 U	0.16 U	0.13 U	0.16 U	0.14 U	**0.29 J**	0.12 U	0.12 U
PCB-187	--	--	**1.8**	**1.1**	**0.99**	**1.2**	**1.7**	**1.8**	**1.7**	0.17 U	**0.43**	**0.47**	0.13 U	0.13 U
PCB-189	--	--	0.11 U	0.11 U	0.096 U	0.11 U	0.1 U	0.11 U	0.091 U	0.11 U	0.093 U	0.1 U	0.083 U	0.08 U
PCB-194	--	--	0.13 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U	0.1 U	0.12 U	0.11 U	0.12 U	0.095 U	0.092 U
PCB-201	--	--	0.06 U	0.057 U	0.051 U	0.057 U	0.054 U	0.059 U	0.048 U	0.058 U	0.049 U	0.054 U	0.044 U	0.042 U
PCB-206	--	--	0.2 U	**0.69**	0.17 U	0.19 U	0.18 U	0.2 U	0.16 U	0.2 U	0.17 U	0.18 U	0.15 U	0.14 U
Total PCB Congener (U = 0)	22.7	180	**41.68**	**26.84**	**10.23**	**3.6**	**13.5**	**18.9**	**8.3**	**3.55**	**6.5 J**	**4.53 J**	**1.07**	**1.45 J**

Notes:
All non-detect results are reported at the MDL.
Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum.
Gamma chlordane and trans-chlordane are synonymous and refer to CAS RN 5103-74-2.
Total chlordane is the sum of cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor, and oxychlordane.
Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total HPAH (9 of 17) is the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthenes, benzo(k)fluoranthenes, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene (if analyzed).
Total LPAH (8 of 17) is the sum of 1-methylnaphthalene, 2-methylnapthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene (if analyzed).
Total PCB congeners is the sum of all PCB congeners listed in this table.
Detected concentration is greater than ERL screening level
Detected concentration is greater than ERM screening level
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
U: compound analyzed but not detected above detection limit

3.1.4 Reference and Composite Sediment from January 2019 Sampling Event

Results of physical and chemical analyses of reference and composite sediment samples from Newport Channel are presented in Table 12. All results are expressed in dry weight unless otherwise indicated.

3.1.4.1 LA-3 ODMDS Reference

Reference sediment results were consistent with the previous reference sample collected in January 2018. Grain size consisted primarily of fines (silt and clay), totaling 82.9%. TOC was measured at a concentration of 2.2%.

Metals, PAHs, pesticides, and PCBs were detected in reference sediment. All metals concentrations were less than ERL values, except nickel. All PAH and PCB concentrations were less than ERL values. One DDT derivative (4,4'-DDE) and total DDTs exceeded ERL values. All concentrations were less than ERM values. Organotins and pyrethroids were not detected in reference sediment.

3.1.4.2 Composite Sediment

Composite sediment from Newport Channel consisted primarily of fines (81.9% and 85.2% silt and clay). TOC was 1.6% and 0.45%.

Metals, organotins, pyrethroids, PAHs, pesticides, and PCBs were detected in composite sediment. All metals were less than the ERM value. Dibutyltin was detected in both samples (13 and 6.6 µg/kg). Bifenthrin was detected in both samples. Several PAHs were detected in composite samples at low concentrations (less than ERL values). Total DDTs were less than the ERM value in both samples. Total PCBs were less than the ERM value in both samples.

Table 12
Results of Physical and Chemical Analyses for Composite Samples from January 2019 Sampling Event

Chemical	Sample ID Sample Date[1] Matrix ERL	 ERM	LA3-REF-021219 2/12/2019 SE	NC2-COMP 2/25/2019 SE	NC3-COMP 2/25/2019 SE
Conventional Parameters (%)					
Total organic carbon	--	--	**2.2**	**1.6**	**0.45**
Total solids	--	--	**48.1**	**65.3**	**73.1**
Grain Size (%)					
Gravel (>2 mm)	--	--	0.01 U	0.01 U	0.01 U
Sand (2.00 mm - 1.00 mm)	--	--	0.01 U	0.01 U	0.01 U
Sand, coarse	--	--	0.01 U	0.01 U	0.01 U
Sand, medium	--	--	**0.037**	0.01 U	0.01 U

Chemical	Sample ID Sample Date[1] Matrix ERL	ERM	LA3-REF-021219 2/12/2019 SE	NC2-COMP 2/25/2019 SE	NC3-COMP 2/25/2019 SE
Sand, fine	--	--	**4.97**	**0.24**	**4.75**
Sand, very fine	--	--	**12.15**	**17.82**	**10.01**
Silt	--	--	**71.71**	**53.65**	**58.46**
Clay (<4 micron)	--	--	**11.14**	**28.29**	**26.78**
Metals (mg/kg)					
Arsenic	8.2	70	**7.06**	**5.73**	**3.68**
Cadmium	1.2	9.6	**0.655**	**0.457**	**0.325**
Chromium	81	370	**38.6 J**	**16.5**	**9.19**
Copper	34	270	**24**	**45.2**	**16.8**
Lead	46.7	218	**10.1 J**	**19.9**	**10.2**
Mercury	0.15	0.71	**0.0742**	**0.529**	**0.173**
Nickel	20.9	51.6	**21.1**	**10.2**	**5.73**
Selenium	--	--	**1.41**	**1.07**	**0.556**
Silver	1	3.7	**0.261**	**0.113 J**	**0.0709 J**
Zinc	150	410	**81.4 J**	**82.7**	**39**
Organometallic Compounds (µg/kg)					
Butyltin (n-Butyltin)	--	--	2.9 U	2.1 U	1.9 U
Dibutyltin	--	--	1.5 U	**13**	**6.6**
Tetrabutyltin	--	--	1.5 U	1.1 U	1 U
Tributyltin	--	--	3.1 UJ	2.3 U	2 U
PAHs (µg/kg)					
1-Methylnaphthalene	--	--	4.7 U	3.5 U	3.2 U
2-Methylnaphthalene	70	670	4.7 U	3.5 U	3.2 U
Acenaphthene	16	500	4.8 U	3.6 U	3.2 U
Acenaphthylene	44	640	3.6 U	2.7 U	2.4 U
Anthracene	85.3	1,100	7.1 U	5.3 U	4.7 U
Benzo(a)anthracene	261	1,600	**7.8 J**	**9 J**	**6.1 J**
Benzo(a)pyrene	430	1,600	**7 J**	**14 J**	**9.2 J**
Benzo(b)fluoranthene	--	--	**8.2 J**	**18**	**9.1 J**
Benzo(g,h,i)perylene	--	--	**6.6 J**	**7.2 J**	**6.4 J**
Benzo(k)fluoranthene	--	--	5.7 U	**11 J**	**7 J**
Chrysene	384	2,800	**7.3 J**	**12 J**	**6.3 J**
Dibenzo(a,h)anthracene	63.4	260	4 U	3 U	2.6 U
Fluoranthene	600	5,100	**14 J**	**12 J**	**8.1 J**
Fluorene	19	540	6.4 U	4.7 U	4.2 U
Indeno(1,2,3-c,d)pyrene	--	--	**4.7 J**	**7 J**	**5.4 J**
Naphthalene	160	2,100	7.1 U	5.3 U	4.7 U
Phenanthrene	240	1,500	**7.3 J**	**5.2 J**	**3.8 J**
Pyrene	665	2,600	**19 J**	**16**	**11 J**
Total HPAH (9 of 17) (U = 0)	1,700	9,600	**74.6 J**	**106.2 J**	**68.6 J**
Total LPAH (8 of 17) (U = 0)	552	3,160	**7.3 J**	**5.2 J**	**3.8 J**
Total PAH (17) (U = 0)	4,022	44,792	**81.9 J**	**111.4 J**	**72.4 J**

Chemical	Sample ID Sample Date[1] Matrix ERL	ERM	LA3-REF-021219 2/12/2019 SE	NC2-COMP 2/25/2019 SE	NC3-COMP 2/25/2019 SE
Pesticides (µg/kg)					
2,4'-DDD (o,p'-DDD)	--	--	0.59 U	0.44 U	0.38 U
2,4'-DDE (o,p'-DDE)	--	--	**6.1**	1.5 U	1.3 U
2,4'-DDT (o,p'-DDT)	--	--	0.65 U	0.48 U	0.42 U
4,4'-DDD (p,p'-DDD)	2	20	**1.8 J**	**7**	**4.9**
4,4'-DDE (p,p'-DDE)	2.2	27	**17 J**	**14 J**	**13**
4,4'-DDT (p,p'-DDT)	1	7	0.91 U	0.67 U	0.59 U
Aldrin	--	--	0.91 U	0.67 U	0.59 U
Chlordane, alpha- (Chlordane, cis-)	--	--	0.84 U	0.62 U	0.54 U
Chlordane, gamma- (Chlordane, trans-)	--	--	1.8 U	1.4 U	1.2 U
Dieldrin	0.02	8	*0.91 U*	*0.67 U*	*0.59 U*
Endosulfan sulfate	--	--	1.1 U	0.8 U	0.7 U
Endosulfan, alpha- (I)	--	--	0.82 U	0.6 U	0.53 U
Endosulfan, beta (II)	--	--	0.98 U	0.72 U	0.63 U
Endrin	--	--	1 U	0.73 U	0.65 U
Endrin aldehyde	--	--	1.3 U	0.92 U	0.81 U
Endrin ketone	--	--	1 U	0.77 U	0.67 U
Heptachlor	--	--	0.9 U	0.66 U	0.58 U
Heptachlor epoxide	--	--	1.5 U	1.1 U	0.99 U
Hexachlorocyclohexane (BHC), alpha-	--	--	1.5 U	1.1 U	0.99 U
Hexachlorocyclohexane (BHC), beta-	--	--	1 U	0.76 U	0.67 U
Hexachlorocyclohexane (BHC), delta-	--	--	1.8 U	1.3 U	1.2 U
Hexachlorocyclohexane (BHC), gamma-(Lindane)	--	--	0.93 U	0.68 U	0.6 U
Methoxychlor	--	--	1.2 U	0.85 UJ	0.75 U
Nonachlor, cis-	--	--	0.54 U	0.39 U	0.35 U
Nonachlor, trans-	--	--	0.56 U	0.41 U	0.36 U
Oxychlordane	--	--	0.56 U	0.41 U	0.36 U
Toxaphene	--	--	19 U	14 U	12 U
Total Chlordane (U = 0)	0.5	6	*1.8 U*	*1.4 U*	*1.2 U*
Total DDx (U = 0)	1.58	46.1	**24.9 J**	**21**	**17.9**
Pyrethroids (µg/kg)					
Allethrin	--	--	0.52 U	0.38 U	0.34 U
Bifenthrin	--	--	0.62 U	**1.1**	**0.69**
Cyfluthrin	--	--	0.52 U	0.38 U	0.34 U
Cypermethrin	--	--	0.52 U	0.38 U	0.34 U
Deltamethrin/Tralomethrin	--	--	0.52 U	0.38 U	0.34 U
Fenpropathrin	--	--	0.52 U	0.38 U	0.34 U
Fenvalerate	--	--	0.52 U	0.38 U	0.34 U
Fluvalinate	--	--	0.52 U	0.38 U	0.34 U
Lambda-cyhalothrin	--	--	0.52 U	0.38 U	0.34 U
Permethrin	--	--	1 U	0.77 U	0.68 U

Chemical	Sample ID Sample Date[1] Matrix ERL	 ERM	LA3-REF-021219 2/12/2019 SE	NC2-COMP 2/25/2019 SE	NC3-COMP 2/25/2019 SE
Phenothrin	--	--	0.52 U	0.38 U	0.34 U
Resmethrin/Bioresmethrin	--	--	0.88 U	0.65 U	0.58 U
Tetramethrin	--	--	0.62 U	0.46 U	0.41 U
PCB Congeners (µg/kg)					
PCB-018	--	--	0.13 U	**0.95**	0.088 U
PCB-028	--	--	0.14 U	**0.97**	**0.21 J**
PCB-037	--	--	0.12 U	**0.17 J**	0.082 U
PCB-044	--	--	0.31 U	**0.66**	**0.23 J**
PCB-049	--	--	0.1 U	**0.87**	**0.25 J**
PCB-052	--	--	0.39 U	**0.81**	**0.55**
PCB-066	--	--	0.25 U	**1.3**	**0.35**
PCB-070	--	--	**0.37 J**	**0.66**	**0.2 J**
PCB-074	--	--	0.18 U	**0.54**	0.12 U
PCB-077	--	--	0.24 U	0.18 U	0.16 U
PCB-081	--	--	0.18 U	0.14 U	0.12 U
PCB-087	--	--	0.23 U	**0.74**	**0.41**
PCB-099	--	--	0.097 U	**1.2**	**0.31**
PCB-101	--	--	0.09 U	**1.3**	**0.63**
PCB-105	--	--	0.11 U	**0.65**	0.072 U
PCB-110	--	--	0.069 U	**1.2**	**0.61**
PCB-114	--	--	0.15 U	0.11 U	0.1 U
PCB-118	--	--	**0.57**	**1**	**0.56**
PCB-119	--	--	0.13 U	0.095 U	0.085 U
PCB-123	--	--	0.15 U	0.11 U	0.099 U
PCB-126	--	--	0.11 U	0.083 U	0.074 U
PCB-128	--	--	0.24 U	0.18 U	0.16 U
PCB-132/153	--	--	**0.79 J**	**2.3**	**0.78**
PCB-138/158	--	--	0.72 U	**1.5**	**0.87**
PCB-149	--	--	**0.41**	**1.4**	**0.6**
PCB-151	--	--	0.18 U	**0.58**	0.12 U
PCB-156	--	--	0.16 U	0.12 U	0.1 U
PCB-157	--	--	0.17 U	0.13 U	0.11 U
PCB-167	--	--	0.27 U	0.2 U	0.18 U
PCB-168	--	--	0.29 U	0.22 U	0.19 U
PCB-169	--	--	0.13 U	0.099 U	0.088 U
PCB-170	--	--	0.23 U	**0.75**	0.15 U
PCB-177	--	--	0.24 U	**0.49**	**0.36**
PCB-180	--	--	0.19 U	**1**	**0.66**
PCB-183	--	--	0.19 U	**0.37**	0.13 U
PCB-187	--	--	0.21 U	**0.93**	**0.42**
PCB-189	--	--	0.13 U	0.097 U	0.087 U
PCB-194	--	--	0.15 U	**0.41**	0.1 U

Chemical	Sample ID Sample Date[1] Matrix ERL	ERM	LA3-REF-021219 2/12/2019 SE	NC2-COMP 2/25/2019 SE	NC3-COMP 2/25/2019 SE
PCB-201	--	--	0.069 U	0.052 U	0.046 U
PCB-206	--	--	0.24 U	0.18 U	0.16 U
Total PCB Congener (U = 0)	22.7	180	**2.14 J**	**22.75 J**	**8 J**

Notes:
All non-detect results are reported at the MDL.
Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum.
Gamma chlordane and trans-chlordane are synonymous and refer to CAS RN 5103-74-2.
Total chlordane is the sum of cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor, and oxychlordane.
Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total HPAH (9 of 17) is the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthenes, benzo(k)fluoranthenes, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene (if analyzed).
Total LPAH (8 of 17) is the sum of 1-methylnaphthalene, 2-methylnapthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene (if analyzed).
Total PCB congeners is the sum of all PCB congeners listed in this table.
Detected concentration is greater than ERL screening level
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
U: compound analyzed but not detected above detection limit
1. Based on composite date

3.1.5 Grain Size Compatibility for Nearshore Placement

Individual sediment cores from the Entrance Channel and grab samples from the nearshore receiver site were analyzed for grain size to determine compatibility for nearshore placement. Grain size was determined by sieve analysis. Grain size results for the Entrance Channel and receiver site are presented in Tables 13 and 14, respectively. Raw data for the analysis are presented in the laboratory reports in Appendix C.

Individual cores from the Entrance Channel consisted of 1.1% to 8.9% fines. Sediments were classified as poorly graded sand (SP) or poorly graded sand with silt (SP-SM). Individual grabs from the receiver site consisted of 0.2% to 21.3% fines. Sediments were classified as poorly graded sand (SP), poorly graded sand with silt (SP-SM), or silty sand (SM).

A grain size envelope was developed based on the information in Table 14 using the coarsest and finest gradation curves from the receiver site. Figure 22 illustrates the grain size envelope, represented as the shaded area falling between the coarsest and finest gradation curves from the receiver site. Source material samples were plotted against the grain size envelope to determine compatibility. A comparison of individual cores from the Entrance Channel to the grain size envelope is presented in Figure 23. The grain size distributions for the Entrance Channel fit within the grain size envelope. Percent fines of all stations were within 10% of the finest receiver site sample.

Table 13
Grain Size Results for Entrance Channel

Dredge Unit	Sample ID	Percent Fines[1]		
		Individual Samples	Weighted-Average	Grain Size Envelope[2]
Entrance Channel	EC-01-011718	8.9	3.3	0.2 to 21.3
	EC-02-011718	1.1		
	EC-03-011718	2.7		
	EC-04-011718	1.7		

Notes:
1. Percent passing #200 sieve (less than 0.074 mm)
2. Coarsest and finest gradation curves from the receiver site

Table 14
Grain Size Results for Receiver Site

Transect	Sample ID	Elevation (feet MLLW)	Percent Fines[1]
A	A-01-020218	12	0.8
	A-02-020218	6	0.9
	A-03-020218	0	0.9
	A-04-020218	-6	1.1
	A-05-030718	-12	2.4
	A-06-030718	-18	5.8
	A-07-030718	-24	9.5
	A-08-030718	-30	21.3
	A-09-030718	-36	15.7
B	B-01-020218	12	0.6
	B-02-020218	6	0.7
	B-03-020218	0	0.8
	B-04-020218	-6	0.8
	B-05-030718	-12	5.1
	B-06-030718	-18	6.5
	B-07-030718	-24	6.7
	B-08-030718	-30	11.9
	B-09-030718	-36	21.2
C	C-01-020218	12	0.8
	C-02-020218	6	0.4
	C-03-020218	0	0.7
	C-04-020218	-6	1.1
	C-05-030718	-12	2.5

Transect	Sample ID	Elevation (feet MLLW)	Percent Fines[1]
C	C-06-030718	-18	6.0
	C-07-030718	-24	9.8
	C-08-030718	-30	9.0
	C-09-030718	-36	8.9
D	D-01-020218	12	0.2
	D-02-020218	6	0.3
	D-03-020218	0	0.9
	D-04-020218	-6	1.8
	D-05-030718	-12	1.3
	D-06-030718	-18	6.6
	D-07-030718	-24	6.7
	D-08-030718	-30	3.6
	D-09-030718	-36	3.5
		Minimum (Coarsest Limit)	0.2
		Maximum (Finest Limit)	21.3

Note:
1. Percent passing #200 sieve (less than 0.074 mm)

3.2 Biological Testing

Biological test results for LNB federal channels sediment are presented below. Testing was performed for both the January 2018 and January 2019 sampling events. January 2018 included the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel. January 2019 included Newport Channel. The laboratory reports, including detailed results and raw data, are provided in Appendix D.

3.2.1 Solid Phase Testing

3.2.1.1 Amphipod Mortality Bioassay

Results of the 10-day amphipod SP tests are summarized in Table 15.

Testing for the January 2018 sampling event was performed in two batches. Mean survival in the controls were 98% and 97%, which met control acceptability criterion. Mean survival in the reference (LA3-REF) was 94%. Survival results in federal channels sediment were compared to survival in the reference to determine suitability for ocean disposal. Mean survival in composite samples ranged from 83% to 99% (Table 15). Lowest survival was measured at Bay Island South; however, an outlier was identified using the Grubbs' test. With the outlier removed, survival was 93.75%. All sample results were within 20% of the reference, indicating that test sediments from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel are not acutely toxic to marine amphipods.

Testing for the January 2019 sampling event was performed in one batch. Mean survival in the control was 95%, which met control acceptability criterion. Mean survival in the reference (LA3-REF) was 100%. Survival results in Newport Channel sediment were compared to survival in the reference to determine suitability for ocean disposal. Mean survival in composite samples was 94% and 97% (Table 15). Both sample results were within 20% of the reference, indicating that test sediments from Newport Channel are not acutely toxic to marine amphipods.

Table 15
Summary of Solid Phase Test Results Using *Ampelisca abdita*

Treatment	Percent Survival in Test Replicates					Mean Survival (%)	Meets LPC for Ocean Disposal
	Rep A	Rep B	Rep C	Rep D	Rep E		
January 2018 Sampling Event – Batch 1							
Control	100	100	100	95	95	98	N/A
LA3-REF	100	100	100	80	90	94	N/A
TB-COMP	95	100	100	100	100	99	Yes
MCN1-COMP-T	100	95	100	100	95	98	Yes
MCN2-COMP-T	100	100	95	95	100	98	Yes
MCN3-COMP	95	100	100	100	100	99	Yes
MCN4-COMP	95	95	95	90	85	92	Yes
January 2018 Sampling Event – Batch 2							
Control	95	100	100	90	100	97	N/A
MCN5-COMP	90	100	100	85	100	95	Yes
EC-COMP	90	95	95	95	100	95	Yes
BIME-COMP-T-M	100	90	100	100	80	94	Yes
BIMW-COMP-T-M	100	95	100	100	95	98	Yes
BIN-COMP-T	100	90	85	100	100	95	Yes
BIS-COMP	95	95	40[1]	90	95	83	Yes
January 2019 Sampling Event							
Control	100	100	95	90	90	95	N/A
LA3-REF	100	100	100	100	100	100	N/A
NC2-COMP	95	95	100	95	100	**97**	Yes
NC3-COMP	90	95	95	90	100	**94**	Yes

Note:
Bold: value is significantly less than the reference ($p < 0.05$)
LPC: limiting permissible concentration
1. Replicate C identified as an outlier (40% survival) using Grubbs' test. Low survival possibly due to no/low aeration on Day 4.

3.2.1.2 Polychaete Mortality Bioassay

Results of the 10-day polychaete SP test are summarized in Table 16.

Testing for the January 2018 sampling event was performed in two batches. Mean survival in the controls were 100% for both batches, which met control acceptability criterion. Mean survival in the reference (LA3-REF) was 100%. Survival results in federal channels sediment were compared to survival in the reference to determine suitability for ocean disposal. Mean survival in composite samples ranged from 92% to 100% (Table 16). All sample results were within 10% of the reference, indicating that test sediments from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel are not acutely toxic to marine polychaetes.

Testing for the January 2019 sampling event was performed in one batch. Mean survival in the control was 100%, which met acceptability criterion. Mean survival in the reference (LA3-REF) was 96%. Survival results in Newport Channel sediment were compared to survival in the reference to determine suitability for ocean disposal. Mean survival was 96% for both composite samples (Table 16). Both sample results were within 10% of the reference, indicating that test sediments from Newport Channel are not acutely toxic to marine polychaetes.

Table 16
Summary of Solid Phase Test Results Using *Neanthes arenaceodentata*

Treatment	Percent Survival in Test Replicates					Mean Survival (%)	Meets LPC for Ocean Disposal
	Rep A	Rep B	Rep C	Rep D	Rep E		
January 2018 Sampling Event – Batch 1							
Control	100	100	100	100	100	100	N/A
LA3-REF	100	100	100	100	100	100	N/A
TB-COMP	100	100	100	100	100	100	Yes
MCN1-COMP-T	100	100	100	100	100	100	Yes
MCN2-COMP-T	100	100	100	100	100	100	Yes
MCN3-COMP	100	100	100	100	100	100	Yes
MCN4-COMP	100	100	100	100	100	100	Yes
January 2018 Sampling Event – Batch 2							
Control	100	100	100	100	100	100	N/A
MCN5-COMP	100	100	100	100	100	100	Yes
EC-COMP	100	80	80	100	100	92	Yes
BIME-COMP-T-M	100	100	100	100	100	100	Yes
BIMW-COMP-T-M	100	100	100	100	100	100	Yes
BIN-COMP-T	80	100	100	100	100	96	Yes
BIS-COMP	100	100	100	100	100	100	Yes

Treatment	Percent Survival in Test Replicates					Mean Survival (%)	Meets LPC for Ocean Disposal
	Rep A	Rep B	Rep C	Rep D	Rep E		
January 2019 Sampling Event							
Control	100	100	100	100	100	100	N/A
LA3-REF	100	100	100	100	80	96	N/A
NC2-COMP	100	100	80	100	100	96	Yes
NC3-COMP	100	100	80	100	100	96	Yes

Note:
LPC: limiting permissible concentration

3.2.2 Suspended Particulate Phase Testing

3.2.2.1 Bivalve Larval Development Bioassay

Results for the 48-hour bivalve larval SPP test are summarized in Table 17.

Testing for the January 2018 sampling event was performed in six batches. Mean normal development in the laboratory controls ranged from 96.2% to 99.3%, and mean survival ranged from 91.8% to 98.1%. All control acceptability criteria were met. Mean normal development in the site water controls ranged from 97.5% to 98.7%, and mean survival ranged from 88.6% to 99.6%. In the 100% elutriate treatments, mean normal development ranged from 0% to 99.3%, and mean survival ranged from 76.5% to 98.4%. The median effective concentration (EC_{50}) ranged from 73.4% to greater than 100%, and the median lethal concentration (LC_{50}) was greater than 100% for all samples. Based on these results, samples from Turning Basin, Bay Island North, Entrance Channel, and Main Channel 1, 2, and 5 are not toxic to bivalve larvae, and further assessment is required for samples from Bay Island Middle East and West, Bay Island South, and Main Channel North 3 and 4. The effect on the development of *M. galloprovincialis* exposed to elutriate from Bay Island Middle East and West, Bay Island South, and Main Channel North 3 and 4 was not unexpected due to the elevated ammonia concentrations measured in these samples. As described in Section 2.3, ammonia reference toxicant tests were run with the bivalve larval development bioassay due to the sensitivity of *M. galloprovincialis* to elevated ammonia concentrations. Ammonia concentrations in the 100% elutriate treatments from Bay Island Middle East and West, Bay Island South, and Main Channel North 3 and 4 (3.8 to 10.5 mg/L) exceeded the no observed effect concentration (NOEC) in the associated ammonia reference toxicant tests (3.5 and 4.0 mg/L), indicating that ammonia likely contributed to the observed toxicity in these samples.

Testing for the January 2019 sampling event was performed in one batch. Mean normal development in the laboratory control was 97.0% and mean survival was 94.1%. All control acceptability criteria were met. Mean normal development in the site water control was 97.6%, and

mean survival was 97.3%. In the 100% elutriate treatments, mean normal development was 97.1% and 97.2%, and mean survival was 97.5% and 97.7%. The EC_{50} and LC_{50} were greater than 100% for both samples. Based on these results, samples from Newport Channel are not toxic to bivalve larvae.

Results were further analyzed using a water column toxicity mixing model (i.e., STFATE) to determine whether sediment from Bay Island Middle East and West, Bay Island South, and Main Channel North 3 and 4 meets limiting permissible concentration (LPC) requirements for ocean disposal. Results of STFATE modeling are presented separately in Section 3.3.

Table 17
Summary of Suspended Particulate Phase Test Results Using *Mytilus galloprovincialis*

Sample ID	Treatment (%)	Mean Normal Development (%)	Standard Deviation (%)	EC_{50} (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
January 2018 Sampling Event – Batch 1								
Laboratory Control	N/A	96.2	1.3	N/A	97.6	5.5	N/A	N/A
Site Water Control	N/A	97.1	1.5	N/A	99.6	1.0	N/A	N/A
BIMW-COMP-T-M	1	96.2	2.1	75.9	98.4	3.5	>100	Requires further assessment[1]
	10	96.7	1.2		98.1	2.0		
	50	97.3	2.0		93.8	8.2		
	100	**3.4**	1.9		**86.6**	7.7		
BIME-COMP-T-M	1	97.1	1.1	74.4	96.0	4.5	>100	Requires further assessment[1]
	10	97.1	1.6		99.1	1.2		
	50	93.5	1.9		85.8	7.6		
	100	**1.0**	1.2		90.4	8.5		
January 2018 Sampling Event – Batch 2								
Laboratory Control	N/A	96.6	0.9	N/A	98.1	2.4	N/A	N/A
Site Water Control	N/A	95.8	0.5	N/A	97.4	4.4	N/A	N/A
TB-COMP	1	96.9	1.2	>100	98.7	1.9	>100	Yes
	10	96.2	1.1		100	0.0		
	50	94.8	1.0		92.8	9.0		
	100	96.0	1.9		98.4	2.8		
BIS-COMP	1	97.5	0.9	75.0	98.4	2.3	>100	Requires further assessment[1]
	10	97.1	1.2		96.7	7.4		
	50	96.9	1.3		91.1	8.6		
	100	**0.0**	0.0		**76.5**	9.4		
January 2018 Sampling Event – Batch 3								
Laboratory Control	N/A	97.5	2.4	N/A	91.8	5.4	N/A	N/A

Sample ID	Treatment (%)	Mean Normal Development (%)	Standard Deviation (%)	EC_{50} (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
Site Water Control	N/A	97.5	1.9	N/A	94.1	5.2	N/A	N/A
MCN1-COMP-T	1	96.5	1.4	> 100	94.3	5.2	> 100	Yes
	10	96.8	1.2		93.9	5.6		
	50	98.0	2.0		86.2	8.8		
	100	96.7	3.3		87.2	4.4		
MCN2-COMP-T	1	97.1	1.0	>100	82.4	8.9	>100	Yes
	10	97.8	2.0		84.9	11.6		
	50	98.1	1.0		82.6	5.6		
	100	96.7	2.1		85.1	7.7		
January 2018 Sampling Event – Batch 4								
Laboratory Control	N/A	97.0	0.7	N/A	97.8	3.5	N/A	N/A
Site Water Control	N/A	98.0	1.0	N/A	88.6	8.3	N/A	N/A
BIN-COMP-T	1	97.8	0.6	>100	96.4	3.6	>100	Yes
	10	96.9	2.2		**84.5**	6.5		
	50	95.2	3.6		88.6	9.8		
	100	**52.7**	7.6		**81.2**	15		
EC-COMP	1	97.4	1.2	>100	**88.4**	6.7	>100	Yes
	10	98.0	1.2		90.9	7.8		
	50	97.1	1.4		**85.5**	9.1		
	100	97.2	1.3		**83.2**	1.5		
January 2018 Sampling Event – Batch 5								
Laboratory Control	N/A	99.2	0.9	N/A	95.7	4.2	N/A	N/A
Site Water Control	N/A	98.0	0.9	N/A	94.6	2.7	N/A	N/A
MCN3-COMP	**1**	98.9	0.9	73.4	97.2	3.9	>100	Requires further assessment[1]
	10	98.6	1.2		94.0	6.4		
	50	**90.2**	7.6		94.5	6.0		
	100	**3.9**	2.6		**77.6**	8.0		
MCN4-COMP	**1**	98.8	0.8	77.2	95.1	4.5	>100	Requires further assessment[1]
	10	98.9	0.9		98.9	2.5		
	50	**94.1**	3.3		97.3	4.8		
	100	**12.4**	3.1		89.3	4.5		
January 2018 Sampling Event – Batch 6								
Laboratory Control	N/A	99.3	0.4	N/A	93.1	7.9	N/A	N/A
Site Water Control	N/A	98.7	1.1	N/A	97.2	4.2	N/A	N/A

Sample ID	Treatment (%)	Mean Normal Development (%)	Standard Deviation (%)	EC_{50} (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
MCN5-COMP	1	99.0	1.1	>100	93.4	4.6	>100	Yes
	10	99.0	0.7		96.1	5.7		
	50	98.6	1.0		89.8	6.4		
	100	99.3	0.8		95.1	7.6		
January 2019 Sampling Event								
Laboratory Control	N/A	97.0	2.0	N/A	94.1	10.0	N/A	N/A
Site Water Control	N/A	97.6	1.3	N/A	97.3	1.1	N/A	N/A
NC2-COMP	1	95.8	1.6	>100	96.9	4.0	>100	Yes
	10	96.0	12		96.9	3.0		
	50	96.8	1.3		96.7	5.1		
	100	97.1	1.0		97.7	2.3		
NC3-COMP	1	97.3	0.9	>100	88.4	8.9	>100	Yes
	10	96.3	1.8		96.2	5.3		
	50	97.5	1.5		99.5	1.1		
	100	97.2	0.4		97.5	2.5		

Notes:
Bold: value is significantly less than the laboratory control ($P < 0.05$)
1. STFATE modeling was required to estimate whether disposal of sediment at the LA-3 ODMDS would negatively impact aquatic life.

3.2.2.2 Mysid Shrimp Bioassay

Results for the 96-hour mysid shrimp SPP test are summarized in Table 18.

Testing for the January 2018 sampling event was performed in five batches. Mean survival in the laboratory controls ranged from 96% to 100%, which met control acceptability criterion. Mean survival in the site water controls ranged from 96% to 100%. Mean survival in the 100% elutriate treatments ranged from 94% to 100%. The LC_{50} was greater than 100% for all samples. Based on these results, sediments from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel are not toxic to mysid shrimp and meet LPC requirements for ocean disposal.

Testing for the January 2019 sampling event was performed in one batch. Mean survival in the laboratory control was 100%, which met control acceptability criterion. Mean survival in the site water control was 98%. Mean survival in the 100% elutriate treatments was 98% for both composite samples. The LC_{50} was greater than 100% for both samples. Based on these results, sediments from Newport Channel are not toxic to mysid shrimp and meet LPC requirements for ocean disposal.

Table 18
Summary of Suspended Particulate Phase Test Results Using *Americamysis bahia*

Sample ID	Treatment (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
January 2018 Sampling Event – Batch 1					
Laboratory Control	N/A	96	8.9	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A
BIMW-COMP-T-M	10	98	4.5	>100	Yes
	50	98	4.5		
	100	98	4.5		
BIME-COMP-T-M	10	94	8.9	>100	Yes
	50	92.5	10		
	100	95	5.8		
January 2018 Sampling Event – Batch 2					
Laboratory Control	N/A	100	0.0	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A
TB-COMP	10	96	5.5	>100	Yes
	50	96	5.5		
	100	94	5.5		
BIS-COMP	10	96	5.5	>100	Yes
	50	98	4.5		
	100	100	0.0		
January 2018 Sampling Event – Batch 3					
Laboratory Control	N/A	98	4.5	N/A	N/A
Site Water Control	N/A	96	5.5	N/A	N/A
MCN1-COMP-T	10	100	0.0	>100	Yes
	50	98	4.5		
	100	96	5.5		
MCN2-COMP-T	10	100	0.0	>100	Yes
	50	100	0.0		
	100	96	5.5		
January 2018 Sampling Event – Batch 4					
Laboratory Control	N/A	98	4.5	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A
BIN-COMP-T	10	96	5.5	>100	Yes
	50	100	0.0		
	100	94	8.9		
EC-COMP	10	96	5.5	>100	Yes
	50	100	0.0		

Sample ID	Treatment (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
	100	96	5.5		
January 2018 Sampling Event – Batch 5					
Laboratory Control	N/A	98	4.5	N/A	N/A
Site Water Control	N/A	96	5.5	N/A	N/A
MCN3-COMP	10	98	4.5	>100	Yes
	50	94	8.9		
	100	98	4.5		
MCN4-COMP	10	96	5.5	>100	Yes
	50	96	5.5		
	100	98	4.5		
MCN5-COMP	10	98	4.5	>100	Yes
	50	96	5.5		
	100	98	4.5		
January 2019 Sampling Event					
Laboratory Control	N/A	100	0.0	N/A	N/A
Site Water Control	N/A	98	4.5	N/A	N/A
NC2-COMP	10	98	4.5	>100	Yes
	50	98	4.5		
	100	98	4.5		
NC3-COMP	10	98	4.5	>100	Yes
	50	100	0.0		
	100	98	4.5		

3.2.2.3 Juvenile Fish Bioassay

Results for the 96-hour juvenile fish SPP test are summarized in Table 19.

Testing for the January 2018 sampling event was performed in six batches. Mean survival in the laboratory controls ranged from 96% to 100%, which met control acceptability criteria. Mean survival in the site water controls ranged from 90% to 100%. Mean survival in the 100% elutriate treatments ranged from 86% to 100%. The LC_{50} was greater than 100% for all samples. Based on these results, sediments from the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel are not toxic to juvenile fish and meet LPC requirements for ocean disposal.

Testing for the January 2019 sampling event was performed in one batch. Mean survival in the laboratory control was 88%. Survival in the laboratory control was slightly less than control acceptability criteria of 90%; therefore, results were conservatively compared to the site water control

(94%). Mean survival in the 100% elutriate treatments was 86% and 90%. The LC_{50} was greater than 100% for both samples. Based on these results, sediments from Newport Channel are not toxic to juvenile fish and meet LPC requirements for ocean disposal.

Table 19
Summary of Suspended Particulate Phase Test Results Using *Menidia beryllina*

Sample ID	Treatment (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
January 2018 Sampling Event – Batch 1					
Laboratory Control	N/A	100	0.0	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A
BIMW-COMP-T-M	10	98	4.5	>100	Yes
	50	100	0.0		
	100	96	5.5		
BIME-COMP-T-M	10	100	0.0	>100	Yes
	50	96	5.5		
	100	98	4.5		
January 2018 Sampling Event – Batch 2					
Laboratory Control	N/A	98	4.5	N/A	N/A
Site Water Control	N/A	98	4.5	N/A	N/A
TB-COMP	10	100	0.0	>100	Yes
	50	98	4.5		
	100	100	0.0		
BIS-COMP	10	98	4.5	>100	Yes
	50	98	4.5		
	100	96	4.5		
January 2018 Sampling Event – Batch 3					
Laboratory Control	N/A	100	0.0	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A
MCN1-COMP-T	10	96	5.5	>100	Yes
	50	98	4.5		
	100	94	5.5		
MCN2-COMP-T	10	98	4.5	>100	Yes
	50	96	8.9		
	100	100	0.0		
January 2018 Sampling Event – Batch 4					
Laboratory Control	N/A	98	4.5	N/A	N/A
Site Water Control	N/A	100	0.0	N/A	N/A

Sample ID	Treatment (%)	Mean Survival (%)	Standard Deviation (%)	LC_{50} (%)	Meets LPC for Ocean Disposal
BIN-COMP-T	10	100	0.0	>100	Yes
	50	94	8.9		
	100	92	8.4		
EC-COMP	10	100	0.0	>100	Yes
	50	100	0.0		
	100	98	4.5		
January 2018 Sampling Event – Batch 5					
Laboratory Control	N/A	96	5.5	N/A	N/A
Site Water Control	N/A	98	4.5	N/A	N/A
MCN3-COMP	10	98	4.5	>100	Yes
	50	92	11.0		
	100	86	11.0		
MCN4-COMP	10	92	4.8	>100	Yes
	50	94	5.5		
	100	100	0.0		
January 2018 Sampling Event – Batch 6					
Laboratory Control	N/A	100	0.0	N/A	N/A
Site Water Control	N/A	90	12.0	N/A	N/A
MCN5-COMP	10	90	10.0	>100	Yes
	50	94	8.9		
	100	94	8.9		
January 2019 Sampling Event					
Laboratory Control	N/A	88	11.0	N/A	N/A
Site Water Control	N/A	94	5.5	N/A	N/A
NC2-COMP	10	88	8.4	>100	Yes
	50	82	27.0		
	100	86	26.0		
NC3-COMP	10	**78**	15.0	>100	Yes
	50	98	4.5		
	100	90	0.0		

Note:
Bold: Value is significantly less than the site water control ($P < 0.05$).

3.2.3 Bioaccumulation Potential Testing

Test results for the 28-day BP tests are presented below. Following the 28-day exposure, organisms were placed into clean seawater for 24 hours to allow organisms to depurate the test sediment. After

this purging process, tissues were shipped frozen to Eurofins Calscience, Inc., for chemical analysis. Tissue chemistry results are presented separately in Section 3.4.

3.2.3.1 Bivalve Bioaccumulation Test

Test results for the 28-day bivalve BP test are presented in Table 20. For the January 2018 sampling event, mean survival in the control and reference sediment was 96.8% and 97.6%, respectively. Mean survival in composite samples ranged from 95.2% to 99.2%. For the January 2019 sampling event, mean survival in the control and reference sediment was 98.0% and 98.7%, respectively. Mean survival in composite samples was 98.0% and 96.7%. For both sampling events, sufficient tissue mass was available at test completion for chemical analysis.

Table 20
Summary of Bioaccumulation Potential Test Results Using *Macoma nasuta*

Treatment	Mean Survival (%)	Standard Deviation (%)
January 2018 Sampling Event		
Control	96.8	3.3
LA3-REF	97.6	3.6
TB-COMP	99.2	1.8
MCN1-COMP-T	96.8	3.3
MCN2-COMP-T	96.0	4.9
MCN3-COMP	99.2	1.8
MCN4-COMP	99.2	1.8
MCN5-COMP	95.2	6.6
EC-COMP	96.0	4.0
BIME-COMP-T-M	95.2	5.2
BIMW-COMP-T-M	98.4	2.2
BIN-COMP-T	97.6	2.2
BIS-COMP	98.4	2.2
January 2019 Sampling Event		
Control	98.0	1.8
LA3-REF	98.7	1.8
NC2-COMP	98.0	1.8
NC3-COMP	96.7	3.3

3.2.3.2 Polychaete Bioaccumulation Test

Test results for the 28-day polychaete BP test are presented in Table 21. For the January 2018 sampling event, mean survival in the control and reference sediment was 100% and 98%, respectively. Mean survival in composite samples ranged from 90% to 100%. For the January 2019 sampling event, mean

survival in the control and reference sediment was 90% and 92%, respectively. Mean survival in composite samples ranged from 66% to 76%. Although survival was somewhat reduced, sufficient tissue mass was available at test completion for chemical analysis; therefore, test acceptability criteria were met (see Section 4.3).

Table 21
Summary of Bioaccumulation Potential Test Results Using *Nereis virens*

Treatment	Mean Survival (%)	Standard Deviation (%)
January 2018 Sampling Event		
Control	100	0.0
LA3-REF	98	4.5
TB-COMP	100	0.0
MCN1-COMP-T	90	0.0
MCN2-COMP-T	100	0.0
MCN3-COMP	100	0.0
MCN4-COMP	98	4.5
MCN5-COMP	98	4.5
EC-COMP	100	0.0
BIME-COMP-T-M	100	0.0
BIMW-COMP-T-M	98	4.5
BIN-COMP-T	98	4.5
BIC-COMP	100	0.0
January 2019 Sampling Event		
Control	90	7.1
LA3-REF	92	11.0
NC2-COMP	66	17.0
NC3-COMP	76	15.0

3.3 Prediction of Water Column Toxicity During Disposal

STFATE is a data modeling tool used to evaluate the suitability of proposed dredged material for placement at an ODMDS. The model simulates the movement of disposed material through the water column to the ocean bottom and then as it becomes resuspended by the current. The model uses 0.01 of the LC_{50} or EC_{50} value to determine compliance with the LPC. The lowest endpoint value from bioassay testing was used in the model to provide the most conservative estimate of water column effects resulting from disposal activities. The EC_{50} value of Main Channel North 3 in the bivalve larval development test was calculated to be 73.4%; therefore, the toxicity criterion, or LPC, used in the model was 0.734%. Although ammonia likely contributed to the observed toxicity in this

sample and is not a contaminant of concern, STFATE modeling was performed to demonstrate LPC compliance. The guidance states that the concentration of dredged material must be less than 0.01 times the LC_{50} or EC_{50} after 4 hours within the disposal site and at all times outside the disposal site.

The input parameters for LA-3 ODMDS are listed in Table 22; complete results are included in Appendix E. Physical characteristics of sediment from Main Channel North 3 were used as inputs to the model. Site-specific input parameters used were derived from the *Final* Environmental *Impact* Statement: *Proposed Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay, Orange County, California* (USEPA/USACE 2005).

Table 22
STFATE Model Input Parameters

Parameter	Units	LA-3 ODMDS Value
Site Description		
Number of Grid Points (left to right + z direction)	--	61
Number of Grid Points (top to bottom + x direction)	--	61
Grid Spacing (left to right)	feet	400
Grid Spacing (top to bottom)	feet	400
Water Depth Within Disposal Boundary	feet	1,600
Roughness Height at Bottom of Disposal Site	feet	0.005[1]
Bottom Slope (x-direction)	degrees	0[1]
Bottom Slope (z-direction)	degrees	0[1]
Number of Points in Density Profile	--	2
Density at Point One (depth = 0 feet)	grams/cubic centimeter	1.0247
Density at Point Three (depth = 1,600 feet)	grams/cubic centimeter	1.0282
Velocity		
Type of Velocity Profile	--	2-point velocity profile for constant depth
X-Direction Velocity (depth = 59 feet)	feet/second	0.85
Z-Direction Velocity (depth = 59 feet)	feet/second	0.85
X-Direction Velocity (depth = 950 feet)	feet/second	-0.12
Z-Direction Velocity (depth = 950 feet)	feet/second	-0.12
Disposal Operation		
Disposal Point Top of Grid	feet	12,000
Disposal Point Left Edge of Grid	feet	12,000
Dumping Over Depression	--	No

Parameter	Units	LA-3 ODMDS Value
Solid Fraction Volume Concentration	--	Gravel = 0.0, Sand = 0.151, Silt = 0.238, Clay = 0.089
Volume of Each Layer	cy	2,000
Length of Disposal Vessel Bin	feet	200
Width of Disposal Vessel Bin	feet	50
Pre-Disposal Draft	feet	14
Post-Disposal Draft	feet	5
Duration	seconds	14,400
Long-Term Time Step for Diffusion	seconds	3,600
Time to Empty Vessel	seconds	30
Location of Upper Left Corner of Disposal Site (distance from top edge)	feet	9,000
Location of Upper Left Corner of Disposal Site (distance from left edge)	feet	9,000
Location of Lower Right Corner of Disposal Site (distance from top edge)	feet	15,000
Location of Lower Right Corner of Disposal Site (distance from left edge)	feet	15,000
Coefficients		
Settling Coefficient	--	0.000[1]
Apparent Mass Coefficient	--	1.000[1]
Drag Coefficient	--	0.500[1]
Form Drag for Collapsing Cloud	--	1.000[1]
Skin Friction for Collapsing Cloud	--	0.010[1]
Drag for an Ellipsoidal Wedge	--	0.100[1]
Drag for a Plate	--	1.000[1]
Friction Between Cloud and Bottom	--	0.010[1]
4/3 Law Horizontal Diffusion Dissipation Factor	--	0.001[1]
Unstratified Water Vertical Diffusion Coefficient	--	0.0250[1]
Cloud/Ambient Density Gradient Ratio	--	0.250[1]
Turbulent Thermal Entrainment	--	0.235[1]
Entrainment in Collapse	--	0.100[1]
Stripping Factor	--	0.003[1]

Note:
1. Model default value

Modeled concentrations were compared to the LPC, established by regulatory requirements as no more than 1% of the EC_{50} (0.734%). After 4 hours, the dredged material plume moved outside the disposal boundary and the maximum predicted water column concentration on the entire grid was 0.000314%. The maximum concentration outside the disposal site boundary at any time was 0.00136%.

Based on STFATE modeling results, sediment from the federal channels meets the LPC requirements for ocean disposal.

3.4 Chemical Analysis of Tissue Residues

Sediment bioaccumulation tests were conducted using a bivalve (*M. nasuta*) and a polychaete (*N. virens*). Chemical analysis of tissue residues was conducted to determine the BP of sediment contaminants. Based on results of sediment chemistry, a subset of chemicals was selected for analysis that included mercury, dibutyltin, DDTs, and PCBs (Table 8). Due to the high percentage of sand (98.1%) and low concentrations of contaminants (all concentrations less than the ERL), tissue analysis was not required for the Entrance Channel. The data evaluation consisted of comparing tissue burdens to the following:

- FDA action levels
- Reference sediment tissue burdens
- TRVs from the ERED (USACE 2018)

Testing was performed for both the January 2018 and January 2019 sampling events. January 2018 included the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel. Results of chemical analysis of bivalve and polychaete tissue residues for the January 2018 sampling event are presented in Tables 23 and 24, respectively. January 2019 included Newport Channel. Results of the January 2019 sampling event are presented in Tables 25 and 26, respectively. All results are expressed in wet weight. MDLs, RLs, and raw data for the analyses are provided in the laboratory reports in Appendix C.

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	Time Zero T0-A-MACOMA-012418 1/24/2018 TBIO	LA3-REF LA3-REF-A-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-B-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-C-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-D-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-E-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-A-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-B-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-C-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-D-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-E-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-A-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-B-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-C-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-D-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-E-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-A-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-B-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-C-MACOMA-022218 2/22/2018 TBIO
Conventional Parameters (%)																				
Lipids	--	**0.32**	**0.38**	**0.4**	**0.44**	**0.38**	**0.31**	**0.33**	**0.37**	**0.43**	**0.44**	**0.31**	**0.44**	**0.66**	**0.49**	**0.32**	**0.37**	**0.36**	**0.47**	**0.34**
Metals (mg/kg)																				
Mercury	1[1]	**0.00698 J**	**0.00612 J**	**0.00432 J**	**0.00357 J**	**0.00375 J**	**0.00501 J**	**0.0482**	**0.0391**	**0.0464**	**0.0372**	**0.0362**	**0.0156**	**0.0194**	**0.0181**	**0.0111**	**0.0227**	**0.012**	**0.0206**	**0.0192**
Organometallic Compounds (µg/kg)																				
Dibutyltin	--	0.72 U	0.72 U	0.72 U	0.74 U	0.75 U	0.74 U	**4.5**	**3.9**	**5.2**	**3.1**	0.75 U	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																				
2,4'-DDD (o,p'-DDD)	--	0.29 U	0.29 U	0.28 U	0.29 U	0.28 U	0.29 U	0.29 U	0.28 U	0.28 U	0.29 U	0.28 U	0.29 U	**0.58 J**	**0.43 J**	0.28 U	**0.53 J**	**0.78 J**	**0.78 J**	**0.38 J**
2,4'-DDE (o,p'-DDE)	5,000[2]	0.99 U	1 U	**1.4 J**	0.99 U	0.99 U	0.99 U	1 U	0.98 U	0.99 U	1 U	0.99 U	1 U	**1.1 J**	**1.2 J**	0.98 U	1 U	**1.3 J**	**1.7 J**	1 U
2,4'-DDT (o,p'-DDT)	5,000[2]	0.31 U	0.32 U	0.31 U	0.31 U	0.31 U	0.31 U	0.32 U	0.31 U	0.31 U	0.32 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.32 U
4,4'-DDD (p,p'-DDD)	--	0.5 U	0.51 U	0.5 U	0.5 U	**0.54 J**	0.5 U	**0.76 J**	**2.7**	**1.7**	**2.3**	**1.9**	**8.1**	**12**	**9.6**	**1.8**	**7.4**	**13**	**18**	**7.4**
4,4'-DDE (p,p'-DDE)	5,000[2]	0.44 U	**5.1**	**4.1**	**5.1**	**4.3**	**2.9**	**4.3**	**9.5**	**6.3**	**10**	**7.8**	**16**	**23**	**18**	**4.8**	**14**	**25**	**29**	**17**
4,4'-DDT (p,p'-DDT)	5,000[2]	0.44 U	0.44 U	0.43 U	0.44 U	0.44 U	0.44 U	0.44 U	0.43 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.43 U	0.44 U	0.44 U	0.44 U	0.44 U
Total DDx (U = 0)	5,000[2]	0.99 U	**5.1**	**5.5 J**	**5.1**	**4.84 J**	**2.9**	**5.06 J**	**12.2**	**8**	**12.3**	**9.7**	**24.1**	**36.68 J**	**29.23 J**	**6.6**	**21.93 J**	**40.08 J**	**49.48 J**	**24.78 J**
PCB Congeners (µg/kg)																				
PCB-018	--	0.071 U	0.072 U	0.07 U	0.071 U	0.071 U	0.071 U	**0.59**	**0.37**	**0.81**	**0.33**	**0.63**	0.072 U	**0.43**	0.07 U	0.07 U	0.072 U	0.072 U	0.071 U	0.071 U
PCB-028	--	0.034 U	0.034 U	0.033 U	0.034 U	0.033 U	0.034 U	**1.9**	**1.6**	**2.2**	**1.6**	**1.6**	**0.48**	**0.71**	**0.94**	**0.68**	**0.75**	**0.76**	**0.57**	**0.69**
PCB-037	--	0.06 U	0.061 U	0.06 U	0.06 U	0.06 U	0.06 U	0.061 U	0.06 U	0.06 U	0.061 U	0.06 U	0.061 U	0.061 U	0.06 U	0.06 U	0.061 U	0.061 U	0.06 U	0.061 U
PCB-044	--	0.087 U	0.088 U	0.086 U	0.087 U	0.086 U	0.087 U	0.088 U	0.086 U	**0.66**	0.087 U	0.086 U	0.088 U	0.087 U	0.086 U	0.086 U	0.088 U	0.088 U	0.086 U	0.087 U
PCB-049	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	**0.68**	**1.2**	**1**	**1.3**	**1.1**	**0.43**	**0.73**	**0.6**	0.11 U	**0.37**	**0.43**	**0.4**	**0.39**
PCB-052	--	0.063 U	0.063 U	0.062 U	0.063 U	0.062 U	0.063 U	**1.8**	**1.5**	**2.3**	**1.9**	**1.5**	**0.59**	**0.95**	**0.78**	**0.59**	**0.55**	**0.65**	**0.54**	**0.71**
PCB-066	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**2.6**	**2.5**	**3.4**	**2.7**	**2.5**	**0.86**	**1.2**	**1.1**	**0.83**	**0.86**	**0.95**	**0.7**	**0.68**
PCB-070	--	0.06 U	0.06 U	0.059 U	0.06 U	0.059 U	0.06 U	**1.9**	**1.8**	**2.5**	**1.8**	**1.8**	**0.49**	**0.72**	**0.65**	**0.44**	**0.46**	**0.62**	**0.45**	**0.51**
PCB-074	--	0.087 U	0.088 U	0.086 U	0.087 U	0.086 U	0.087 U	**1.2**	**1.1**	**1.5**	**1.1**	**1.1**	**0.35**	**0.52**	**0.43**	**0.35**	**0.38**	**0.39**	**0.29**	**0.34**
PCB-077	--	0.078 U	0.078 U	0.077 U	0.078 U	0.077 U	0.078 U	0.078 U	0.077 U	0.077 U	**0.3**	**0.29**	0.079 U	0.078 U	0.077 U	0.077 U	0.078 U	0.078 U	0.077 U	0.078 U
PCB-081	--	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
PCB-087	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	**0.51**	**0.6**	**0.8**	**0.66**	**0.63**	**0.42**	**0.57**	**0.52**	**0.29**	**0.39**	**0.43**	**0.39**	**0.39**
PCB-099	--	0.061 U	0.061 U	0.06 U	0.061 U	0.06 U	0.061 U	**1.4**	**1.2**	**1.8**	**1.5**	**1.2**	**0.67**	**0.9**	**0.74**	**0.53**	**0.54**	**0.69**	**0.58**	**0.62**
PCB-101	--	0.098 U	0.099 U	0.097 U	0.098 U	0.097 U	0.098 U	**2**	**2.1**	**2.7**	**2**	**2**	**0.93**	**1.2**	**1.1**	**0.82**	**0.96**	**1.2**	**0.87**	**0.84**
PCB-105	--	0.055 U	0.055 U	0.054 U	0.055 U	0.054 U	0.055 U	**0.65**	**0.61**	**0.88**	**0.67**	**0.66**	**0.38**	**0.43**	**0.35**	**0.35**	**0.28**	**0.31**	**0.25**	**0.21**
PCB-110	--	0.046 U	0.046 U	0.045 U	0.046 U	0.046 U	0.046 U	**1.8**	**1.9**	**2.5**	**1.9**	**1.8**	**0.82**	**1.1**	**0.92**	**0.8**	**0.77**	**0.98**	**0.75**	**0.85**
PCB-114	--	0.082 U	0.083 U	0.081 U	0.082 U	0.082 U	0.082 U	0.083 U	0.081 U	0.082 U	0.082 U	0.082 U	0.083 U	0.082 U	0.081 U	0.081 U	0.083 U	0.083 U	0.082 U	0.082 U
PCB-118	--	0.084 U	0.085 U	**0.19 J**	0.084 U	**0.21**	0.084 U	**1.6**	**1.7**	**2.2**	**1.8**	**1.6**	**0.62**	**0.9**	**0.88**	**0.66**	**0.64**	**0.8**	**0.62**	**0.65**
PCB-119	--	0.094 U	0.095 U	0.094 U	0.094 U	0.094 U	0.094 U	0.095 U	0.094 U	0.094 U	0.095 U	0.094 U	0.096 U	0.095 U	0.094 U	0.094 U	0.095 U	0.095 U	0.094 U	0.095 U
PCB-123	--	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U
PCB-126	--	0.08 U	0.081 U	0.079 U	0.08 U	0.08 U	0.08 U	0.081 U	0.079 U	0.08 U	0.08 U	0.08 U	0.081 U	0.08 U	0.079 U	0.079 U	0.081 U	0.081 U	0.08 U	0.08 U
PCB-128	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**0.28**	0.1 U	**0.36**	**0.25**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PCB-132/153	--	0.17 U	**0.3 J**	**0.25 J**	**0.33 J**	**0.42**	**0.21 J**	**1.6**	**1.5**	**2.1**	**1.7**	**1.6**	**1**	**1.4**	**1.2**	**0.97**	**0.98**	**1.4**	**1**	**1.1**
PCB-138/158	--	0.094 U	0.095 U	**0.26 J**	0.094 U	**0.2 J**	0.094 U	**1.2**	**1.2**	**1.7**	**1.3**	**1.2**	**0.8**	**1.2**	**1**	**0.66**	**0.84**	**1**	**0.86**	**0.9**
PCB-149	--	0.098 U	0.099 U	0.097 U	0.098 U	0.097 U	0.098 U	**1**	**1**	**1.4**	**1**	**0.92**	**0.81**	**0.91**	**0.82**	**0.72**	**0.68**	**0.79**	**0.69**	**0.74**
PCB-151	--	0.067 U	0.068 U	0.067 U	0.067 U	0.067 U	0.067 U	**0.32**	**0.28**	**0.4**	**0.3**	**0.4**	**0.23**	**0.37**	**0.2**	0.067 U	**0.22**	**0.3**	**0.23**	**0.22**
PCB-156	--	0.058 U	0.058 U	0.057 U	0.058 U	0.057 U	0.058 U	0.058 U	0.057 U	0.057 U	0.058 U	0.057 U	0.058 U	0.058 U	0.057 U	0.057 U	0.058 U	0.058 U	0.057 U	0.058 U
PCB-157	--	0.052 U	0.053 U	0.052 U	0.052 U	0.052 U	0.052 U	0.053 U	0.052 U	0.052 U	0.053 U	0.052 U	0.053 U	0.053 U	0.052 U	0.052 U	0.053 U	0.053 U	0.052 U	0.053 U
PCB-167	--	0.062 U	0.062 U	0.061 U	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.061 U	0.062 U	0.061 U	0.063 U	0.062 U	0.061 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U
PCB-168	--	0.049 U	0.049 U	0.048 U	0.049 U	0.048 U	0.049 U	0.049 U	0.048 U	0.048 U	0.049 U	0.048 U	0.049 U	0.049 U	0.048 U	0.048 U	0.049 U	0.049 U	0.048 U	0.049 U

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	Time Zero T0-A-MACOMA-012418 1/24/2018 TBIO	LA3-REF LA3-REF-A-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-B-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-C-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-D-MACOMA-022218 2/22/2018 TBIO	LA3-REF LA3-REF-E-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-A-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-B-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-C-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-D-MACOMA-022218 2/22/2018 TBIO	TB TB-COMP-E-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-A-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-B-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-C-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-D-MACOMA-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-E-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-A-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-B-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-C-MACOMA-022218 2/22/2018 TBIO
PCB-169	--	0.061 U	0.062 U	0.06 U	0.061 U	0.061 U	0.061 U	0.062 U	0.06 U	0.061 U	0.061 U	0.061 U	0.062 U	0.061 U	0.06 U	0.06 U	0.062 U	0.062 U	0.061 U	0.061 U
PCB-170	--	0.063 U	0.064 U	0.063 U	0.063 U	0.063 U	0.063 U	0.064 U	0.063 U	**0.26**	0.064 U	0.063 U	0.064 U	0.064 U	0.063 U	0.063 U	0.064 U	0.064 U	0.063 U	0.064 U
PCB-177	--	0.087 U	0.088 U	0.086 U	0.087 U	0.087 U	0.087 U	0.088 U	0.086 U	0.087 U	0.088 U	0.087 U	0.088 U	0.088 U	0.086 U	0.086 U	0.088 U	0.088 U	0.087 U	0.088 U
PCB-180	--	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	**0.43**	0.042 U	0.042 U	0.042 U	0.042 U	0.043 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U
PCB-183	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	**0.34**	0.11 U	**0.37**	**0.26**	**0.32**	0.11 U	**0.25**	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-187	--	0.084 U	0.085 U	0.083 U	0.084 U	0.084 U	0.084 U	**0.58**	**0.46**	**0.69**	**0.57**	**0.73**	**0.46**	**0.57**	**0.42**	**0.28**	**0.4**	**0.35**	**0.26**	**0.33**
PCB-189	--	0.061 U	0.062 U	0.06 U	0.061 U	0.061 U	0.061 U	0.062 U	0.06 U	0.061 U	0.061 U	0.061 U	0.062 U	0.061 U	0.06 U	0.06 U	0.062 U	0.062 U	0.061 U	0.061 U
PCB-194	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-201	--	0.097 U	0.098 U	0.096 U	0.097 U	0.096 U	0.097 U	0.098 U	0.096 U	0.096 U	0.097 U	0.096 U	0.098 U	0.097 U	0.096 U	0.096 U	0.098 U	0.098 U	0.096 U	0.097 U
PCB-206	--	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
Total PCB Congener (U = 0)	2,000[3]	0.19 U	**0.3 J**	**0.7 J**	**0.33 J**	**0.83 J**	**0.21 J**	**24.38**	**22.62**	**32.53**	**24.94**	**23.58**	**10.34**	**15.06**	**12.65**	**8.97**	**10.07**	**12.05**	**9.45**	**10.17**

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID / Sample ID / Sample Date / Matrix	FDA Action Level	MCN2 MCN2-COMP-T-D-MACOMA-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-E-MACOMA-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-A-MACOMA-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-B-MACOMA-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-C-MACOMA-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-D-MACOMA-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-E-MACOMA-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-A-MACOMA-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-B-MACOMA-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-C-MACOMA-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-D-MACOMA-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-E-MACOMA-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-A-MACOMA-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-B-MACOMA-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-C-MACOMA-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-D-MACOMA-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-E-MACOMA-022218 2/22/2018 TBIO	BIN BIN-COMP-T-A-MACOMA-022218 2/22/2018 TBIO	BIN BIN-COMP-T-B-MACOMA-022218 2/22/2018 TBIO
Conventional Parameters (%)																					
Lipids	--		**0.61**	**0.7**	**0.4**	**0.4**	**0.56**	**0.43**	**0.36**	**0.44**	**0.54**	**0.35**	**0.36**	**0.36**	**0.34**	**0.53**	**0.5**	**0.35**	**0.33**	**0.29**	**0.61**
Metals (mg/kg)																					
Mercury	1[1]		**0.0147**	**0.0165**	**0.00713 J**	**0.00996**	**0.0107**	**0.0125**	**0.00927 J**	0.00352 U	0.00367 U	**0.00469 J**	0.00336 U	**0.00357 J**	**0.00542 J**	**0.00369 J**	**0.00498 J**	**0.00405 J**	**0.00446 J**	0.00367 U	0.00342 U
Organometallic Compounds (µg/kg)																					
Dibutyltin	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																					
2,4'-DDD (o,p'-DDD)	--		**1.3**	**1.3**	**1.9**	**2.1**	**1.5**	**0.73 J**	**0.9 J**	**0.78 J**	**1.5**	**0.77 J**	**0.77 J**	**1.7**	**0.76 J**	**0.93 J**	**0.68 J**	**0.42 J**	0.29 U	0.29 U	**1.4**
2,4'-DDE (o,p'-DDE)	5,000[2]		**2.2**	**3.3**	**1.3 J**	**2.4**	**2.2**	0.99 U	**1.2 J**	**1.2 J**	**2.1**	**1.1 J**	**1.2 J**	**1.6 J**	1 U	**1.6 J**	**1.7 J**	**1.6 J**	1 U	1 U	**5.6**
2,4'-DDT (o,p'-DDT)	5,000[2]		0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	**0.36 J**	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.32 U	0.32 U	0.32 U	0.31 U	0.32 U	0.32 U	0.32 U
4,4'-DDD (p,p'-DDD)	--		**21**	**28**	**16**	**23**	**21**	**12**	**10**	**11**	**15 J**	**11**	**10**	**16 J**	**5.9**	**9.2**	**8.8**	**6.2**	**3.9**	**4.9**	**20**
4,4'-DDE (p,p'-DDE)	5,000[2]		**37**	**53**	**22**	**34**	**35**	**19**	**20**	**35**	**50**	**32**	**30**	**31**	**25**	**39**	**36**	**25**	**15**	**23**	**68**
4,4'-DDT (p,p'-DDT)	5,000[2]		0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Total DDx (U = 0)	5,000[2]		**61.5**	**85.6**	**41.2 J**	**61.5**	**59.7**	**31.73 J**	**32.46 J**	**47.98 J**	**68.6 J**	**44.87 J**	**41.97 J**	**50.3 J**	**31.66 J**	**50.73 J**	**47.18 J**	**33.22 J**	**18.9**	**27.9**	**95**
PCB Congeners (µg/kg)																					
PCB-018	--		0.071 U	0.071 U	0.071 U	0.072 U	0.071 U	0.071 U	0.071 U	0.071 U	0.071 U	0.071 U	0.072 U	0.072 U	0.071 U	0.072 U	0.072 U	0.071 U	0.071 U	0.071 U	0.072 U
PCB-028	--		**0.66**	**0.98**	0.034 U	**0.38**	**0.47**	0.034 U	**0.36**	0.034 U	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U
PCB-037	--		0.06 U	0.06 U	0.061 U	0.061 U	0.06 U	0.06 U	0.061 U	0.06 U	0.06 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.06 U	0.061 U	0.061 U	0.061 U
PCB-044	--		0.087 U	0.087 U	0.087 U	0.088 U	0.087 U	0.087 U	0.087 U	0.087 U	0.086 U	0.087 U	0.088 U	0.088 U	0.087 U	0.088 U	0.088 U	0.087 U	0.087 U	0.087 U	0.088 U
PCB-049	--		**0.68**	**0.88**	**0.33**	**0.44**	**0.44**	**0.27**	**0.23**	**0.26**	**0.3**	**0.25**	**0.2 J**	**0.25**	0.11 U	**0.27**	**0.21**	**0.19 J**	0.11 U	0.11 U	**0.31**
PCB-052	--		**0.93**	**1**	**0.55**	**0.5**	**0.62**	**0.59**	**0.47**	**0.51**	**0.51**	**0.4**	**0.46**	**0.41**	**0.27**	**0.26**	**0.32**	**0.3**	**0.3**	**0.31**	**0.42**
PCB-066	--		**0.98**	**1.3**	**0.56**	**0.75**	**0.72**	**0.71**	**0.56**	**0.35**	**0.41**	**0.47**	**0.42**	**0.44**	**0.38**	**0.45**	**0.35**	**0.49**	**0.31**	**0.42**	**0.52**
PCB-070	--		**0.62**	**0.9**	**0.45**	**0.39**	**0.45**	**0.45**	**0.44**	**0.38**	**0.35**	**0.38**	**0.33**	**0.25**	**0.27**	**0.27**	**0.35**	**0.21**	**0.24**	**0.27**	**0.32**
PCB-074	--		**0.45**	**0.54**	**0.28**	**0.29**	**0.31**	**0.38**	**0.24**	**0.26**	**0.25**	**0.21**	**0.25**	0.088 U	0.087 U	**0.28**	0.088 U	**0.23**	**0.22**	0.087 U	0.088 U
PCB-077	--		0.078 U	0.078 U	0.078 U	0.079 U	0.078 U	0.078 U	0.078 U	0.078 U	0.077 U	0.078 U	0.079 U	0.079 U	0.078 U	0.079 U	0.078 U	0.078 U	0.078 U	0.078 U	0.079 U
PCB-081	--		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
PCB-087	--		**0.57**	**0.92**	**0.46**	**0.49**	**0.46**	**0.49**	**0.35**	**0.63**	**0.54**	**0.45**	**0.36**	**0.46**	**0.53**	**0.49**	**0.43**	**0.44**	**0.31**	**0.28**	**0.79**
PCB-099	--		**0.76**	**1.1**	**0.53**	**0.5**	**0.6**	**0.59**	**0.46**	**0.4**	**0.41**	**0.38**	**0.21**	**0.29**	**0.43**	**0.38**	**0.31**	**0.3**	**0.29**	**0.28**	**0.46**
PCB-101	--		**1.2**	**1.6**	**0.71**	**0.97**	**0.86**	**0.9**	**0.76**	**0.53**	**0.63**	**0.64**	**0.51**	**0.66**	**0.45**	**0.59**	**0.61**	**0.5**	**0.47**	**0.5**	**0.73**
PCB-105	--		0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.054 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
PCB-110	--		**1**	**1.5**	**0.76**	**0.73**	**0.72**	**0.74**	**0.63**	**0.63**	**0.61**	**0.58**	**0.5**	**0.51**	**0.49**	**0.54**	**0.55**	**0.49**	**0.42**	**0.45**	**0.67**
PCB-114	--		0.082 U	0.082 U	0.082 U	0.083 U	0.082 U	0.082 U	0.082 U	0.082 U	0.082 U	0.082 U	0.083 U	0.083 U	0.082 U	0.083 U	0.083 U	0.082 U	0.082 U	0.082 U	0.083 U
PCB-118	--		**0.87**	**1.2**	**0.62**	**0.65**	**0.63**	**0.72**	**0.6**	**0.47**	**0.39**	**0.51**	**0.45**	**0.48**	**0.38**	**0.49**	**0.38**	**0.44**	**0.36**	**0.34**	**0.58**
PCB-119	--		0.094 U	0.094 U	0.095 U	0.096 U	0.094 U	0.094 U	0.095 U	0.094 U	0.094 U	0.095 U	0.096 U	0.096 U	0.095 U	0.096 U	0.095 U	0.094 U	0.095 U	0.095 U	0.096 U
PCB-123	--		0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.1 U	0.11 U
PCB-126	--		0.08 U	0.08 U	0.08 U	0.081 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.081 U	0.081 U	0.08 U	0.081 U	0.081 U	0.08 U	0.08 U	0.08 U	0.081 U
PCB-128	--		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PCB-132/153	--		**1.3**	**1.9**	**1**	**1.1**	**1.2**	**1.1**	**0.86**	**0.89**	**0.76**	**0.79**	**0.73**	**0.76**	**0.73**	**0.87**	**0.74**	**0.59**	**0.72**	**0.58**	**0.92**
PCB-138/158	--		**1.1**	**1.4**	**0.73**	**0.86**	**0.91**	**0.85**	**0.71**	**0.74**	**0.7**	**0.72**	**0.6**	**0.65**	**0.62**	**0.83**	**0.62**	**0.57**	**0.53**	**0.62**	**0.74**
PCB-149	--		**1**	**1.4**	**0.72**	**0.6**	**0.75**	**0.83**	**0.6**	**0.59**	**0.57**	**0.62**	**0.48**	**0.7**	**0.64**	**0.63**	**0.47**	**0.51**	**0.48**	**0.58**	**0.65**
PCB-151	--		**0.27**	**0.37**	**0.26**	0.068 U	**0.22**	**0.24**	**0.22**	0.067 U	**0.25**	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.067 U	0.068 U	0.068 U	0.068 U
PCB-156	--		0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.057 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U
PCB-157	--		0.052 U	0.052 U	0.053 U	0.053 U	0.052 U	0.052 U	0.053 U	0.052 U	0.052 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.053 U	0.052 U	0.053 U	0.053 U	0.053 U
PCB-167	--		0.062 U	0.062 U	0.062 U	0.063 U	0.062 U	0.062 U	0.062 U	0.062 U	0.061 U	0.062 U	0.063 U	0.063 U	0.062 U	0.063 U	0.062 U	0.062 U	0.062 U	0.062 U	0.063 U
PCB-168	--		0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.048 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID / Sample ID / Sample Date / Matrix	FDA Action Level	MCN2 / MCN2-COMP-T-D-MACOMA-022218 / 2/22/2018 / TBIO	MCN2 / MCN2-COMP-T-E-MACOMA-022218 / 2/22/2018 / TBIO	MCN3 / MCN3-COMP-A-MACOMA-022218 / 2/22/2018 / TBIO	MCN3 / MCN3-COMP-B-MACOMA-022218 / 2/22/2018 / TBIO	MCN3 / MCN3-COMP-C-MACOMA-022218 / 2/22/2018 / TBIO	MCN3 / MCN3-COMP-D-MACOMA-022218 / 2/22/2018 / TBIO	MCN3 / MCN3-COMP-E-MACOMA-022218 / 2/22/2018 / TBIO	MCN4 / MCN4-COMP-A-MACOMA-022218 / 2/22/2018 / TBIO	MCN4 / MCN4-COMP-B-MACOMA-022218 / 2/22/2018 / TBIO	MCN4 / MCN4-COMP-C-MACOMA-022218 / 2/22/2018 / TBIO	MCN4 / MCN4-COMP-D-MACOMA-022218 / 2/22/2018 / TBIO	MCN4 / MCN4-COMP-E-MACOMA-022218 / 2/22/2018 / TBIO	MCN5 / MCN5-COMP-A-MACOMA-022218 / 2/22/2018 / TBIO	MCN5 / MCN5-COMP-B-MACOMA-022218 / 2/22/2018 / TBIO	MCN5 / MCN5-COMP-C-MACOMA-022218 / 2/22/2018 / TBIO	MCN5 / MCN5-COMP-D-MACOMA-022218 / 2/22/2018 / TBIO	MCN5 / MCN5-COMP-E-MACOMA-022218 / 2/22/2018 / TBIO	BIN / BIN-COMP-T-A-MACOMA-022218 / 2/22/2018 / TBIO	BIN / BIN-COMP-T-B-MACOMA-022218 / 2/22/2018 / TBIO
PCB-169	--	0.061 U	0.061 U	0.061 U	0.062 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.061 U	0.061 U	0.062 U
PCB-170	--	0.063 U	0.063 U	0.064 U	0.064 U	0.063 U	0.063 U	0.064 U	0.063 U	0.063 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.063 U	0.064 U	0.064 U	0.064 U
PCB-177	--	0.087 U	0.087 U	0.088 U	0.088 U	0.087 U	0.087 U	0.088 U	0.087 U	0.087 U	0.088 U	0.088 U	0.088 U	0.088 U	0.088 U	0.088 U	0.087 U	0.088 U	0.088 U	0.088 U
PCB-180	--	0.042 U	0.042 U	0.042 U	0.043 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.043 U	0.043 U	0.042 U	0.043 U	0.042 U	0.042 U	0.042 U	0.042 U	0.043 U
PCB-183	--	**0.21**	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-187	--	**0.32**	**0.51**	**0.27**	**0.37**	**0.55**	**0.41**	**0.25**	**0.27**	**0.22**	**0.22**	0.086 U	**0.26**	**0.23**	**0.27**	**0.24**	0.084 U	0.085 U	0.085 U	**0.29**
PCB-189	--	0.061 U	0.061 U	0.061 U	0.062 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.061 U	0.061 U	0.062 U
PCB-194	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-201	--	0.097 U	0.097 U	0.097 U	0.098 U	0.097 U	0.097 U	0.097 U	0.097 U	0.096 U	0.097 U	0.098 U	0.098 U	0.097 U	0.098 U	0.098 U	0.097 U	0.097 U	0.097 U	0.098 U
PCB-206	--	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
Total PCB Congener (U = 0)	2,000[3]	**12.92**	**17.5**	**8.23**	**9.02**	**9.91**	**9.27**	**7.74**	**6.91**	**6.9**	**6.62**	**5.5 J**	**6.12**	**5.42**	**6.62**	**5.58**	**5.26 J**	**4.65**	**4.63**	**7.4**

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID	BIN	BIN	BIN	BIME	BIME	BIME	BIME	BIME	BIME	BIMW	BIMW	BIMW	BIMW	BIMW	BIS	BIS	BIS	BIS	BIS
	Sample ID	BIN-COMP-T-C-MACOMA-022218	BIN-COMP-T-D-MACOMA-022218	BIN-COMP-T-E-MACOMA-022218	BIME-COMP-T-M-A-MACOMA-022218	BIME-COMP-T-M-B-MACOMA-022218	BIME-COMP-T-M-C-MACOMA-022218	BIME-COMP-T-M-D-MACOMA-022218	BIME-COMP-T-M-E-MACOMA-022218	BIMW-COMP-T-M-A-MACOMA-022218	BIMW-COMP-T-M-B-MACOMA-022218	BIMW-COMP-T-M-C-MACOMA-022218	BIMW-COMP-T-M-D-MACOMA-022218	BIMW-COMP-T-M-E-MACOMA-022218	BIS-COMP-A-MACOMA-022218	BIS-COMP-B-MACOMA-022218	BIS-COMP-C-MACOMA-022218	BIS-COMP-D-MACOMA-022218	BIS-COMP-E-MACOMA-022218
	Sample Date	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018	2/22/2018
	Matrix	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO	TBIO
	FDA Action Level																			
Conventional Parameters (%)																				
Lipids	--	**0.29**	**0.46**	**0.32**	**0.55**	**0.44**	**0.65**	**0.37**	**0.41**	**0.53**	**0.5**	**0.36**	**0.42**	**0.41**	**0.34**	**0.44**	**0.48**	**0.37**	**0.39**
Metals (mg/kg)																				
Mercury	1[1]	0.00371 U	0.00339 U	0.00336 U	**0.00568 J**	0.00339 U	**0.0085 J**	0.00342 U	0.00363 U	0.00349 U	0.00342 U	0.00342 U	0.00352 U	0.00342 U	0.00352 U	0.00339 U	0.00336 U	0.00336 U	0.00359 U
Organometallic Compounds (µg/kg)																				
Dibutyltin	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																				
2,4'-DDD (o,p'-DDD)	--	**0.37 J**	**0.95 J**	**0.49 J**	**2.3**	**2.7**	**3.3**	**0.77 J**	**1.8**	**1.4**	**2.3**	**0.68 J**	**1.4**	**0.94 J**	**0.74 J**	**0.3 J**	**1.3**	0.29 U	0.28 U
2,4'-DDE (o,p'-DDE)	5,000[2]	1 U	**2.6**	1 U	**2.8**	**2.9**	**3.7**	**1.4 J**	**1.8 J**	**4.6**	**2.7**	**1.3 J**	**2.8**	**2**	1 U	0.99 U	**2.8**	1 U	**1.3 J**
2,4'-DDT (o,p'-DDT)	5,000[2]	**0.6 J**	0.31 U	0.32 U	0.31 U	0.32 U	0.32 U	0.31 U	0.32 U	0.32 U	0.32 U	0.31 U	0.31 U	0.31 U	0.32 U	0.31 U	0.31 U	0.32 U	0.31 U
4,4'-DDD (p,p'-DDD)	--	**7.3**	**15**	**7.8**	**26**	**27**	**31**	**17**	**23**	**26**	**25**	**14**	**21**	**17**	**11**	**6.3**	**18**	**6.2 J**	**11**
4,4'-DDE (p,p'-DDE)	5,000[2]	**26**	**40**	**28**	**52**	**52**	**64**	**35**	**55**	**68**	**62**	**34**	**45**	**41**	**31**	**24**	**55**	**17 J**	**30**
4,4'-DDT (p,p'-DDT)	5,000[2]	0.44 U	0.43 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.43 U	0.44 U	0.44 U	0.44 U	0.43 U	0.44 U	0.44 U
Total DDx (U = 0)	5,000[2]	**34.27 J**	**58.55 J**	**36.29 J**	**83.1**	**84.6**	**102**	**54.17 J**	**81.6 J**	**100**	**92**	**49.98 J**	**70.2**	**60.94 J**	**42.74 J**	**30.6 J**	**77.1**	**23.2 J**	**42.3 J**
PCB Congeners (µg/kg)																				
PCB-018	--	0.072 U	0.071 U	0.072 U	0.071 U	0.072 U	0.072 U	0.071 U	0.072 U	0.071 U	0.072 U	0.071 U	0.07 U	0.071 U	--	--	--	--	--
PCB-028	--	0.034 U	**0.34**	0.034 U	0.033 U	0.034 U	0.034 U	0.034 U	**0.59**	0.034 U	**0.46**	0.033 U	0.033 U	0.034 U	--	--	--	--	--
PCB-037	--	0.061 U	0.06 U	0.061 U	0.06 U	0.061 U	0.061 U	0.06 U	0.061 U	0.061 U	0.061 U	0.06 U	0.06 U	0.06 U	--	--	--	--	--
PCB-044	--	0.088 U	0.086 U	0.088 U	0.086 U	0.088 U	0.088 U	0.087 U	0.088 U	0.087 U	0.088 U	0.086 U	0.086 U	0.087 U	--	--	--	--	--
PCB-049	--	0.11 U	**0.25**	0.11 U	**0.39**	**0.33**	**0.36**	**0.21**	**0.32**	**0.34**	**0.41**	0.11 U	**0.28**	0.11 U	--	--	--	--	--
PCB-052	--	0.063 U	**0.6**	**0.44**	**0.56**	**0.53**	**0.52**	**0.41**	**0.5**	**0.56**	**0.61**	**0.46**	**0.43**	**0.4**	--	--	--	--	--
PCB-066	--	**0.43**	**0.53**	**0.44**	**0.66**	**0.63**	**0.59**	**0.67**	**0.67**	**0.75**	**0.65**	**0.58**	**0.57**	**0.43**	--	--	--	--	--
PCB-070	--	0.06 U	**0.4**	**0.41**	**0.49**	**0.4**	**0.56**	**0.39**	**0.43**	**0.46**	**0.43**	**0.38**	**0.36**	**0.22**	--	--	--	--	--
PCB-074	--	**0.21**	**0.21**	**0.28**	**0.33**	**0.33**	**0.24**	**0.27**	**0.3**	**0.3**	**0.37**	**0.29**	**0.2**	0.087 U	--	--	--	--	--
PCB-077	--	0.078 U	0.077 U	0.079 U	0.077 U	0.078 U	0.079 U	0.078 U	0.078 U	0.078 U	0.078 U	0.077 U	0.077 U	0.078 U	--	--	--	--	--
PCB-081	--	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	--	--	--	--	--
PCB-087	--	**0.27**	**0.46**	**0.41**	**0.65**	**0.65**	**0.79**	**0.62**	**0.66**	**0.74**	**0.57**	**0.37**	**0.57**	**0.35**	--	--	--	--	--
PCB-099	--	**0.45**	**0.48**	**0.46**	**0.47**	**0.42**	**0.44**	**0.4**	**0.54**	**0.51**	**0.38**	**0.38**	**0.32**	**0.28**	--	--	--	--	--
PCB-101	--	**0.41**	**0.7**	**0.66**	**0.75**	**0.86**	**0.82**	**0.7**	**0.81**	**0.83**	**0.93**	**0.53**	**0.7**	**0.41**	--	--	--	--	--
PCB-105	--	0.055 U	**0.33**	0.055 U	0.054 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.054 U	0.054 U	0.055 U	--	--	--	--	--
PCB-110	--	**0.52**	**0.6**	**0.61**	**0.8**	**0.76**	**0.86**	**0.67**	**0.73**	**0.78**	**0.78**	**0.66**	**0.59**	**0.44**	--	--	--	--	--
PCB-114	--	0.083 U	0.082 U	0.083 U	0.082 U	0.083 U	0.083 U	0.082 U	0.083 U	0.082 U	0.083 U	0.082 U	0.081 U	0.082 U	--	--	--	--	--
PCB-118	--	**0.41**	**0.55**	**0.37**	**0.6**	**0.63**	**0.63**	**0.54**	**0.64**	**0.6**	**0.55**	**0.45**	**0.52**	**0.37**	--	--	--	--	--
PCB-119	--	0.095 U	0.094 U	0.096 U	0.094 U	0.095 U	0.096 U	0.094 U	0.095 U	0.095 U	0.095 U	0.094 U	0.094 U	0.094 U	--	--	--	--	--
PCB-123	--	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	--	--	--	--	--
PCB-126	--	0.081 U	0.08 U	0.081 U	0.08 U	0.081 U	0.081 U	0.08 U	0.081 U	0.08 U	0.081 U	0.08 U	0.079 U	0.08 U	--	--	--	--	--
PCB-128	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	--	--	--	--	--
PCB-132/153	--	**0.68**	**0.9**	**0.86**	**1.1**	**1**	**1.2**	**0.89**	**1**	**1**	**0.96**	**0.75**	**0.88**	**0.53**	--	--	--	--	--
PCB-138/158	--	**0.55**	**0.8**	**0.68**	**0.83**	**0.83**	**0.88**	**0.7**	**0.88**	**0.84**	**0.81**	**0.82**	**0.76**	**0.54**	--	--	--	--	--
PCB-149	--	**0.46**	**0.65**	**0.64**	**0.79**	**0.8**	**0.8**	**0.66**	**0.79**	**0.64**	**0.8**	**0.64**	**0.56**	**0.39**	--	--	--	--	--
PCB-151	--	0.068 U	0.067 U	0.068 U	**0.29**	**0.29**	**0.28**	0.067 U	**0.23**	**0.25**	**0.23**	0.067 U	0.067 U	0.067 U	--	--	--	--	--
PCB-156	--	0.058 U	0.057 U	0.058 U	0.057 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.057 U	0.057 U	0.058 U	--	--	--	--	--
PCB-157	--	0.053 U	0.052 U	0.053 U	0.052 U	0.053 U	0.053 U	0.052 U	0.053 U	0.053 U	0.053 U	0.052 U	0.052 U	0.052 U	--	--	--	--	--
PCB-167	--	0.062 U	0.061 U	0.063 U	0.061 U	0.062 U	0.063 U	0.062 U	0.062 U	0.062 U	0.062 U	0.061 U	0.061 U	0.062 U	--	--	--	--	--
PCB-168	--	0.049 U	0.048 U	0.049 U	0.048 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.049 U	0.048 U	0.048 U	0.049 U	--	--	--	--	--

Table 23

Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2018

Chemical	Location ID / Sample ID / Sample Date / Matrix	FDA Action Level	BIN BIN-COMP-T-C-MACOMA-022218 2/22/2018 TBIO	BIN BIN-COMP-T-D-MACOMA-022218 2/22/2018 TBIO	BIN BIN-COMP-T-E-MACOMA-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-A-MACOMA-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-B-MACOMA-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-C-MACOMA-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-D-MACOMA-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-E-MACOMA-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-A-MACOMA-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-B-MACOMA-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-C-MACOMA-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-D-MACOMA-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-E-MACOMA-022218 2/22/2018 TBIO	BIS BIS-COMP-A-MACOMA-022218 2/22/2018 TBIO	BIS BIS-COMP-B-MACOMA-022218 2/22/2018 TBIO	BIS BIS-COMP-C-MACOMA-022218 2/22/2018 TBIO	BIS BIS-COMP-D-MACOMA-022218 2/22/2018 TBIO	BIS BIS-COMP-E-MACOMA-022218 2/22/2018 TBIO
PCB-169	--		0.062 U	0.061 U	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.061 U	0.062 U	0.061 U	0.06 U	0.061 U	--	--	--	--	--
PCB-170	--		0.064 U	0.063 U	0.064 U	0.063 U	0.064 U	0.064 U	0.063 U	0.064 U	0.064 U	0.064 U	0.063 U	0.063 U	0.063 U	--	--	--	--	--
PCB-177	--		0.088 U	0.087 U	0.088 U	0.087 U	0.088 U	0.088 U	0.087 U	0.088 U	0.088 U	0.088 U	0.087 U	0.086 U	0.087 U	--	--	--	--	--
PCB-180	--		**0.2 J**	0.042 U	0.043 U	0.042 U	0.042 U	0.043 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	--	--	--	--	--
PCB-183	--		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	--	--	--	--	--
PCB-187	--		0.085 U	**0.32**	0.086 U	**0.22**	**0.24**	**0.27**	**0.22**	**0.35**	**0.47**	0.085 U	0.084 U	**0.38**	0.084 U	--	--	--	--	--
PCB-189	--		0.062 U	0.061 U	0.062 U	0.061 U	0.062 U	0.062 U	0.061 U	0.062 U	0.061 U	0.062 U	0.061 U	0.06 U	0.061 U	--	--	--	--	--
PCB-194	--		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	--	--	--	--	--
PCB-201	--		0.098 U	0.096 U	0.098 U	0.096 U	0.098 U	0.098 U	0.097 U	0.098 U	0.097 U	0.098 U	0.096 U	0.096 U	0.097 U	--	--	--	--	--
PCB-206	--		0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	--	--	--	--	--
Total PCB Congener (U = 0)	2,000[3]		**4.59 J**	**8.12**	**6.26**	**8.93**	**8.7**	**9.24**	**7.35**	**9.44**	**9.07**	**8.94**	**6.31**	**7.12**	**4.36**	--	--	--	--	--

Notes:

All non-detect results are reported at the method detection limit.

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum.

Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.

Total PCB congeners is the sum of all PCB congeners listed in this table.

USEPA Stage 2A data validation was completed by Anchor QEA.

Bold: detected result

Italicized: non-detected concentration is above one or more identified screening levels

J: estimated value

U: compound analyzed but not detected above detection limit

1. Action level for methyl mercury.

2. Action level for DDT and DDE (individually or in combination).

3. Tolerance level for PCBs. No action level.

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	Time Zero T0-A-NEREIS-012418 1/24/2018 TBIO	LA3-REF LA3-REF-A-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-B-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-C-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-D-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-E-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-A-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-B-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-C-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-D-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-B-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-C-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-B-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-C-NEREIS-022218 2/22/2018 TBIO
Conventional Parameters (%)																				
Lipids	--	**0.61**	**1.1**	**0.74**	**1.1**	**0.92**	**0.75**	**0.46**	**0.52**	**0.55**	**0.71**	**0.71**	**0.79**	**0.69**	**0.93**	**0.82**	**0.62**	**0.72**	**0.9**	**0.81**
Metals (mg/kg)																				
Mercury	1[1]	**0.0218**	**0.0121**	**0.00973**	**0.00562 J**	**0.0374**	**0.0186**	**0.0164 J**	**0.0187**	**0.0163**	**0.0149**	**0.0124**	**0.012**	**0.0143**	**0.0215**	**0.0301**	**0.0118**	**0.027**	**0.0263**	**0.0242**
Organometallic Compounds (µg/kg)																				
Dibutyltin	--	0.73 U	0.72 U	0.74 U	0.72 U	0.72 U	0.72 U	0.74 U	0.72 U	0.74 U	0.72 U	0.73 U	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																				
2,4'-DDD (o,p'-DDD)	--	0.29 U	0.29 U	0.28 U	0.28 U	0.29 U	0.29 U	0.34 U	0.28 U	0.28 U	0.29 U	0.29 U	0.29 U	0.28 U	0.28 U	0.29 U	0.29 U	0.28 U	0.28 U	0.29 U
2,4'-DDE (o,p'-DDE)	5,000[2]	**2 J**	1 U	0.98 U	**1.9 J**	1 U	**1.2 J**	1.2 U	0.98 U	0.97 U	0.99 U	1 U	**1.3 J**	**1 J**	0.98 U	**1.5 J**	**1.1 J**	**2.7**	**1.6 J**	**2.7**
2,4'-DDT (o,p'-DDT)	5,000[2]	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.37 U	0.31 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.31 U
4,4'-DDD (p,p'-DDD)	--	0.51 U	0.51 U	0.5 U	0.5 U	0.51 U	**1.7**	**5.1**	**4.3**	**5.7**	**6**	**5.4**	**5.9**	**9.6**	**5.7**	**9.5**	**10**	**15**	**23**	**20**
4,4'-DDE (p,p'-DDE)	5,000[2]	**1.8**	**0.98 J**	**1.6**	**1.2**	**1.2**	**2.6**	**3.7**	**3.5**	**4.2**	**4.2**	**2.5**	**5.8**	**6.4**	**4.5**	**6.8**	**4.4**	**6.6**	**9.8**	**8.7**
4,4'-DDT (p,p'-DDT)	5,000[2]	0.44 U	0.44 U	0.43 U	0.43 U	**0.78 J**	0.44 U	0.51 U	0.43 U	0.43 U	0.44 U	0.44 U	0.45 U	0.43 U	0.43 U	0.44 U	0.45 U	0.43 U	0.43 U	0.44 U
Total DDx (U = 0)	5,000[2]	**3.8 J**	**0.98 J**	**1.6**	**3.1 J**	**1.98 J**	**5.5 J**	**8.8**	**7.8**	**9.9**	**10.2**	**7.9**	**13 J**	**17 J**	**10.2**	**17.8 J**	**15.5 J**	**24.3**	**34.4 J**	**31.4**
PCB Congeners (µg/kg)																				
PCB-018	--	0.072 U	0.072 U	0.07 U	0.07 U	0.072 U	0.072 U	**0.64**	**0.74**	**0.82**	**0.61**	**0.77**	**0.22**	**0.25**	0.07 U	**0.23**	**0.24**	0.07 U	0.07 U	0.071 U
PCB-028	--	0.034 U	0.034 U	0.033 U	0.033 U	0.034 U	0.034 U	**0.75**	**0.89**	**1.2**	**0.73**	**0.91**	0.034 U	0.033 U	**0.28**	0.034 U	0.034 U	**0.23**	0.033 U	0.034 U
PCB-037	--	0.061 U	0.061 U	0.06 U	0.06 U	0.061 U	0.061 U	0.071 U	0.06 U	0.059 U	0.06 U	0.061 U	0.062 U	0.06 U	0.06 U	0.061 U	0.062 U	0.059 U	0.06 U	0.06 U
PCB-044	--	0.088 U	0.088 U	0.086 U	0.086 U	0.088 U	0.088 U	**0.69**	**0.75**	**0.74**	**0.74**	**0.81**	0.089 U	**0.33**	0.086 U	0.088 U	0.089 U	0.085 U	**0.27**	0.087 U
PCB-049	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	**0.66**	**0.68**	**0.83**	**0.71**	**0.86**	**0.23**	**0.44**	**0.35**	**0.33**	**0.37**	**0.33**	**0.28**	**0.25**
PCB-052	--	0.063 U	0.063 U	0.062 U	0.062 U	0.063 U	0.063 U	**1.8**	**2**	**2.6**	**2.2**	**2.5**	**0.85**	**1.2**	**0.7**	**0.72**	**0.67**	**0.86**	**0.97**	**0.77**
PCB-066	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**1.2**	**1.3**	**1.5**	**1.4**	**1.7**	**0.5**	**0.83**	**0.64**	**0.43**	**0.89**	**0.54**	**0.78**	**0.49**
PCB-070	--	0.06 U	0.06 U	0.059 U	0.059 U	0.06 U	0.06 U	**0.43**	**0.3**	**0.55**	**0.37**	**0.5**	0.061 U	**0.26**	0.059 U	0.06 U	0.061 U	0.058 U	0.059 U	0.06 U
PCB-074	--	0.088 U	0.088 U	0.086 U	0.086 U	0.088 U	0.088 U	**0.38**	**0.46**	**0.48**	**0.45**	**0.53**	**0.21**	**0.3**	0.086 U	**0.22**	**0.21**	**0.21**	**0.26**	0.087 U
PCB-077	--	0.078 U	0.078 U	0.077 U	0.077 U	0.078 U	0.078 U	**0.24**	0.077 U	0.076 U	0.078 U	**0.32**	0.079 U	0.077 U	0.077 U	0.078 U	0.079 U	0.076 U	0.077 U	0.078 U
PCB-081	--	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.14 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
PCB-087	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.13 U	0.11 U	0.11 U	**0.26**	0.11 U	0.11 U	**0.24**	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-099	--	**0.24**	0.061 U	0.06 U	0.06 U	0.061 U	0.061 U	**0.86**	**0.99**	**1**	**1**	**1.2**	**0.61**	**0.72**	**0.6**	**0.48**	**0.73**	**0.42**	**0.62**	**0.52**
PCB-101	--	**0.31**	**0.3**	0.097 U	0.097 U	0.099 U	**0.28**	**1.7**	**1.8**	**2**	**2**	**2.2**	**0.93**	**1.3**	**1**	**1**	**1.1**	**0.87**	**1.1**	**0.85**
PCB-105	--	0.055 U	0.055 U	0.054 U	0.054 U	0.055 U	0.055 U	0.064 U	0.054 U	0.054 U	0.055 U	0.055 U	0.056 U	**0.41**	**0.38**	**0.45**	**0.42**	**0.26**	**0.38**	**0.35**
PCB-110	--	0.046 U	0.046 U	0.045 U	0.045 U	0.046 U	0.046 U	**1.2**	**1.2**	**1.7**	**1.5**	**1.7**	**0.78**	**0.89**	**0.62**	**0.58**	**0.68**	**0.51**	**0.83**	**0.58**
PCB-114	--	0.083 U	0.083 U	0.081 U	0.081 U	0.083 U	0.083 U	0.096 U	0.081 U	0.08 U	0.082 U	0.083 U	0.084 U	0.081 U	0.081 U	0.083 U	0.084 U	0.08 U	0.081 U	0.082 U
PCB-118	--	**0.26**	**0.24**	0.083 U	0.083 U	0.085 U	0.085 U	**0.92**	**0.96**	**1.2**	**1.1**	**1.2**	**0.51**	**0.66**	**0.56**	**0.57**	**0.58**	**0.47**	**0.66**	**0.39**
PCB-119	--	0.095 U	0.095 U	0.094 U	0.094 U	0.095 U	0.095 U	0.11 U	0.094 U	0.093 U	0.094 U	0.095 U	0.096 U	0.094 U	0.094 U	0.095 U	0.096 U	0.093 U	0.094 U	0.094 U
PCB-123	--	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.12 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.1 U
PCB-126	--	0.081 U	0.081 U	0.079 U	0.079 U	0.081 U	0.081 U	0.094 U	0.079 U	0.078 U	0.08 U	0.081 U	0.082 U	0.079 U	0.079 U	0.081 U	0.082 U	0.078 U	0.079 U	0.08 U
PCB-128	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.12 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PCB-132/153	--	**1.1**	**1.1**	**0.73**	**0.81**	**0.7**	**0.99**	**2.2**	**2.1**	**2.3**	**2.4**	**2.6**	**1.8**	**2.1**	**1.7**	**1.9**	**2.1**	**1.6**	**2**	**1.6**
PCB-138/158	--	**0.84**	**0.75**	**0.54**	**0.56**	**0.46**	**0.56**	**1.5**	**1.6**	**1.8**	**1.8**	**1.9**	**1.2**	**1.7**	**1.3**	**1.4**	**1.5**	**1**	**1.5**	**1.2**
PCB-149	--	**0.38**	**0.39**	**0.3**	**0.35**	0.099 U	**0.31**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.2**	**1.2**	**0.95**	**0.97**	**1.1**	**0.86**	**1.2**	**0.95**
PCB-151	--	0.068 U	0.068 U	0.067 U	0.067 U	0.068 U	0.068 U	**0.38**	0.067 U	**0.43**	**0.47**	**0.4**	0.069 U	**0.31**	**0.26**	**0.3**	**0.43**	**0.23**	**0.36**	**0.3**
PCB-156	--	0.058 U	0.058 U	0.057 U	0.057 U	0.058 U	0.058 U	0.068 U	0.057 U	0.056 U	0.058 U	0.058 U	0.059 U	0.057 U	0.057 U	0.058 U	0.059 U	0.056 U	0.057 U	0.058 U
PCB-157	--	0.053 U	0.053 U	0.052 U	0.052 U	0.053 U	0.053 U	0.061 U	0.052 U	0.051 U	0.052 U	0.053 U	0.053 U	0.052 U	0.052 U	0.053 U	0.053 U	0.051 U	0.052 U	0.052 U
PCB-167	--	0.062 U	0.062 U	0.061 U	0.061 U	0.062 U	0.062 U	0.073 U	0.061 U	0.06 U	0.062 U	0.062 U	0.063 U	0.061 U	0.061 U	0.062 U	0.063 U	0.06 U	0.061 U	0.062 U
PCB-168	--	0.049 U	0.049 U	0.048 U	0.048 U	0.049 U	0.049 U	0.057 U	0.048 U	0.048 U	0.049 U	0.049 U	0.05 U	0.048 U	0.048 U	0.049 U	0.05 U	0.048 U	0.048 U	0.049 U
PCB-169	--	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.072 U	0.06 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.06 U	0.06 U	0.061 U
PCB-170	--	**0.29**	0.064 U	0.063 U	0.063 U	0.064 U	**0.22**	**0.3**	**0.44**	**0.5**	0.063 U	**0.42**	**0.34**	0.063 U	**0.33**	**0.32**	**0.44**	**0.32**	**0.39**	0.063 U
PCB-177	--	0.088 U	0.088 U	0.086 U	0.086 U	0.088 U	0.088 U	0.1 U	**0.23**	**0.28**	0.087 U	0.088 U	0.089 U	0.086 U	0.086 U	0.088 U	0.089 U	**0.24**	0.086 U	0.087 U
PCB-180	--	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.049 U	0.042 U	0.041 U	0.042 U	0.042 U	0.043 U	0.042 U	**0.69**	0.042 U	0.043 U	**0.64**	**0.85**	**0.61**
PCB-183	--	**0.26**	**0.21**	0.11 U	0.11 U	0.11 U	**0.24**	**0.29**	**0.29**	**0.31**	**0.33**	**0.43**	**0.21**	**0.4**	**0.32**	**0.29**	**0.32**	**0.24**	**0.31**	**0.2 J**
PCB-187	--	**0.57**	**0.55**	**0.35**	**0.32**	**0.31**	**0.48**	**0.8**	**0.77**	**0.97**	**0.83**	**0.78**	**0.67**	**0.79**	**0.65**	**0.68**	**0.79**	**0.6**	**0.88**	**0.59**
PCB-189	--	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.072 U	0.06 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.06 U	0.06 U	0.061 U
PCB-194	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	**0.34**	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-201	--	0.098 U	0.098 U	0.096 U	0.096 U	0.098 U	0.098 U	0.11 U	0.096 U	0.095 U	0.097 U	0.098 U	0.099 U	0.096 U	0.096 U	0.098 U	0.099 U	0.095 U	0.096 U	0.097 U
PCB-206	--	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.23 U	**0.29**	**0.27**	**0.29**	0.19 U	0.2 U	0.19 U	**0.22**	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	Time Zero T0-A-NEREIS-012418 1/24/2018 TBIO	LA3-REF LA3-REF-A-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-B-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-C-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-D-NEREIS-022218 2/22/2018 TBIO	LA3-REF LA3-REF-E-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-A-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-B-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-C-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-D-NEREIS-022218 2/22/2018 TBIO	TB TB-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-B-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-C-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	MCN1 MCN1-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-B-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-C-NEREIS-022218 2/22/2018 TBIO
Total PCB Congener (U = 0)	2,000[3]	**4.25**	**3.54**	**1.92**	**2.04**	**1.47**	**3.08**	**18.48**	**19.09**	**22.78**	**20.59**	**23.13**	**10.26**	**14.33**	**11.55**	**10.87**	**12.57**	**10.43**	**13.64**	**9.65 J**

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	MCN2 MCN2-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-E-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-B-NEREIS-022218 2/22/2018 TBIO
Conventional Parameters (%)																				
Lipids	--	**0.85**	**0.76**	**1.2**	**0.58**	**0.95**	**0.72**	**0.62**	**0.68**	**0.68**	**0.5**	**0.86**	**0.55**	**1.2**	**0.76**	**1**	**0.56**	**1**	**1**	**0.65**
Metals (mg/kg)																				
Mercury	1[1]	**0.0201**	**0.0148**	**0.016**	**0.0134**	**0.0231**	**0.0191 J**	**0.0148 J**	0.00339 UJ	**0.00459 J**	**0.00726 J**	**0.0182 J**	0.00356 UJ	**0.0109 J**	**0.00754 J**	**0.00381 J**	**0.0182 J**	**0.00358 J**	**0.0219 J**	**0.0123 J**
Organometallic Compounds (µg/kg)																				
Dibutyltin	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																				
2,4'-DDD (o,p'-DDD)	--	0.29 U	0.28 U	0.28 U	0.28 U	0.29 U	0.29 U	0.29 U	0.28 U	0.28 U	0.29 U	0.29 U	0.28 U	0.29 U	0.29 U	0.29 U	0.28 U	0.29 U	0.29 U	0.29 U
2,4'-DDE (o,p'-DDE)	5,000[2]	**1.7 J**	**4.5**	**1.8 J**	**1.3 J**	**1.5 J**	**2.1**	**1.3 J**	**1.6 J**	**1.2 J**	**1 J**	**1.3 J**	**1.9 J**	0.99 U	**1.3 J**	1 U	**1 J**	**1.5 J**	**1.6 J**	**1.3 J**
2,4'-DDT (o,p'-DDT)	5,000[2]	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.32 U	0.32 U	0.32 U
4,4'-DDD (p,p'-DDD)	--	**23**	**22**	**24**	**19**	**17**	**26**	**15**	**22**	**15**	**16**	**15**	**21**	**9.5 J**	**11**	**7.1**	**7.1**	**8.3 J**	**14**	**12**
4,4'-DDE (p,p'-DDE)	5,000[2]	**7.6**	**8.8**	**7**	**8.3**	**5.6**	**10**	**6**	**8.8**	**7.9**	**11**	**9.1**	**7.3 J**	**8.6 J**	**7.9 J**	**7.5**	**5.1**	**8.3 J**	**7.9 J**	**8**
4,4'-DDT (p,p'-DDT)	5,000[2]	0.44 U	0.43 U	0.43 U	0.43 U	0.44 U	0.44 U	0.45 U	0.43 U	0.43 U	0.44 U	0.45 U	0.43 U	0.44 U	0.45 U	0.44 U	0.43 U	0.45 U	0.45 U	0.44 U
Total DDx (U = 0)	5,000[2]	**32.3 J**	**35.3**	**32.8 J**	**28.6 J**	**24.1 J**	**38.1**	**22.3 J**	**32.4 J**	**24.1 J**	**28 J**	**25.4 J**	**30.2 J**	**18.1 J**	**20.2 J**	**14.6**	**13.2 J**	**18.1 J**	**23.5 J**	**21.3 J**
PCB Congeners (µg/kg)																				
PCB-018	--	0.071 U	**0.31**	**0.31**	**0.25**	0.071 U	**0.27**	0.073 U	0.07 U	0.07 U	0.072 U	**0.22**	0.07 U	0.071 U	0.073 U	0.072 U	0.07 U	0.073 U	0.073 U	0.072 U
PCB-028	--	0.034 U	0.033 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.033 U	0.033 U	0.034 U	0.034 U	0.033 U	0.034 U	0.034 U	0.034 U	0.033 U	0.034 U	0.034 U	0.034 U
PCB-037	--	0.06 U	0.06 U	0.059 U	0.06 U	0.06 U	0.061 U	0.062 U	0.059 U	0.06 U	0.061 U	0.062 U	0.059 U	0.06 U	0.062 U	0.061 U	0.059 U	0.062 U	0.062 U	0.061 U
PCB-044	--	0.087 U	0.086 U	**0.39**	0.086 U	0.087 U	0.088 U	0.089 U	0.085 U	0.086 U	0.088 U	0.089 U	**0.25**	0.087 U	0.089 U	0.088 U	0.085 U	0.089 U	0.089 U	0.088 U
PCB-049	--	0.11 U	**0.31**	**0.26**	**0.22**	0.11 U	0.11 U	**0.21**	**0.25**	**0.28**	0.11 U	0.11 U	**0.26**	**0.25**	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-052	--	**0.82**	**0.9**	**0.89**	**0.55**	**0.64**	**1**	**0.46**	**0.32**	**0.56**	**0.52**	**0.66**	**0.43**	**0.53**	**0.65**	**0.39**	0.061 U	**0.44**	**0.55**	**0.41**
PCB-066	--	**0.43**	**0.6**	**0.6**	**0.39**	**0.28**	**0.49**	**0.42**	**0.27**	**0.56**	**0.35**	**0.21**	**0.5**	**0.27**	**0.22**	**0.28**	0.1 U	0.1 U	**0.36**	0.1 U
PCB-070	--	0.06 U	0.059 U	0.058 U	0.059 U	0.06 U	0.06 U	0.061 U	0.058 U	0.059 U	0.06 U	0.061 U	0.058 U	0.06 U	0.061 U	0.06 U	0.058 U	0.061 U	0.061 U	0.06 U
PCB-074	--	0.087 U	**0.26**	0.085 U	0.086 U	0.087 U	0.088 U	0.089 U	0.085 U	0.086 U	0.088 U	0.089 U	0.085 U	0.087 U	0.089 U	0.088 U	0.085 U	0.089 U	0.089 U	0.088 U
PCB-077	--	0.078 U	0.077 U	0.076 U	0.077 U	0.078 U	0.078 U	0.079 U	0.076 U	0.077 U	0.078 U	0.079 U	0.076 U	0.078 U	0.079 U	0.078 U	0.076 U	0.079 U	0.079 U	0.078 U
PCB-081	--	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
PCB-087	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-099	--	**0.45**	**0.59**	**0.63**	**0.46**	**0.38**	**0.52**	**0.4**	**0.26**	**0.44**	**0.33**	**0.23**	**0.3**	**0.27**	**0.33**	**0.2**	**0.25**	**0.35**	**0.33**	**0.23**
PCB-101	--	**0.98**	**1**	**0.97**	**0.71**	**0.69**	**1**	**0.62**	**0.51**	**0.61**	**0.61**	**0.6**	**0.44**	**0.63**	**0.65**	**0.48**	**0.44**	**0.51**	**0.68**	**0.52**
PCB-105	--	**0.49**	**0.46**	**0.33**	0.054 U	0.055 U	**0.41**	0.056 U	0.054 U	0.054 U	0.055 U	0.056 U	0.054 U	0.055 U	0.056 U	0.055 U	0.054 U	0.056 U	0.056 U	0.055 U
PCB-110	--	**0.53**	**0.71**	**0.66**	**0.51**	**0.47**	**0.64**	**0.36**	**0.33**	**0.4**	**0.33**	**0.42**	**0.42**	**0.42**	**0.49**	**0.36**	**0.3**	**0.44**	**0.56**	**0.42**
PCB-114	--	0.082 U	0.081 U	0.08 U	0.081 U	0.082 U	0.083 U	0.084 U	0.08 U	0.081 U	0.083 U	0.084 U	0.08 U	0.082 U	0.084 U	0.083 U	0.08 U	0.084 U	0.084 U	0.083 U
PCB-118	--	**0.37**	**0.5**	**0.69**	**0.51**	**0.4**	**0.52**	**0.29**	**0.31**	**0.3**	**0.31**	**0.33**	**0.35**	**0.32**	0.086 U	**0.27**	**0.27**	0.086 U	**0.32**	**0.25**
PCB-119	--	0.094 U	0.094 U	0.093 U	0.094 U	0.094 U	0.095 U	0.096 U	0.093 U	0.094 U	0.095 U	0.096 U	0.093 U	0.094 U	0.096 U	0.095 U	0.093 U	0.096 U	0.096 U	0.095 U
PCB-123	--	0.1 U	0.1 U	**0.34**	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.11 U
PCB-126	--	0.08 U	0.079 U	0.078 U	0.079 U	0.08 U	0.081 U	0.082 U	0.078 U	0.079 U	0.081 U	0.082 U	0.078 U	0.08 U	0.082 U	0.081 U	0.078 U	0.082 U	0.082 U	0.081 U
PCB-128	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
PCB-132/153	--	**1.7**	**1.9**	**2.2**	**1.5**	**1.5**	**2**	**1.5**	**1.5**	**1.7**	**1.6**	**1.2**	**1.4**	**1.5**	**1.5**	**1.3**	**1.1**	**1.4**	**1.4**	**1.3**
PCB-138/158	--	**1.2**	**1.5**	**1.9**	**1.3**	**1**	**1.7**	**1.1**	**1**	**1.2**	**0.95**	**0.94**	**0.92**	**1.3**	**1.1**	**0.87**	**0.75**	**1**	**1**	**1.1**
PCB-149	--	**0.89**	**1.1**	**1.2**	**0.82**	**0.91**	**1.1**	**0.75**	**0.87**	**0.9**	**0.7**	**0.7**	**0.82**	**0.76**	**0.77**	**0.64**	**0.59**	**0.71**	**0.85**	**0.78**
PCB-151	--	**0.3**	**0.33**	**0.35**	**0.25**	**0.21**	**0.36**	0.069 U	0.066 U	0.067 U	0.068 U	0.069 U	0.066 U	0.067 U	0.069 U	0.068 U	0.066 U	0.069 U	0.069 U	0.068 U
PCB-156	--	0.058 U	0.057 U	0.056 U	0.057 U	0.058 U	0.058 U	0.059 U	0.056 U	0.057 U	0.058 U	0.059 U	0.056 U	0.058 U	0.059 U	0.058 U	0.056 U	0.059 U	0.059 U	0.058 U
PCB-157	--	0.052 U	0.052 U	0.051 U	0.052 U	0.052 U	0.053 U	0.053 U	0.051 U	0.052 U	0.053 U	0.053 U	0.051 U	0.052 U	0.053 U	0.053 U	0.051 U	0.053 U	0.053 U	0.053 U
PCB-167	--	0.062 U	0.061 U	0.06 U	0.061 U	0.062 U	0.062 U	0.063 U	0.06 U	0.061 U	0.062 U	0.063 U	0.06 U	0.062 U	0.063 U	0.062 U	0.06 U	0.063 U	0.063 U	0.062 U
PCB-168	--	0.049 U	0.048 U	0.048 U	0.048 U	0.049 U	0.049 U	0.05 U	0.048 U	0.048 U	0.049 U	0.05 U	0.048 U	0.049 U	0.05 U	0.049 U	0.048 U	0.05 U	0.05 U	0.049 U
PCB-169	--	0.061 U	0.06 U	0.06 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.062 U	0.062 U	0.062 U
PCB-170	--	0.063 U	**0.42**	**0.56**	**0.27**	0.063 U	**0.48**	**0.31**	0.062 U	**0.34**	0.064 U	0.065 U	0.062 U	**0.44**	**0.37**	**0.29**	**0.27**	0.065 U	**0.37**	**0.27**
PCB-177	--	0.087 U	0.086 U	0.085 U	0.086 U	0.087 U	0.088 U	0.089 U	0.085 U	0.086 U	0.088 U	0.089 U	0.085 U	0.087 U	0.089 U	0.088 U	0.085 U	0.089 U	0.089 U	0.088 U
PCB-180	--	0.042 U	**0.83**	**1**	0.042 U	0.042 U	**0.73**	0.043 U	0.041 U	0.042 U	**0.71**	0.043 U	0.041 U	**0.67**	**0.6**	**0.49**	**0.39**	**0.65**	0.043 U	0.042 U
PCB-183	--	**0.27**	**0.26**	**0.4**	**0.23**	**0.26**	**0.35**	**0.27**	**0.39**	**0.31**	**0.29**	**0.26**	**0.31**	**0.25**	**0.22**	**0.2**	0.11 U	**0.22**	**0.26**	0.11 U
PCB-187	--	**0.63**	**0.7**	**0.84**	**0.62**	**0.64**	**0.86**	**0.54**	**0.55**	**0.73**	**0.57**	**0.61**	**0.54**	**0.69**	**0.69**	**0.56**	**0.43**	**0.61**	**0.65**	**0.38**
PCB-189	--	0.061 U	0.06 U	0.06 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.06 U	0.062 U	0.062 U	0.06 U	0.061 U	0.062 U	0.062 U	0.06 U	0.062 U	0.062 U	0.062 U
PCB-194	--	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
PCB-201	--	0.097 U	0.096 U	0.095 U	0.096 U	0.097 U	0.098 U	0.099 U	0.095 U	0.096 U	0.098 U	0.099 U	0.095 U	0.097 U	0.099 U	0.098 U	0.095 U	0.099 U	0.099 U	0.098 U
PCB-206	--	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	**0.42**	0.19 U	0.19 U	0.2 U	0.2 U	0.19 U

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	MCN2 MCN2-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	MCN2 MCN2-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN3 MCN3-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN4 MCN4-COMP-E-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-A-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-B-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-C-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-D-NEREIS-022218 2/22/2018 TBIO	MCN5 MCN5-COMP-E-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-A-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-B-NEREIS-022218 2/22/2018 TBIO
Total PCB Congener (U = 0)	2,000[3]	**9.06**	**12.68**	**14.52**	**8.59**	**7.38**	**12.43**	**7.23**	**6.56**	**8.33**	**7.27**	**6.38**	**6.94**	**8.3**	**8.01**	**6.33**	**4.79**	**6.33**	**7.33**	**5.66**

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID / Sample ID / Sample Date / Matrix	FDA Action Level	BIN	BIN	BIN	BIME	BIME	BIME	BIME	BIME	BIMW	BIMW	BIMW	BIMW	BIMW	BIS	BIS	BIS	BIS	BIS
			BIN-COMP-T-C-NEREIS-022218 2/22/2018 TBIO	BIN-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	BIN-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	BIME-COMP-T-M-A-NEREIS-022218 2/22/2018 TBIO	BIME-COMP-T-M-B-NEREIS-022218 2/22/2018 TBIO	BIME-COMP-T-M-C-NEREIS-022218 2/22/2018 TBIO	BIME-COMP-T-M-D-NEREIS-022218 2/22/2018 TBIO	BIME-COMP-T-M-E-NEREIS-022218 2/22/2018 TBIO	BIMW-COMP-T-M-A-NEREIS-022218 2/22/2018 TBIO	BIMW-COMP-T-M-B-NEREIS-022218 2/22/2018 TBIO	BIMW-COMP-T-M-C-NEREIS-022218 2/22/2018 TBIO	BIMW-COMP-T-M-D-NEREIS-022218 2/22/2018 TBIO	BIMW-COMP-T-M-E-NEREIS-022218 2/22/2018 TBIO	BIS-COMP-A-NEREIS-022218 2/22/2018 TBIO	BIS-COMP-B-NEREIS-022218 2/22/2018 TBIO	BIS-COMP-C-NEREIS-022218 2/22/2018 TBIO	BIS-COMP-D-NEREIS-022218 2/22/2018 TBIO	BIS-COMP-E-NEREIS-022218 2/22/2018 TBIO
Conventional Parameters (%)																				
Lipids	--		**1.2**	**1.2**	**0.84**	**0.89**	**0.81**	**0.59**	**1.2**	**0.9**	**0.73**	**0.74**	**0.96**	**0.94**	**1.1**	**0.65**	**0.87**	**1.1**	**0.86**	**0.86**
Metals (mg/kg)																				
Mercury	1[1]		**0.0247 J**	**0.0273 J**	**0.0173 J**	0.00336 UJ	0.00349 UJ	0.00356 UJ	**0.00637 J**	0.00345 UJ	**0.00434 J**	**0.00746 J**	**0.0118 J**	**0.0228 J**	**0.0238 J**	**0.0125 J**	**0.0214 J**	**0.0227 J**	**0.026 J**	**0.0144 J**
Organometallic Compounds (µg/kg)																				
Dibutyltin	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/kg)																				
2,4'-DDD (o,p'-DDD)	--		0.28 U	0.28 U	0.29 U	0.28 U	0.29 U	0.29 U	0.29 U	0.29 U	0.28 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
2,4'-DDE (o,p'-DDE)	5,000[2]		**2.4**	**2.5**	**1.9 J**	**2.7**	**1.7 J**	**3.5**	**3.7**	**2.4**	**1.7 J**	**2.9**	**5**	**1.6 J**	**4.8**	**1.8 J**	**1.1 J**	**2.9**	**2**	**1.4 J**
2,4'-DDT (o,p'-DDT)	5,000[2]		0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.32 U	0.32 U	0.32 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.31 U	0.31 U	0.32 U
4,4'-DDD (p,p'-DDD)	--		**16**	**10**	**16**	**34**	**30**	**32**	**24**	**30**	**18**	**19**	**31**	**14**	**23**	**16**	**8.5**	**18**	**12**	**15**
4,4'-DDE (p,p'-DDE)	5,000[2]		**11**	**5.7**	**11**	**16**	**14**	**15**	**15**	**15**	**10**	**10**	**11**	**6.7**	**14**	**12**	**6.4**	**17**	**8**	**8.5**
4,4'-DDT (p,p'-DDT)	5,000[2]		0.43 U	0.43 U	0.44 U	0.43 U	0.44 U	0.45 U	0.44 U	0.45 U	0.43 U	0.44 U	0.45 U	0.44 U	0.44 U	0.45 U	0.45 U	0.44 U	0.44 U	0.44 U
Total DDx (U = 0)	5,000[2]		**29.4**	**18.2**	**28.9 J**	**52.7**	**45.7 J**	**50.5**	**42.7**	**47.4**	**29.7 J**	**31.9**	**47**	**22.3 J**	**41.8**	**29.8 J**	**16 J**	**37.9**	**22**	**24.9 J**
PCB Congeners (µg/kg)																				
PCB-018	--		**0.19 J**	0.07 U	0.071 U	**0.28**	**0.22**	**0.21**	**0.23**	0.073 U	0.07 U	0.072 U	0.073 U	0.071 U	0.071 U	--	--	--	--	--
PCB-028	--		0.033 U	0.033 U	0.034 U	**0.26**	**0.28**	0.035 U	0.034 U	**0.23**	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	--	--	--	--	--
PCB-037	--		0.059 U	0.059 U	0.06 U	0.059 U	0.06 U	0.062 U	0.061 U	0.062 U	0.06 U	0.061 U	0.062 U	0.06 U	0.06 U	--	--	--	--	--
PCB-044	--		0.085 U	0.085 U	0.087 U	0.085 U	0.087 U	0.09 U	**0.25**	0.089 U	0.086 U	0.088 U	0.089 U	0.087 U	0.087 U	--	--	--	--	--
PCB-049	--		**0.22**	0.11 U	0.11 U	**0.33**	**0.33**	**0.25**	**0.24**	**0.28**	0.11 U	0.11 U	0.11 U	0.11 U	**0.21**	--	--	--	--	--
PCB-052	--		**0.73**	**0.4**	**0.52**	**0.72**	**0.77**	**0.59**	**0.59**	**0.54**	**0.54**	**0.6**	**0.62**	**0.54**	**0.73**	--	--	--	--	--
PCB-066	--		**0.36**	**0.34**	**0.34**	**0.45**	**0.45**	**0.4**	**0.46**	**0.37**	**0.24**	**0.32**	**0.32**	0.1 U	**0.39**	--	--	--	--	--
PCB-070	--		0.058 U	0.058 U	0.06 U	0.058 U	0.06 U	0.061 U	0.06 U	0.061 U	0.059 U	0.06 U	0.061 U	0.06 U	**0.21**	--	--	--	--	--
PCB-074	--		0.085 U	0.085 U	0.087 U	0.085 U	0.087 U	0.09 U	0.088 U	0.089 U	0.086 U	0.088 U	0.089 U	0.087 U	0.087 U	--	--	--	--	--
PCB-077	--		0.076 U	0.076 U	0.078 U	0.076 U	0.078 U	0.08 U	0.078 U	0.079 U	0.077 U	0.078 U	0.079 U	0.078 U	0.078 U	--	--	--	--	--
PCB-081	--		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	--	--	--	--	--
PCB-087	--		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	--	--	--	--	--
PCB-099	--		**0.37**	**0.27**	**0.32**	**0.44**	**0.48**	**0.48**	**0.4**	**0.33**	**0.27**	**0.26**	**0.37**	**0.32**	**0.45**	--	--	--	--	--
PCB-101	--		**0.69**	**0.65**	**0.66**	**0.94**	**0.87**	**0.91**	**0.84**	**0.73**	**0.58**	**0.64**	**0.71**	**0.66**	**0.86**	--	--	--	--	--
PCB-105	--		0.054 U	**0.24**	0.055 U	**0.4**	0.055 U	**0.31**	0.055 U	**0.46**	0.054 U	**0.24**	**0.21**	0.055 U	0.055 U	--	--	--	--	--
PCB-110	--		**0.59**	**0.53**	**0.51**	**0.65**	**0.65**	0.047 U	**0.56**	**0.52**	**0.43**	**0.49**	**0.6**	**0.45**	**0.61**	--	--	--	--	--
PCB-114	--		0.08 U	0.08 U	0.082 U	0.08 U	0.082 U	0.085 U	0.083 U	0.084 U	0.081 U	0.083 U	0.084 U	0.082 U	0.082 U	--	--	--	--	--
PCB-118	--		**0.32**	**0.57**	**0.31**	**0.49**	**0.61**	**0.52**	**0.89**	0.086 U	**0.28**	**0.33**	**0.43**	**0.4**	**0.48**	--	--	--	--	--
PCB-119	--		0.093 U	0.093 U	0.094 U	0.093 U	0.094 U	0.097 U	0.095 U	0.096 U	0.094 U	0.095 U	0.096 U	0.094 U	0.094 U	--	--	--	--	--
PCB-123	--		0.1 U	**1.6**	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	**0.26**	0.1 U	--	--	--	--	--
PCB-126	--		0.078 U	0.078 U	0.08 U	0.078 U	0.08 U	0.082 U	0.081 U	0.082 U	0.079 U	0.081 U	0.082 U	0.08 U	0.08 U	--	--	--	--	--
PCB-128	--		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	--	--	--	--	--
PCB-132/153	--		**1.9**	**1.6**	**1.5**	**2**	**1.7**	**1.6**	**1.7**	**1.7**	**1.5**	**1.4**	**1.6**	**1.4**	**1.8**	--	--	--	--	--
PCB-138/158	--		**1.4**	**1.4**	**1**	**1.4**	**1.4**	**1.3**	**1.3**	**1.3**	**0.98**	**1**	**1.3**	**0.99**	**1.3**	--	--	--	--	--
PCB-149	--		**1.1**	**0.83**	**0.84**	**1.1**	**1.2**	**1**	**0.93**	**0.92**	**0.81**	**0.79**	**0.91**	**0.69**	**0.98**	--	--	--	--	--
PCB-151	--		**0.24**	**0.41**	**0.22**	0.066 U	**0.31**	0.069 U	0.068 U	0.069 U	0.067 U	0.068 U	**0.29**	0.067 U	**0.29**	--	--	--	--	--
PCB-156	--		0.056 U	0.056 U	0.058 U	0.056 U	0.058 U	0.059 U	0.058 U	0.059 U	0.057 U	0.058 U	0.059 U	0.058 U	0.058 U	--	--	--	--	--
PCB-157	--		0.051 U	0.051 U	0.052 U	0.051 U	0.052 U	0.054 U	0.053 U	0.053 U	0.052 U	0.053 U	0.053 U	0.052 U	0.052 U	--	--	--	--	--
PCB-167	--		0.06 U	0.06 U	0.062 U	0.06 U	0.062 U	0.064 U	0.062 U	0.063 U	0.061 U	0.062 U	0.063 U	0.062 U	0.062 U	--	--	--	--	--
PCB-168	--		0.048 U	0.048 U	0.049 U	0.048 U	0.049 U	0.05 U	0.049 U	0.05 U	0.048 U	0.049 U	0.05 U	0.049 U	0.049 U	--	--	--	--	--
PCB-169	--		0.06 U	0.06 U	0.061 U	0.06 U	0.061 U	0.063 U	0.062 U	0.062 U	0.06 U	0.062 U	0.062 U	0.061 U	0.061 U	--	--	--	--	--
PCB-170	--		**0.51**	**0.37**	0.063 U	**0.4**	**0.47**	**0.36**	**0.3**	**0.38**	**0.37**	**0.29**	**0.35**	**0.21**	**0.36**	--	--	--	--	--
PCB-177	--		0.085 U	0.085 U	0.087 U	0.085 U	0.087 U	0.09 U	0.088 U	0.089 U	0.086 U	0.088 U	0.089 U	0.087 U	0.087 U	--	--	--	--	--
PCB-180	--		0.041 U	0.041 U	0.042 U	**0.76**	**0.78**	**0.9**	**0.6**	**0.75**	**0.72**	**0.45**	**0.59**	**0.5**	0.042 U	--	--	--	--	--
PCB-183	--		**0.29**	**0.31**	**0.29**	**0.26**	**0.26**	**0.29**	**0.28**	**0.28**	0.11 U	**0.21**	**0.26**	**0.23**	**0.31**	--	--	--	--	--
PCB-187	--		**0.81**	**0.72**	**0.52**	**0.7**	**0.69**	**0.52**	**0.69**	**0.74**	**0.71**	**0.55**	**0.66**	**0.56**	**0.74**	--	--	--	--	--
PCB-189	--		0.06 U	0.06 U	0.061 U	0.06 U	0.061 U	0.063 U	0.062 U	0.062 U	0.06 U	0.062 U	0.062 U	0.061 U	0.061 U	--	--	--	--	--
PCB-194	--		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	--	--	--	--	--
PCB-201	--		0.095 U	0.095 U	0.097 U	0.095 U	0.097 U	0.1 U	0.098 U	0.099 U	0.096 U	0.098 U	0.099 U	0.097 U	0.097 U	--	--	--	--	--
PCB-206	--		0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	--	--	--	--	--

Table 24

Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2018

Chemical	Location ID Sample ID Sample Date Matrix FDA Action Level	BIN BIN-COMP-T-C-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-D-NEREIS-022218 2/22/2018 TBIO	BIN BIN-COMP-T-E-NEREIS-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-A-NEREIS-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-B-NEREIS-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-C-NEREIS-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-D-NEREIS-022218 2/22/2018 TBIO	BIME BIME-COMP-T-M-E-NEREIS-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-A-NEREIS-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-B-NEREIS-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-C-NEREIS-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-D-NEREIS-022218 2/22/2018 TBIO	BIMW BIMW-COMP-T-M-E-NEREIS-022218 2/22/2018 TBIO	BIS BIS-COMP-A-NEREIS-022218 2/22/2018 TBIO	BIS BIS-COMP-B-NEREIS-022218 2/22/2018 TBIO	BIS BIS-COMP-C-NEREIS-022218 2/22/2018 TBIO	BIS BIS-COMP-D-NEREIS-022218 2/22/2018 TBIO	BIS BIS-COMP-E-NEREIS-022218 2/22/2018 TBIO
Total PCB Congener (U = 0)	2,000[3]	**9.72 J**	**10.24**	**7.03**	**11.58**	**11.47**	**9.64**	**10.26**	**9.53**	**7.43**	**7.57**	**9.22**	**7.21**	**9.72**	--	--	--	--	--

Notes:
All non-detect results are reported at the method detection limit.
Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest limit value is reported as the sum.
Total DDx is the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total PCB congeners is the sum of all PCB congeners listed in this table.
USEPA Stage 2A data validation was completed by Anchor QEA.
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
N: normal environmental sample
U: compound analyzed but not detected above detection limit
1. Action level for methyl mercury.
2. Action level for DDT and DDE (individually or in combination).
3. Tolerance level for PCBs. No action level.

Table 25
Results of Chemical Analyses of *Macoma nasuta* Tissue Residues for January 2019 Sampling Event

Chemicals	Location ID / Sample ID / Sample Date / Matrix / FDA Action Level	Time Zero T0-A-MACOMA-022619 2/26/2019 TBIO --	LA3-REF LA3-REF-A-MACOMA-032719 3/27/2019 TBIO --	LA3-REF LA3-REF-B-MACOMA-032719 3/27/2019 TBIO --	LA3-REF LA3-REF-C-MACOMA-032719 3/27/2019 TBIO --	LA3-REF LA3-REF-D-MACOMA-032719 3/27/2019 TBIO --	LA3-REF LA3-REF-E-MACOMA-032719 3/27/2019 TBIO --	NC2 NC2-COMP-A-MACOMA-032719 3/27/2019 TBIO --	NC2 NC2-COMP-B-MACOMA-032719 3/27/2019 TBIO --	NC2 NC2-COMP-C-MACOMA-032719 3/27/2019 TBIO --	NC2 NC2-COMP-D-MACOMA-032719 3/27/2019 TBIO --	NC2 NC2-COMP-E-MACOMA-032719 3/27/2019 TBIO --	NC3 NC3-COMP-A-MACOMA-032719 3/27/2019 TBIO --	NC3 NC3-COMP-B-MACOMA-032719 3/27/2019 TBIO --	NC3 NC3-COMP-C-MACOMA-032719 3/27/2019 TBIO --	NC3 NC3-COMP-D-MACOMA-032719 3/27/2019 TBIO --	NC3 NC3-COMP-E-MACOMA-032719 3/27/2019 TBIO --
Conventional Parameters (%)																	
Lipids	--	**0.72**	**0.63**	**0.32**	**0.39**	**0.53**	**0.38**	**0.34**	**0.32**	**0.38**	**0.34**	**0.49**	**0.25**	**0.54**	**0.38**	**0.44**	**0.48**
Metals (mg/kg)																	
Mercury	1[1]	**0.00535 J**	**0.00721 J**	**0.00707 J**	**0.0175 J**	**0.00919 J**	**0.0143 J**	**0.0197 J**	**0.0155 J**	**0.0224 J**	**0.0137 J**	**0.0228 J**	**0.0122 J**	**0.0127 J**	**0.015 J**	**0.0124 J**	**0.0144 J**

Notes:
All non-detect results are reported at the MDL.
USEPA Stage 2A data validation was completed by Anchor QEA.
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
U: compound analyzed but not detected above detection limit
1. Action level for methyl mercury.

Table 26
Results of Chemical Analyses of *Nereis virens* Tissue Residues for January 2019 Sampling Event

Chemicals	Location ID Sample ID Sample Date Matrix FDA Action Level	Time Zero T0-A-NEREIS-022619 2/26/2019 TBIO	LA3-REF LA3-REF-A-NEREIS-032719 3/27/2019 TBIO	LA3-REF LA3-REF-B-NEREIS-032719 3/27/2019 TBIO	LA3-REF LA3-REF-C-NEREIS-032719 3/27/2019 TBIO	LA3-REF LA3-REF-D-NEREIS-032719 3/27/2019 TBIO	LA3-REF LA3-REF-E-NEREIS-032719 3/27/2019 TBIO	NC2 NC2-COMP-A-NEREIS-032719 3/27/2019 TBIO	NC2 NC2-COMP-B-NEREIS-032719 3/27/2019 TBIO	NC2 NC2-COMP-C-NEREIS-032719 3/27/2019 TBIO	NC2 NC2-COMP-D-NEREIS-032719 3/27/2019 TBIO	NC2 NC2-COMP-E-NEREIS-032719 3/27/2019 TBIO	NC3 NC3-COMP-A-NEREIS-032719 3/27/2019 TBIO	NC3 NC3-COMP-B-NEREIS-032719 3/27/2019 TBIO	NC3 NC3-COMP-C-NEREIS-032719 3/27/2019 TBIO	NC3 NC3-COMP-D-NEREIS-032719 3/27/2019 TBIO	NC3 NC3-COMP-E-NEREIS-032719 3/27/2019 TBIO
Conventional Parameters (%)																	
Lipids	--	**0.96**	**0.82**	**0.9**	**0.86**	**0.77**	**0.52**	**0.71**	**0.54**	**0.5**	**0.68**	**0.54**	**1.1**	**0.41**	**0.42**	**0.96**	**0.52**
Metals (mg/kg)																	
Mercury	1[1]	**0.0302 J**	**0.00628 J**	**0.0218 J**	**0.00519 J**	**0.023 J**	**0.0254 J**	**0.0239 J**	**0.0213 J**	**0.00924 J**	**0.0235 J**	**0.011 J**	**0.0197 J**	**0.0229 J**	**0.0253 J**	**0.00842 J**	**0.0259 J**

Notes:
All non-detect results are reported at the MDL.
USEPA Stage 2A data validation was completed by Anchor QEA.
Bold: detected result
Italicized: non-detected concentration is above one or more identified screening levels
J: estimated value
U: compound analyzed but not detected above detection limit
1. Action level for methyl mercury.

3.4.1 Comparison of Tissue Burdens to U.S. Food and Drug Administration Action Levels

A comparison of FDA action levels for poisonous or deleterious substances in fish and shellfish for human food is presented in Tables 23 through 26. The FDA action level for mercury is 1 mg/kg of methyl mercury. Methyl mercury is only a fraction of the total mercury concentration. All concentrations of mercury in tissues exposed to LNB federal channels sediments were less than this action level. The FDA action level for DDT and DDE (individually or in combination) is 5,000 µg/kg. All concentrations of DDTs in tissues exposed to LNB sediments were less than this action level. The FDA does not have action levels for PCBs or dibutyltin. Total PCB concentrations were compared to the FDA tolerance level of 2,000 µg/kg. All PCB concentrations in tissues exposed to federal channels sediments were less than this tolerance level. FDA actions levels were not exceeded or absent; therefore, results were also compared to tissue concentrations of organisms exposed to reference sediment.

3.4.2 Comparison of Tissue Burdens to Reference Sediment Tissue Burdens

Bioaccumulation data were analyzed by statistically comparing chemical concentrations in tissues of organisms exposed to project material to tissues of organisms exposed to reference sediment (Appendix F). Results of statistical analysis are presented in Tables 27 and 28.

3.4.2.1 Macoma nasuta

Mercury, four DDT derivatives (2,4′-DDD, 2,4′-DDE, 4,4′-DDD, and 4,4′-DDE), total DDTs, dibutyltin, several PCB congeners, and total PCBs were statistically elevated in *M. nasuta* tissue samples exposed to federal channels sediments. Mercury was statistically elevated in tissues from four DUs (Turning Basin and Main Channels 1, 2, and 3). The magnitudes of exceedances were low, with mean mercury concentrations ranging from 2.2 to 9.1 times greater than the reference. DDTs were statistically elevated in tissues from all DUs tested. Mean DDT derivative concentrations ranged from 1.8 to 80.3 times greater than the reference, while mean total DDT concentrations ranged from 7.8 to 17.3 times greater than the reference. Dibutyltin was statistically elevated in tissues from the Turning Basin. The mean dibutyltin concentration was 9.3 times greater than the reference. PCBs were statistically elevated in tissues from all DUs tested, except Bay Island South. Mean PCB congener concentrations ranged from 2.4 to 106 times greater than the reference, while mean total PCB concentrations ranged from 12.8 to 65.2 times greater than the reference.

3.4.2.2 Nereis virens

Three DDT derivatives (2,4′-DDE, 4,4′-DDD and 4,4′-DDE), total DDTs, several PCB congeners, and total PCBs were statistically elevated in *N. virens* tissue samples exposed to federal channels sediments. DDTs were statistically elevated in tissues from eight DUs (Main Channel North 2, 3, 4, and 5; and Bay Island North, Middle East and West, and South). Mean DDT derivative concentrations ranged from 2.9 to 55.4 times greater than the reference, while mean total DDT concentrations

ranged from 9.2 to 18.2 times greater than the reference. PCBs were statistically elevated in tissues from all DUs tested, except Bay Island South. Mean PCB congener concentrations ranged from 1.5 to 70.9 times greater than the reference, while mean total PCB concentrations ranged from 2.9 to 9.6 times greater than the reference.

3.4.3 Comparison of Tissue Burdens to Environmental Residue Effects Database

The comparison of day zero corrected project tissue concentrations to selected ERED TRVs is presented in Tables 27 and 28. All concentrations were less than selected ERED TRVs. A summary of the rationale for selection of each TRV is presented in Table 29.

Table 27
Summary of Statistically Elevated *Macoma nasuta* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Turning Basin	4,4'-DDE	µg/kg	2.2	0.22 U	4.3	7.58	0.0216	1.76	7.58	No relevant effects in ERED.	--	--
	Dibutyltin	µg/kg	0.75	0.36 U	0.367 U	3.42	0.0283	9.31	3.42	NOED: 48 µg/kg for reproduction in Atlantic dogwinkle *Nucella lapillus* (controlled laboratory study; single chemical exposure).	48	No
	Mercury	mg/kg	0.00371	0.00698	0.0046	0.0414	<.0001	9.10	0.0344	LOED: 8.0 mg/kg for development of the common slipper shell *Crepidula fornicata*.	8.0	No
	PCB005/008	µg/kg	0.15	0.07 U	0.071 U	0.432	0.0122	6.08	0.432	No relevant effects in ERED.	--	--
	PCB018	µg/kg	0.072	0.0355 U	0.0355 U	0.546	0.0122	15.4	0.55	No relevant effects in ERED.	--	--
	PCB028	µg/kg	0.034	0.017 U	0.0168 U	1.78	0.0122	106	1.78	No relevant effects in ERED.	--	--
	PCB033	µg/kg	0.13	0.06 U	0.061 U	1.12	0.0122	18.3	1.12	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	1.06	0.0122	19.2	1.06	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.063	0.0315 U	0.0313 U	1.8	0.0122	57.5	1.8	No relevant effects in ERED.	--	--
	PCB056	µg/kg	0.13	0.065 U	0.064 U	0.724	0.01	11.31	0.724	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	2.74	0.0122	54.8	2.74	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.06	0.03 U	0.0298 U	1.96	0.0122	65.8	1.96	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	1.2	0.0122	27.6	1.2	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.640	0.0122	11.6	0.640	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	1.12	0.0122	15.3	1.12	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.069 U	0.820	<.0001	11.9	0.820	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.061	0.0305 U	0.0303 U	1.42	0.0122	46.9	1.42	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	2.16	0.0122	44.2	2.16	No relevant effects in ERED.	--	--
	PCB105	µg/kg	0.055	0.0275 U	0.0273 U	0.694	0.0122	25.4	0.694	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.046	0.023 U	0.0229 U	1.98	0.0122	86.5	1.98	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	1.78	0.0122	16.9	1.78	No relevant effects in ERED.	--	--
	PCB128	µg/kg	0.1	0.05 U	0.05 U	0.198	0.0472	3.96	0.198	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.17	0.085 U	0.302	1.7	0.0122	5.63	1.7	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.095	0.047 U	0.120	1.32	0.0122	11.0	1.32	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	1.06	<.0001	21.8	1.06	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.068	0.0335 U	0.0336 U	0.340	0.0122	10.1	0.340	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.085	0.042 U	0.042 U	0.606	0.0122	14.4	0.606	No relevant effects in ERED.	--	--
	Total PCB Congeners (ND = 0)	µg/kg	0.087	0.095 U	0.474	30.9	0.0122	65.2	30.9	1,620 µg/kg: significant difference in embryo development of *Asterias rubens*.	162[4]	No
Main Channel North 1	4,4'-DDD	µg/kg	2.5	0.25 U	0.309	7.78	0.0074	25.2	7.78	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	2.3	0.22 U	4.3	15.2	0.0122	3.53	15.2	No relevant effects in ERED.	--	--
	Mercury	mg/kg	0.00356	0.0070	0.0046	0.0174	<.0001	3.82	0.0104	LOED: 8.0 mg/kg for development of the common slipper shell *C. fornicata*.	8	No
	PCB028	µg/kg	0.034	0.017 U	0.0168 U	0.712	0.0122	42.4	0.712	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.437	0.0216	7.95	0.437	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.692	0.0122	22.1	0.692	No relevant effects in ERED.	--	--
	PCB056	µg/kg	0.13	0.065 U	0.064 U	0.198	0.0367	3.09	0.198	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.970	0.0122	19.4	0.970	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.552	0.0122	18.5	0.552	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.406	0.0122	9.35	0.406	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.438	0.0122	7.96	0.438	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.622	0.0122	8.52	0.622	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.069 U	0.340	<.0001	4.93	0.340	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.676	0.0122	22.3	0.676	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	1.00	0.0122	20.5	1.00	No relevant effects in ERED.	--	--
	PCB105	µg/kg	0.055	0.0275 U	0.0273 U	0.358	0.0122	13.1	0.358	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.882	0.0122	38.5	0.882	No relevant effects in ERED.	--	--

Table 27
Summary of Statistically Elevated *Macoma nasuta* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Main Channel North 1	PCB118	µg/kg	0.085	0.042 U	0.105	0.740	0.0122	7.03	0.740	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	1.11	0.0122	3.68	1.11	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.1203	0.900	0.0119	7.48	0.900	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.788	<.0001	16.1	0.788	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.068	0.0335 U	0.0336 U	0.211	0.0216	6.27	0.211	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.042 U	0.042 U	0.426	0.0122	10.1	0.426	No relevant effects in ERED.	--	--
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	13.0	0.0122	27.3	13.0	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 2	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	0.908	0.0122	6.35	0.91	No relevant effects in ERED.	--	--
	2,4'-DDE	µg/kg	1	0.495 U	0.677	1.8	0.0367	2.66	1.8	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5	0.25 U	0.309	17.5	<.0001	56.6	17.5	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.4	0.22 U	4.3	32.2	0.0122	7.49	32.2	No relevant effects in ERED.	--	--
	Mercury	mg/kg	0.00371	0.0070	0.0046	0.0166	<.0001	3.65	0.0096	LOED: 8.0 mg/kg for development of the common slipper shell *C. fornicata.*	8.0	No
	PCB028	µg/kg	0.034	0.017 U	0.0168 U	0.732	0.0122	43.6	0.732	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.556	0.0122	10.1	0.556	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.063	0.0315 U	0.0313 U	0.766	0.0122	24.5	0.766	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.922	0.0122	18.4	0.922	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.06	0.03 U	0.0298 U	0.620	0.0122	20.8	0.620	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.402	0.0122	9.26	0.402	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.540	0.0122	9.82	0.540	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.652	0.0122	8.93	0.652	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.069 U	0.416	<.0001	6.03	0.416	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.061	0.0305 U	0.0303 U	0.750	0.0122	24.8	0.750	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	1.14	0.0122	23.4	1.14	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.046	0.023 U	0.0229 U	1.02	0.0122	44.4	1.02	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.828	0.0122	7.86	0.828	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.17	0.085 U	0.302	1.34	0.0122	4.44	1.34	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.095	0.047 U	0.120	1.05	0.0122	8.74	1.05	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.924	<.0001	18.9	0.924	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.068	0.0335 U	0.0336 U	0.278	0.0122	8.27	0.278	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.085	0.042 U	0.042 U	0.354	0.0122	8.43	0.354	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	52.3	<.0001	11.2	52.3	LD50: 2,690 µg/kg for mortality of the amphipod *Leptocheirus plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.087	0.095 U	0.474	14.0	0.0122	29.6	14.0	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 3	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	1.43	0.0122	9.97	1.43	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5.1	0.25 U	0.309	16.4	<.0001	53.1	16.4	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	0.22 U	4.3	26	0.0122	6.05	26	No relevant effects in ERED.	--	--
	Mercury	mg/kg	0.00363	0.0070	0.0046	0.0099	<.0001	2.18	0.0029	LOED: 8.0 mg/kg for development of the common slipper shell *C. fornicata.*	8.0	No
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.342	0.0122	6.22	0.342	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.546	0.0122	17.4	0.546	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.660	0.0122	13.2	0.660	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.436	0.0122	14.6	0.436	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.300	0.0122	6.91	0.300	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.450	0.0122	8.18	0.450	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.494	0.0122	6.77	0.494	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.069 U	0.326	<.0001	4.72	0.326	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.536	0.0122	17.7	0.536	No relevant effects in ERED.	--	--

Table 27
Summary of Statistically Elevated *Macoma nasuta* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Main Channel North 3	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.840	0.0122	17.2	0.840	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.716	0.0122	31.3	0.716	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.644	0.0122	6.12	0.644	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	1.05	0.0122	3.48	1.05	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.1203	0.812	0.0122	6.75	0.812	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.700	<.0001	14.3	0.700	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.068	0.0335 U	0.0336 U	0.195	0.0367	5.80	0.195	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.042 U	0.042 U	0.370	0.0122	8.81	0.370	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	45.3	<.0001	9.67	45.3	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	9.82	0.0122	20.7	9.82	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 4	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	1.10	0.0122	7.72	1.10	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5	0.25 U	0.309	12.6	<.0001	40.8	12.6	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.4	0.22 U	4.3	35.6	0.0122	8.28	35.6	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.252	0.0119	4.58	0.252	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.458	0.0122	14.6	0.458	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.418	0.0122	8.36	0.418	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.338	0.0122	11.3	0.338	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.203	0.0367	4.67	0.203	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.488	0.0119	8.87	0.488	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.318	0.0122	4.36	0.318	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.338	0.0122	11.2	0.338	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.594	0.0122	12.1	0.594	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.566	0.0122	24.7	0.566	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.460	0.0122	4.37	0.460	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	0.786	0.0122	2.60	0.786	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.120	0.682	0.0122	5.67	0.682	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.592	<.0001	12.1	0.592	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.042 U	0.042 U	0.203	0.0367	4.82	0.203	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	50.7	<.0001	10.8	50.7	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	6.82	0.0122	14.4	6.82	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 5	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	0.587	0.0216	4.10	0.587	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	2.5	0.25 U	0.309	6.8	0.0073	22.0	6.8	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	2.3	0.22 U	4.3	28	0.0122	6.51	28	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.156	0.0367	2.84	0.156	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.290	0.0122	9.27	0.290	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.396	0.0122	7.92	0.396	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.268	0.0122	8.99	0.268	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.440	0.0122	8.00	0.440	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.298	0.0122	4.08	0.298	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.342	0.0122	11.3	0.342	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.524	0.0122	10.7	0.524	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.498	0.0122	21.7	0.498	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.410	0.0122	3.89	0.410	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	0.730	0.0122	2.42	0.730	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.120	0.634	0.0122	5.27	0.634	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.546	<.0001	11.2	0.546	No relevant effects in ERED.	--	--

Table 27
Summary of Statistically Elevated *Macoma nasuta* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Main Channel North 5	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	36.3	<.0001	7.75	36.3	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	6.08	0.0122	12.8	6.08	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Bay Island North	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	0.671	0.0216	4.69	0.671	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5.1	0.25 U	0.309	11	<.0001	35.6	11	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	0.22 U	4.3	37	0.0122	8.60	37	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.360	0.0216	11.5	0.360	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.468	0.0122	9.36	0.468	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.286	0.0216	9.60	0.286	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.442	0.0122	8.04	0.442	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.366	0.0119	5.01	0.366	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.426	0.0122	14.1	0.426	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.600	0.0122	12.3	0.600	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.570	0.0122	24.9	0.570	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.450	0.0122	4.27	0.450	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	0.788	0.0122	2.61	0.788	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.120	0.678	0.0122	5.64	0.678	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.596	<.0001	12.2	0.596	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	50.4	<.0001	10.8	50.4	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus* .	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	6.57	0.0122	13.9	6.57	1,620 µg/kg: significant difference in embryo development of *A. rubens*	162[4]	No
Bay Island Middle East	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	2.17	0.0122	15.2	2.17	No relevant effects in ERED.	--	--
	2,4'-DDE	µg/kg	1	0.495 U	0.677	2.52	0.0122	3.72	2.52	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5.1	0.25 U	0.309	24.8	<.0001	80.3	24.8	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	0.22 U	4.3	51.6	0.0122	12.0	51.6	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.322	0.0122	5.85	0.322	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.504	0.0122	16.1	0.504	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.644	0.0122	12.9	0.644	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.061	0.03 U	0.0298 U	0.454	0.0122	15.2	0.454	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.294	0.0122	6.77	0.294	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.674	0.0122	12.3	0.674	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.458	0.0122	6.27	0.458	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.069 U	0.308	0.0007	4.46	0.308	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.0305 U	0.0303 U	0.454	0.0122	15.0	0.454	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.788	0.0122	16.1	0.788	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0229 U	0.764	0.0122	33.4	0.764	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.608	0.0122	5.77	0.608	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	0.085 U	0.302	1.04	0.0122	3.44	1.04	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.047 U	0.120	0.824	0.0122	6.85	0.824	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.768	<.0001	15.7	0.768	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.068	0.0335 U	0.0336 U	0.225	0.0367	6.69	0.225	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.042 U	0.042 U	0.260	0.0122	6.19	0.260	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	81.1	<.0001	17.3	81.1	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	0.095 U	0.474	9.62	0.0122	20.3	9.62	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Bay Island Middle West	2,4'-DDD	µg/kg	0.29	0.145 U	0.143 U	1.34	0.0122	9.40	1.34	No relevant effects in ERED.	--	--
	2,4'-DDE	µg/kg	1	0.495 U	0.677	2.68	0.0122	3.96	2.68	No relevant effects in ERED.	--	--

Table 27
Summary of Statistically Elevated *Macoma nasuta* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Bay Island Middle West	4,4'-DDD	µg/kg	5.1	0.25 U	0.309	20.6	<.0001	66.7	20.6	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	0.22 U	4.3	50	0.0122	11.6	50	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.063	0.0315 U	0.0313 U	0.492	0.0122	15.7	0.492	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.596	0.0122	11.9	0.596	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.06	0.03 U	0.0298 U	0.370	0.0122	12.4	0.370	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.088	0.0435 U	0.0434 U	0.241	0.0367	5.55	0.241	No relevant effects in ERED.	--	--
	PCB087	µg/kg	0.11	0.055 U	0.055 U	0.520	0.0122	9.45	0.520	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.386	0.0122	5.29	0.386	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.061	0.0305 U	0.0303 U	0.374	0.0122	12.3	0.374	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.099	0.049 U	0.0489 U	0.680	0.0122	13.9	0.680	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.046	0.023 U	0.0229 U	0.650	0.0122	28.4	0.650	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.085	0.042 U	0.105	0.498	0.0122	4.73	0.498	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.17	0.085 U	0.302	0.824	0.0122	2.73	0.824	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.095	0.047 U	0.120	0.754	0.0122	6.27	0.754	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.099	0.049 U	0.0489 U	0.606	<.0001	12.4	0.606	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	74.6	<.0001	15.9	74.6	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.087	0.095 U	0.474	7.80	0.0122	16.5	7.80	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Bay Island South	4,4'-DDD	µg/kg	5	0.25 U	0.309	10.5	<.0001	34.0	10.5	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	0.22 U	4.3	31.4	0.0122	7.30	31.4	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	0.495 U	4.69	43.2	<.0001	9.21	43.2	LD50: 2,690 µg/kg for mortality of the amphipod L. plumulosus.	134[3]	No

Notes:
Organics were normalized to percent lipids prior to statistical analysis.
U: non-detect; half the detection limit shown
1. If MDL differed between samples, maximum MDL is presented.
2. Tissue effects data from the ERED (USACE 2018)
3. An uncertainty factor of 20 was applied to ED50 and/or LD50 values to estimate LOED (USACHPPM 2000).
4. Full dose/response curve not measured; therefore, an uncertainty factor of 10 was applied to estimate LOED (Lin and Davis 2018; USACHPPM 2000).

Table 28
Summary of Statistically Elevated *Nereis virens* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Turning Basin	PCB018	µg/kg	0.084	0.036 U	0.0356 U	0.716	0.0122	20.1	0.716	No relevant effects in ERED.	--	--
	PCB028	µg/kg	0.039	0.017 U	0.0168 U	0.896	0.0122	53.3	0.896	No relevant effects in ERED.	--	--
	PCB044	µg/kg	0.1	0.044 U	0.0436 U	0.746	0.0122	17.1	0.746	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.13	0.055 U	0.055 U	0.748	0.0122	13.6	0.748	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.074	0.0315 U	0.0313 U	2.22	0.0122	70.9	2.22	No relevant effects in ERED.	--	--
	PCB056	µg/kg	0.15	0.065 U	0.063 U	0.49	0.0122	7.78	0.49	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.12	0.05 U	0.05 U	1.42	0.0122	28.4	1.42	No relevant effects in ERED.	--	--
	PCB070	µg/kg	0.07	0.03 U	0.0298 U	0.43	0.0122	14.4	0.43	No relevant effects in ERED.	--	--
	PCB074	µg/kg	0.1	0.044 U	0.0436 U	0.46	0.0122	10.6	0.46	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.17	0.075 U	0.073 U	1.6	0.0122	21.9	1.6	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.16	0.07 U	0.068 U	0.612	0.0119	9.00	0.612	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.071	0.24	0.0303 U	1.01	0.0122	33.3	0.77	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.12	0.31	0.145	1.94	0.0122	13.4	1.63	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.054	0.023 U	0.0228 U	1.46	0.0122	64.0	1.46	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.099	0.26	0.082	1.08	0.0122	13.2	0.816	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.2	1.1	0.866	2.32	<.0001	2.68	1.22	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.11	0.84	0.574	1.72	<.0001	3.00	0.88	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.11	0.38	0.280	1.32	<.0001	4.72	0.94	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.079	0.034 U	0.0338 U	0.343	0.0122	10.1	0.343	No relevant effects in ERED.	--	--
	PCB170	µg/kg	0.075	0.29	0.069	0.338	0.0216	4.87	0.048	No relevant effects in ERED.	--	--
	PCB183	µg/kg	0.13	0.26	0.123	0.33	<.0001	2.68	0.07	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.099	0.57	0.402	0.83	<.0001	2.06	0.26	No relevant effects in ERED.	--	--
	PCB206	µg/kg	0.23	0.095 U	0.095 U	0.212	0.0216	2.23	0.212	No relevant effects in ERED.	--	--
	Total PCB Congeners (ND = 0)	µg/kg	0.1	4.85	2.45	23.7	0.0122	9.64	18.8	1,620 µg/kg: significant difference in embryo development of *Asterias rubens* .	162[4]	No
Main Channel North 1	PCB049	µg/kg	0.11	0.055 U	0.055 U	0.344	0.0122	6.25	0.344	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.828	0.0122	26.5	0.828	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.658	0.0122	13.2	0.658	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.872	0.0122	11.9	0.872	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.068 U	0.304	0.0122	4.47	0.304	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.628	0.0122	20.7	0.388	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.145	1.07	0.0122	7.34	0.756	No relevant effects in ERED.	--	--
	PCB105	µg/kg	0.056	0.0275 U	0.0273 U	0.338	0.0216	12.4	0.338	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.71	0.0122	31.1	0.71	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.086	0.26	0.082	0.576	0.0122	7.06	0.316	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.92	<.0001	2.22	0.82	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.84	0.574	1.42	<.0001	2.47	0.58	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	1.08	<.0001	3.87	0.704	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.069	0.034 U	0.0338 U	0.267	0.0216	7.90	0.267	No relevant effects in ERED.	--	--
	PCB170	µg/kg	0.065	0.29	0.069	0.292	0.0216	4.21	0.002	No relevant effects in ERED.	--	--

Table 28
Summary of Statistically Elevated *Nereis virens* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Main Channel North 1	PCB183	µg/kg	0.11	0.26	0.123	0.308	0.0004	2.50	0.048	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.57	0.402	0.716	<.0001	1.78	0.146	No relevant effects in ERED.	--	--
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	13.3	0.0122	5.42	8.46	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 2	2,4'-DDE	µg/kg	0.99	2	0.918	2.64	0.0122	2.88	0.64	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	2.5	0.255 U	0.542	20.6	<.0001	38.0	20.6	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	2.2	1.8	1.52	8.3	0.001	5.47	6.5	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.063	0.0315 U	0.0313 U	0.864	0.0122	27.6	0.864	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.568	0.0122	11.4	0.568	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.83	0.0122	11.4	0.83	No relevant effects in ERED.	--	--
	PCB097	µg/kg	0.14	0.07 U	0.068 U	0.31	0.0122	4.56	0.31	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.061	0.24	0.0303 U	0.52	0.0122	17.2	0.28	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.098	0.31	0.145	0.96	0.0122	6.61	0.65	No relevant effects in ERED.	--	--
	PCB105	µg/kg	0.055	0.0275 U	0.0273 U	0.388	0.0122	14.21	0.388	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.046	0.023 U	0.0228 U	0.632	0.0122	27.7	0.632	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.084	0.26	0.082	0.478	0.0122	5.86	0.218	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.17	1.1	0.866	1.76	<.0001	2.03	0.66	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.094	0.84	0.574	1.28	<.0001	2.23	0.44	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.098	0.38	0.280	1	<.0001	3.57	0.62	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.067	0.034 U	0.0338 U	0.304	0.0122	8.99	0.304	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.084	0.57	0.402	0.68	0.0001	1.69	0.11	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	31.5	<.0001	12.0	27.7	LD50: 2,690 µg/kg for mortality of the amphipod *Leptocheirus plumulosus* .	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.086	4.85	2.45	12.2	0.0122	4.98	7.38	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel North 3	4,4'-DDD	µg/kg	2.6	0.255 U	0.542	20.2	<.0001	37.3	20.2	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	2.2	1.8	1.52	7.38	0.0017	4.87	5.58	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.708	0.0122	22.6	0.708	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.436	0.0122	8.72	0.436	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.664	0.0122	9.10	0.664	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.478	0.0122	15.8	0.238	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.1453	0.798	0.0122	5.49	0.488	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.528	0.0122	23.2	0.528	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.086	0.26	0.082	0.482	0.0122	5.91	0.222	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.74	<.0001	2.01	0.64	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.84	0.574	1.4	<.0001	2.44	0.56	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	0.956	<.0001	3.42	0.576	No relevant effects in ERED.	--	--
	PCB151	µg/kg	0.069	0.034 U	0.0338 U	0.241	0.0122	7.13	0.241	No relevant effects in ERED.	--	--
	PCB183	µg/kg	0.11	0.26	0.123	0.302	0.0014	2.46	0.042	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.57	0.402	0.7	<.0001	1.74	0.13	No relevant effects in ERED.	--	--

Table 28
Summary of Statistically Elevated *Nereis virens* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Main Channel North 3	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	29.2	<.0001	11.1	25.4	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	10.9	0.0122	4.42	6.00	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Main Channel 4	4,4'-DDD	µg/kg	5.1	0.255 U	0.542	17.8	<.0001	32.8	17.8	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	1.8	1.52	8.82	<.0001	5.82	7.02	No relevant effects in ERED.	--	--
	PCB018	µg/kg	0.073	0.036 U	0.0356 U	0.072	0.0361	2.03	0.072	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.498	0.0122	15.9	0.498	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.378	0.0122	7.56	0.378	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.46	0.0119	6.30	0.46	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.312	0.0122	10.3	0.072	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.1453	0.554	0.0122	3.81	0.244	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.38	0.0122	16.7	0.38	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.086	0.26	0.082	0.32	0.0122	3.92	0.06	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.48	<.0001	1.71	0.38	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.84	0.574	1.00	<.0001	1.75	0.162	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	0.798	<.0001	2.85	0.418	No relevant effects in ERED.	--	--
	PCB183	µg/kg	0.11	0.26	0.123	0.312	<.0001	2.54	0.052	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.57	0.402	0.6	<.0001	1.49	0.03	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	28.0	<.0001	10.6	24.2	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	7.60	0.0122	3.10	2.748	1,620 µg/kg: significant difference in embryo development of *A. rubens* .	162[4]	No
Main Channel North 5	4,4'-DDE	µg/kg	4.5	1.8	1.52	7.48	0.0133	4.93	5.68	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.408	0.0122	13.0	0.408	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.408	0.0122	5.59	0.408	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.28	0.0122	9.24	0.04	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.145	0.542	0.0122	3.73	0.232	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.402	0.0122	17.6	0.402	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.36	0.0047	1.57	0.26	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.84	0.574	1.00	0.0007	1.75	0.164	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	0.694	0.0188	2.48	0.314	No relevant effects in ERED.	--	--
	PCB180	µg/kg	0.043	0.021 U	0.021 U	0.56	0.0122	26.7	0.56	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.57	0.402	0.596	0.0129	1.48	0.026	No relevant effects in ERED.	--	--
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	7.16	0.0122	2.92	2.31	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Bay Island North	4,4'-DDD	µg/kg	5.1	0.255 U	0.542	13.6	0.0067	25.1	13.6	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	1.8	1.52	8.72	0.0035	5.75	6.92	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.522	0.0122	16.7	0.522	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.1	0.05 U	0.05 U	0.29	0.0216	5.80	0.29	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.546	0.0122	7.48	0.546	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.304	0.0122	10.0	0.064	No relevant effects in ERED.	--	--

Table 28
Summary of Statistically Elevated *Nereis virens* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Bay Island North	PCB101	µg/kg	0.1	0.31	0.145	0.64	0.0122	4.40	0.33	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.522	0.0122	22.9	0.522	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.086	0.26	0.082	0.354	0.0122	4.34	0.094	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.54	0.0022	1.78	0.44	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.096	0.84	0.574	1.18	0.0001	2.06	0.34	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	0.88	0.0022	3.14	0.5	No relevant effects in ERED.	--	--
	PCB170	µg/kg	0.065	0.29	0.069	0.310	0.0367	4.47	0.0203	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	24.3	0.0031	9.22	20.5	LD50: 2,690 µg/kg for mortality of the amphipod L. plumulosus.	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	8.58	0.0122	3.50	3.73	1,620 µg/kg: significant difference in embryo development of *A. rubens* .	162[4]	No
Bay Island Middle East	2,4'-DDE	µg/kg	1	2	0.918	2.8	0.0122	3.05	0.8	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5.1	0.255 U	0.542	30	<.0001	55.4	30	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	1.8	1.52	15	<.0001	9.89	13.2	No relevant effects in ERED.	--	--
	PCB049	µg/kg	0.12	0.055 U	0.055 U	0.286	0.0122	5.20	0.286	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.065	0.0315 U	0.0313 U	0.642	0.0122	20.5	0.642	No relevant effects in ERED.	--	--
	PCB066	µg/kg	0.11	0.05 U	0.05 U	0.426	0.0122	8.52	0.426	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.704	0.0122	9.64	0.704	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.063	0.24	0.0303 U	0.426	0.0122	14.1	0.186	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.1453	0.858	0.0122	5.91	0.548	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.481	0.0122	21.1	0.481	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.74	<.0001	2.01	0.64	No relevant effects in ERED.	--	--
	PCB138/158	µg/kg	0.097	0.84	0.574	1.34	<.0001	2.33	0.5	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	1.03	<.0001	3.68	0.65	No relevant effects in ERED.	--	--
	PCB170	µg/kg	0.065	0.29	0.069	0.382	0.0216	5.50	0.092	No relevant effects in ERED.	--	--
	PCB180	µg/kg	0.043	0.021 U	0.021 U	0.758	0.0122	36.1	0.758	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.087	0.57	0.402	0.668	0.0006	1.66	0.098	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	47.8	<.0001	18.2	44	LD50: 2,690 µg/kg for mortality of the amphipod *L.* plumulosus.	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.089	4.85	2.45	11.4	0.0122	4.65	6.55	1,620 µg/kg: significant difference in embryo development of *A. rubens* .	162[4]	No
Bay Island Middle West	2,4'-DDE	µg/kg	1	2	0.918	3.2	0.0216	3.49	1.2	No relevant effects in ERED.	--	--
	4,4'-DDD	µg/kg	5.1	0.255 U	0.542	21	<.0001	38.7	21	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	1.8	1.52	10.3	0.0001	6.82	8.54	No relevant effects in ERED.	--	--
	PCB052	µg/kg	0.064	0.0315 U	0.0313 U	0.606	0.0122	19.4	0.606	No relevant effects in ERED.	--	--
	PCB095	µg/kg	0.15	0.075 U	0.073 U	0.6	0.0122	8.22	0.6	No relevant effects in ERED.	--	--
	PCB099	µg/kg	0.062	0.24	0.0303 U	0.334	0.0122	11.0	0.094	No relevant effects in ERED.	--	--
	PCB101	µg/kg	0.1	0.31	0.1453	0.69	0.0122	4.75	0.38	No relevant effects in ERED.	--	--
	PCB110	µg/kg	0.047	0.023 U	0.0228 U	0.516	0.0122	22.6	0.516	No relevant effects in ERED.	--	--
	PCB118	µg/kg	0.086	0.26	0.082	0.384	0.0122	4.71	0.124	No relevant effects in ERED.	--	--
	PCB132/153	µg/kg	0.18	1.1	0.866	1.54	0.0004	1.78	0.44	No relevant effects in ERED.	--	--

Table 28
Summary of Statistically Elevated *Nereis virens* Tissue Residues

Dredge Unit	Analyte	Units	MDL[1]	Day 0 Tissue Concentration	Reference Mean Tissue Concentration	Project Area Mean Tissue Concentration	P Value	Project Area Mean: Reference Mean Ratio	Day 0 Corrected Project Area Mean Tissue Concentration	ERED[2]	TRV	Conclusion: Project Tissue > TRV?
Bay Island Middle West	PCB138/158	µg/kg	0.096	0.84	0.574	1.11	<.0001	1.94	0.274	No relevant effects in ERED.	--	--
	PCB149	µg/kg	0.1	0.38	0.280	0.836	0.0015	2.99	0.456	No relevant effects in ERED.	--	--
	PCB170	µg/kg	0.065	0.29	0.069	0.316	0.0216	4.55	0.026	No relevant effects in ERED.	--	--
	PCB187	µg/kg	0.086	0.57	0.402	0.644	0.0027	1.60	0.074	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	34.5	<.0001	13.1	30.7	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No
	Total PCB Congeners (ND = 0)	µg/kg	0.088	4.85	2.45	8.93	0.0122	3.64	4.08	1,620 µg/kg: significant difference in embryo development of *A. rubens.*	162[4]	No
Bay Island South	4,4'-DDD	µg/kg	5.1	0.255 U	0.542	13.9	0.0017	25.6	13.9	No relevant effects in ERED.	--	--
	4,4'-DDE	µg/kg	4.5	1.8	1.52	10.4	<.0001	6.85	8.58	No relevant effects in ERED.	--	--
	Total DDTs (ND = 0)	µg/kg	0.29	3.8	2.63	26.1	0.0003	9.92	22.3	LD50: 2,690 µg/kg for mortality of the amphipod *L. plumulosus.*	134[3]	No

Notes:

Organics were normalized to percent lipids prior to statistical analysis.

U: non-detect; half the detection limit shown

1. If MDL differed between samples, maximum MDL is presented.

2. Tissue effects data from the ERED (USACE 2018)

3. An uncertainty factor of 20 was applied to ED50 and/or LD50 values to estimate LOED (USACHPPM 2000).

4. Full dose/response curve not measured; therefore, an uncertainty factor of 10 was applied to estimate LOED (Lin and Davis 2018; USACHPPM 2000).

Table 29

Summary of Rationale for Selection of Toxicity Reference Values

Analyte	ERED[1]	TRV	Rationale
2,4'-DDD	No relevant effects in ERED	--	No marine invertebrate species in ERED
2,4'-DDE	No relevant effects in ERED	--	No marine invertebrate species in ERED
4,4'-DDD	No relevant effects in ERED	--	No marine invertebrate species in ERED
4,4'-DDE	No relevant effects in ERED	--	No marine invertebrate species in ERED
Total DDTs	LD50: 2,690 µg/kg for mortality of the amphipod *Leptocheirus plumulosus*	134 µg/kg[2]	TRV selected by Lin and Davis (2018) for San Francisco Bay
Dibutyltin	LOED: 18 µg/kg for imposex in gastropod *Hexaplex trunculus* (field study; exposure to mixture of organotins in sediment)	--	TRV selected by USEPA in 2017 (Anchor QEA 2017b). Following review of Pellizzato et al. (2004), it was determined that this was a field study in which gastropods were exposed to a mixture of organotins in situ; therefore, it was not clear whether some or all of the organotins or other confounding factors were the cause of the observed imposex (Anchor QEA 2017b). The updated ERED (2018) correlates observed effects in this study to tributyltin; therefore, this TRV has been removed.
	NOED: 48 µg/kg for reproduction in Atlantic dogwinkle *Nucella lapillus* (controlled laboratory study; single chemical exposure)	48 µg/kg	Although the endpoint documented is the NOED, which is not the preferred endpoint, the study involved controlled, single chemical exposures in the laboratory with a sensitive gastropod; results showed no effects associated with a water exposure (NOED = 48 µg/kg) or following injection with dibutyltin (NOED = 226 µg/kg).
Mercury	LOED: 8.0 mg/kg for development of the common slipper shell *Crepidula fornicata*.	8.0 mg/kg	Selected based on lowest LOED in ERED for marine invertebrate with an ecologically relevant effect (i.e., growth, development survival, reproduction); whole body measurement
PCB005/008	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB018	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB028	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB033	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB044	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB049	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB052	No relevant effects in ERED	--	No marine invertebrate species in ERED
PCB056	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB066	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB070	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB074	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB087	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB095	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB097	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB099	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB101	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED

Table 29

Summary of Rationale for Selection of Toxicity Reference Values

Analyte	ERED[1]	TRV	Rationale
PCB105	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB110	No relevant effects in ERED	--	No data for any aquatic organisms in ERED.
PCB118	No relevant effects in ERED	--	Only biochemical effects measured in marine invertebrate species (i.e., *Asteria rubens*)
PCB128	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED.
PCB132/153	No relevant effects in ERED	--	PCB153: Only biochemical effects measured in marine invertebrate species (i.e., *A. rubens*)
PCB138/158	No relevant effects in ERED	--	PCB138: Only marine invertebrate species in ERED was mussel (*Mytilus galloprovincialis*); effects were observed only for non-ecologically relevant (i.e., digestion) endpoints at 1,580 µg/kg.
PCB149	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB151	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB170	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB180	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB183	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB187	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
PCB206	No relevant effects in ERED	--	No data for any aquatic invertebrates in ERED
Total PCB Congeners	1,620 µg/kg: significant difference in embryo development of *A. rubens*	162 µg/kg[3]	TRV selected by Lin and Davis (2018). Total PCBs based on Clophen A50. Clophen A50 is similar to Aroclor 1254, which is representative of PCB congener profile in San Francisco Bay (Lin and Davis 2018).

Notes:

1. Tissue effects data from the ERED (USACE 2018)

2. An uncertainty factor of 20 was applied to ED50 and/or LD50 values to estimate LOED (USACHPPM 2000).

3. Full dose/response curve not measured; therefore, an uncertainty factor of 10 was applied to estimate LOED (Lin and Davis 2018; USACHPPM 2000).

4 Quality Assurance/Quality Control

A review of analytical results was conducted to evaluate the laboratories' performance in meeting quality assurance/quality control (QA/QC) guidelines outlined in the SAP (Anchor QEA 2017a).

4.1 Physical and Chemical Analyses of Sediment

The data validation reports prepared by Anchor QEA for physical and chemical analyses of sediment are presented in Appendix G. Samples were analyzed within the appropriate holding times, with only minor exceptions. Mercury analysis on individual core samples from the January 2018 sampling event was performed past the 28-day hold time for USEPA method 7471A; however, samples were stored frozen from the time of sample receipt at the laboratory until extraction. Based on the State Water Resources Control Board (SWRCB) Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Program Plan's Measurement Quality Objectives (SWRCB 2017), a 1-year hold time is allowed for mercury, if samples are stored frozen and analyzed within 14 days of thawing; therefore, this deviation is not expected to affect the overall results.

Generally, QA/QC sample results were within the project-specified control limits, with the following exceptions:

- Reference and composite sediment from January 2018 sampling event:
  - Selenium was detected in the method blank associated with sample LA3-REF, and chromium was detected in the method blank associated with sample BIN-COMP. Associated sample results were significantly greater than (five times) the concentrations in the method blanks, so no data were qualified.
  - The pyrethroid surrogate dibutyl chlorendate percent recovery value was below the control limit for sample BIN-COMP. Associated results were qualified to indicate a potentially low bias.
  - The matrix spike (MS) percent recovery value for TOC exceeded the control limit for sample BIN-COMP. Associated results were qualified to indicate a potentially high bias.
  - The matrix spike duplicate (MSD) percent recovery values for 4,4'-DDT and methoxychlor were below the control limit for sample LA3-REF, and the MS/MSD relative percent difference (RPD) values exceeded the control limit. The MS/MSD RPD value for 4,4'-DDD also exceeded the control limit for LA3-REF. Parent sample results were qualified to indicate a potentially low bias.
  - 4,4'-DDE did not recover in the MS and MSD for sample BIS-COMP. The sample concentration was greater than four times the spike concentration, so no data were qualified. Endrin aldehyde also did not recover in the MS and MSD for sample BIS-COMP. This compound was not detected in the parent sample, so the result was rejected.

  - The MS and MSD percent recovery values for 4,4′-DDD, 4,4′-DDE, and heptachlor epoxide exceeded the control limit for sample BIN-COMP. The parent sample result for 4,4′-DDD was qualified to indicate a potentially high bias. The sample concentration for 4,4′-DDE was greater than four times the spike concentration and heptachlor epoxide was not detected; therefore, no data were qualified.
  - The MS and MSD percent recovery values for tributyltin were below the control limit for sample BIMW-COMP. The parent sample result was qualified to indicate a potentially low bias.
  - The MS and/or MSD percent recovery values for several pyrethroids exceeded the control limit on sample BIS-COMP. Cyfluthrin was detected in the parent sample and was qualified to indicate a potentially high bias.
  - The MS/MSD RPD values for allethrin and resmethrin/bioresmethrin exceeded the control limit for sample EC-COMP. These compounds were not detected in the parent sample, so no data were qualified. The MSD percent recovery value for fluvinate was below the control limit for sample EC-COMP. The parent sample result was qualified to indicate a potentially low bias.
- Individual core samples from the January 2018 sampling event:
  - The pesticide surrogate decachlorobiphenyl percent recovery value exceeded the control limit for sample BIN-06. No data were qualified because the sample was analyzed at a high dilution.
  - The MSD percent recovery value for 4,4′-DDT was below the control limit for sample MCN1-03, and the MS/MSD RPD value exceeded the control limit. The MS and MSD percent recovery values for 4,4′-DDT were below 20% for sample BIS-03. Parent sample results were qualified to indicate a potentially low bias.
- Reference, composite and Individual core samples from the January 2019 sampling event:
  - The laboratory control sample (LCS) and laboratory control sample duplicate percent recovery values for tributyltin were below the control limit. Associated results were qualified to indicate a potentially low bias.
  - The LCS percent recovery values for benzo(k)fluoranthene, 1-methylnaphthalene, and pyrene were below the control limit. Associated results were qualified to indicate a potentially low bias.
  - The MS percent recovery value for naphthalene was below the control limit for sample NC2-04. The parent sample result was qualified to indicate a potentially low bias.
  - The MS and/or MSD percent recovery values for several pyrethroids and pesticides were above the control limit for sample LA3-REF. The parent sample results for 4,4′-DDD and 4,4′-DDE were qualified to indicate a potentially high bias. Other analytes were not detected in the parent sample, so no data were qualified.

- The MS and/or MSD percent recovery values for chromium, zinc, and lead were above the control limit for sample LA3-REF. Associated results were qualified to indicate a potentially high bias.
- The MS and/or MSD percent recovery values for several pyrethroids were above the control limit for samples NC3-04 and/or NC2-COMP. Parent sample results were not detected, so no data were qualified.
- The MS and MSD percent recovery values for zinc were above the control limit for sample LA3-REF. Associated results were qualified to indicate a potentially high bias.
- The MS and/or MSD percent recovery values for aldrin and 4,4'-DDE were below the control limit for sample NC3-04. Parent sample results were qualified to indicate a potentially low bias.
- The MS and/or MSD percent recovery values for methoxychlor and 4,4'-DDE were outside the control limit for sample NC2-COMP. Parent sample results were qualified to indicate they are estimated.
- The MS and/or MSD percent recovery values for several PAHs were below the control limit for samples NC3-04 and/or NC2-COMP. Parent sample results were qualified to indicate a potentially low bias.

Results of this assessment concluded that most data were acceptable as reported; all other data were acceptable as qualified, except for one endrin aldehyde result. Endrin aldehyde did not recover in the MS, MSD, or sample BIS-COMP, so this result was rejected. The sediment data reviewed from LNB federal channels met the data quality objective of 95% completeness.

4.2 Biological Testing

Biological testing of LNB federal channels sediments incorporated standard QA/QC procedures, consistent with OTM (USEPA/USACE 1991) and ITM (USEPA/USACE 1998) guidelines.

Sediments were stored at 4°C plus or minus 2°C and used within the 8-week holding period. All test organism responses within the negative (laboratory) controls met acceptability criteria, except one SPP testing using *M. beryllina* (initiated on February 27, 2019). Survival in the laboratory control (88%) was slightly less than control acceptability criterion of 90%; therefore, results were conservatively compared to the site water control (94%). All water quality conditions were within the appropriate limits. Raw water quality data are provided in Appendix D.

All SP reference toxicant tests LC_{50} values were within two standard deviations of the laboratory mean, indicating that sensitivity of test organisms was normal. However, amphipod control survival was less than 90% for each reference toxicant test associated with the January 2018 sampling event. Although control survival was reduced, the response to both toxicants (cadmium chloride and ammonium chloride) was normal based on historical tests, and mean survival in the laboratory

controls associated with project sediments met acceptability criterion. All SPP reference toxicant tests LC_{50} and/or EC_{50} values were within two standard deviations of the laboratory mean, with two exceptions. The LC_{50} value of one *A. bahia* reference toxicant test (initiated on February 21, 2018; 160.2 micrograms per liter [µg/L]) was below the control limit (175.9 µg/L), indicating organisms were slightly more sensitive when compared to historical tests. Therefore, if test performance was affected, these organisms would have shown a greater level of toxicity than other batches. The LC_{50} value of one *M. beryllina* reference toxicant test (initiated on February 22, 2018; 266.7 µg/L) was slightly above the control limit (266 µg/L), indicating organisms may have been slightly less sensitive when compared to historical tests. These minor deviations are not expected to affect the overall results.

As discussed in Section 2.3, interstitial ammonia concentrations were measured on project sediments prior to testing. Ammonia concentrations in composite samples from Bay Island North (21.7 mg/L), Bay Island Middle East (26.1 mg/L), Bay Island Middle West (27.8 mg/L), and Bay Island South (26.1 mg/L) were at levels of potential concern for the amphipod SP test (greater than 15 mg/L; USACE et al. 2001). Test sediments were purged to reduce ammonia concentrations prior to testing. In addition, a water-only ammonia reference toxicant test was conducted with the amphipod test to evaluate the contribution of elevated ammonia concentrations on test organism survival. An ammonia reference toxicant test was also run with the bivalve larval development bioassay due to the sensitivity of *M. galloprovincialis* to elevated ammonia concentrations. As described in Section 3.2.2, ammonia concentrations in the 100% elutriate treatments from Bay Island Middle East and West, Bay Island South, and Main Channel North 3 and 4 (3.8 to 10.5 mg/L) exceeded the NOEC in the associated ammonia reference toxicant tests (3.5 and 4.0 mg/L), indicating that ammonia likely contributed to the abnormal development of *M. galloprovincialis* in these samples.

In BP tests, mean survival of *N. virens* was slightly reduced in composite samples from Newport Channel 2 and 3 (66% and 76%, respectively). Upon arrival, test organisms appeared stressed; however, organisms were deemed acceptable for use based on low mortality, activity level, and overall size. Because reference toxicant tests are not performed with BP tests, the sensitivity of test organisms could not be evaluated. Although survival was somewhat reduced, sufficient tissue mass was available for the required chemical analysis; therefore, test acceptability criteria were met.

4.3 Chemical Analysis of Tissue Residues

The data validation reports prepared by Anchor QEA for chemical analysis of tissue residues are presented in Appendix G. Samples were analyzed within the appropriate holding times, with only minor exceptions. Mercury analysis for samples from the January 2018 sampling event was performed past the 28-day hold time for USEPA method 7471A; however, samples were stored frozen from the time of sample receipt at the laboratory until extraction. Based on the SWRCB SWAMP Quality Assurance Program Plan's Measurement Quality Objectives (SWRCB 2017), a 1-year hold time is allowed for

mercury, if samples are stored frozen and analyzed within 14 days of thawing; therefore, this deviation is not expected to affect the overall results.

Generally, QA/QC sample results were within the project-specified control limits, with the following exceptions:

- The MS and/or MSD percent recovery values for mercury were below the control limit for samples MCN3-COMP-D-NEREIS, BIMW-COMP-T-M-D-NEREIS, T0-A-NEREIS-022619, and NC3-COMP-D-NEREIS. Associated results were qualified to indicate a potentially low bias.
- 4,4′-DDD did not recover in the MS and MSD for sample MCN4-COMP-B-MACOMA. The parent sample result was qualified to indicate a potentially low bias.
- 4,4′-DDD exceeded the control limit and did not recover in the MSD for sample MCN4-COMP-E-MACOMA. The associated result was qualified to indicate an estimated concentration. The MS percent recovery value for 4,4′-DDT also exceeded the control limit for sample MCN4-COMP-E-MACOMA. This compound was not detected in the parent sample, so no data were qualified.
- The MS and MSD percent recovery values for 4,4′-DDD, 4,4′-DDE, and 4,4′-DDT exceeded the control limit for sample BIS-COMP-D-MACOMA. Parent sample results for 4,4′-DDD and 4,4′-DDE were qualified to indicate a potentially high bias. 4,4′-DDT was not detected in the parent sample, so no data were qualified.
- The MS percent recovery value for 4,4′-DDT exceeded the control limit for sample BIS-COMP-E-MACOMA. This compound was not detected in the parent sample, so no data were qualified.

Results of this assessment concluded that most data were acceptable as reported; all other data were acceptable as qualified. The tissue data reviewed from LNB federal channels met the data quality objective of 95% completeness.

5 Discussion

LNB federal channels sediments were tested to determine suitability for ocean disposal at LA-3 ODMDS. In addition, sediment from the Entrance Channel was evaluated to determine compatibility for nearshore placement along beaches north of the harbor entrance and up to the Santa Ana River. Testing for ocean disposal included physical and chemical analyses and biological testing in accordance with guidelines specified in the OTM (USEPA/USACE 1991). To support the evaluation for nearshore placement, grain size data were collected from Newport Pier to the Newport Bay entrance channel to establish a grain size envelope for the nearshore receiver site.

5.1 Evaluation for Nearshore Placement

Sediments from the Entrance Channel and nearshore receiver site were analyzed for grain size to determine compatibility for nearshore placement. A grain size envelope was developed using the coarsest and finest gradation curves from the receiver site. Source material samples were plotted against the grain size envelope to determine compatibility. The grain size distributions for the Entrance Channel fit within the grain size envelope, and percent fines of all stations were within 10% of the finest receiver site sample. These results indicate the sediment from the Entrance Channel is compatible with the nearshore receiver site.

Composite sediment chemistry results indicated that sediment from the Entrance Channel is clean, with all concentrations less than the ERL. SP and SPP testing indicated that sediment from the Entrance Channel is not acutely toxic to marine organisms. Due to the high percentage of sand (98.12%) and low concentrations of contaminants, tissue analysis was not required. Based on the results of testing, sediment from the Entrance Channel should be considered suitable for nearshore placement.

5.2 Evaluation for Ocean Disposal

5.2.1 Turning Basin, Main Channel North, Bay Island, and the Entrance Channel

Sediment core sampling was conducted within the Turning Basin, Main Channel North, Bay Island, and the Entrance Channel in January 2018. Sediment from all DUs were evaluated for ocean disposal. Sediment cores were collected at 48 stations, and 11 composite samples were created for physical and chemical analyses and biological testing. Based on composite sediment chemistry results, potential contaminants of concern included mercury, DDTs, dibutyltin, and PCBs. Mercury exceeded the ERM value in sediment from the Turning Basin and Main Channel North 1, 2, and 3. Total DDTs exceeded the ERM value in all DUs, except the Entrance Channel. Total PCBs exceeded the ERM in the Turning Basin. Dibutyltin ranged from non-detect to 40 µg/kg, with the highest concentration measured in the Turning Basin.

Based on composite sediment chemistry results, individual core samples were analyzed for mercury, DDTs, and PCBs, as requested by USEPA (Table 6). Mercury exceeded the USEPA-recommended threshold of 1 mg/kg at several stations within the Turning Basin and Main Channel North 1, 2, and 3 (Figure 18). Total DDTs exceeded the ERM value at all stations, except MCN3-04 and BIN-03 (Figure 19). Total PCBs exceeded the ERM value at three stations within the Turning Basin (Figure 20).

No toxicity was observed during SP testing with amphipods or polychaetes. Survival was greater than 90% in all test treatments. During SPP testing, sediment from Bay Island Middle East, Bay Island Middle West, Bay Island South, and Main Channel North 3 and 4 resulted in an effect on the development of *M. galloprovincialis*. Although ammonia likely contributed to the observed toxicity in these samples and is not a contaminant of concern, STFATE modeling was performed to demonstrate LPC compliance. Based on STFATE modeling, LNB federal channel sediments do not pose a toxicity risk to water column organisms after discharge. BP testing and tissue chemistry indicated significant bioaccumulation of mercury, dibutyltin, DDTs, and PCBs when compared to reference sediment; however, all concentrations were less than FDA action levels and selected TRVs that have been shown to cause toxicity to marine invertebrates. These results indicate that it is unlikely that exposure to LNB federal channel sediments would cause impairment to marine organisms.

The SAPR for Turning Basin, Main Channel North, Bay Island, and the Entrance Channel was initially presented to the SC-DMMT in July 2018. At this meeting, USEPA expressed concerns regarding mercury and PCB concentrations but indicated no material would be excluded from ocean disposal due to DDT concentrations. USEPA requested supplemental information to support a suitability determination, including mass loading calculations and a compilation of historical data from Newport Bay. Mass loading calculations and a compilation of historical data were provided to USEPA in April 2019.

The data compilation consists of a comprehensive summary of past data from Newport Bay, including historical sediment mercury, DDT, and PCB data; bioassay testing data; and bioaccumulation tissue data. The data compilation was developed using historical data from 2003 to 2019, including dredge material evaluations, post-dredge sediment sampling investigations, and a feasibility study (i.e., Rhine Channel). The data compilation is presented in Appendix H.

Mass loadings of mercury and PCBs were calculated for each DU. Mass loading calculations are presented in Appendix I. The calculations show that approximately 50% of the mercury loadings and nearly 40% of the total PCB loadings are attributed to Turning Basin and Newport Channel 1 DUs. As previously discussed, Newport Channel 1 (Stations NC1-01 and NC1-02) was eliminated from the evaluation for ocean disposal based on elevated mercury concentrations in individual cores.

5.2.2 Newport Channel

Newport Channel was not initially included in this sediment characterization program or the previous federal channels investigation in 2009 (Newfields 2009) due to historical contamination and amphipod toxicity in 2003 and 2006 (Weston 2007). During the federal channels sampling in January 2018, exploratory sampling was conducted within Newport Channel and results were cleaner than expected. Based on these results, the City expanded the federal channels characterization to include Newport Channel.

Sediment core sampling was conducted within Newport Channel in January 2019. Sediment cores were collected at 12 stations within three DUs. Sediment from each core was submitted for physical and chemical analyses. Based on individual core sediment chemistry results, two composite samples (NC2-COMP and NC3-COMP) were created in coordination with USEPA for physical and chemical analyses and biological testing. Stations NC1-01 and NC1-02 were eliminated from the sediment characterization for ocean disposal due to elevated mercury.

Based on composite sediment chemistry results, potential contaminants of concern included mercury. No toxicity was observed during SP testing with amphipods or polychaetes. Survival was greater than 90% in all test treatments. During SPP testing, no toxicity was observed with LC_{50} and/or EC_{50} values greater than 100% for all tests. For BP testing and tissue chemistry, all mercury concentrations were less than the FDA action level. All *N. virens* tissue concentrations were less than the time zero sample. *N. virens* and *M. nasuta* tissue concentrations were not statistically elevated when compared to the reference; therefore, no further evaluation of tissue samples was not performed. These results indicate that it is unlikely that exposure to Newport Channel 2 and 3 sediments would cause impairment to marine organisms.

6 Conclusions

Physical, chemical, and biological analyses were conducted to evaluate the suitability of LNB federal channels sediments for ocean disposal. In addition, sediment from the Entrance Channel was evaluated to determine compatibility for nearshore placement. Based on the results of analyses, the following conclusions may be drawn:

- Composite sediment chemistry and further chemical characterization of individual cores showed some areas with elevated mercury above the USEPA-recommended threshold of 1 mg/kg and PCBs above 100 µg/kg. These include Newport Channel 1 and areas within the Turning Basin and the Main Channel North.
- Results of SP testing indicate that no sediments were acutely toxic to benthic organisms and meet LPC requirements for ocean disposal.
- Results of SPP testing and STFATE modeling also suggest that sediments do not pose a toxicity risk to existing water column organisms after discharge and meet LPC requirements for ocean disposal.
- Tissue concentrations from the bioaccumulation tests showed levels less than established FDA action thresholds and concentrations that have been shown to cause toxicity to marine invertebrates.
- Grain size of composite sediments consisted primarily of fines (silt and clay), except for the Entrance Channel. Grain size of the Entrance Channel consisted primarily of sand, which was compatible with the nearshore receiver site.

7 References

Anchor QEA (Anchor QEA, LLC), 2017a. *Lower Newport Bay Federal Channels Dredging Sampling and Analysis Plan.* Prepared for the City of Newport Beach. Revised December 20, 2017.

Anchor QEA, 2017b. *Sampling and Analysis Report: Port of Hueneme Deepening: Berths 1, 2, and* 3. Prepared for Oxnard Harbor District. May 2017.

Anchor QEA, 2018a. *Newport Channel Sampling and Analysis Approach.* Newport Beach, California. Presentation to the SC-DMMT. June 27, 2018.

Anchor QEA, 2018b. *RGP 54 Sediment Characterization Sampling and Analysis Report*. Prepared for the City of Newport Beach. June 2018.

Lin, D. and J.A. Davis, 2018. *Support for Sediment Bioaccumulation Evaluation: Toxicity Reference Values for San Francisco Bay*. SFEI Contribution No. 916. Richmond, California: San Francisco Estuary Institute.

Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder, 1995. "Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments." *Environmental Management* 19:81–97.

Moffatt & Nichol, 2006. *Final Sand Compatibility and Opportunistic Use Program Plan*. Prepared for SANDAG and the California Coastal Sediments Management Workgroup. March 2006.

Newfields (Newfields Northwest, LLC), 2009. *Dredged Material* Evaluation *of Lower Newport Bay, Newport Beach, California*. November 2009.

Pellizzato, F., E. Centanni, M.G. Marin, V. Moschino, and B. Pavoni, 2004. "Concentrations of organotin compounds and imposex in the gastropod *Hexaplex trunculus* from the Lagoon of Venice." *Science of the Total Environment* 332:89–100.

SWRCB (State Water Resources Control Board), 2017. Measurement Quality Objectives Table 2. Surface Water Ambient Monitoring Program Quality Assurance Program Plan. Final Draft. May 2017.

USACE (U.S. Army Corps of Engineers), 2018. Environmental Residue Effects Database. Environmental Laboratory, USACE Research and Development Center. Updated December 7, 2018. Accessed April 25, 2019. Available at: http://el.erdc.usace.army.mil/ered/.

USACE, 1989. *Requirements for Sampling, Testing and Data Analysis of Dredged Material.* USACE Los Angeles District, Los Angeles.

USACE, USEPA (U.S. Environmental Protection Agency), San Francisco Bay Conservation and Development Commission, Regional Water Quality Control Board, and California State Lands Commission, 2001. *Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region.* Public Notice 01-01.

USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine), 2000. *Standard Practice for Wildlife Toxicity Reference Values*. Technical Guide No. 254. October 2000.

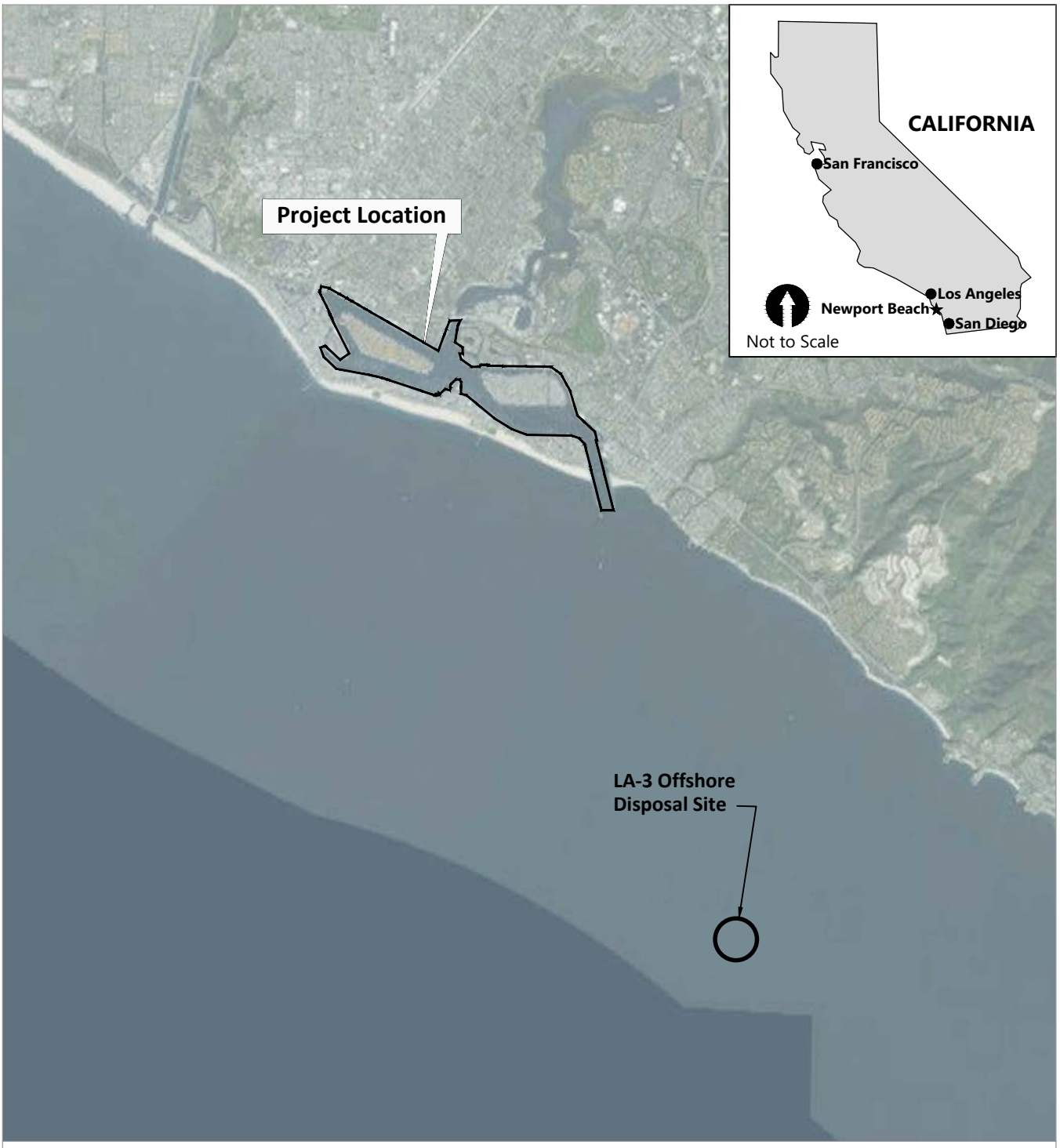
USEPA/USACE, 1991. *Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual.* USEPA 503/8-91/001. USEPA Office of Water (4504F). February 1991.

USEPA/USACE, 1998. *Evaluation of Dredged Material Proposed for Discharge* in *Waters of the U.S. – Testing Manual:* Inland Testing *Manual*. USEPA-823-B-94-004. USEPA Office of Water (4305). February 1998.

USEPA/USACE, 2005. Final Environmental Impact Statement: Proposed Site Designation of the LA-3 Ocean Dredged Material Disposal Site off Newport Bay, Orange County, California. July 2005.

Weston Solutions, Inc., 2007. *Tier IV Evaluation of the Lower Newport Bay Federal Newport Beach, California.* February 2007.

Figures



SOURCE: Image from Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Approximate Project Location:
33° 36.540', 117° 54.230'

0 1.5
Miles

Publish Date: 2017/11/20 1:26 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-001 VIC_recover.dwg AQ-A-VMAP

ANCHOR QEA

Figure 1
Vicinity Map
Lower Newport Bay Federal Channels Dredging

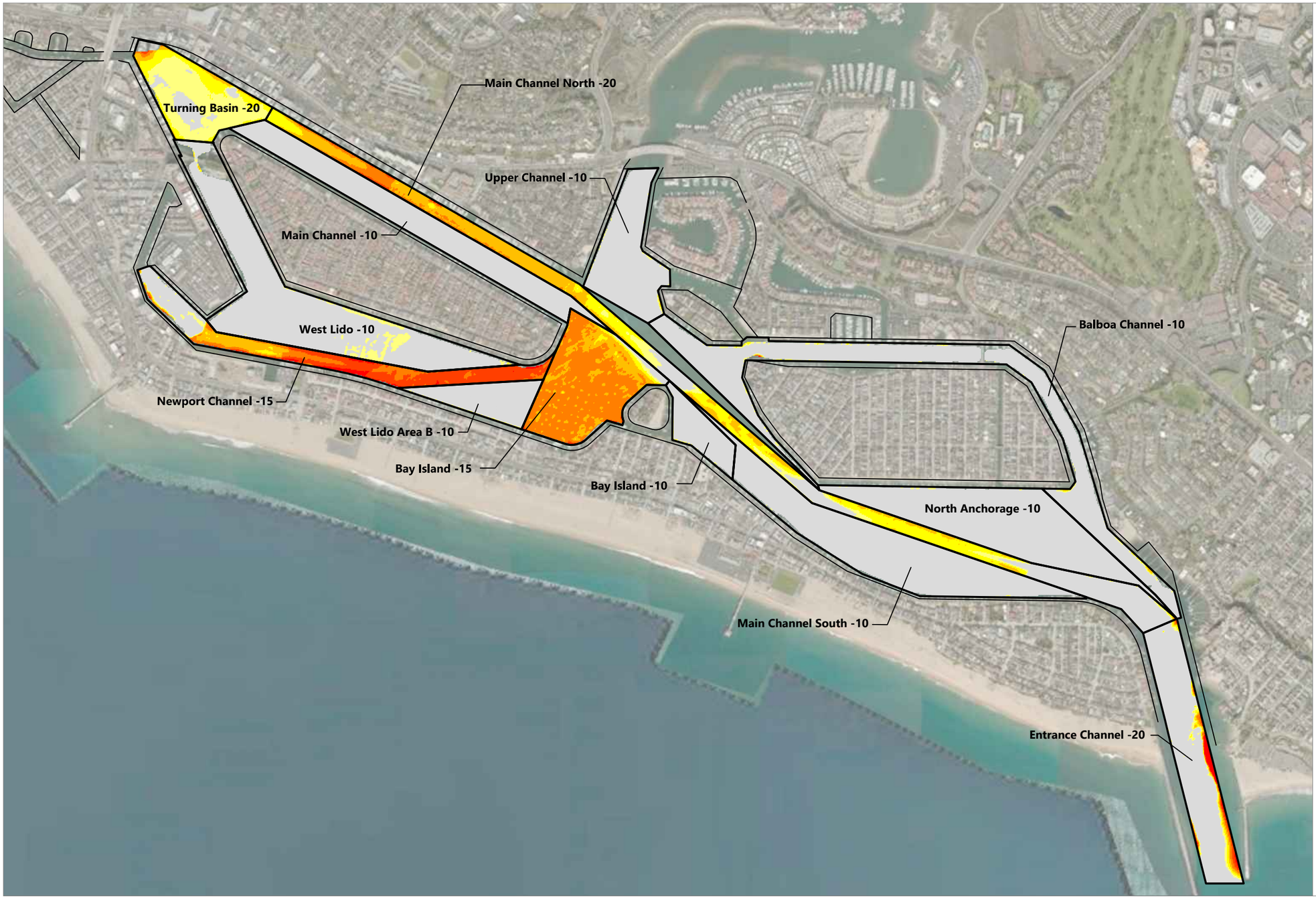
0 1,400
Feet

AERIAL SOURCE: Bing Maps 2016. Dredge depths and boundaries from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Publish Date: 2017/12/18 3:47 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-012 FEDERAL CHANNELS.dwg FIG 2

ANCHOR QEA

Figure 2
Federal Channels and Authorized Design Depths
Lower Newport Bay Federal Channels Dredging



Difference between Existing Bathymetry (Base) and Authorized Depth (Comparison)	
Design Elevation Below Bathy (ft)	**Color**
At or Above Existing Bathy	
0.0 to - 1.0	
- 1.0 to - 2.0	
- 2.0 to - 3.0	
- 3.0 to - 4.0	
- 4.0 to - 5.0	
- 5.0 <	

0 1,400
Feet

AERIAL SOURCE: Bing Maps 2016
SURVEY SOURCE: U.S. Army Corps of Engineers survey dated June 2017. Dredge depths and boundaries from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Publish Date: 2017/12/18 4:38 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-008 2017 ISOPACH.dwg FIG-3

ANCHOR QEA

Figure 3
Comparison of 2017 Harborwide Bathymetric Survey to Authorized Design Depths
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- -20 Design Depth
- Dredge Footprint
- -10 Existing Bathymetry

0 1,400
Feet

Publish Date: 2019/05/10 3:31 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Federal Channel\0243-RP-010 DREDGING.dwg FIG 4

ANCHOR QEA

Figure 4
Overview of Dredge Units and Bathymetry
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- -20 Design Depth
- Dredge Footprint
- ⊙-# Actual Sampling Location
- —10— Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2019/05/02 3:39 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015A ACTUAL SAMPLING.dwg FIG 5

ANCHOR QEA

Figure 5
Dredge Unit, Bathymetry, and Actual Sampling Locations - Turning Basin
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- -20 — Design Depth
- Dredge Footprint
- -# — Actual Sampling Location
- -10 — Existing Bathymetric Contour
- -16.5 — Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 9:06 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015B ACTUAL SAMPLING.dwg FIG 7

ANCHOR QEA

Figure 6
Dredge Unit, Bathymetry, and Actual Sampling Locations - Main Channel North 1
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

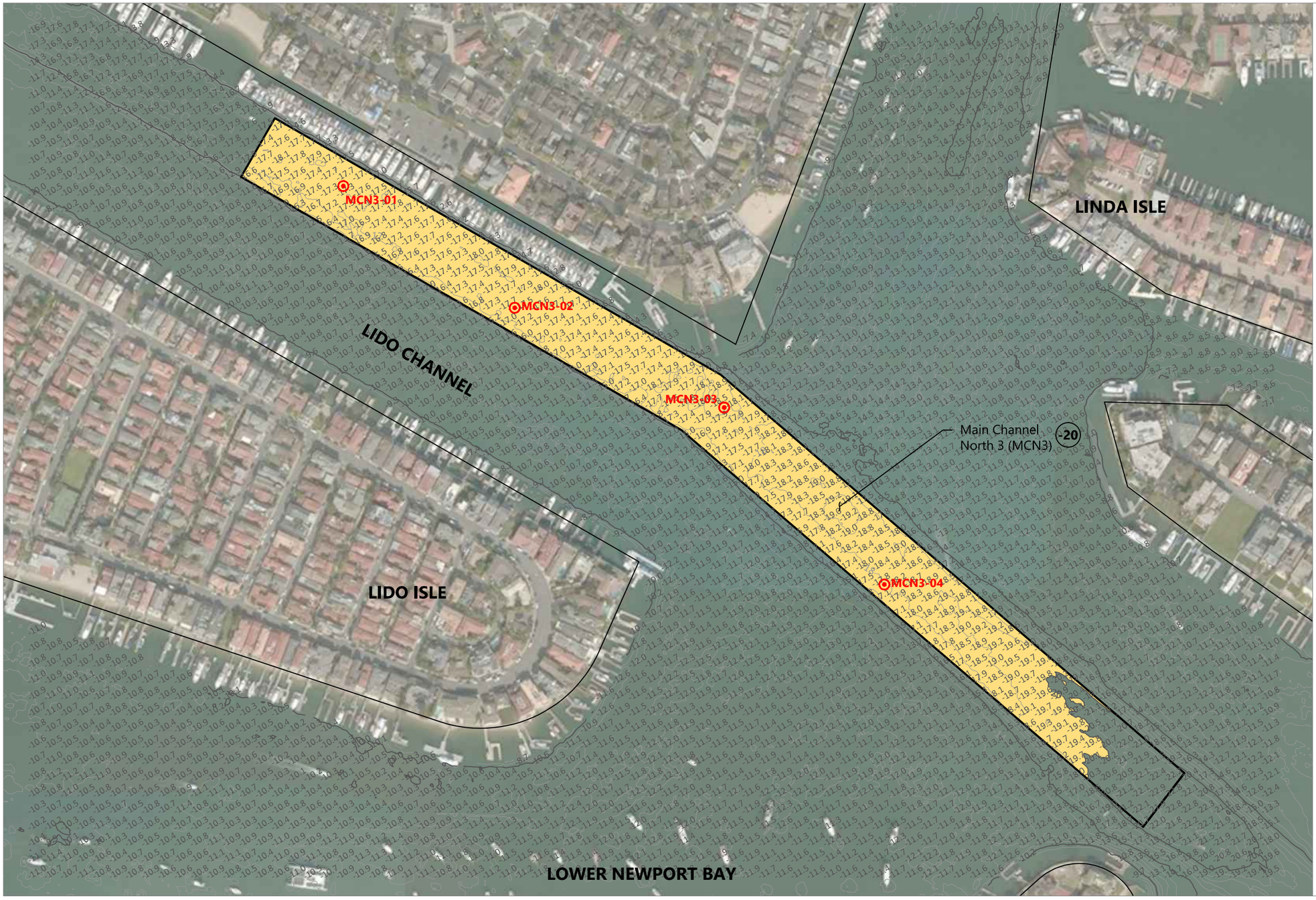
- Dredge Unit Boundary
- -20 — Design Depth
- Dredge Footprint
- -# — Actual Sampling Location
- -10 — Existing Bathymetric Contour
- -16.5 — Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 9:11 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015C ACTUAL SAMPLING.dwg FIG 8

ANCHOR QEA

Figure 7
Dredge Unit, Bathymetry and Actual Sampling Locations - Main Channel North 2
Lower Newport Bay Federal Channels Dredging



SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

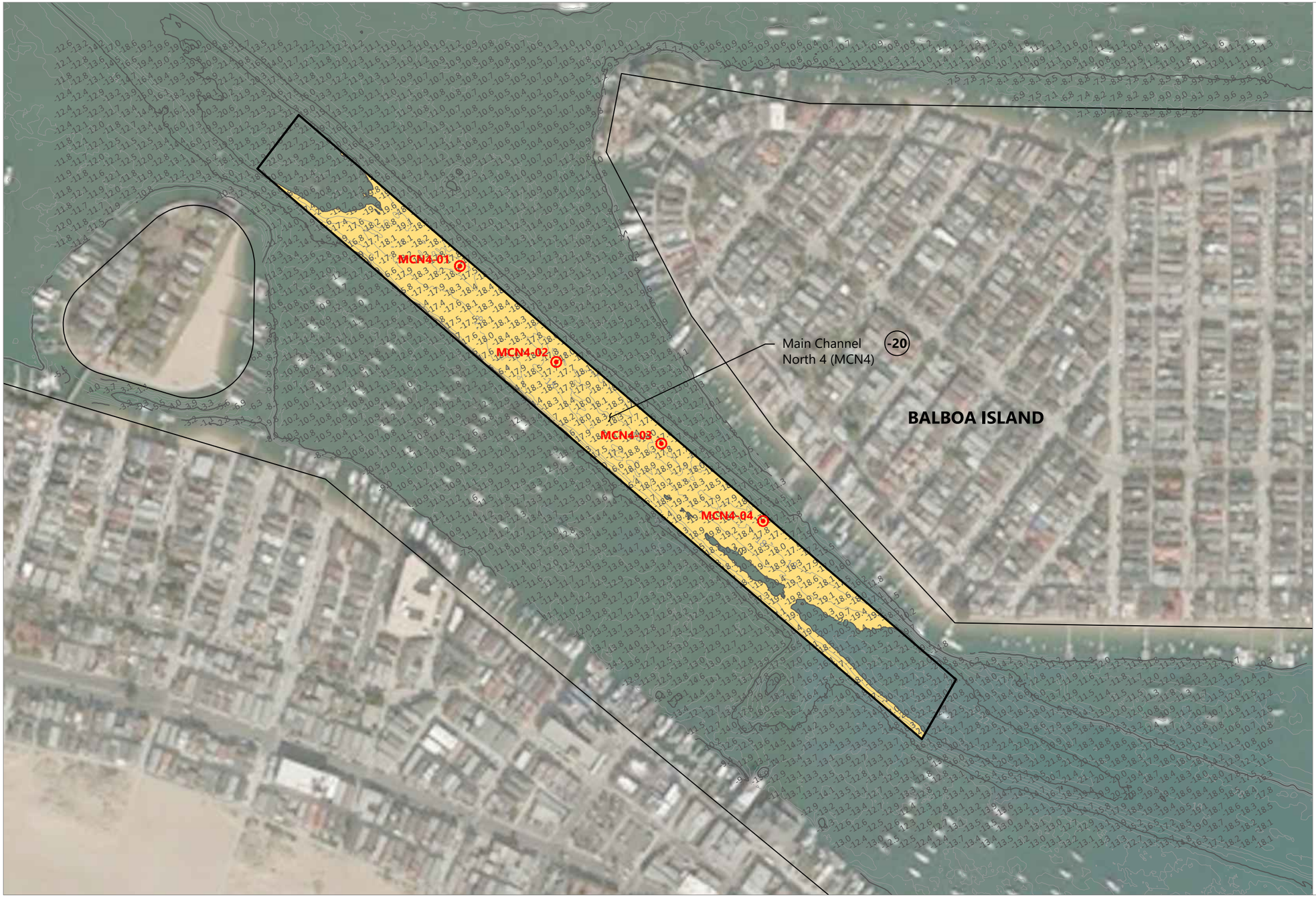
- Dredge Unit Boundary
- (-20) Design Depth
- Dredge Footprint
- -# Actual Sampling Location
- —-10— Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 10:36 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015D ACTUAL SAMPLING.dwg FIG 9

ANCHOR QEA

Figure 8
Dredge Unit, Bathymetry, and Actual Sampling Locations - Main Channel North 3
Lower Newport Bay Federal Channels Dredging



SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

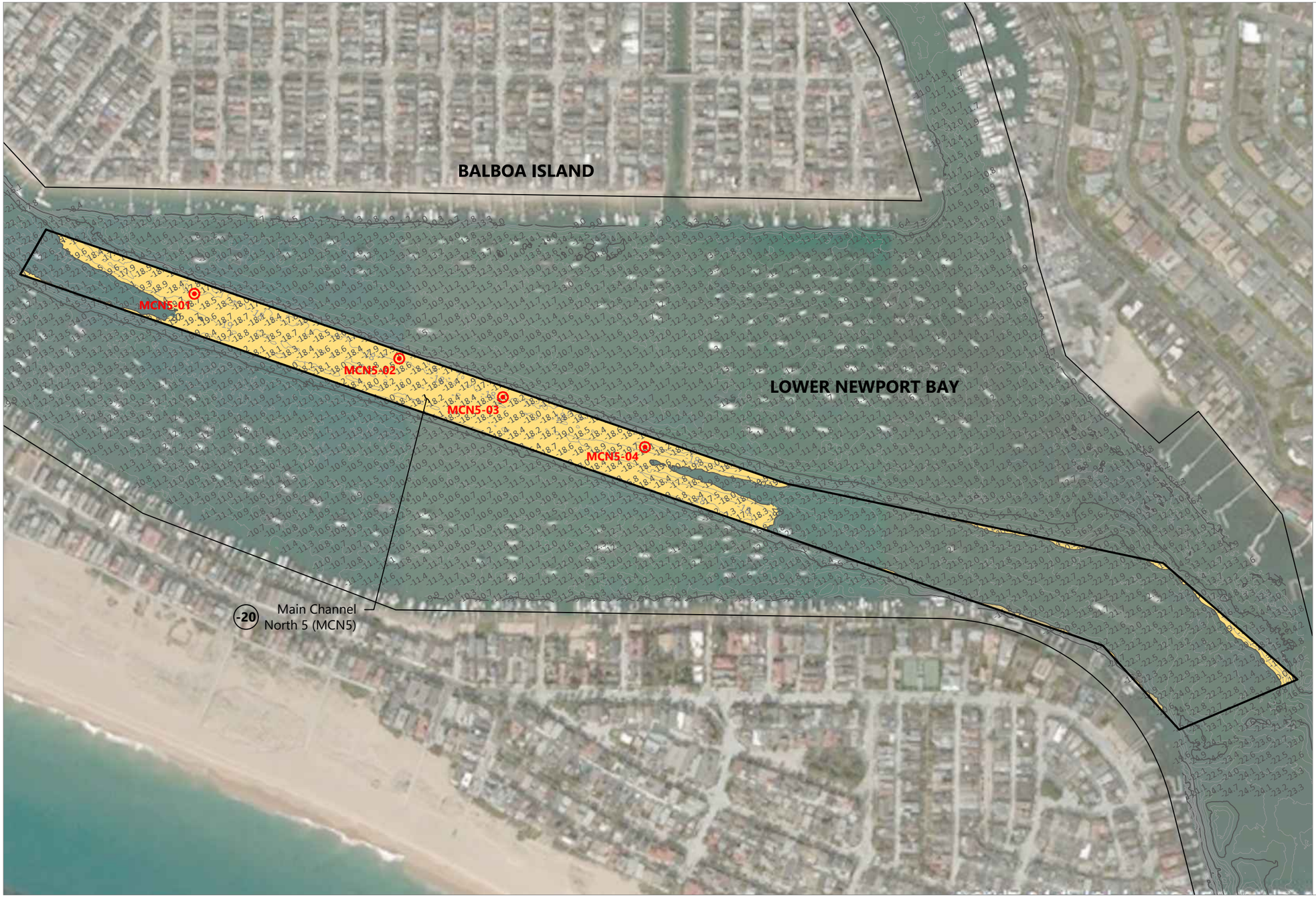
- Dredge Unit Boundary
- -20 — Design Depth
- Dredge Footprint
- -# — Actual Sampling Location
- -10 — Existing Bathymetric Contour
- -16.5 — Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 12:43 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015I ACTUAL SAMPLING.dwg FIG 14

ANCHOR QEA

Figure 9
Dredge Unit, Bathymetry, and Actual Sampling Locations - Main Channel North 4
Lower Newport Bay Federal Channels Dredging



SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

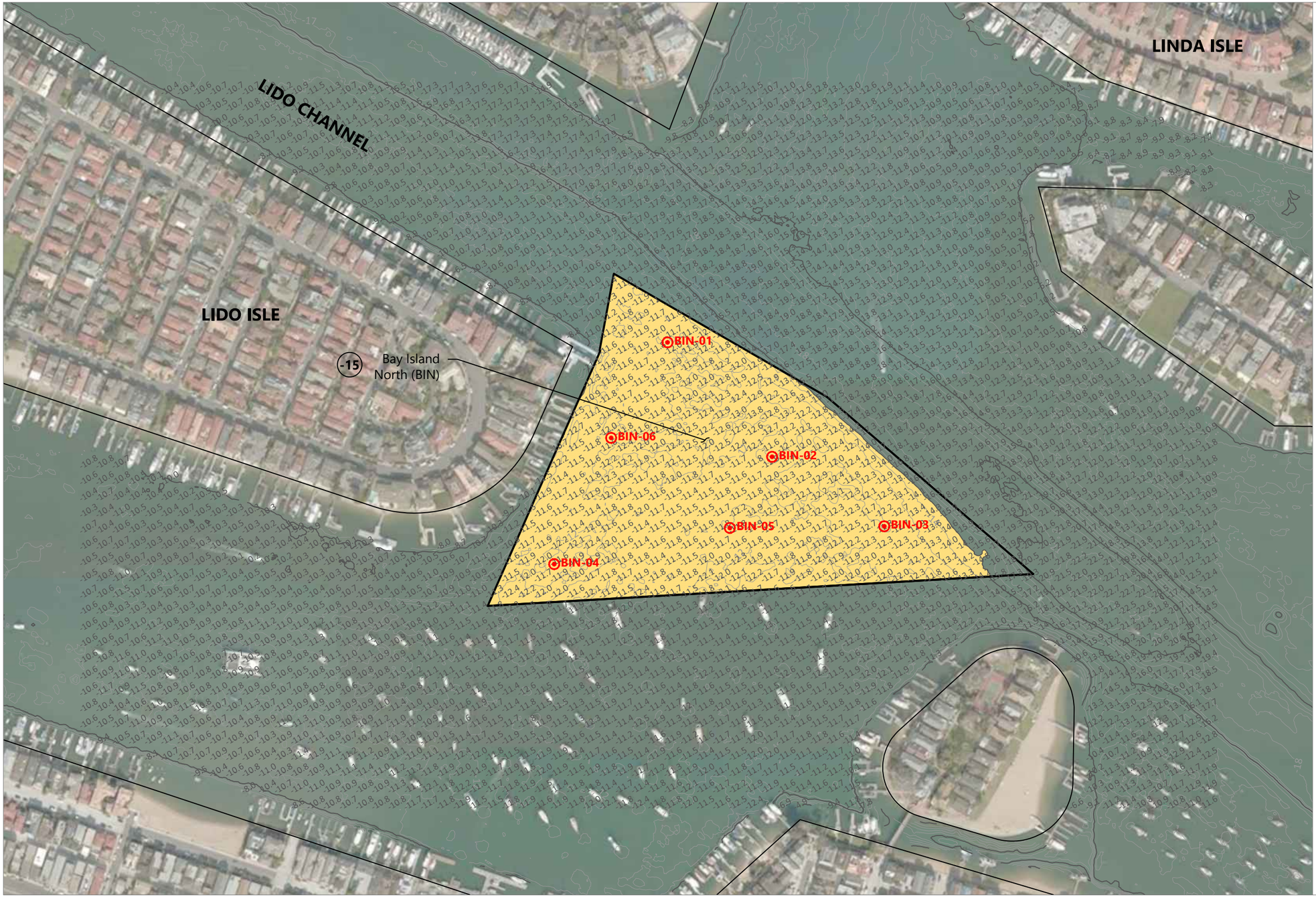
- Dredge Unit Boundary
- -20: Design Depth
- Dredge Footprint
- -#: Actual Sampling Location
- -10: Existing Bathymetric Contour
- -16.5: Existing Bathymetric Sounding

0 400
Feet

Publish Date: 2018/02/09 12:53 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015J ACTUAL SAMPLING.dwg FIG 15

ANCHOR QEA

Figure 10
Dredge Unit, Bathymetry, and Actual Sampling Locations - Main Channel North 5
Lower Newport Bay Federal Channels Dredging



SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- -15 Design Depth
- Dredge Footprint
- -# Actual Sampling Location
- -10 Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 11:09 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015E ACTUAL SAMPLING.dwg FIG 10

ANCHOR QEA

Figure 11
Dredge Unit, Bathymetry, and Actual Sampling Locations - Bay Island North
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- (-15) Design Depth
- Dredge Footprint
- -# Actual Sampling Location
- —-10— Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 3:35 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015G ACTUAL SAMPLING.dwg FIG 12

ANCHOR QEA

Figure 12
Dredge Unit, Bathymetry, and Actual Sampling Locations - Bay Island Middle East
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- (-15) Design Depth
- Dredge Footprint
- -# Actual Sampling Location
- -10 Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2018/02/09 3:57 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015F ACTUAL SAMPLING.dwg FIG 11

ANCHOR QEA

Figure 13
Dredge Unit, Bathymetry, and Actual Sampling Locations - Bay Island Middle West
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- (-15) Design Depth
- Dredge Footprint
- ⊙-# Actual Sampling Location
- —-10— Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 300
Feet

Publish Date: 2019/05/10 3:52 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015H ACTUAL SAMPLING.dwg Figure 14

ANCHOR QEA

Figure 14
Dredge Unit, Bathymetry, and Actual Sampling Locations - Bay Island South
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- -20 Design Depth
- Dredge Footprint
- -# Actual Sampling Location
- -10 Existing Bathymetric Contour
- -16.5 Existing Bathymetric Sounding

0 500
Feet

Publish Date: 2018/02/09 1:09 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-015K ACTUAL SAMPLING.dwg FIG 16

ANCHOR QEA

Figure 15
Dredge Unit, Bathymetry, and Actual Sampling Locations - Entrance Channel
Lower Newport Bay Federal Channels Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

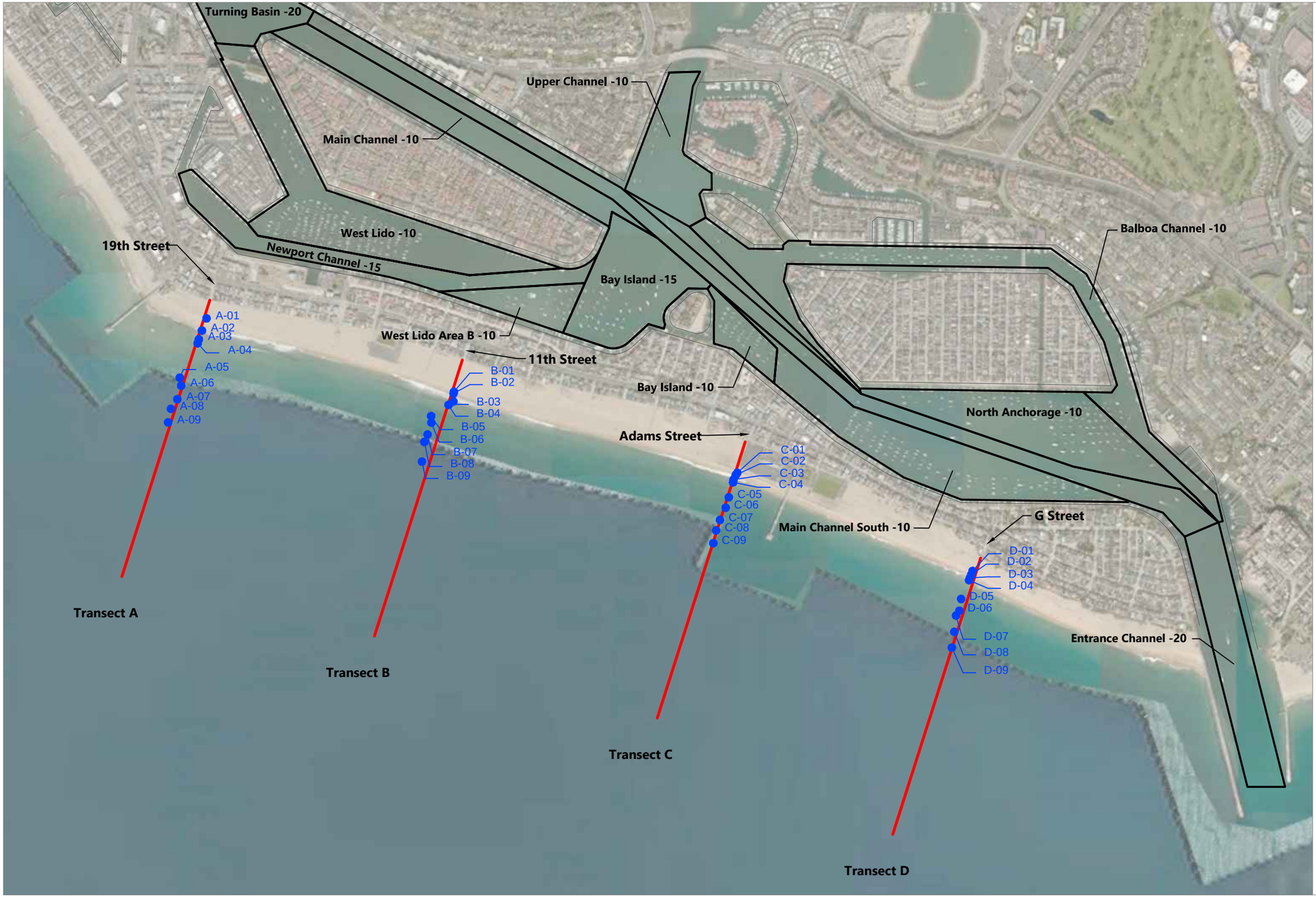
- Dredge Unit Boundary
- (-15) Design Depth
- Dredge Footprint
- -12.8 Existing Bathymetry
- NC-# Actual Sampling Location

0 400 Feet

Publish Date: 2019/05/02 4:05 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-018 NEWPORT CHANNEL.dwg FIG 16

ANCHOR QEA

Figure 16
Dredge Units, Bathymetry, and Actual Sampling Locations - Newport Channel
Lower Newport Bay Federal Channels Dredging

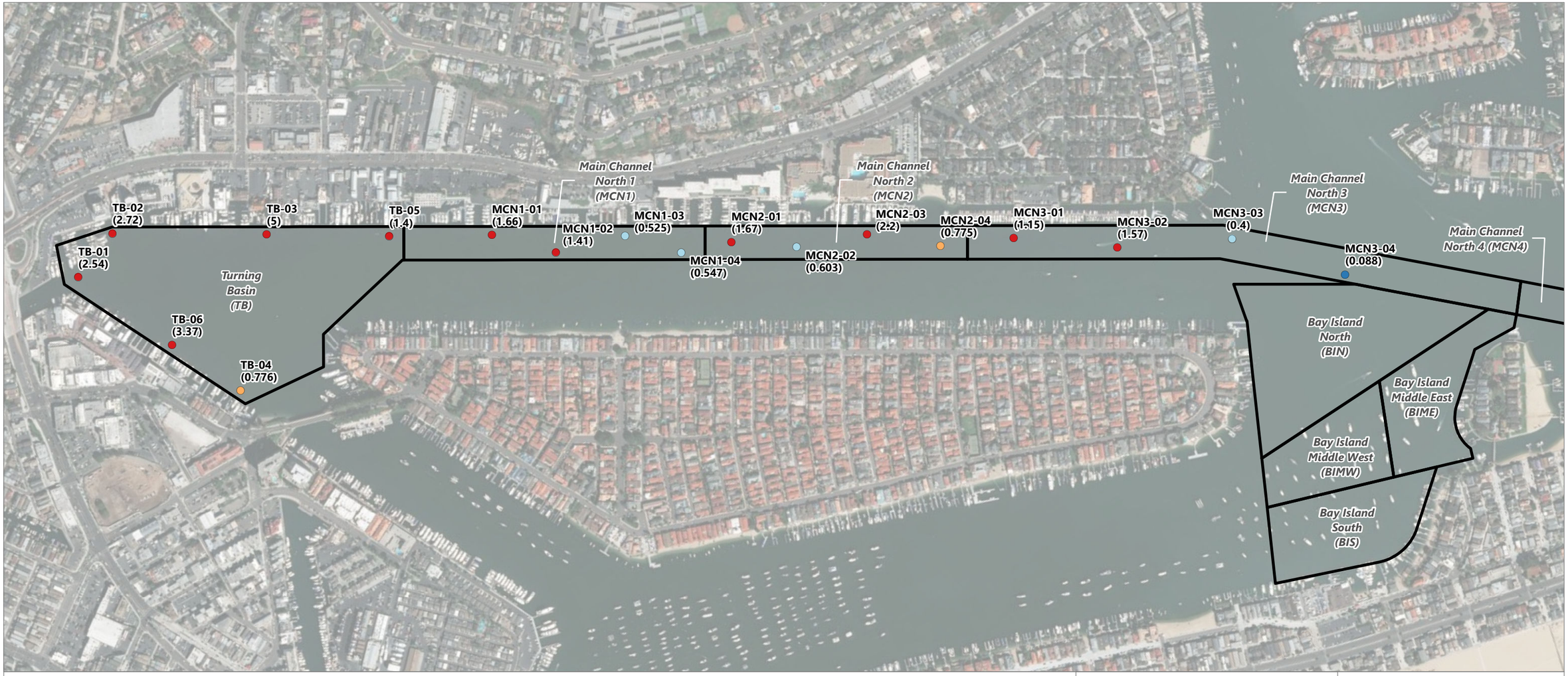


AERIAL SOURCE: Bing Maps 2016. Dredge depths and boundaries from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Publish Date: 2018/03/20 3:40 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Dredging Options\0243-RP-016 ACTUAL TRANSECTS.dwg FIG 1

ANCHOR QEA

Figure 17
Newport Beach Transects with Actual Sampling Locations
Lower Newport Bay Federal Channels Dredging



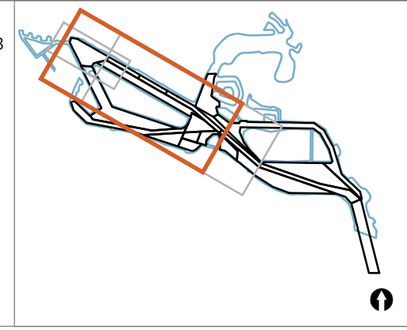
LEGEND:

Mercury (mg/kg)

- 0.088 - 0.15 (< ERL)
- 0.151 - 0.71 (< ERM)
- 0.711 - 1 (< USEPA Recommended Threshold)
- 1.01 - 5 (> USEPA Recommended Threshold)

Dredge Units

NOTES:
Horizontal datum: California State Plane Zone 6, NAD83
Aerial photo: ESRI

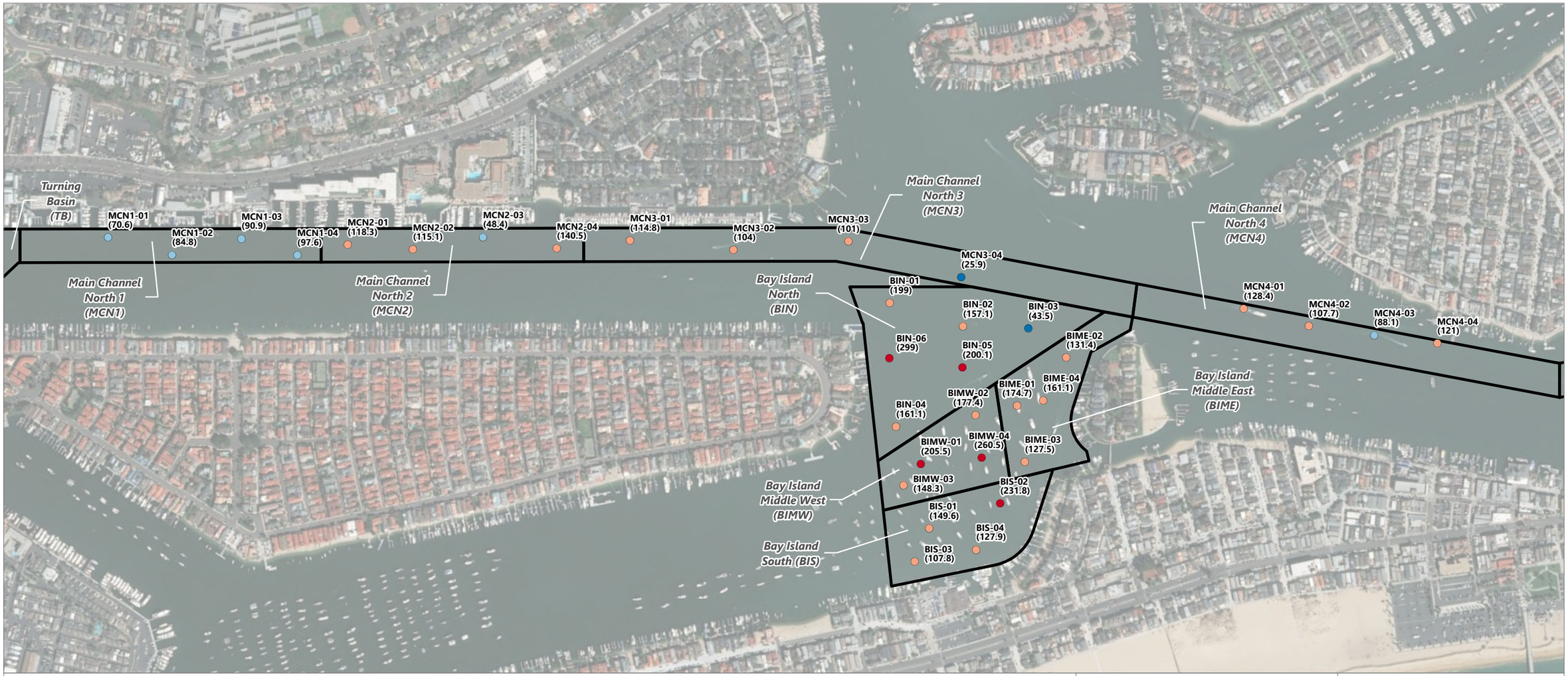


0 1,000
Feet

Publish Date: 2019/05/15, 12:41 PM | User: ckiblinger
Filepath: \\orcas\GIS\Jobs\City_of_Newport_Beach_0243\RGP_54_SedimentSampling\Maps\Core_Sediment\Core_Sed_Hg_PCB_DDT_Lower_Newport.mxd

ANCHOR QEA

Figure 18
Mercury Concentrations for Individual Stations within Turning Basin and Main Channel North 1, 2, and 3
Lower Newport Bay Federal Channels Dredging



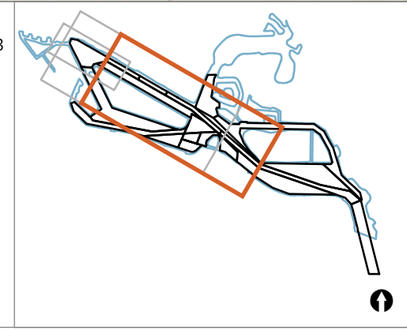
LEGEND:

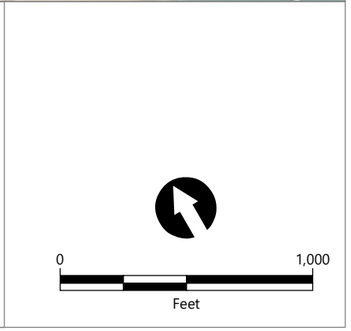
Total DDTs (µg/kg)

- 25.9 - 46.1 (< ERM)
- 46.2 - 100 (> ERM)
- 101 - 200
- 201 - 299

Dredge Units

NOTES:
Horizontal datum: California State Plane Zone 6, NAD83
Aerial photo: ESRI

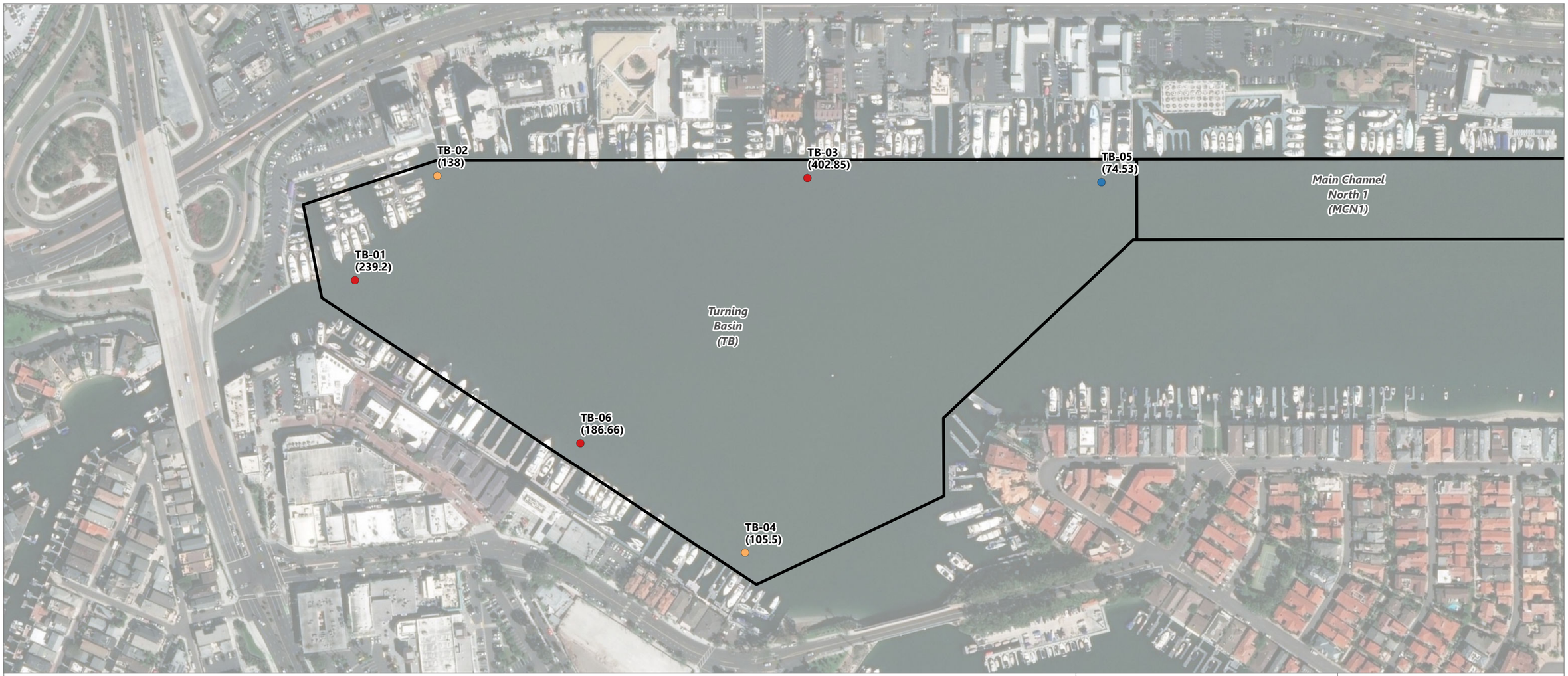




Publish Date: 2019/05/15, 12:41 PM | User: ckiblinger
Filepath: \\orcas\GIS\Jobs\City_of_Newport_Beach_0243\RGP_54_SedimentSampling\Maps\Core_Sediment\Core_Sed_Hg_PCB_DDT_Lower_Newport.mxd

ANCHOR QEA

Figure 19
Total DDT Concentrations for Individual Stations within Main Channel North 1, 2, 3, and 4, and Bay Island
Lower Newport Bay Federal Channels Dredging



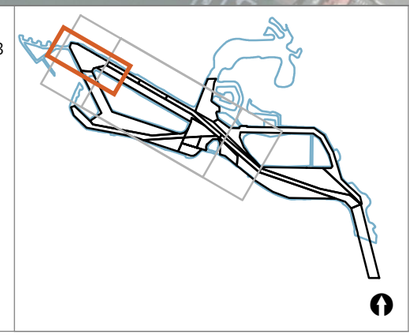
LEGEND:

Total PCBs (µg/kg)

- 74.5 - 100
- 101 - 180 (< ERM)
- 181 - 403 (> ERM)

Dredge Units

NOTES:
Horizontal datum: California State Plane Zone 6, NAD83
Aerial photo: ESRI



0 420
Feet

Publish Date: 2019/05/15, 12:42 PM | User: ckiblinger
Filepath: \\orcas\GIS\Jobs\City_of_Newport_Beach_0243\RGP_54_SedimentSampling\Maps\Core_Sediment\Core_Sed_Hg_PCB_DDT_Lower_Newport.mxd

ANCHOR QEA

Figure 20
Total PCB Concentrations for Individual Stations within the Turning Basin
Lower Newport Bay Federal Channels Dredging

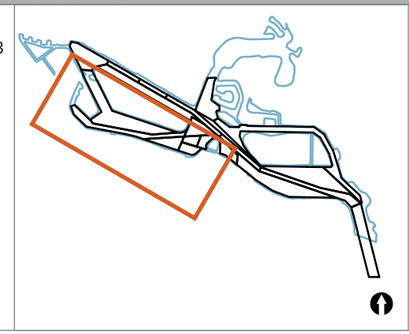
LEGEND:

Mercury (mg/kg)

- 0.088 - 0.15 (< ERL)
- 0.151 - 0.71 (ERL - ERM)
- 0.711 - 1
- 1.01 - 5
- 2019 Stations
- 2018 Exploratory Stations

Dredge Units

NOTES:
Horizontal datum: California State Plane Zone 6, NAD83
Aerial photo: ESRI

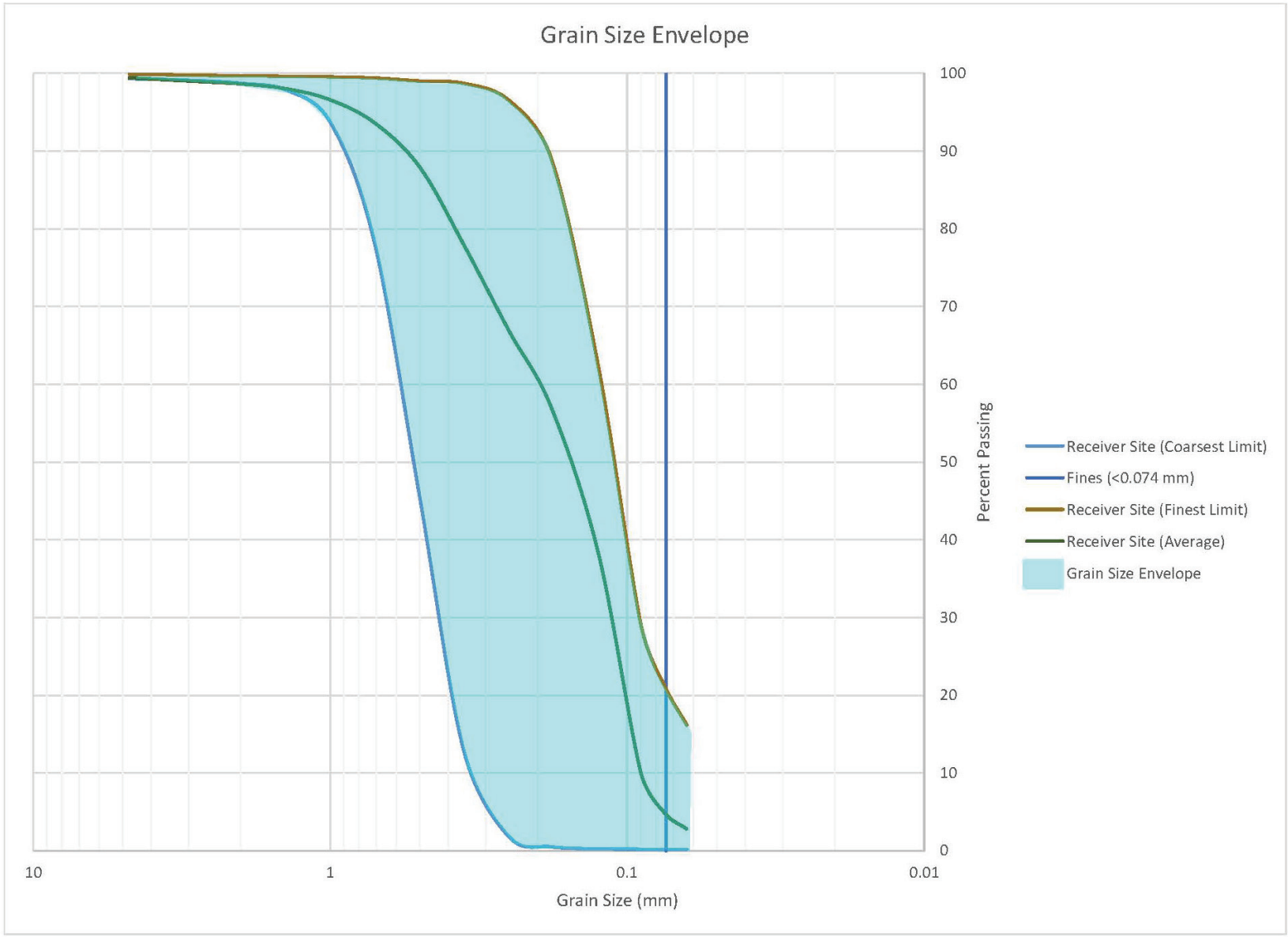


0 1,000
Feet

Publish Date: 2019/05/15, 12:39 PM | User: ckiblinger
Filepath: \\orcas\GIS\Jobs\City_of_Newport_Beach_0243\RGP_54_SedimentSampling\Maps\Core_Sediment\Core_Sed_Hg_Lower_Newport_201902_SAR.mxd

ANCHOR QEA

Figure 21
Mercury Concentrations for Individual Stations within Newport Channel
Lower Newport Bay Federal Channels Dredging



ANCHOR QEA

Figure 22
Grain Size Envelope for Newport Beach
Lower Newport Bay Federal Channels Dredging

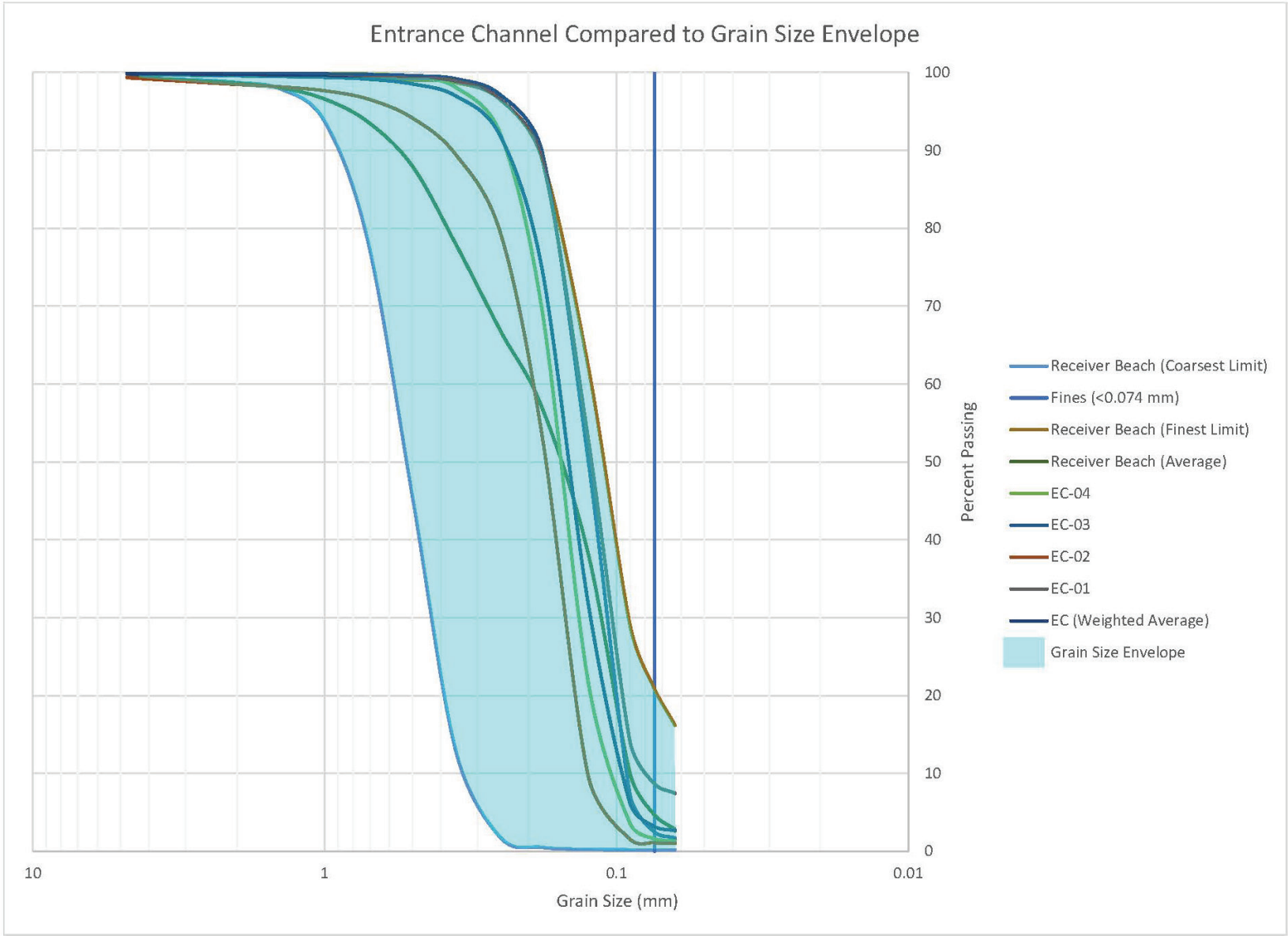


Figure 23
Comparison of Grain Size from the Entrance Channel to Grain Size Envelope
Lower Newport Bay Federal Channels Dredging

APPENDIX C

NATIONAL HISTORIC PRESERVATION ACT COMPLIANCE CORRESPONDENCE

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Ms. Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, California 95816-7100

Dear Ms. Polanco:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the

footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

The Corps contacted the Native American Heritage Commission (NAHC) Sacred Lands File in November 2021 but never received a response. Contact the year prior with the NAHC regarding another undertaking on the LNBH resulted in a negative finding for cultural resources within the APE. Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor, and would only penetrate a negligibly small area unlikely to contain cultural resources in the project area, the following tribes have been contacted should they have concerns about cultural resources: Gabrieleno Band of Mission Indians-Kizh Nation, Gabrieleno/Tongva San Gabriel Band of Mission Indians, Gabrielino/Tongva nation, Gabrielino Tongva Indians of California Tribal Council, Gabrielino-Tongva Tribe, Juaneno Band of Mission Indians Acjachemen Nation, Pala Band of Mission Indians, and Soboba Band of Luiseno Indians. We will notify you if we receive responses to these notifications within the thirty-day comment period.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, to assess the effects of this undertaking and recommends a finding under 36 CFR § 800.5(a)(1) that excavation of the federal channels would pose no potential to affect the National Register eligibility of the LNBH; as well as a finding under 36 CFR § 800.4(c)(1) that no other historic properties would be affected by excavation in the federal channels. Finally, the abandoned electrical cable that would be

removed is an isolated and ubiquitous piece infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

ATTACHMENTS – Lower Newport Bay Harbor Dredging and CAD Construction

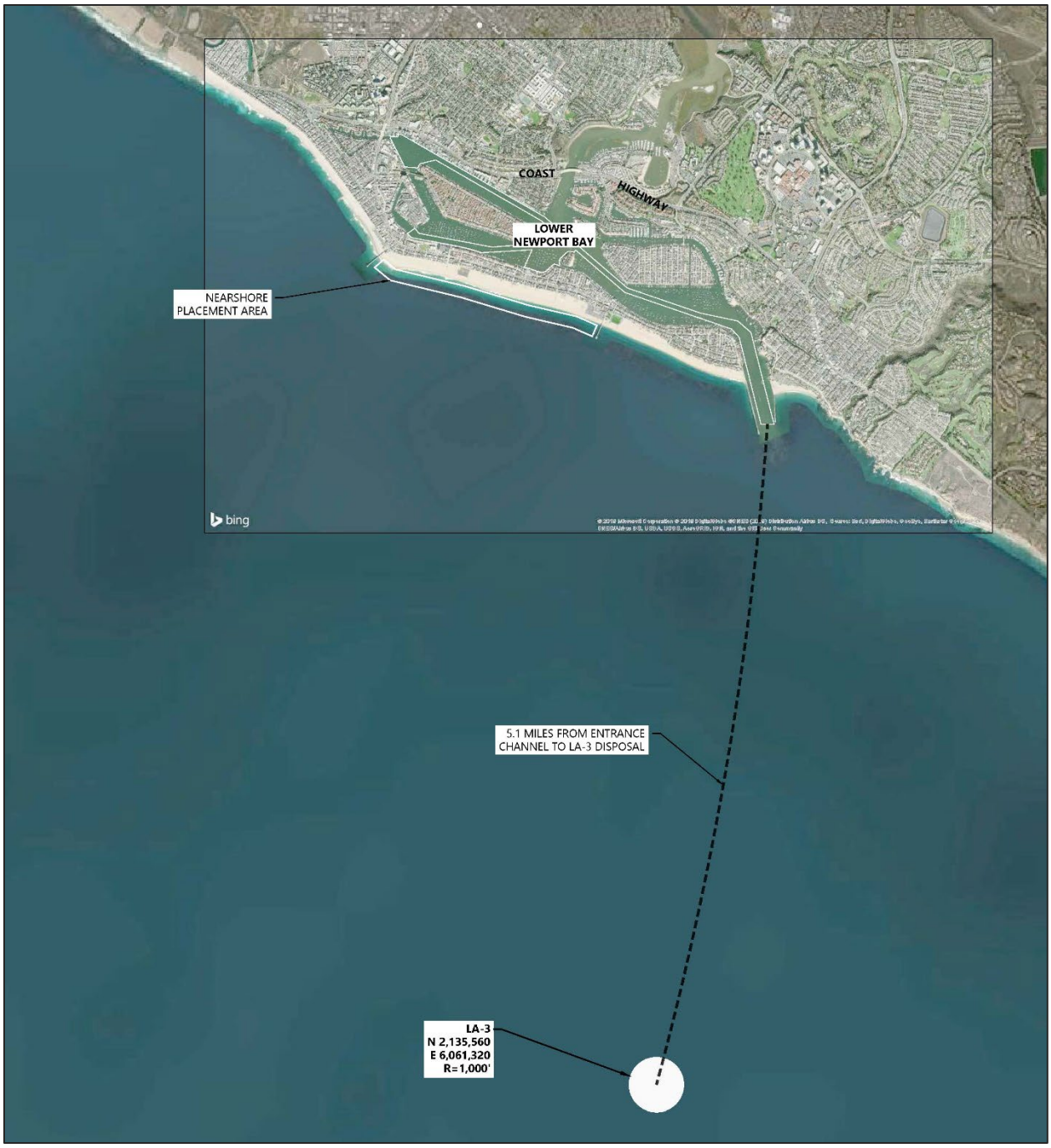


Figure 1. Overview of project area, showing the Lower Newport Harbor Bay channels, proposed nearshore disposal site along the beach, and ocean disposal site LA-3.

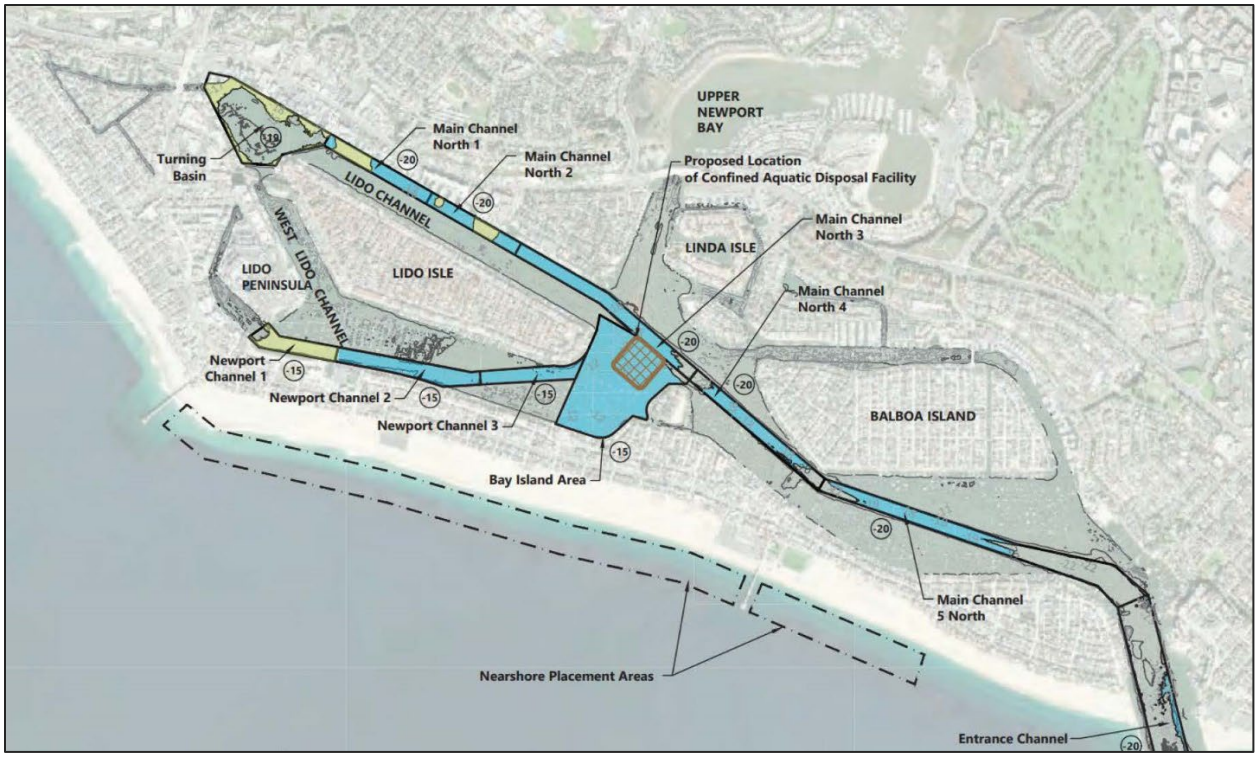


Figure 2. The APE is the dark outline defining the federal channels, to include the proposed CAD facility, shown as a brown square with mesh infill, as well as the dashed nearshore area where clean sediments will be placed for beach nourishment.

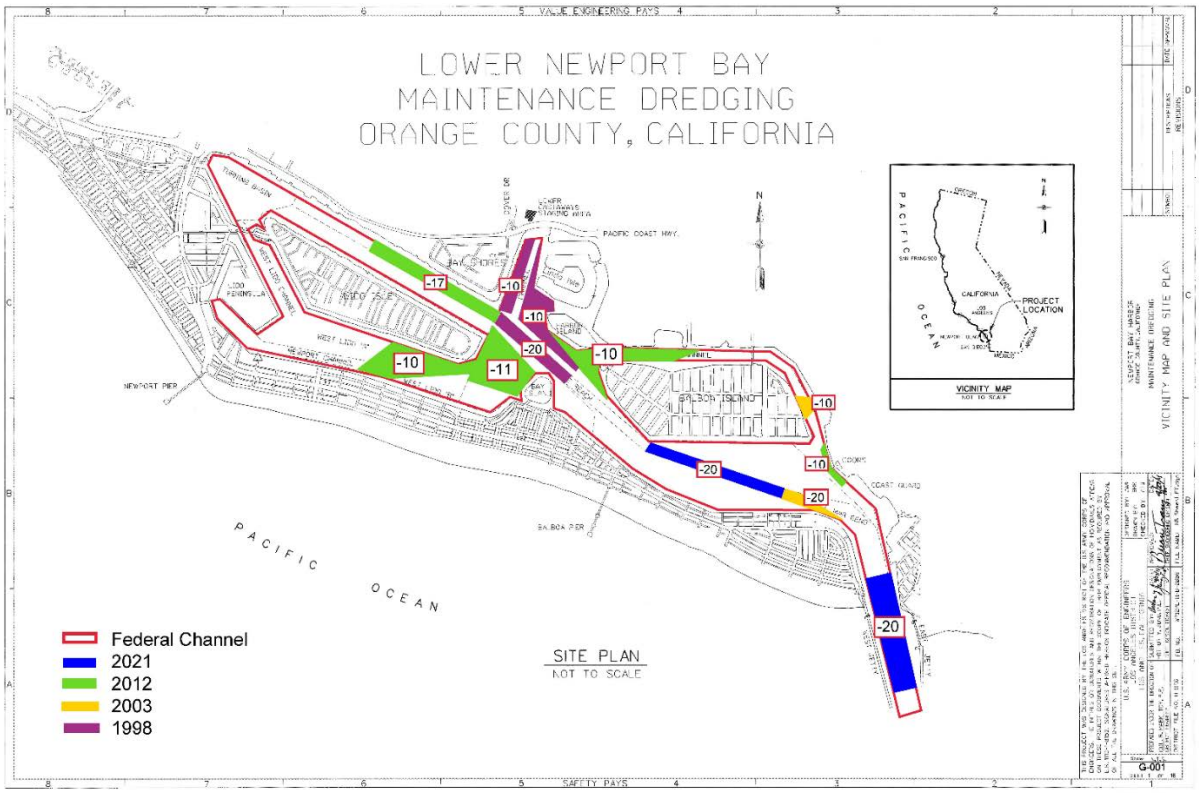


Figure 3. Site plan of LNBH showing color coded locations of past maintenance dredging events. All actions removed 10’-20’ of accumulated sediments to maintain the original authorized channel depth.

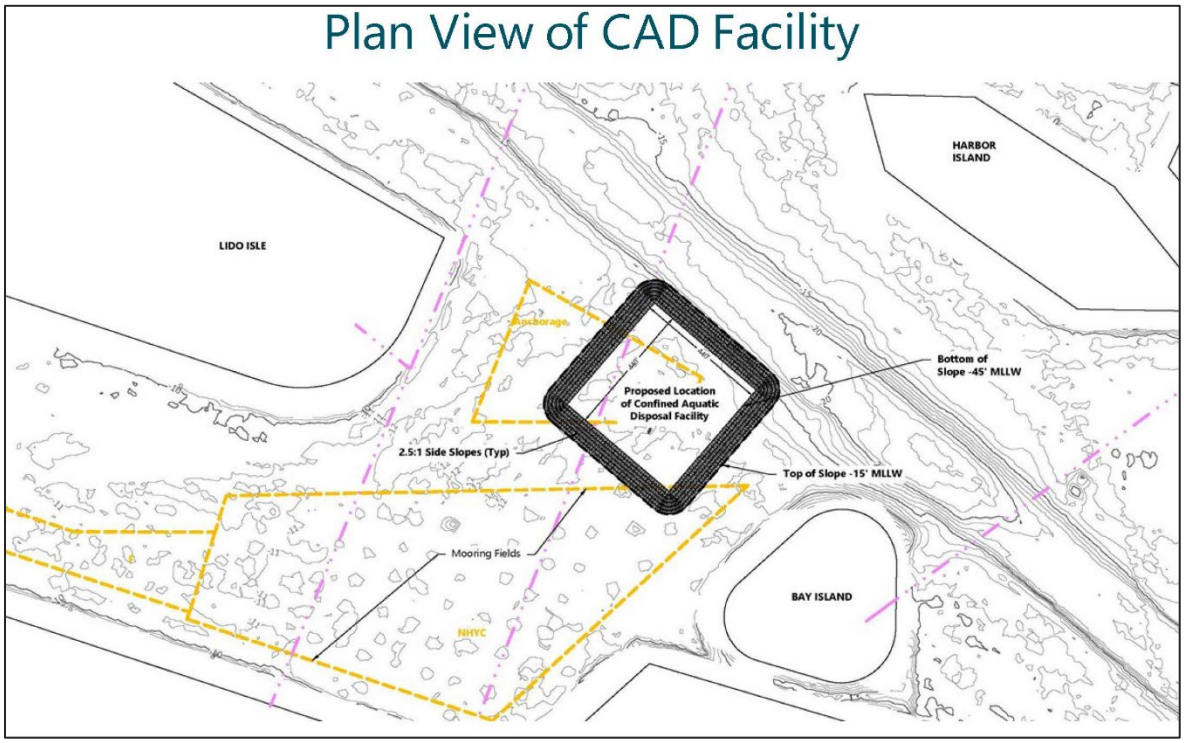


Figure 4. Detailed site plan showing the footprint of the proposed CAD facility, located in the federal channel between Lido and Bay Islands. Unsuitable soils removed during dredging will be placed in the CAD and capped with a clean layer.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Charles Alvarez
Gabrielino-Tongva Tribe
23454 Vanowen Street
West Hills, California 91307
Phone: (310) 403-6048
Email: roadkingcharles@aol.com

Dear Mr. Alvarez:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Matias Belardes
Chairperson
Juaneno Band of Mission Indians Acjachemen Nation
32161 Avenida Los Amigos
San Juan Capistrano, California 92675
Email: kaamalam@gmail.com

Dear Chairperson Belardes:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of 20'; the horizontal depth for the CAD structure is 47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Scott Cozart
Chairperson
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, California 92583
Email: jontiveros@soboba-nsn.gov

Dear Chairperson Cozart:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Robert Dorame
Chairperson
Gabrielino Tongva Indians of California Tribal Council
P.O. Box 490
Bellflower, California 90707
Email: gtongva@gmail.com

Dear Chairperson Dorame:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Ms. Shasta Gaughen
Tribal Historic Preservation Officer
Pala band of Mission Indians
PMB 50, 35008 Pala Temecula Road
Pala, California 92059
Email: sgaughen@palatribe.com

Dear Officer Gaughen:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Ms. Sandonne Goad
Chairperson
Gabrielino/Tongva Nation
106 ½ Judge John Aiso Street, #231
Los Angeles, California 90012
Email: sgoad@gabrielino-tongva.com

Dear Chairperson Goad:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Anthony Morales
Chairperson
Gabrieleno/Tongva San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, California 91778
Email: GTTribalcouncil@aol.com

Dear Chairperson Morales:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Joseph Ontiveros
Cultural Resource Department
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, California 92581
Email: jontiveros@soboba-nsn.gov

Dear Mr. Ontiveros:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Ms. Joyce Perry
Tribal Manager
Juaneno Band of Mission Indians Acjachemen Nation
4955 Paseo Segovia
Irvine, California 92603
Email: kaamalam@gmail.com

Dear Ms. Perry:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 930
LOS ANGELES, CALIFORNIA 90017-3489

January 28, 2022

Mr. Andrew Salas
Chairperson
Gabrieleno Band of Mission Indians – Kizh Nation
P.O. Box 393
Covina, California 91723
Email: admin@gabrielenoindians.org

Dear Chairman Salas:

The U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to conduct maintenance dredging of accumulated sediments in the federal channels of Lower Newport Bay Harbor (LNBH) and to create a Confined Aquatic Disposal facility (CAD) to contain unsuitable sediments. The Corps evaluated the LNBH's eligibility for listing in the National Register of Historic Places, and on August 10, 2020 (COE_2020_0709_001) you concurred with our finding the resource meets Criterion A for associations with the Corps' significant development of small watercraft harbor. To meet obligations under the National Historic Preservation Act (NHPA), 36 CFR § 800, as amended, the Corps is hereby consulting with your office regarding the presence of cultural resources that may be affected by the undertaking.

In 1920, prior to dredging and establishment of the Newport Bay Harbor, the Bitter Point Dam was built to divert the Santa Ana River to the north of the bay, away from the marshland, cutting off an influx of river sediments. In 1934 construction of the present harbor began, with dredged materials used to create islands within the harbor. Since that time, lack of deposition from an inland waterway, and the sheltered nature of the bay has made frequent removal of sediments from the navigation channels unnecessary. Portions of the LNBH have received periodic maintenance dredging over the last 50 years. Figure 3 depicts the record of these dredging events.

The current project, undertaken as maintenance dredging to ensure continued safe navigation, would remove 15' – 20' of accumulated sediments to original authorized depths. The CAD, measuring 440' x 44' with walls inclined upward 3' for every 1' would be created between Bay and Lido Islands, extending to a maximum depth of -47'. Removal of an abandon Southern California Edison (SCE) electrical cable, installed in 1962, would be necessary for placement of the CAD.

Sediment removal would be accomplished using an electric clamshell/scow operated from a barge, upon which a crane fitted with clamshell bucket would scoop sediment and place it on a separate barge. Material would then be ferried by a tugboat for dumping at a nearshore location for beach nourishment or ocean disposal site

previously approved by the Environmental Protection Agency (for which Section 106 has previously been conducted). Dredged sediments containing high mercury content or other material unsuitable for near or offshore disposal would be placed in the CAD and capped with clean soil.

The vertical Area of Potential Effects (APE), depicted on the enclosure (Figure 2), is defined as the extent of the previously authorized federal channels, which also encompassed the footprint of the CAD (Figures 2 and 4). As previously described, the horizonal APE has a maximum depth of -20'; the horizontal depth for the CAD structure is -47'.

Regarding the potential for cultural resources to be affected by the proposed CAD facility, the Corps considered the potential for Paleolandscapes to exist within the APE. Due to extensive modification of coastal wetlands and urbanization beginning in the late nineteenth century, original terrains at this locale have been greatly altered. Prior to diversion of the Santa Ana River in 1920, the bay now known as the LNBH was marshy and frequently scoured by flood waters emptying into the ocean, leaving low probability for past habitation or intact cultural deposits. Beginning in 1934, any existing deposits would have been removed during the initial excavation of the harbor channels. Because the LNBH has not been directly fed by an inland waterway since 1920, the possibility of cultural resource deposits washing into the harbor is not a factor. Installation of an electrical cable at a depth of -25' in 1962 further disturbed the bay floor between Bay and Lido Islands.

Given the undertaking's location near the culturally sensitive California coast, the Corps acknowledges the concerns of local Native American groups regarding the potential for cultural resources to be present in the project area. Although the undertaking will not disturb previously undredged harbor and would only penetrate a negligibly small area unlikely to contain cultural resources, the Corps is hereby notifying you of this action.

The lack of cultural resources previously identified within the APE and the fact that the project represents a small amount of harbor floor disturbance has led to the Corps' determination that an archaeological survey is not needed for this undertaking. If post-review discoveries are encountered, project activities within 15 m (50 feet) will cease, and the Corps Real Estate Division and Archaeologist will be notified. Post-review discoveries will be treated and evaluated in accordance with the regulations set forth in CFR § 800.13(b)(3). As the project would be taking place on federal, city, and county property if approved, if human remains are encountered on federal land, consultation will be conducted pursuant to the Native American Graves Protection and Repatriation Act. If human remains are discovered on city or county property, to the extent not inconsistent with Federal law, the Corps shall ensure that Native American burials and related cultural items are treated in accordance with applicable requirements of the California Public Resources Code at Sections 5097.98 and 5097.991, and of the California Health and Human Safety Code at Section 7050.5(c).

The Corps believes the above constitutes a reasonable and good faith effort pursuant to Section106 of National Historic Preservation Act, 36 CFR § 800.5(b) to assess the effects of this undertaking and recommends a finding of *no potential to affect* the National Register eligibility of the LNBH; as well as a finding that no historic properties would be affected by dredging federal channels to maintain maximum harbor floor depth of -20'. Finally, the abandoned electrical cable that would be removed is an isolated and ubiquitous piece of infrastructure that lacks any material or visual association with the historic patterns and events for which the LNBH is eligible.

We hereby request your review of our effects determination per 36 CFR § 800.3(g) and invite your comment. Should you have questions about this project, please do not hesitate to contact Ms. Lauren McCroskey at (253) 279-3316 or via email lauren.l.mccroskey@usace.army.mil.

Sincerely,

Eduardo T. De Mesa
Chief, Planning Division

Enclosure(s)

APPENDIX D

AIR EMISSIONS CALCULATIONS

Maintenance Dredging

Emission Source Data for Maintenance Dredging

Construction Activity/Equipment Type	Power Rating	Load Factor	# Active	Hourly Hp-Hrs	Fuel Use GPH	Hrs per Day (1)	Total Work Days (2)	DailyTotal Hp-Hrs (1)
Clamshell dredge	N/A	N/A	N/A	N/A	N/A	10	14/18	N/A
Tug boat-clamshell dredge	800	0.20	1	160	8.0	10	14/18	80

Tug boat propulsion factor 0.20 for idling; 0.50 for towing; and 0.4 for dredge barge movement (fuel use for 0.5 is 20 GPH, for 0.4 is 16 GPH)

(1) Assume 22 hours per day dredging; 2 hours per day shift change and maintenance

(2) 14 daysfor clamshell; 18 days for excavator

Emission Factors for Construction Equipment

Equipment Type	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Clamshell dredge (lb/hr)	1.1	0.3	1.1	1.0	0.7	0.6
Tugboat (lbs/1,000 Gal)	18.2	57.0	419.0	75.0	9.0	8.1

Daily Emissions from Construction Activities Clamshell Dredge

	Pounds per day					
Construction Activity/Equipment Type	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Clamshell dredge	10.8	3.0	10.9	9.5	6.9	6.0
Tug boat-nearshore/CAD placement						
Idling	0.5	1.6	11.7	2.1	0.3	0.2
Towing sediment barge	1.6	5.1	37.7	6.8	0.8	0.7
Shifting dredge barge	0.6	1.8	13.4	2.4	0.3	0.3
Subtotal Tug Boat Nearshore	2.7	8.6	62.9	11.3	1.4	1.2
Tug boat-ocean disposal						
Idling	0.0	0.0	0.0	0.0	0.0	0.0
Towing sediment barge	1.8	5.7	41.9	7.5	0.9	0.8
Shifting dredge barge	0.3	0.9	6.7	1.2	0.1	0.1
Subtotal Tug Boat Ocean Disposal	2.1	6.6	48.6	8.7	1.0	0.9
Crew boat (3)	0.9	0.4	0.8	0.1	0.1	0.1
Worker Vehicles (3)	0.1	1.2	0.9	0.1	0.1	0.1
Peak Daily Emissions						
Nearshore/CAD	**14.6**	**13.1**	**75.5**	**20.9**	**8.5**	**7.4**
Ocean Disposal	**14.0**	**11.1**	**61.2**	**18.4**	**8.1**	**7.1**

Assume dredge volume of 908,000 cubic yards, maximum expected based on funding limitations

Emissions factors for Maintenance Dredging for tugboat taken from the Port of Los Angeles Channel Deepening Project Final Supplemental Environmental Impact Statement/Environmental Impact Report, September 2000.

Emissions factors for Maintenance Dredging for the Clamshell Dredge provided by Justice and Associates for a Manson clamshell dredge.

Nearshore Placement/CAD Placement

- Tug speed towing loaded barge 6 knots
- Tug speed towing unloaded barge 8 knots
- Distance to placement site 1-1/2 mile
- Transit time loaded = 15 minutes
- Transit time unloaded = 10 minutes
- 1,500 cubic yards per day, 10-day project duration to dredge 15,000 cubic yards from Entrance Channel
- 3,000 cubic yards per day, 32-day project duration to dredge 98,000 cubic yards for CAD Site placement
- Tug operations: 10 hours per day total, 1 trip per day to nearshore placement site from Entrance Channel
- Tug operations: 10 hours per day total, 2 trips per day to CAD Site
  - 2 hour moving barge
  - 2 hours towing barge
  - 2-1/2 hour at placement site
  - 3-1/2 hour idling
  - 5 disposal events per day

Ocean Disposal

- Distance to disposal site 5 miles
- Transit outside 3 miles is outside SCAQMD and is not included in calculations
- Tug operations: 10 hours per day total, 2 trips per day to disposal site
  - 1 hour moving barge
  - 5 hour towing barge inside south coast air basin (approximately 1 hour per trip)
  - 7-1/2 hour towing barge outside south coast air basin (not included), includes 30 minutes at disposal site and 60 minutes transit)
  - 0 hour idling
  - Tug speed towing loaded barge 6 knots
  - Tug speed towing unloaded barge 8 knots
  - 5 disposal events per day

3,000 cubic yards per day, 268-day project duration to dredge 793,000 cubic yards
Dredging 6 days per week, 12 weeks dredging in CY 2022 and 40 weeks dredging in CY 2023. Nearshore and CAD placement dredging completed first, followed by ocean disposal dredging.
Nearshore and CAD placement dredging 8 weeks CY 2022. Ocean disposal dredging 4 weeks CY 2022 and 40 weeks in CY 2023.

Total Project Construction Emissions

	CY 2022 Tons						CY 2023 Tons					
	ROG	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Project Emissions												
Nearshore/CAD Placement	0.3	0.3	1.6	0.4	0.2	0.2						
Ocean Disposal	0.2	0.1	0.7	0.2	0.1	0.1	1.7	1.3	7.3	2.2	1.0	0.9
Total	0.5	0.4	2.3	0.7	0.3	0.2	1.7	1.3	7.3	2.2	1.0	0.9
Applicability Rate	**10**	**100**	**10**		**100**	**70**	**10**	**100**	**10**		**100**	**70**

GHG Emissions

Maintenance Dredging

Emission Source Data for Maintenance Dredging

Construction Activity/Equipment Type	Power Rating	Load Factor	# Active	Hourly Hp-Hrs	Fuel Use GPH	Hrs per Day	Total Work Days(3)	DailyTotal Hp-Hrs (1)
Clamshell dredge	1,890	1.0	1	1,890	N/A	10	180	18,900
Tug boat-clamshell dredge	800	0.20	1	160	8.0	10	180	80
Crew Boat	50	NA	1	NA	NA	4	180	NA
Tug boat-hydraulic dredge	1,600	NA	1	NA	NA	2	180	NA
Worker vehicles	NA	NA	18	NA	NA	2	180	NA
Hopper Dredge	2,000					22	180	22,000

Emission Factors for Construction Equipment

	Grams per HP-HR
Equipment Type	**CO2**
Clamshell dredge	568
Tugboat	509
Crew Boat	75
Worker vehicles	1.1

Estimated Emissions from Construction Equipment

	CO2	
Equipment Type	**lbs/day**	**tons total**
Clamshell dredge	12.5	1.9
Tugboat	11.2	1.7
Crew Boat	0.7	0.1
Worker vehicles	0.1	0.0
Total	24.5	3.8
Total Equivalent CO2		
Clamshell dredge	24.7	3.8

CO2 Equivalent = CO2*1.008

Maintenance Dredging-Priority Pollutants

Emission Source Data for Maintenance Dredging

Construction Activity/Equipment Type	Power Rating	Load Factor	# Active	Hourly Hp-Hrs	Fuel Use GPH	Hrs per Day [(1)]	Total Work Days [(2)]	DailyTotal Hp-Hrs (1)
Excavator	N/A	N/A	N/A	N/A	N/A	10	607	N/A
Tug boat-clamshell dredge	800	0.20	1	160	8.0	10	607	80

Tug boat propulsion factor 0.20 for idling; 0.50 for towing; and 0.4 for dredge barge movement (fuel use for 0.5 is 20 GPH, for 0.4 is 16 GPH)

(1) Assume 10 hours per day dredging; 1-1/2 hours per day shift change and maintenance weekdays

(2) 607 days for excavator

Emission Factors for Construction Equipment

Equipment Type	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Excavator (lb/hr)	1.1	0.3	1.1	1.0	0.7	0.6
Tugboat (lbs/1,000 Gal)	18.2	57.0	419.0	75.0	9.0	8.1

Daily Emissions from Construction Activities Excavator Dredge

	Pounds per day					
Construction Activity/Equipment Type	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Excavator dredge	10.8	3.0	10.9	9.5	6.9	6.0
Tug boat-nearshore placement						
Idling	1.2	3.9	28.5	5.1	4.2	0.6
Towing sediment barge	0.4	1.1	8.4	1.5	0.2	0.2
Shifting dredge barge	0.1	0.5	3.4	0.6	0.1	0.1
Subtotal Tug Boat Nearshore	1.7	5.5	40.2	7.2	4.5	0.8
Tug boat-ocean disposal						
Idling	0.9	3.0	21.8	3.9	0.5	0.4
Towing sediment barge	0.9	2.9	21.0	3.8	0.5	0.4
Shifting dredge barge	0.3	0.9	6.7	1.2	0.1	0.1
Subtotal Tug Boat Ocean Disposal	2.1	6.7	49.4	8.9	1.1	1.0
Crew boat [(3)]	0.9	0.4	0.8	0.1	0.1	0.1
Worker Vehicles [(3)]	0.1	1.2	0.9	0.1	0.1	0.1
Peak Daily Emissions						
Nearshore	**13.6**	**10.0**	**52.8**	**16.9**	**11.6**	**7.0**
Ocean Disposal	**14.0**	**11.2**	**62.1**	**18.5**	**8.2**	**7.2**

Assume dredge volume of 908,000 cubic yards, maximum expected based on funding limitations

Emissions factors for Maintenance Dredging for tugboat taken from the Port of Los Angeles Channel Deepening Project Final Supplemental Environmental Impact Statement/Environmental Impact Report, September 2000.

Emissions factors for Maintenance Dredging for the Clamshell Dredge provided by Justice and Associates for a Manson clamshell dredge.

Nearshore Placement/CAD Placement

Tug speed towing loaded barge 6 knots
Tug speed towing unloaded barge 8 knots
Distance to placement site 1-1/2 mile
Transit time loaded = 15 minutes
Transit time unloaded = 10 minutes
1,500 cubic yards per day, 10-day project duration to dredge 15,000 cubic yards from Entrance Channel
3,000 cubic yards per day, 32-day project duration to dredge 98,000 cubic yards for CAD Site placement
Tug operations: 10 hours per day total, 1 trip per day to nearshore placement site from Entrance Channel
Tug operations: 10 hours per day total, 2 trips per day to CAD Site
2 hour moving barge
2 hours towing barge
2-1/2 hour at placement site
3-1/2 hour idling
5 disposal events per day

Ocean Disposal

Distance to disposal site 5 miles
Transit outside 3 miles is outside SCAQMD and is not included in calculations
Tug operations: 10 hours per day total, 2 trips per day to disposal site
1 hour moving barge
5 hour towing barge inside south coast air basin (approximately 1 hour per trip)
7-1/2 hour towing barge outside south coast air basin (not included), includes 30 minutes at disposal site and 60 minutes transit)
0 hour idling
Tug speed towing loaded barge 6 knots
Tug speed towing unloaded barge 8 knots
5 disposal events per day
3,000 cubic yards per day, 268-day project duration to dredge 793,000 cubic yards
Dredging 6 days per week, 12 weeks dredging in CY 2022 and 40 weeks dredging in CY 2023. Nearshore and CAD placement dredging completed first, followed by ocean disposal dredging.
Nearshore and CAD placement dredging 8 weeks CY 2022. Ocean disposal dredging 4 weeks CY 2022 and 40 weeks in CY 2023.

Total Project Construction Emissions

	CY 2022 Tons						**CY 2023 Tons**						**CY 2024 Tons**					
Excavator	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Project Emissions																		
Alternative 1 Nearshore Placement[1]	0.5	0.3	1.9	0.6	0.3	0.2	2.2	1.8	9.7	2.9	1.3	1.1	1.6	1.3	7.1	2.1	0.9	0.8
Alternative 2 Ocean Disposal[2]	0.5	0.3	1.9	0.6	0.3	0.2	2.2	1.8	9.7	2.9	1.3	1.1	1.6	1.3	7.1	2.1	0.9	0.8
Applicability Rates	**10**	**100**	**10**		**100**	**70**	**10**	**100**	**10**		**70**	**70**	**10**	**100**	**10**		**100**	**70**

[1] Nearshore placement Entrance Channel only

[2] LA-3 for Entrance Channel and federal channels

Maintenance Dredging-Greenhouse Gases

Emission Source Data for Maintenance Dredging

Construction Activity/Equipment Type	Power Rating	Load Factor	# Active	Hourly Hp-Hrs	Fuel Use GPH	Hrs per Day	Total Work Days(3)	DailyTotal Hp-Hrs (1)
Excavator	1,890	1.0	1	1,890	N/A	10	28	18,900
Tug boat-clamshell dredge	800	0.20	1	160	8.0	10	28	80
Crew Boat	50	NA	1	NA	NA	4	28	NA
Tug boat-hydraulic dredge	1,600	NA	1	NA	NA	2	28	NA
Worker vehicles	NA	NA	18	NA	NA	2	28	NA

64 days for clamshell; 107 days for excavator

Emission Factors for Construction Equipment

	Grams per HP-HR
Equipment Type	**CO2**
Clamshell dredge	568
Tugboat	509
Crew Boat	75
Worker vehicles	1.1

Estimated Emissions from Construction Equipment

	CO2	
Equipment Type	**lbs/day**	**tons total**
Clamshell dredge	12.5	0.4
Tugboat	11.2	0.4
Crew Boat	0.7	0.0
Worker vehicles	0.1	0.0
Total	24.5	0.8
Total Equivalent CO2		
Clamshell dredge	24.7	0.8

CO2 Equivalent = CO2*1.008

	CO2	
Equipment Type	**lbs/day**	**tons total**
Excavator dredge	12.5	0.7
Tugboat	11.2	0.6
Crew Boat	0.7	0.0
Worker vehicles	0.1	0.0
Total	24.5	1.3
Total Equivalent CO2		
Excavator dredge	24.7	1.3

CO2 Equivalent = CO2*1.008

APPENDIX E

404(b)(1) EVALUATION

THE EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO THE WATERS OF THE UNITED STATES IN SUPPORT OF THE ENVIRONMENTAL ASSESSMENT FOR LOWER NEWPORT BAY MAINTENANCE DREDGING PROJECT ORANGE COUNTY, CALIFORNIA

INTRODUCTION. The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) as amended by the Clean Water Act of 1977 (Public Law 95-217). Its intent is to succinctly state and evaluate information regarding the effects of discharge of dredged or fill material into the waters of the U.S. As such, it is not meant to stand-alone and relies heavily upon information provided in the environmental document to which it is attached. Citation in brackets [] refer to expanded discussion found in the Draft Environmental Assessment (Draft EA), to which the reader should refer for details.

I. Project Description [1.1]

a. Location: [1.1.1] The proposed project is located in Orange County and consists of maintenance dredging the federal navigation channels in Lower Newport Bay.

b. General Description: [1.1.2; 3.2.2] The proposed project is maintenance dredging to maintain authorized channel depths in the federal navigation channels to allow for continued, safe navigation for recreational and commercial boats in Lower Newport Bay. Dredged sediments from the Entrance Channel portion would be beneficially reused for beach nourishment purposes by placing them in the Newport Beach Nearshore Placement Site identified for this purpose for sediments dredged from Lower Newport Bay. Approximately 7,000 cubic yards (cy) of sediments would be dredged by either a clamshell dredge or a barge-mounted excavator discharging into scows. Full scows would be towed to the Newport Beach Nearshore Placement Site and the sediments placed into the Newport Beach Nearshore Placement Site.

   Dredging would take place in the federal navigation channels with approximately 793,000 cy of sediment disposed of at the LA-3 Ocean Dredged Material Disposal Site (ODMDS). Sediments in the federal channels excluding the Entrance Channel are not considered suitable for nearshore placement. Ocean disposal is not addressed in this 404(b)(1) Evaluation as it is not under the jurisdiction of the Clean Water Act.

   Dredge approximately 98,000 cubic yards of sediments determined to be unsuitable for ocean disposal from the federal channels in Lower Newport Bay with placement at the proposed Confined Aquatic Disposal (CAD) site to be located in the Lower Bay, if available. If the CAD site is not available in time to be used for this purpose, the sediments found to be unsuitable for ocean disposal, would not be dredged and would remain in place. Dredge approximately 10,000 cubic yards of material suitable for ocean disposal that

would be used as an interim cap for the proposed CAD Site to isolate the unsuitable material from the bay waters. If the CAD site is unavailable, this material would be disposed at the LA-3 ODMDS.

c. Basic and Overall Purpose. [2.2] The basis project purpose is navigation. The overall project purpose is to maintain authorized channel depths in the federal channels to allow for continued, safe navigation for recreational and commercial boats in Lower Newport Bay.

d. General Description of Dredged or Fill Material: [4.1, Appendix B]

(1) General Characteristics of Material (grain size, soil type): A sediment sampling program was conducted in 2018-2019 to support maintenance dredging in the Entrance Channel. Sediment from the Entrance Channel consisted primarily of sand (98.1%). TOC ranged from non-detect to 1.9%. Composite sediment chemistry results indicated that sediment from the Entrance Channel is clean, with all concentrations less than the NOAA ERL values. Solid Phase and Suspended Particulate Phase bioassay testing indicated that sediment from the Entrance Channel is not acutely toxic to marine organisms. Due to the high percentage of sand (98.1%) and low concentrations of contaminants, tissue analysis for bioaccumulation evaluation was not required. Based on the results of testing, sediment from the Entrance Channel is considered suitable for nearshore placement. It is also considered suitable for ocean disposal, however, Corps/USEPA policy is to beneficially reuse dredged sediments wherever possible, so ocean disposal is considered suitable, but not acceptable given the presence of the beneficial reuse at the Newport Beach Nearshore Placement Site.

Sediments to be placed in the CAD Site are consisted primarily of fines (68.6% to 98.2% silt and clay). Based on elevated levels of mercury, these sediments were determined to be unsuitable for ocean disposal

(2) Quantity of Material: Approximately 7,000 cy of sediments dredged from the project area would be placed in the Newport Beach Nearshore Placement Site and 108,000 cy of sediment would be placed within the CAD site.

(3) Source Material: federal navigation channels of Lower Newport Bay.

e. Description of the Proposed Discharge Site:

(1) Suitable dredged material would be placed in the nearshore area of the Newport Beach Nearshore Placement Site. The characteristic habitat type subject to impact by dredge material discharge is open-coast sandy beach. The receiver site consisted of 0.2% to 21.3% fines. Sediments were classified as poorly graded sand (SP), poorly graded sand with silt (SP-SM), or silty sand (SM). The CAD site is characteristic harbor bottom sediments. Sediments to be placed here would be similar to those excavated to create

the CAD site but are considered unsuitable for ocean disposal due to what are considered to be elevated levels of mercury.

(2) Size (acres): Suitable dredged material would be placed in an approximately 35-acre Newport Beach Nearshore Placement Site. Material deemed unsuitable for unconfined aquatic disposal would be placed in proposed CAD site, if available.

(3) Type of Site (confined, unconfined, open water): Unconfined, open water for the Newport Beach Nearshore Placement Site and Lower Newport Bay harbor bottom for the CAD site.

(4) Types of Habitats: Newport Beach Nearshore Placement Site is offshore of a typical southern California sandy beach. Bottom type is poorly graded, fine to medium sands. Bottom depths range from -25 ft MLLW to -40 ft MLLW. The CAD site is in typical harbor bottom sediments in the lower bay. Bottom type is poorly graded sandy silts.

f. Description of Disposal Method: [9.1] Material would be dredged by either a clamshell dredge or a barge-mounted excavator and dredged sediments transported via split hull dredge scow to either the Newport Beach Nearshore Placement Site or the CAD site.

II. Factual Determinations**.**

a. Physical Substrate Determinations:

(1) Substrate Elevation and Slope:

Current bottom elevations in the Newport Beach Nearshore Placement Site range from -25’ to -40’ MLLW. The area is relatively flat. The CAD site is located within an identified federal navigation channel with an authorized depth of -15’ MLLW. This area is relatively flat.

(2) Sediment Type.

Geotechnical studies indicate that the sediment in both sites consists primarily of poorly graded sand (SP), poorly graded sand with silt (SP-SM), or silty sand (SM). Sediments from the Entrance Channel are compatible with existing Newport Beach Nearshore Placement Site materials. Sediments to be placed in the CAD Site are consisted primarily of fines (68.6% to 98.2% silt and clay).

(3) Dredged Material Movement.

Suitable dredged material would be placed into the Newport Beach Nearshore Placement Site from the Entrance Channel. The area experiences moderate levels of sand movement protecting and nourishing adjacent beaches. Dredged material

deemed unsuitable for unconfined aquatic disposal would be placed into the CAD Site, if available, and capped with no movement anticipated.

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.).

Temporary, short-term adverse impacts would occur. The placement of sediments would bury benthic organisms. Recolonization would be expected to occur quickly. No long-term adverse effects are expected.

(5) Other Effects. None.

(6) Actions Taken to Minimize Impacts (Subpart H).

Needed: X YES NO

In accordance with the Environmental Commitments, weekly monitoring of water quality to control turbidity and to monitor dissolved oxygen levels during placement would occur. If turbidity exceeds set standards and/or dissolved oxygen fall below a set standard of 5 mg/l, placement would be evaluated, and modifications would be made to get back into compliance.

If needed, Taken: X YES NO

In accordance with the Environmental Commitments, a water quality monitoring plan will be part of the construction contract and will be coordinated with the Regional Water Quality Control Board, Santa Ana Region.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water (refer to sections 230.11(b), 230.22 Water, and 230.25 Salinity Gradients; test specified in Subpart G may be required). Consider effects on salinity, water chemistry, clarity, odor, taste, dissolved gas levels, nutrients, eutrophication, others.

The proposed federal action is not expected to significantly affect water circulation, fluctuation, and/or salinity. Only clean, compatible sands from the project will be used for the nearshore placement. These sands are not a source of contaminants. Minor turbidity levels may exist in the immediate vicinity of the placement operations that may result in minor, temporary reductions in dissolved oxygen. Sands will not be a source of nutrients; thus, eutrophication is not expected to result. Sediments to be placed in the CAD site will be taken from other parts of the lower bay and would be placed below the current harbor bottom eventually resulting in no change in bathymetry. There will be no overall changes to water circulation or salinity.

(2) Current Patterns and Circulation (consider items in sections 230.11(b), and 230.23), Current Flow, and Water Circulation.

The proposed federal action is not expected to significantly affect current patterns or circulation. Circulation and current patterns in the harbor are determined by a combination of tide, wind, thermal structure, and local bathymetry. Placement of material at the Newport Beach Nearshore Placement Site would result in negligible, localized changes to circulation patterns within the area. Placement of sediment in the CAD site would fill in an excavated pit with no overall change to harbor bottom topography and thus no net change in current patterns or circulation.

(3) Normal Water Level Fluctuations (tides, river stage, etc.) (consider items in sections 230.11(b) and 230.24)

The proposed federal action is not expected to have a significant impact on normal water level fluctuations. There would no change to tidal elevations, which is determined by access to the open ocean, which would not be changed.

(4) Salinity Gradients (consider items in sections 230.11(b) and230.25)

The proposed federal action is not expected to have any impact on normal water salinity nor is it expected to create salinity gradients. Water placed in the scow as part of the dredging process would be sea water as is water adjacent to the Newport Beach Nearshore Placement Site and CAD site, thus there will be no creation of salinity gradients.

(5) Actions That Will Be Taken to Minimize Impacts (refer to Subpart H)

Needed: X YES _ NO
If needed, Taken: X YES _ NO

In accordance with the Environmental Commitments, all placement operations would be monitored for effects on water quality, including turbidity, temperature, salinity, dissolved oxygen, and pH; monthly water samples will be taken and analyzed for total dissolved solids and TRPH. Best management practices, including modification to the dredge methodology, and use of silt curtains, would be implemented if turbidity and/or dissolved oxygen exceeds water quality criteria.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (consider items in sections 230.11(c) and 230.21)

Placement of sediments generally results in minor impacts to water quality from turbidity. Impacts would be temporary and adverse, but not significant. This is expected to be highly localized and visually indistinguishable from normal turbidity levels. The area is expected to return to background after placement ceases. Water

quality monitoring during placement will allow the Corps to modify operations (such as by slowing rate of discharge) until any water quality problems abate.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column (consider environmental values in section 230.21, as appropriate)

Newport Beach Nearshore Placement Site: Placement of clean sandy sediments generally results in minor impacts to water quality due to resuspension of chemical contaminants in the sediments. Sediments are free of contaminants and impacts are expected to be negligible and be temporary. CAD Site: Placement of sediments unsuitable for ocean disposal would result in increased, short-term turbidity. Contaminants in the sediment that render them unsuitable for ocean disposal is mercury, which is not expected to disassociate from sediments during dredging or placement and are not expected to result in water quality impacts. Dredging and placement would be monitored and if impacts result, measures would be taken such as the use of silt curtains or a closed bucket for dredging.

(3) Effects on Biota (consider environmental values in sections 230.21, as appropriate).

Biota buried during placement are expected to recolonize over the short term. Impacts will be temporary and adverse, but not significant.

(4) Actions taken to Minimize Impacts (Subpart H)

Needed: X YES _ NO
If needed, Taken: X YES __ NO

In accordance with the Environmental Commitments, monitoring of water quality to control turbidity and to monitor for possible resuspension of contaminants during placement would occur. If turbidity exceeds set standards and/or dissolved oxygen exceeds water quality criteria, disposal would be evaluated, and modifications made to get back into compliance.

A water quality monitoring plan will be part of the construction contract and will be coordinated with the Regional Water Quality Control Board, Santa Ana Region.

d. Contaminant Determinations (consider requirements in section 230.11(d)): The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

(1) Physical characteristics _X_

(2) Hydrography in relation to known or anticipated sources of contaminants _X_

(3) Results from previous testing of the material or similar material in the vicinity of the

proposed project _X_

(4) Known, significant sources of contaminants (e.g. pesticides) from land runoff or percolation_____X

(5) Spill records for petroleum products or designated (Section 311 of the CWA) hazardous substances

(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources

(7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man- induced discharge activities

(8) Other sources (specify)_X_____ _____

An evaluation of sediment testing indicates that the proposed dredged material is not a carrier of contaminants and that levels of contaminants are substantively similar in the extraction and placement sites and are not likely to be constraints.

e. Aquatic Ecosystem and Organism Determinations (use evaluation and testing procedures in Subpart G, as appropriate).

(1) Plankton, Benthos and Nekton

Placement operations would result in short-term turbidity impacts that could affect plankton in the area. Organisms could stifle in the immediate vicinity as these small organisms are impacted by turbidity. However, these effects would be small in both area and time and the plankton would be expected to recover quickly once disposal is completed. Benthic organisms would be buried by placement, but the areas would be minor in area and would quickly recolonize. Larger organisms in the nekton would be expected to avoid disposal operations and would not be impacted.

(2) Food Web

Impacts to the bottom of the food chain (plankton and nekton) would be short term and occur in a small area. Recovery would be quick once placement operations are concluded.

(3) Special Aquatic Sites

There are no special aquatic sites within the nearshore placement site or CAD site.

(4) Threatened & Endangered Species

There would be no affect to any listed threatened or endangered species or to their designated critical habitat. The federally listed endangered California least tern (*Sternula antillarum browni*) is a migratory bird. California least terns predominately nest on coastal foredunes and other sites with gravelly or sandy substrate and sparse vegetation. Because terns would abandon nests if disturbed, they require nest areas relatively free of human disturbance and predators. The historical habitat of the California least tern has been significantly reduced and modified by human activities including marine and industrial development and residential development along beaches. This loss of habitat has resulted in small, isolated breeding colonies that are vulnerable to local extirpation. Primary threats to California least tern populations include increased predation and recreation-related disturbances. California least terns arrive and move through the harbor area in late April and utilize nest areas in Orange County from mid-May through August. Although nesting does not occur at Newport Beach, other areas in the region provide suitable habitat. These areas include Upper Newport Bay to the 4 miles to the northeast. California least terns have been observed foraging in the bay and may forage in waters offshore during the breeding season. Beaches within the harbor are not an important resting area for the species due to the presence of extensive human activity. Because the project area is routinely subject to elevated noise and activity of workers and equipment associated with common commercial and recreational practices, short-term project-related disturbances are not expected to affect the foraging and resting of least terns.

There is a low likelihood of green sea turtle (*Chelonia mydas*) occurring in the project area. With the inclusion of the monitoring and avoidance measures included in Section 6 of the EA, the proposed maintenance activities would not affect green sea turtles in Lower Newport Bay.

(5) Other fish and wildlife:

Marine mammals would not be affected by placement activities. Birds would generally avoid the placement site, although placement could attract birds to the placement site.

(6) Actions to Minimize Impacts (refer to Subpart H)

Needed: __X__ YES _ _ NO

Monitor and control turbidity to minimize impacts to plankton and nekton.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination (consider factors in section 230.11(f)(2))

Is the mixing zone for each disposal site confined to the smallest practicable zone?
__X__ YES__NO

The sediments do not require a mixing zone in order to remain in compliance with water quality standards. As such, the mixing zone is considered to be the smallest practicable.

(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard)

The project will be in compliance with state water quality standards. Placement of material at the receiver site would result in short-term elevated turbidity levels and suspended sediment concentrations, but no appreciable long-term changes in other water quality parameters, including dissolved oxygen, pH, nutrients, or chemical contaminants. Factors considered in this assessment include the relatively localized nature of the expected turbidity plumes for the majority of the disposal/placement period and rapid diluting capacity of the receiving environment and the clean nature of re sediments to be dredged and placed at the Newport Beach Nearshore Placement Site. Water quality monitoring would be required as part of the overall project. If monitoring indicated that suspended particulate concentrations outside the zone of initial dilution exceeded permissible limits, disposal/placement operations would be modified to reduce turbidity to permissible levels. Therefore, impacts to water quality from disposal/placement of material at the receiver site would not violate water quality objectives or compromise beneficial uses listed in the Basin Plan. USACE will continue to coordinate with the Santa Ana Regional Water Quality Control Board during construction to minimize impacts to water quality.

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply (refer to section 230.50)

There are no municipal or private water supply resources (i.e. aquifers, pipelines) in the project area. The proposed project would have no effect on municipal or private water supplies or water conservation.

(b) Recreational and Commercial Fisheries (refer to section 230.51)

The harbor and nearshore areas are not subject to commercial fishing. Recreational fishing would move to avoid the placement activities and to follow fish out of these areas.

(c) Water Related Recreation (refer to section 230.52)

Construction equipment would be required to maintain ocean access for all uses. During placement activities, proper advanced notice to mariners would occur and navigational traffic would not be allowed within the nearshore placement discharge area. The displacement of recreational boating would be temporary and short-term.

However, the proposed project would not significantly impact surfing conditions or other water sports once completed. The currents are not expected to change in magnitude or direction. Therefore, the federal action is not expected to measurably change currents or change surfing in any discernible way. To minimize navigation impacts and threats to vessel safety, all floating equipment would be equipped with markings and lightings in accordance with the U.S. Coast Guard regulations. The location and schedule of the work would be published in the U.S. Coast Guard Local Notice to Mariners

(d) Aesthetics (refer to section 230.53)

Minor, short term effects during placement are anticipated. The federal action would not result in any visible changes to the nearshore area or CAD Site.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (refer to section 230.54)

The federal action would not have any effect on national and historic monuments, national seashores, wild and scenic rivers, wilderness areas or research sites.

(f) Determination of Cumulative Effects on the Aquatic Ecosystem (consider requirements in section 230.11(g))

Cumulative effects were determined to be insignificant, refer to section 5 of the Environmental Assessment.

(g) Determination of Secondary Effects on the Aquatic Ecosystem (consider requirements in section 230.11(h))

Secondary effects of the discharge of dredged or fill would be negligible. Areas outside the direct impact would have only negligible turbidity effects from disposal. Turbidity levels would be low and in the immediate vicinity of the disposal operations. Impacts of the federal action are all temporary construction impacts. Movement of sand downcoast would be indistinguishable from natural sand movement resulting in lowered erosion rates due to the increased volume of sand.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem:

All practicable alternatives for dredging/placement were evaluated. This included differing alternative dredge depths. The recommended plan is the least environmentally damaging practicable alternative.

c. Compliance with Applicable State Water Quality Standards.

The proposed project meets State of California water quality standards.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act.

No toxic materials/wastes are expected to be produced or introduced into the environment by this project.

e. Compliance with Endangered Species Act of 1973.

As discussed in the EA, the Corps has determined the placement of dredged/fill material will not have an effect on any species Federally listed as threatened or endangered nor any designated critical habitat. Consultation pursuant to Section 7 of this Act is not required for this project.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972.

No sanctuaries as designated by the Marine Protection, Research and Sanctuaries Act of 1972 will be affected by the proposed project.

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies

The proposed project will have no significant adverse effects on municipal and private water supplies.

(b) Recreation and Commercial Fisheries

The proposed project will have minor, short-term impacts, but no significant adverse effects on recreation fisheries. The harbor and nearshore areas are not subject to commercial fishing. Recreational fishing would move to avoid the disposal activities and to follow fish out of these areas. To minimize navigation impacts and threats to vessel safety, all floating equipment would be equipped with markings and lightings in accordance with the U.S. Coast Guard regulations.

The location and schedule of the work would be published in the U.S. Coast Guard Local Notice to Mariners.

(c) Plankton

Disposal operations would result in short-term turbidity impacts that would affect plankton in the area. Organisms could stifle in the immediate vicinity as these small organisms are impacted by turbidity. However, these effects would be small in both area and time and the plankton would be expected to recover quickly once placement is completed.

(d) Fish

Larger organisms in the nekton would be expected to avoid placement operations and would not be impacted.

(e) Shellfish

Benthic organisms, including shellfish, would be buried by disposal, but the areas would be minor in area and would quickly recolonize.

(f) Wildlife

Marine mammals would not be affected by placement. Birds would generally avoid the placement, although nearshore placement could attract birds to the benthic organisms coming out of the dredge pipe as an alternate food source.

(g) Special Aquatic Sites

There are no special aquatic sites in the project area.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems: Any adverse effects would be short-term and insignificant. Refer to section 4 of this Environmental Assessment.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability: Any adverse effects would be short-term and insignificant. Refer to section 4 of this Environmental Assessment.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values: Any adverse effects would be short-term and insignificant. Refer to section 4 of this Environmental Assessment.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Specific environmental commitments are outlined in the analysis above and in the attached Environmental Assessment. All appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

i. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material (specify which) is: **THE FINAL 404(B)(1) AND FINDINGS OF COMPLIANCE WILL BE INCLUDED IN THE FINAL EA.**

Prepared by: Larry Smith Date: DRAFT

APPENDIX F

ENVIRONMENTAL JUSTICE SCREEN RESULTS

EJSCREEN Report (Version 2020)

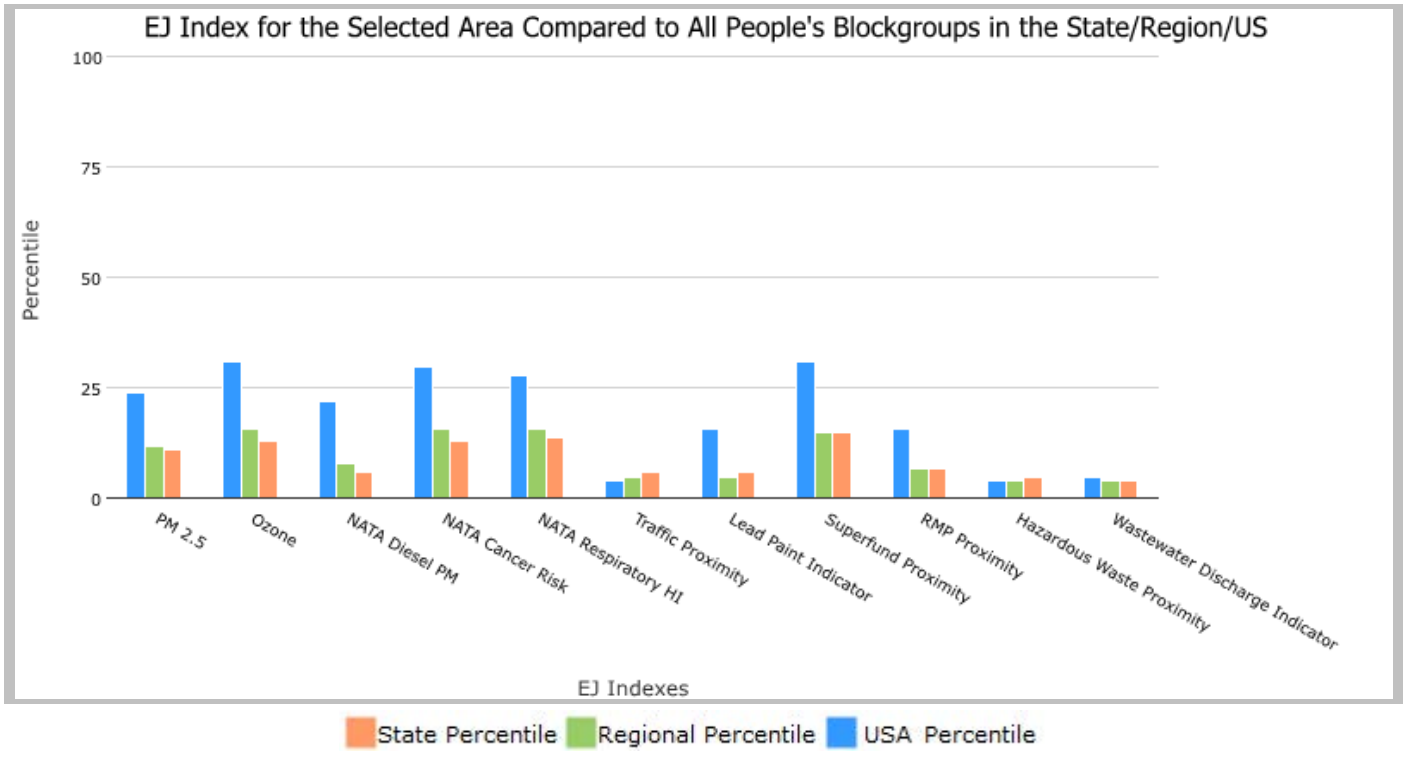
1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 31,542

Input Area (sq. miles): 8.34

Dredge Footprint

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	11	12	24
EJ Index for Ozone	13	16	31
EJ Index for NATA* Diesel PM	6	8	22
EJ Index for NATA* Air Toxics Cancer Risk	13	16	30
EJ Index for NATA* Respiratory Hazard Index	14	16	28
EJ Index for Traffic Proximity and Volume	6	5	4
EJ Index for Lead Paint Indicator	6	5	16
EJ Index for Superfund Proximity	15	15	31
EJ Index for RMP Proximity	7	7	16
EJ Index for Hazardous Waste Proximity	5	4	4
EJ Index for Wastewater Discharge Indicator	4	4	5



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

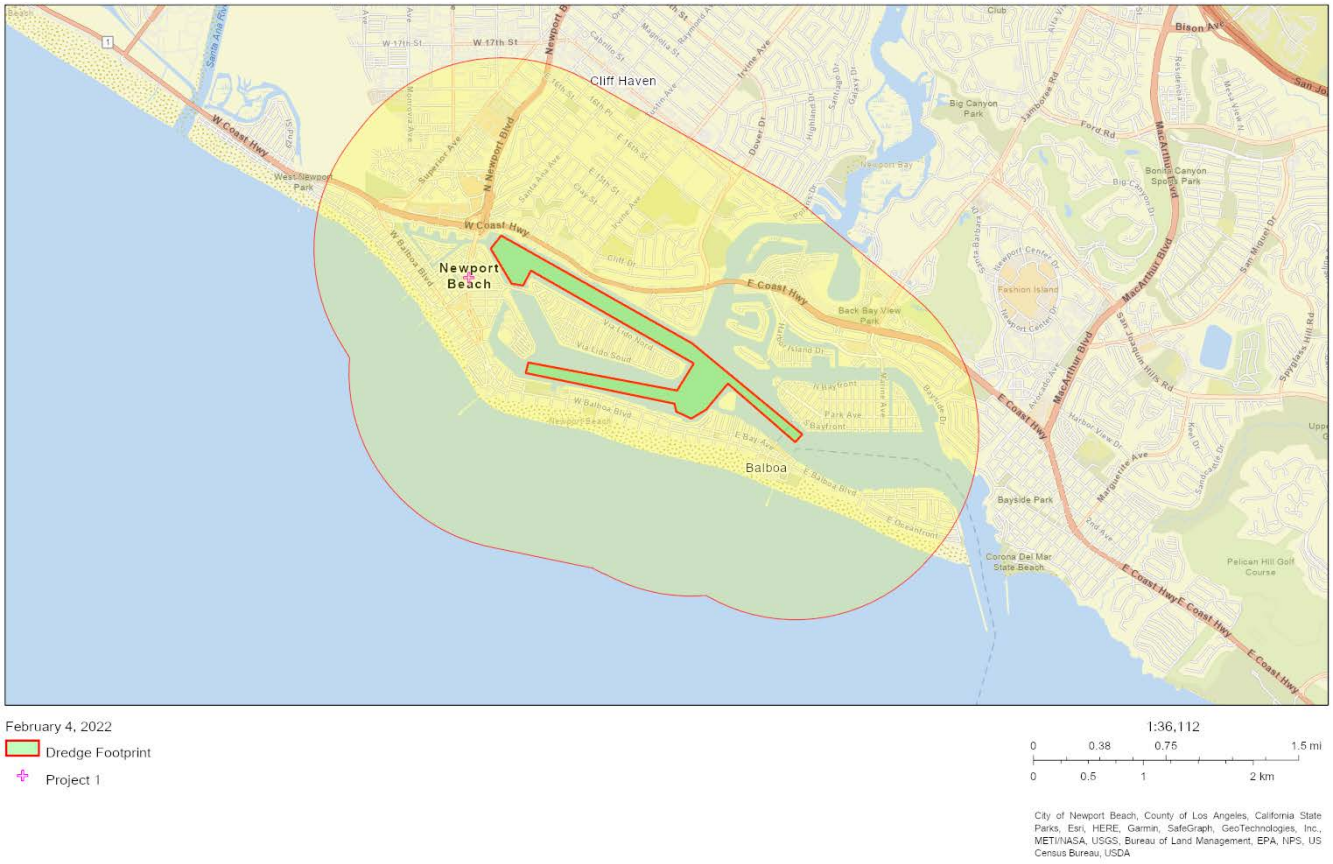
EJSCREEN Report (Version 2020)

1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 31,542

Input Area (sq. miles): 8.34

Dredge Footprint



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	5

EJSCREEN Report (Version 2020)

1 mile Ring around the Area, CALIFORNIA, EPA Region 9

Approximate Population: 31,542

Input Area (sq. miles): 8.34

Dredge Footprint

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	10.5	10.6	48	9.99	59	8.55	92
Ozone (ppb)	43.6	49.2	31	50.1	25	42.9	56
NATA* Diesel PM (µg/m^3)	0.481	0.467	60	0.479	50-60th	0.478	60-70th
NATA* Cancer Risk (lifetime risk per million)	30	36	24	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.43	0.55	19	0.53	<50th	0.44	50-60th
Traffic Proximity and Volume (daily traffic count/distance to road)	1700	2000	65	1700	71	750	89
Lead Paint Indicator (% Pre-1960 Housing)	0.33	0.29	61	0.24	68	0.28	65
Superfund Proximity (site count/km distance)	0.051	0.17	31	0.15	36	0.13	43
RMP Proximity (facility count/km distance)	0.66	1.1	53	0.99	58	0.74	66
Hazardous Waste Proximity (facility count/km distance)	6.8	6.2	62	5.3	70	5	88
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.079	18	82	18	83	9.4	88
Demographic Indicators							
Demographic Index	17%	47%	6	46%	7	36%	24
People of Color Population	18%	62%	5	60%	7	39%	35
Low Income Population	16%	33%	26	33%	25	33%	25
Linguistically Isolated Population	1%	9%	20	8%	25	4%	51
Population With Less Than High School Education	2%	17%	10	16%	10	13%	12
Population Under 5 years of age	3%	6%	16	6%	17	6%	18
Population over 64 years of age	22%	14%	86	14%	84	15%	81

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2020)

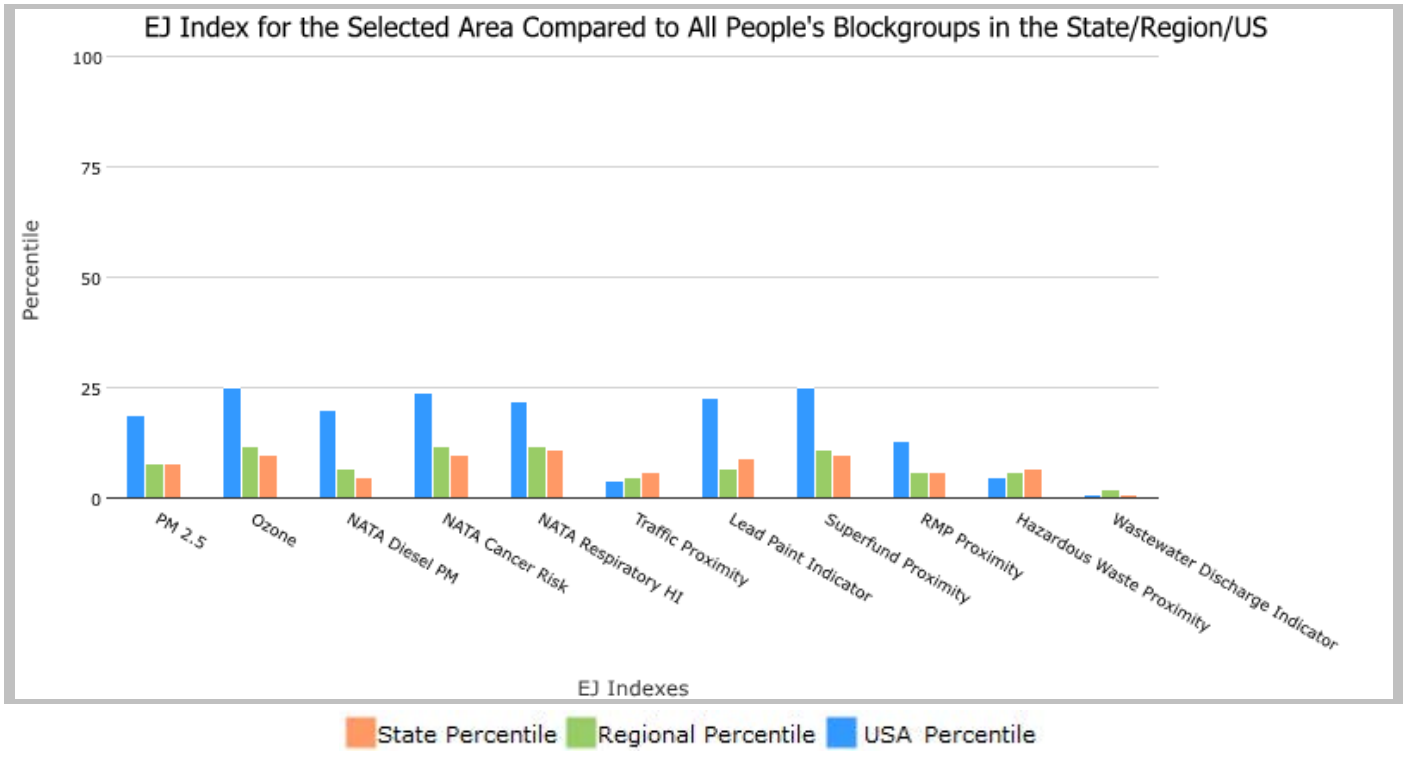
City: Newport Beach, CALIFORNIA, EPA Region 9

Approximate Population: 86,288

Input Area (sq. miles): 52.95

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	8	8	19
EJ Index for Ozone	10	12	25
EJ Index for NATA* Diesel PM	5	7	20
EJ Index for NATA* Air Toxics Cancer Risk	10	12	24
EJ Index for NATA* Respiratory Hazard Index	11	12	22
EJ Index for Traffic Proximity and Volume	6	5	4
EJ Index for Lead Paint Indicator	9	7	23
EJ Index for Superfund Proximity	10	11	25
EJ Index for RMP Proximity	6	6	13
EJ Index for Hazardous Waste Proximity	7	6	5
EJ Index for Wastewater Discharge Indicator	1	2	1



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

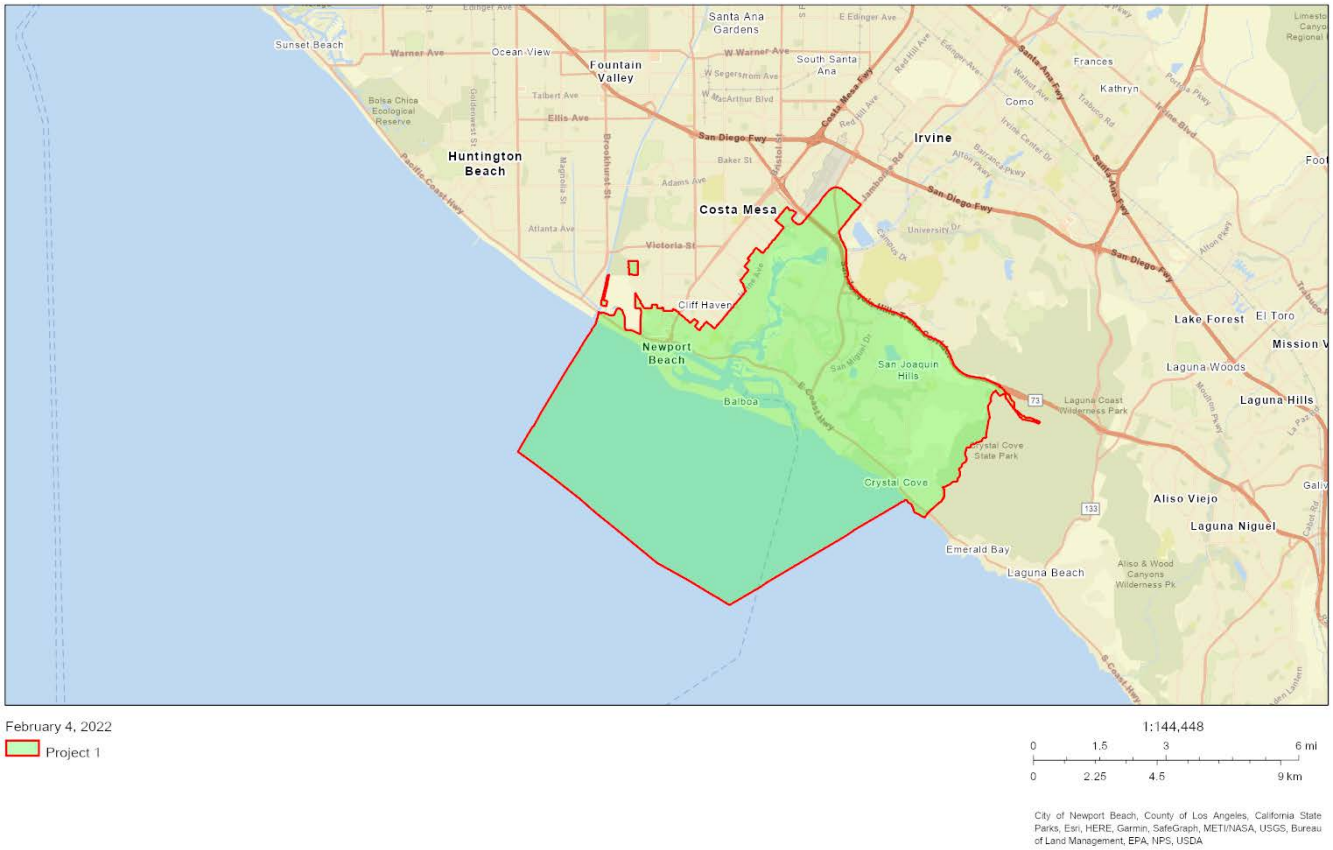
EJSCREEN Report (Version 2020)

City: Newport Beach, CALIFORNIA, EPA Region 9

Approximate Population: 86,288

Input Area (sq. miles): 52.95

(The study area contains 1 blockgroup(s) with zero population.)



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	9

EJSCREEN Report (Version 2020)

City: Newport Beach, CALIFORNIA, EPA Region 9

Approximate Population: 86,288

Input Area (sq. miles): 52.95

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	10.6	10.6	49	9.99	59	8.55	93
Ozone (ppb)	44.3	49.2	34	50.1	27	42.9	65
NATA* Diesel PM (µg/m^3)	0.442	0.467	55	0.479	50-60th	0.478	50-60th
NATA* Cancer Risk (lifetime risk per million)	30	36	26	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.44	0.55	20	0.53	<50th	0.44	50-60th
Traffic Proximity and Volume (daily traffic count/distance to road)	1400	2000	60	1700	67	750	86
Lead Paint Indicator (% Pre-1960 Housing)	0.2	0.29	49	0.24	57	0.28	52
Superfund Proximity (site count/km distance)	0.061	0.17	37	0.15	43	0.13	49
RMP Proximity (facility count/km distance)	0.6	1.1	50	0.99	55	0.74	64
Hazardous Waste Proximity (facility count/km distance)	4.5	6.2	48	5.3	57	5	82
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	1.9	18	92	18	92	9.4	95
Demographic Indicators							
Demographic Index	17%	47%	6	46%	7	36%	24
People of Color Population	21%	62%	7	60%	9	39%	38
Low Income Population	14%	33%	22	33%	21	33%	21
Linguistically Isolated Population	2%	9%	23	8%	27	4%	54
Population With Less Than High School Education	2%	17%	10	16%	10	13%	12
Population Under 5 years of age	4%	6%	26	6%	27	6%	29
Population over 64 years of age	23%	14%	88	14%	86	15%	83

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

APPENDIX G

LOWER NEWPORT BAY MAINTENANCE DREDGING PROJECT CAULERPA SURVEY PROPOSAL

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
915 WILSHIRE BOULEVARD, SUITE 1109
LOS ANGELES, CALIFORNIA 90017-3409

CESPL-PDR-Q 25 FEB 2022

MEMORANDUM FOR RECORD

SUBJECT: Lower Newport Bay Maintenance Dredging Project

REFERENCES:
a. *Caulerpa* Control Protocol (Version 5 – October 20, 2021)

This Memorandum for the Record (MFR) was prepared to document a revised proposal to conduct surveys for species of invasive algae in the genus *Caulerpa*. Surveys would be conducted in coordination with proposed maintenance dredging in Lower Newport Bay. In April 2021, federal, state, and local agencies were notified that an invasive algae species, *Caulerpa prolifera*, was discovered in Newport Bay, California. As a result, Lower Newport Bay is currently considered to be an infected system as defined by the *Caulerpa* Control Protocol. As a result, any *Caulerpa* surveys performed in Newport Bay should adhere to the more stringent survey level requirements for an infected system until it has been re-designated as a "Caulerpa-Free System".

The U.S. Army Corps of Engineers, Los Angeles District (USACE) is currently preparing plans and environmental documentation to dredge the remaining federal navigation channels in Lower Newport Bay that were not dredged in 2021. Figure 1 shows the extent of the proposed dredging. Most of the sediments in the remaining channels are considered to be suitable for ocean disposal at the LA-3 Ocean Dredged Material Disposal Site (ODMDS). Sediments not considered suitable for ocean disposal would be placed within a Confined Aquatic Disposal (CAD) Site to be created by the City of Newport Beach for this purpose and capped in place. A very small volume of sediments is being considered for dredging as part of this effort in the ocean end of the Entrance Channel. These sediments were left in place due to difficult ocean conditions that precluded dredging in 2021. These sediments would be placed in the nearshore placement site located off Newport Beach (shown on Figure 1). These sediments are in an area of the Entrance Channel that does not contain eelgrass. Estimated dredge volumes for all of the federal channels are given in Table 1.

The USACE conferred with Keith Merkel, our *Caulerpa* and eelgrass contractor for Lower Newport Bay dredging, to discuss our survey obligations under the *Caulerpa* Control Protocol. The proposed dredge area is approximately 146 acres in area. The proposed survey area, which no longer includes the initially proposed 100-foot buffer, is approximately 146 acres.

Table 1. Estimated Dredge Volumes by Reach

		Suitable for ocean disposal		Unsuitable for ocean disposal		Nearshore compatible		
Federal Channel	**Design Depth (feet MLLW)**	**Estimated Volume to Design**	**2-Foot Overdepth Volume (KCY)**	**Estimated Volume to Design**	**2-Foot Overdepth Volume (KCY)**	**Estimated Volume to Design**	**2-Foot Overdepth Volume (KCY)**	**Total Volume (KCY)**
Entrance Channel	-20					2	5	**7**
Lido Isle Reach	-20	106	77	19	17			**219**
Harbor Island Reach	-20	25	28					**53**
Balboa Reach	-20	Completed in 2021						-
Turning Basin	-19			5	17			**22**
Yacht Anchorage	-15	229	140					**369**
Newport Channel	-15	136	62	22	18			**238**
	TOTAL	496	307	46	52			**908**
	TOTAL		803		98			

The *Caulerpa* Control Protocol for an infected system recommends the following survey criteria:

1. Prior to initiation of any authorized Bottom Disturbing Activity within an Infected System, two surveys, initiated not less than 60 days apart, shall be conducted within the project APE [Area of Potential Effect]. The first survey shall be conducted using High Intensity Level techniques and the second survey shall be conducted using Eradication Area Level techniques. Both surveys shall be conducted within the same High Growth Period. Deviations from this condition may be considered on a case-by-case basis by the appropriate regulatory agency in consultation with NOAA Fisheries and CDFW.

2. At least one survey shall be conducted within 45 days of initiation of an authorized Bottom Disturbing Activity (a "Pre-Act Survey"). This survey could be the second (Eradication Area Level) survey conducted during the High Growth Period. However, project delays may require that a third survey be conducted prior to initiation of the Bottom Disturbing Activity to meet this 45-day requirement. If a third survey is required, this survey shall be conducted at either a High Intensity Level or Eradication Area Level as determined by the NOAA Fisheries/CDFW Contacts based upon site circumstances and proximity to infestations. To determine appropriate survey level, please contact the NOAA Fisheries/CDFW Contacts with project specific information.

3. If the Bottom Disturbing Activity extends for over 90 calendar days, the portions of the APE that would be expected to be impacted by a Bottom Disturbing Activity within the subsequent 90 days must be re-surveyed at a High Intensity Level. This subsequent survey must be conducted within 15 days following the first 90 days. Prolonged activities would require a repetition of this phased survey requirement.

4. If dredged material is removed from the APE and placed elsewhere in the marine environment, then between 60 and 120 days after placement of the dredged materials and, to the extent feasible, during the High Growth Period, the applicant shall conduct a Surveillance Level survey at all disposal areas except where material is disposed of within an existing U.S. EPA designated deep ocean disposal site. Deviations from this condition may be considered on a case-by-case basis by the appropriate regulatory agency in consultation with NOAA Fisheries and CDFW.

Due to a few factors, including distance from the infected site, the unvegetated nature of the channel bottom, the large size of the area to be dredged, and the expected duration of dredging, the USACE is proposing to modify the survey requirements as discussed below.

The nearest dredge location is approximately 1-1/4 miles from the infected site in China Cove. Most of the dredge areas are located much farther away across bends in the channel that further reduce the likelihood of encountering *Caulerpa prolifera* from the infected site.

Requiring both high intensity level surveys and eradication level surveys over such a large area would be time consuming and costly, possibly jeopardizing the entire dredge project. Time is

the critical factor as dredging must be initiated prior to January 2023, or face requirements to retest all sediments to be dredged due to extended time limits placed on sediment quality data by the USACE and the U.S. Environmental Protection Agency (USEPA). While that may seem adequate, that time must include environmental evaluation of the project, contracting to conduct surveys, conduct the surveys, contracting to conduct dredging and associated environmental monitoring, completion of all pre-dredge planning by the contractor, coordination with resource agencies, and state certifications for the proposed dredging. This becomes an almost impossible timeline if full *Caulerpa* Control Protocol recommendations are followed.

Maintenance dredging of the proposed federal channels is expected to take approximately 52 weeks. Having to redo surveys of segments of the dredge area every 90 days would also add to delays and costs that could jeopardize our ability to complete the project.

USACE's proposed modified survey criteria would meet the intent of the *Caulerpa* Control Protocol of identifying further infected areas and thereby reducing or eliminating the risk of potential spread of *Caulerpa prolifera*.

USACE proposes the following surveys to be conducted in association with the proposed maintenance dredging in Lower Newport Bay:

1. Dredge footprint, excluding the Entrance Channel.

Conduct Eradication Level surveys of the area identified on Figure 3. This area combines all or portions of areas known as Main Channel North 4, Main Channel North 3, Bay Island North, Bay Island Middle East, Bay Island Middle West, and Bay Island South. Surveys would be conducted within 45 days of initiation of dredging. This area is approximately 65 acres and includes the proposed Confined Aquatic Disposal (CAD) Site.

Should *Caulerpa spp.* be found in the survey of this area, dredging will not start, and the Southern California Caulerpa Action Team (SCCAT) will be notified within 24 hours. Dredging will then be evaluated in consultation with the SCCAT following delineation of the infected area. Areas in the vicinity of the newly detected area would be evaluated using Eradication Level surveys while areas more distant would be first surveyed using High Intensity Level techniques. Exact survey locations would depend on location of the newly detected area and areas to be dredged in the next 90-day window.

If no *Caulerpa spp.* are found during these surveys, results will be shared with the SCCAT and areas to be dredged over the first 90 days of dredging will be surveyed using High Intensity Level techniques if areas other than those surveyed using Eradication Level techniques are proposed for dredging at that time. If initial dredging starts in the surveyed area, the Eradication Level results will serve to clear the area for dredging. The remaining portions of the federal channel would be broken down into 90-day segments. Each segment would be surveyed within 45 days of initiation of dredging in that segment using High Intensity Level techniques. Any areas identified as possible *Caulerpa spp.* would be delineated using Eradication Area Level

techniques. Results of each survey will be shared with the SCCAT, positive results within 24 hours of detection.

2. Surveys in the Entrance Channel would be conducted using Eradication Area Level techniques at the same time the Main Channel area described above is being surveyed. Should *Caulerpa spp.* be found in this survey, dredging will not start, and the SCCAT will be notified within 24 hours. Should dredging not start in this area in the first 90 days of dredging, the area would be re-surveyed using High Intensity Level techniques within 45 days of initiation of dredging in this area. This is an optional area for this contract and may not be dredged.

3. If dredged, sediments from the Entrance Channel would be placed in the nearshore placement site located off Newport Beach that was used for the 2021 Entrance Channel dredging. USACE would conduct a Surveillance Level survey of the placement area between 60 and 120 days after placement of the dredged materials.

4. USACE would consult with the SCCAT for all proposed survey plans and results. Surveys would be conducted to the maximum extent practicable during the high growth period (March 1 to October 31).

Very respectfully,

Larry Smith
Ecologist
Los Angeles District, Corps of Engineers

DISTRIBUTION: Draft EA for Lower Newport Bay Maintenance Dredging

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated September 2021. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83
VERTICAL DATUM: Mean Lower Low Water (MLLW)

LEGEND:

- Authorized Federal Channel Limits and Dredge Unit Boundaries
- (-20) Authorized Depth
- —10— Existing Bathymetry
- Dredged Material Not Suitable for Open Ocean or Nearshore Disposal
- Dredged Material Suitable for Open Ocean or Nearshore Disposal
- Proposed Confined Aquatic Disposal Facility
- Nearshore Placement Area

0 1,800
Feet

Publish Date: 2022/01/13 6:19 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Federal Channel\0243-RP-036 2021 DREDGE SUITABILITY.dwg Figure J-3

Figure 1
Federal Channels Maintenance Dredging Sediment Suitability Map

SOURCE: Drawing prepared from Bing maps. Bathymetric contours from U.S. Army Corps of Engineers survey dated June 2017. Dredge units from U.S. Army Corps of Engineers.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Dredge Unit Boundary
- (-20) Design Depth
- Dredge Footprint
- —-10— Existing Bathymetry

0 1,400
Feet

Publish Date: 2019/05/10 3:31 PM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\Federal Channel\0243-RP-010 DREDGING.dwg FIG 4

ANCHOR QEA

Figure 2
Overview of Dredge Units and Bathymetry
Lower Newport Bay Federal Channels Dredging

NOTES:

1. SOUNDINGS IN FEET, INDICATE THE GENERAL CONDITIONS EXISTING ONLY AT THE TIME OF SURVEY - SEPTEMBER 2021.
2. COORDINATES ARE NAD 1983 EPOCH 2003.5 CALIFORNIA ZONE VI, US SURVEY FEET.
3. SOUNDINGS LOCATED BY DIFFERENTIAL GPS SYSTEM. DEPTHS MEASURED BY A MULTI-BEAM ECHO SOUNDER PROVIDING NEAR FULL BOTTOM COVERAGE.
5. MEAN LOWER LOW WATER (MLLW) ELEVATIONS ESTABLISHED FROM NEWPORT BEACH (STA. ID 9410580).
6. ALL STRUCTURES SHOWN ARE APPROXIMATE.

LEGEND

EXISTING UTILITY CROSSING (PROVIDED BY DUDEK)

EXISTING UTILITY CROSSING (PROVIDED BY SO CAL EDISON)

PROPOSED ERADICATION-LEVEL SURVEY COVERAGE

A1 ERADICATION LEVEL CAULERPA SURVEY AREA
SCALE: 1"=300'

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY:
DRAWN BY:
CHECKED BY:
SUBMITTED BY:
ISSUE DATE:
SOLICITATION NO.:
CONTRACT NO.:
SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
915 WILSHIRE BLVD
LOS ANGELES, CA 90017

ORANGE COUNTY, CALIFORNIA
NEWPORT BAY HARBOR
MAINTENANCE DREDGING
AND CONFINED AQUATIC DISPOSAL FACILITY

ERADICATION LEVEL CAULERPA SURVEY AREA

SHEET ID

FIG 3

30% DESIGN-NOT FOR CONSTRUCTION