DRAFT ENVIRONMENTAL ASSESSMENT (DEA)

FOR THE

SANTA BARBARA HARBOR
SIX-YEAR
FEDERAL MAINTENANCE
DREDGING PROGRAM

SANTA BARBARA COUNTY, CALIFORNIA

PREPARED BY:

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT
LOS ANGELES, CALIFORNIA
August 2016

DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)
SANTA BARBARA HARBOR
SIX-YEAR FEDERAL MAINTENANCE DREDGING PROGRAM
SANTA BARBARA COUNTY, CALIFORNIA

I have reviewed the enclosed Environmental Assessment (EA) that has been prepared for the proposed six-year Federal maintenance dredging program at the Santa Barbara Harbor, located in Santa Barbara County, California. The Proposed Project includes an annual removal of up to 600,000 cubic yards of littoral material from the federal entrance and navigation channels, and from the sand trap within the federal channels. Dredging would occur twice a year, one dredging operation in late fall or early winter, and one dredging operation in spring. Dredged material placement would occur downcoast of the harbor within the East Beach placement area. The Proposed Project is required to maintain the Federally-authorized channel configurations and to restore and ensure safe navigability within the harbor. The Proposed Project is a fully Federal project, funded with Federal dollars.

Dredging is expected to be performed using an electric powered hydraulic cutterhead dredge with pipeline. Operations are expected to occur September 1 to April 30 each year. Single-point discharge would be utilized from March 1 through April 30 to minimize impacts to grunion.

Sediment has been tested in accordance with applicable regulations. Based on sediment and bulk chemistry analyses, and a grain size compatibility determination, the Corps has determined that the sediment material to be dredged was found to be uncontaminated, suitable, and compatible for dredged material placement within the East Beach placement area and/or in the nearshore for beach nourishment.

Project-related potential environmental impacts to all resources would be avoided or minimized through the implementation of environmental commitments and Best Management Practices, as outlined in the EA.

This project is in compliance with all applicable laws, including National Environmental Policy Act (NEPA), Clean Water Act (CWA), the Coastal Zone Management Act (CZMA), the Endangered Species Act, the National Historic Preservation Act, the Magnuson-Stevens Fishery Management and Conservation Act, the Fish and Wildlife Coordination Act, the Clean Air Act, and Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations.

The Proposed Project has been evaluated pursuant to Section 404(b)(1) of the CWA. The Proposed Project complies with the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b)(1) of the Clean Water Act (33 USC 1251). The Corps has coordinated the Proposed Project with the Central Coast Regional Water Quality Control Board (Central Coast RWQCB), and is requesting an amendment of the CWA 401

Water Quality Certification (WQC) Number 34210WQ03 For Santa Barbara Harbor Maintenance Dredging Operations Project, Santa Barbara Harbor.

The Proposed Project activities and related impacts have been analyzed as required by the CZMA of 1972. The Corps finds this project to be consistent to the maximum extent practicable with the articles and provisions of the CZMA of 1972 and the California Coastal Act. The Corps has coordinated with the California Coastal Commission for a Negative Determination. The Corps has received concurrence on the Negative Determination from the California Coastal Commission.

The Corps has determined that the continued maintenance of the Santa Barbara Harbor is the type of activity that does not have the potential to cause effects to historic properties. The undertaking is routine maintenance that has occurred since at least 1972 and would not alter the current setting or integrity of any historic properties that may be located within the Santa Barbara Harbor.

Coordination with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the California Coastal Commission, the California Department of Fish and Wildlife, and the Central Coast Regional Water Quality Control Board would continue throughout the duration of this project to ensure that threatened, endangered, and sensitive species are not affected.

I have considered the available information contained in the EA and it is my determination that impacts resulting from the proposed Santa Barbara Harbor dredging project would not have a significant adverse effect upon the existing environment or the quality of the human environment. Preparation of an Environmental Impact Statement, therefore, is not required.

_____ _____

Date

Kirk E. Gibbs
Colonel, U.S. Army
Commander and District Engineer

Table of Contents

APPENDICES

This Page Left Blank Intentionally

I. INTRODUCTION

As part of the periodic maintenance program for the period from September 1, 2016, to August 31, 2022, the U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to perform maintenance dredging within Santa Barbara Harbor, Santa Barbara County, California, to include maintenance of the Federal entrance and navigation channels, and the sand trap within the channels. Dredged material placement would occur downcoast of the harbor on East Beach placement area. Dredging is expected to be performed using an electric powered hydraulic cutterhead dredge with pipeline.

Maintenance dredging is required in the authorized federal channels to ensure a safe and adequate navigation depth for the draft requirements of vessels using the harbor. The proposed Santa Barbara Harbor dredging project would serve the following purposes: (1) maintain the entrance and navigation channels which are subject to continual filling by sand accretion; (2) assure the continued safe navigation for maritime traffic within the harbor; (3) minimize the risk of hazardous shoaling conditions developing within the entrance and navigation channels by maintaining a sand trap in the channels; and (4) provide beach nourishment material for downcoast beaches severely eroded by the littoral processes and by the harbor disruption of the longshore transport of sand.

The purpose of this Environmental Assessment (EA) is to address potential impacts that may result from the continuation of the operation and maintenance dredging of the federal entrance and navigation channels, and sand trap of Santa Barbara Harbor, as proposed by the Corps. This EA has been prepared in compliance with the National Environmental Policy Act (NEPA).

II. PROPOSED PROJECT

A. AUTHORIZATION

Maintenance dredging of Santa Barbara Harbor is authorized by the River and Harbor Act approved March 2, 1945. A modification to the Act (P.L. 91-611, Sec 114) dated December 31, 1970, provided that dredging and maintenance of the Santa Barbara Harbor would be the responsibility of the United States (U.S.) Federal government. The Proposed Project is a fully Federal project, funded with Federal dollars.

B. BACKGROUND

In 1927-28 local interests constructed, at their own expense, a 1,800-foot long, detached breakwater parallel to and about 600 feet (ft.) from the shore. The breakwater afforded protection from southwesterly waves for Stearns Wharf and a mooring area for small boats and yachts. One effect of this structure, however, was to interrupt the natural flow of easterly directed wave energy along the coast, which caused deposition of sand in the lee of the breakwater. Because the resulting shoal caused navigation difficulties at the west end of the harbor by late 1929, the breakwater was extended in 1930 to connect with the shore at Point

Castillo. The effect of the extension, in turn, was to impound the eastward flowing sediment completely until the trapping area was filled. By 1933-34 this accumulated sand had advanced far enough seaward to migrate along the south face of the breakwater, and was deposited in the lee of the eastern end, which formed a sand spit that encroached on the channel. The problems resulting from this breakwater, in sum, were twofold: (1) the accumulation of sediment at the harbor entrance resulted in hazards to navigation; and (2) as a result of interruption in the littoral transport, beaches to the east, which were previously nourished by the longshore transport of sand, were severely eroded.

In 1954, local interests proposed that a part of the sand spit formed at the tip of the breakwater be allowed to remain as partial protection from southeasterly storms.

In 1972, the U.S. Federal Government started annual dredging and maintenance of Santa Barbara Harbor, while the city retained responsibility for dredging the remainder of the harbor. The average annual amount of material dredged consists of approximately 342,000 cubic yards, based on dredging history, 1996 – 2016, as summarized in Table 1, with an annual potential maximum total of approximately 600,000 cubic yards of dredged material, or a potential maximum of 3,600,000 CY of material over a six year period.

In August 1985, the City of Santa Barbara extended the breakwater an additional 240 ft. (Corps Regulatory permit number 85-53-RC). The harbor entrance channel has continued to develop shoal areas that severely restrict and endanger navigation.

Table 1. Santa Barbara Harbor Dredging History, 1996-2016

Start	End	Volume (cubic yards) [1]		Dredging Contract Cycle[2]
Dec-95	Jan-96	144,000		1st Year - first cycle
Feb-96	Apr-96	270,000		1st Year - 2nd cycle
Nov-96	Dec-96	235,000		2nd Year - third cycle
Mar-97	Apr-97	144,000		2nd Year - fourth cycle
Nov-97	Jan-98	330,000		3rd Year - fifth cycle
Feb-98	Apr-98	262,000		3rd Year - sixth cycle
Nov-98	Jan-99	185,000		1st Year - first cycle
Mar-99	Apr-99	197,000		1st Year - 2nd cycle
Oct-99	Dec-99	197,000		2nd Year - third cycle
Feb-00	May-00	179,000		2nd Year - fourth cycle
Oct-00	Nov-00	72,000		3rd Year - fifth cycle
Mar-01	May-01	190,000		3rd Year - sixth cycle
Nov-01	Dec-01	186,000		1st Year - first cycle
Mar-02	Apr-02	150,000		1st Year - 2nd cycle
Nov-02	Dec-02	166,000		2nd Year - third cycle
Feb-03	Mar-03	252,000		2nd Year - fourth cycle
Oct-03	Dec-03	114,000		3rd Year - fifth cycle
Mar-04	Apr-04	192,000		3rd Year - sixth cycle
Nov-04	Dec-04	135,000		1st Year - first cycle
Mar-05	Apr-05	158,000		1st Year - 2nd cycle
Dec-05	Jan-06	148,000		2nd Year - third cycle
Mar-06	Mar-06	170,000		2nd Year - fourth cycle
Nov-06	Dec-06	111,000		3rd Year - fifth cycle
Feb-07	Mar-07	161,000		3rd Year - sixth cycle
Nov-07	Dec-07	150,000		1st Year - first cycle
Feb-08	Apr-08	251,000		1st Year - 2nd cycle
Nov-08	Nov-08	68,000		2nd Year - third cycle
Mar-09	Apr-09	103,000		2nd Year - fourth cycle
Dec-09	Jan-10	94,000		3rd Year - fifth cycle
Feb-10	Apr-10	218,000		3rd Year - sixth cycle
Nov-10	Dec-10	109,000		1st Year - first cycle
Mar-11	Apr-11	90,000		1st Year - 2nd cycle
Nov-11	Dec-11	110,000		2nd Year - third cycle
Mar-12	Apr-12	136,000		2nd Year - fourth cycle
Dec-12	Jan-13	154,000		3rd Year - fifth cycle
Mar-13	Apr-13	101,000		3rd Year - sixth cycle
Mar-14	Apr-14	249,500		1st Year - first cycle
Dec-14	Dec-14	120,000		1st Year - 2nd cycle
Mar-15	Mar-15	120,700		2nd Year - third cycle
Dec-15	Dec-15	120,000		2nd Year - fourth cycle
Feb -16	Apr -16	289,000		3rd Year - fifth cycle
Total: ***6,831,200 cy***		***341,560 cy / year***		***20 years***

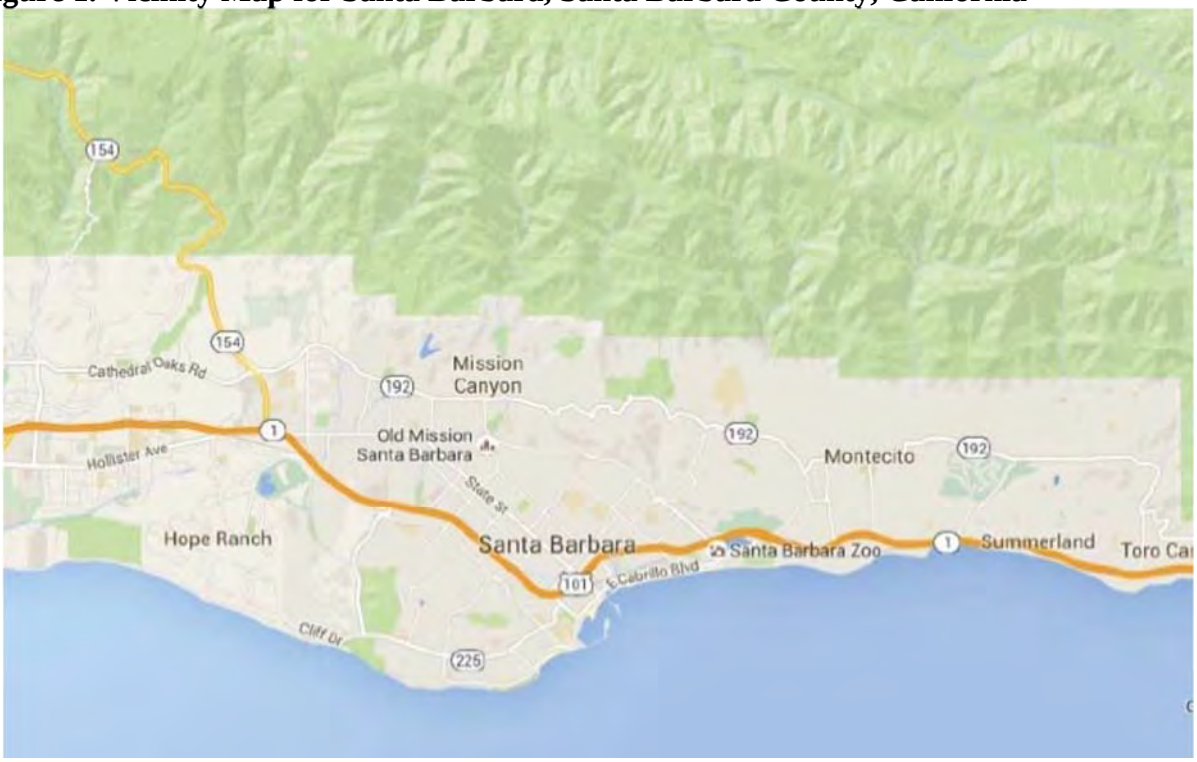
[1]All dredged material was placed downcoast of Stearns Wharf or parallel to the beach in the nearshore. [2] A dredge contract cycle is typically a 3 year dredge contract for the Proposed Project. Source: Corps 2016a

Dredging operations in Santa Barbara Harbor during the recent 6 years continue the trend to perform dredging twice a year, once in late fall or early winter and once in spring, except in fall 2013 when dredging was not performed. Each year, the composites of the sediment material being deposited on the beach contained clean sand material and were suitable and compatible with the sand that was currently on the beach. The Proposed Project is similar in kind to previous, annual maintenance dredging in Santa Barbara Harbor. The Proposed Project is a fully Federal program, funded with Federal dollars.

C. LOCATION

The Proposed Project area is bounded on the north by the West Basin of the Santa Barbara Harbor, on the east by East Beach, on the southwest by Leadbetter Beach, and on the west by the west breakwater. The proposed project entails dredging and removal of sediment resulting from longshore transport and deposition of material into the federal channels, and dredged material placement discharge downcoast of the harbor on East Beach placement area, at Santa Barbara Harbor, Santa Barbara County, California (Figure 1, Vicinity Map).

Figure 1. Vicinity Map for Santa Barbara, Santa Barbara County, California



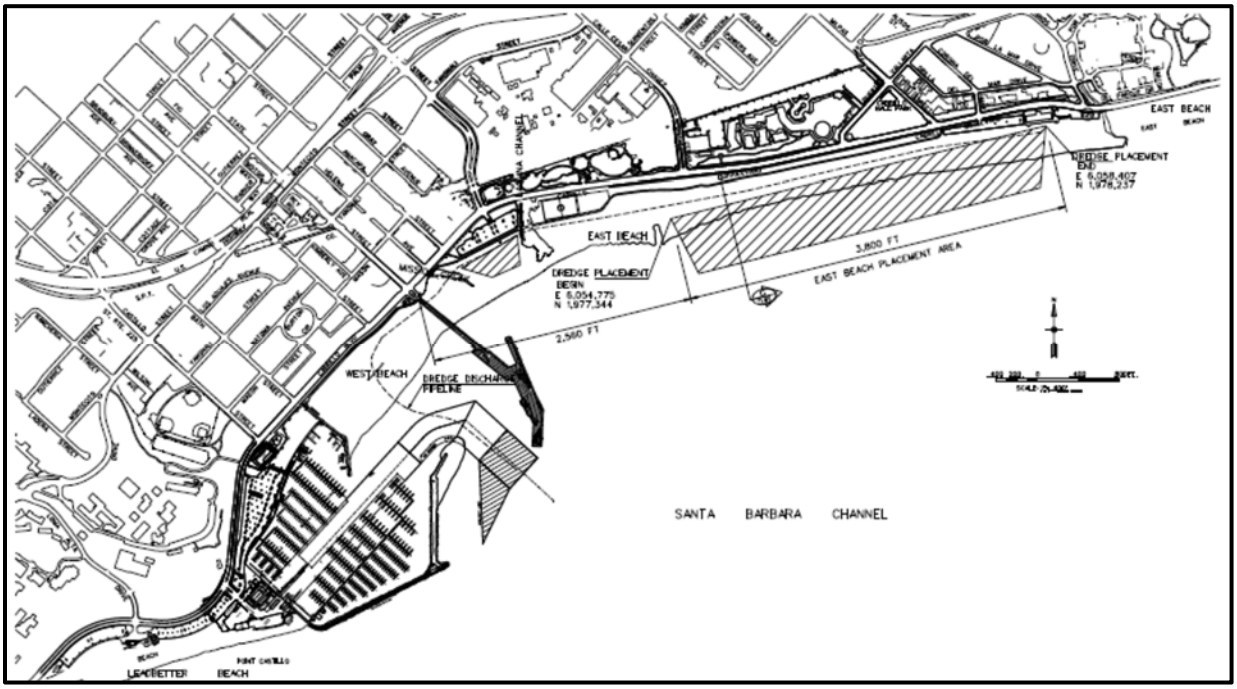
Source: Corps, 2016a.

D. DESCRIPTION OF THE DREDGED MATERIAL

The dredged material is derived principally from littoral drift, and includes sediment from coastal streams and bluff erosion. This material shoals in the harbor at an average rate of approximately 890 cubic yards (cy) per day (Corps, 1991). A faster rate of shoaling may close the federal channels within a span of a few weeks, as was observed during January and February 1986, and during late February into early March 2013. Dredging of the Santa Barbara Harbor and dredged placement onto the beach and surf zone has been occurring since 1972.

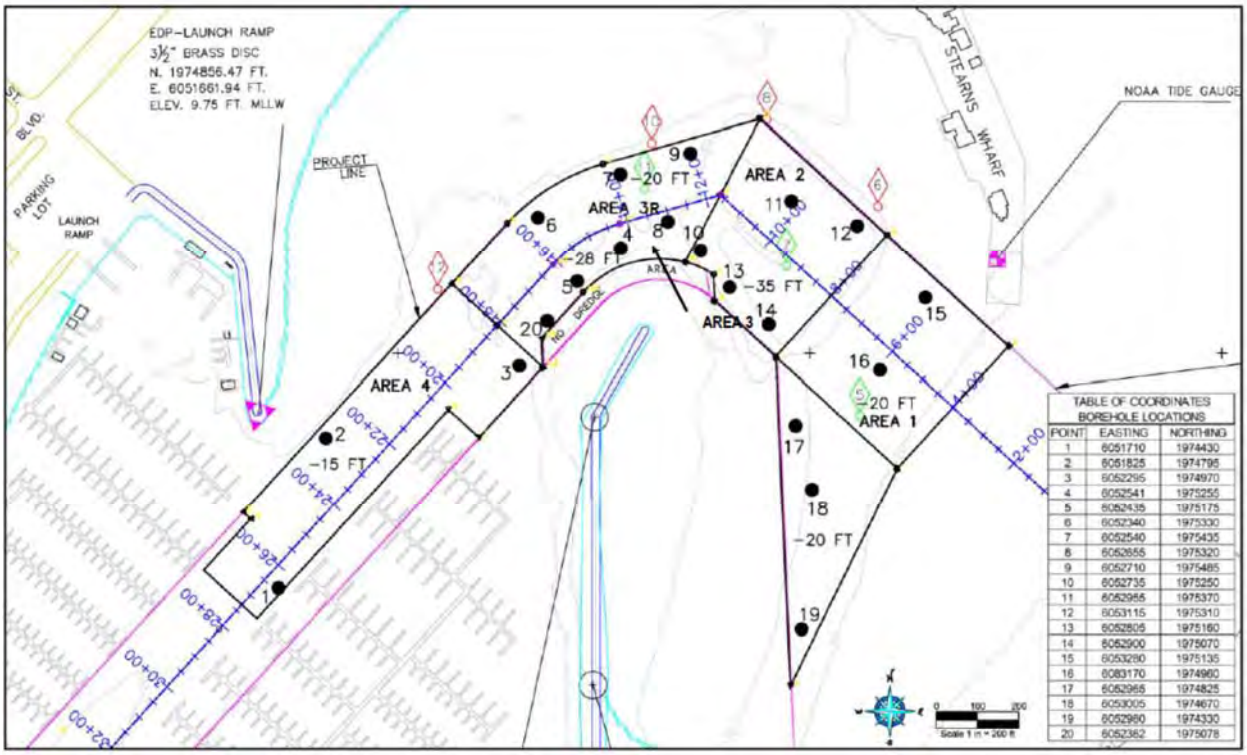
The Proposed Project includes an annual removal of up to 600,000 cubic yards of littoral material from the federal entrance and navigation channels, and from the sand trap within the federal channels. The Corps proposes to conduct maintenance dredging in the authorized federal channel areas (Entrance, Approach, Turning Basin – Inside; Turning Basin – Outside), and the Marina Channel of Santa Barbara Harbor from the harbor entrance to the beginning of the marina area. Dredge Areas 1 (Entrance Channel) and 2 (Approach Channel) are located in the outer portion of the harbor, from the entrance channel to the middle of the harbor where the channel bends to the southwest toward the marina. Dredge Area 3 (Turning Area – Inside), Dredge Area 3R (Turning Area – Outside), and Dredge Area 4 (Marina Channel) extend southwest from Dredge Area 3 to the marina entrance at the western end of West Beach. The Approach, Turning Basin – Inside, Turning Basin - Outside and Marina Channel are referred to as navigation channel. The channel area within Santa Barbara Harbor identified by the dredge footprint would be dredged to varying design depths ranging from a -15.0 ft. Mean Lower Low Water (MLLW) in Dredge Area 4 to a maximum depth of -35 ft. MLLW in Dredge Area 2. Except for the advanced maintenance dredging area in Dredge Area 2, there is also two ft. overdepth (- 2 ft. MLLW) that is added to the design depth(s). The proposed dredge footprint extends along the authorized federal channel from the offshore end of Stearns Wharf at the mouth of Santa Barbara Harbor to a point parallel to Bath Street at the western end of West Beach. The dredged material placement area(s) (also known as receiver beach, beach nourishment area, or discharge area) would occur downcoast of the harbor at the East Beach placement area. Figure 2 is the Proposed Project Area of the Federal channel areas and the dredged material placement area [Corps, 2013a]. Figure 3 identifies the Federal dredge channel areas (Corps, 2015a).

Figure 2. Proposed Project Area Federal Channels Dredge Areas in Santa Barbara Harbor and Dredged Material Placement Areas



Note: Santa Barbara Harbor Federal Channels Dredge Areas [Entrance Channel Dredge Area 1 shown as triangular shape and square shape with hatched/diagonal lines; Approach Channel Dredge Area 2 shown as square shape without hatched/diagonal lines; Turning Basin-Inside Dredge Area 3 shown as the northern bent shaped parallelogram without hatched/diagonal lines; Turning Basin-Outside Dredge Area 3R shown as the southern bent shaped parallelogram without hatched/diagonal lines; Marina Channel Dredge Area 4 is shown as the long rectangular shape without hatched diagonal lines. Dredged material placement would occur downcoast of the harbor on East Beach placement area. The temporary dredged discharge pipeline shown as dashed line on the top part of the beach through the harbor.
Source: Corps, 2013a.

Figure 3. Federal Channel Dredge Areas, Sampling Cores and Composite Area in Santa Barbara Harbor (Source: Corps, 2015a)

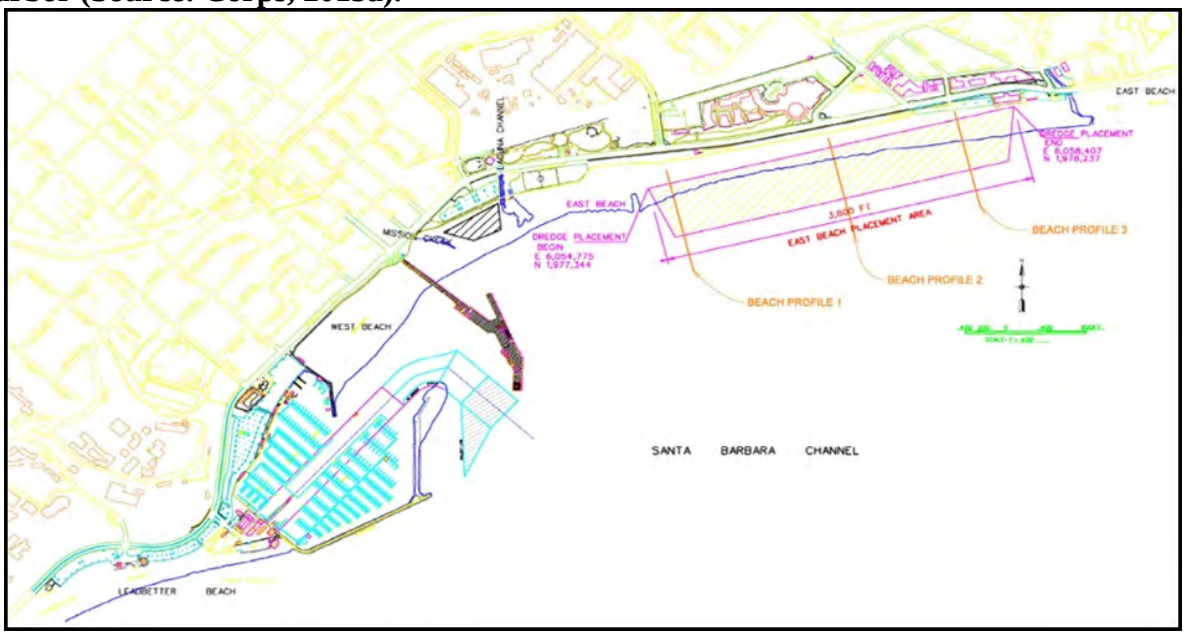


Recently, in late 2015, dredge material sediments from the federal channel areas in Santa Barbara Harbor were sampled [Sampling and Analysis Plan (SAP), Corps, 2015a, See Appendix A of the EA], analyzed and tested in accordance with applicable regulations [Sampling and Analysis Plan Results (SAPR) Report and its Appendices, and Compatibility Determination Report, Corps, 2016a, See Appendix A of the EA]. The dredged material evaluated five (5) dredge areas (Areas 1, 2, 3, 3R and 4) that historically are within the dredge footprint for sampling and analysis activities of 20 sampling cores within the 5 dredge areas, and 5 composites [Composite Sample E1 (Area 1); Composite Sample A2 (Area 2); Composite Sample T3 (Area 3); Composite Sample T3R (Area 3R), and; Composite Sample M4 (Area 4)] representative of each of the 5 dredge areas in Santa Barbara Harbor (Figure 3). A series of beach reference samples were collected from the dredged material placement beach and the nearshore along three transect lines extending offshore in the nearshore from the receiving beach at regular depth intervals in order to assess grain size compatibility with the proposed dredged material from the harbor (Figure 4).

The sampling occurred in November 2015, and the results were finalized in June 2016. Sediments from most cores were described as poorly graded sand (SP) down to the project allowable overdepth elevations. Regarding sediment grain size, results indicated that all

composite areas have greater than 80 percent (%) overall sand and gravel content (81% to 99%), and sediments in most cores from the mudline to the overdepth elevation consisted of greater than 95% poorly graded fine to medium grained sand (SP) with approximately 5% silty sand (SM). The average sand content among the 20 cores from all of the dredge footprint areas was 94%. Fine sand (<0.355 mm) made up the bulk of the sediments in most cores. The average fines content among all primary core intervals was only about 5%. There were no obvious layers of elevated contamination and there was no observed trash in any of the cores. Most cores contained at least a trace amount of organic material in the upper sediments. The grain size compatibility analysis report concluded that all of the sediment within all five dredge footprint areas are uncontaminated, suitable, and compatible for placement at the designated downcoast beach placement site based on the weighted average grain size composite curve of the area as a whole and the individual weighted grains size average of 19 of the 20 vibratory core borehole locations. The composite weighted average grain size curves for all 20 vibratory core samples collected from the Santa Barbara Harbor channel areas fit within the overall grain size compatibility envelope curves for the receiving beach. Grain sizes ranged from 0.07 mm to 1 mm in diameter.

Figure 4. East Beach Placement Area and Sampling Transect Locations, Santa Barbara Harbor (Source: Corps, 2015a).



Overall, analyte concentrations in the Santa Barbara channel area composite samples were below detection limits or low compared to effects based screening values. The only detected analyte concentrations above National Oceanic Atmospheric Administration's (NOAA) Effects Range Low (ERL) values were for 4,4' dichlorodiphenyldichloroethylene (DDE) and total dichlorodiphenyltrichloroethane (DDTs). There were no analyte concentrations above NOAA Effects Range Medium (ERM) values. The only other analytes detected were low levels of organic semi-volatile compounds. The mean ERM quotient among all analytes with ERM values

in a composite sample was very low (0.009 to 0.032). With an ERMq of 0.1, there is less than a 12% probability of a toxic response. Except for arsenic in all composite samples and Benzo (a) Pyrene in the Area T3 and M4 composite samples, all analytes detected in the Santa Barbara Channel composite samples were well below Regional Screening Levels (RSLs) and California Human Health Screening Levels (CHHSLs) developed for human protection.

Elevated arsenic concentrations occur commonly from natural as well as from anthropogenic sources in California dredge sediments and soils, and the concentrations of arsenic in the Santa Barbara Harbor composite samples were similar to the estimated background concentration (3.5 mg/kg) for soils throughout California, and less than the concentration (12 mg/kg) that the Department of Toxic Substance Control (DTSC) considers dangerous to human health. The arsenic concentrations were also similar to background concentrations determined for a few Central California beaches (Morro Strand State Beach, Silver Strand Beach and Hueneme Beach). Calculated background concentrations for these beaches ranged from 2.14 to 4.37 mg/kg (Diaz-Yourman, GeoPentech and Kinnetic Laboratories Joint Venture, 2012 and 2013).

Benzo (a) Pyrene results from incomplete combustion and has been positively linked to numerous cancers. Benzo (a) Pyrene was just slightly above the residential RSL in the T3 composite sample but it did not exceed the residential CHSSL value in the T3 composite sample. Benzo (a) Pyrene in the M4 composite sample exceeded both the residential RSL value and the Residential CHHSL value but did not exceed either commercial/industrial values. Therefore, based on sediment analysis, grain size compatibility analysis, and bulk chemistry analysis studies in the SAPR Report and its Appendices, and the Compatibility Determination Report, the Corps determined that sediment materials to be dredged were found to be uncontaminated, suitable, and compatible for dredged material placement on East Beach placement area and/or in the nearshore (Corps, 2016a).

The SAP, and the SAP Report, its Appendices including the Compatibility Determination Report, have been reviewed by Southern California Dredged Material Management Team (SC-DMMT), an interagency team for the coordinated review of dredging projects and dredging policy issues within the Southern California area, specifically the counties of San Diego, Orange, Los Angeles, Ventura, Santa Barbara, and parts of San Luis Obispo County (SC-DMMT, 2010). The draft SAP was reviewed by the SC-DMMT in the monthly SC-DMMT October 28, 2015 meeting. On November 2, 2015, a modification to the SAP was reviewed by the pertinent agencies [U.S. Environmental Protection Agency (USEPA); California Coastal Commission (CCC); Central Coast Regional Water Quality Control Board (Central Coast RWQCB)] comprising of the SC-DMMT, and the SAP was revised. On November 6, 2015, the revised SAP was sent to the SC-DMMT for review and comment. On November 10, 2015, the Corps coordinated the final SAP with the SC-DMMT. In February 2016, during the monthly SC-DMMT February 24, 2016 meeting, and in March 2016, during the monthly SC-DMMT March 23, 2016, meeting, the SC-DMMT reviewed the Draft SAPR Report and its Appendices, and in March 2016, the SC-DMMT also reviewed the Draft Compatibility Determination Report. On May 17, 2016, the revised SAPR Report and its Appendices including the Compatibility Determination Report were coordinated with the pertinent agencies (USEPA; CCC, Central

Coast RWQCB) comprising of the SC-DMMT for review and comment. In early June 2016, the pertinent agencies (USEPA; CCC; Central Coast RWQCB) comprising the SC-DMMT concurred that the material tested is suitable for placement within the East Beach placement area.

E. EQUIPMENT

1. Dredge

Dredging operations are expected to be performed typically using an electric powered hydraulic cutterhead dredge with pipeline. Depending on weather and beach conditions, the pipeline could be placed on top of the beach, buried underground, or a combination of pipeline on the beach and buried underground. Installation (mobilization) of the dredge pipeline on the beach typically involves the use of a bulldozer, excavator, and industrial fork lift to excavate, drag, and to position the pipe. Similar equipment is utilized during the demobilization process.

2. Equipment Storage

During operations, the Contractor would anchor the dredge by the sandpit. The Dredge Tender can also tie to the Navy Pier for loading/unloading and on an emergency basis. Excess pipeline and equipment would be kept at the same contractor's staging area used for previous operations, a section of sandy beach adjacent to Cabrillo Blvd. This site is surrounded by an 8-foot chain link fence. For aesthetic reasons, the fence will be covered with neutral-colored wood slats. Fence construction will take approximately one day and will require on-site use of a concrete truck.

F. PROPOSED PROJECT ALTERNATIVE DESCRIPTION

Dredging would occur twice a year. Operations are expected to occur from September 1 to April 30 each year. In any year, the first dredging operation is expected to occur in the fall or early winter typically between October through January while the second dredging operation is expected to occur in the spring typically between February through April. Dredging would occur in the Federal channel dredge area(s), Approach Channel, Entrance Channel, Turning Area – Inside, Turning Area – Outside, and the Marina Channel. In the twice a year dredging operations, dredged material placement would occur downcoast of the harbor on the East Beach placement area. Though dredged material placement has occurred in the nearshore and West Beach area in the recent past, such placement is not being considered for this upcoming 6-year period at this time. The dredged material placement is expected to be discharged above +6 feet MLLW typically from September 1 to March 1. From March 1 to April 30, the dredged material is expected to be discharged into the surf zone using the single point discharge method. This schedule would avoid most of the peak of the grunion spawning season (usually May through June in Santa Barbara). This schedule would also minimize impacts to beach goers, improve littoral transport of dredged material, create less disturbance of the beach, and would create no change in water quality compared to dredged material placement above +6 ft. MLLW. Each dredging operation is expected to last for approximately three weeks, or approximately six weeks

a year. Weather conditions, performance of the dredging equipment, and funding levels can all influence the duration of the activities. Because of these uncertainties, a performance period of up to 60 days is allowed for each dredging operation, or approximately 120 days a year. Dredging would operate up to 24 hours a day, seven days a week for each dredging operation.

Specifically, the Proposed Project for maintenance dredging of Santa Barbara Harbor includes the following: (1) dredging of the harbor Federal channel to project dimensions and sand trap maintenance within the Federal channels; (2) placement of dredged material; (3) environmental monitoring; and (4) surf-zone discharge dredged material placement. The Proposed Project also includes installation and removal of the dredge pipeline on the beach. Periodically (typically every 3 years), the segment of pipe spanning Mission Creek and Laguna Creek is installed/removed coinciding with the commencement of a new contract cycle. Proposed Project features also include fence construction around the staging area, and equipment storage, as discussed above.

1. Harbor Federal Channel Dredging to Project Dimensions

Dredging of the Federal entrance and navigation channels, and sand trap at Santa Barbara Harbor could annually remove a maximum approximately 600,000 cy of sediment, or a potential maximum of 3,600,000 CY of material over a six year period, which is deposited annually due to littoral drift processes. The federal dredge channel areas are identified as follows (Figure 3): Dredge Area 1 (Entrance Channel, with an authorized design dredge depth of -20 ft. MLLW) and Dredge Area 2 (Approach Channel, with an authorized design depth of -35 ft. MLLW) are located in the outer portion of the harbor, from the entrance channel to the middle of the harbor where the channel bends to the southwest toward the marina; Dredge Area 3 (Turning Area – Inside, with an authorized design dredge depth of -28 ft. MLLW), Dredge Area 3R (Turning Area – Outside, with an authorized design dredge depth of -20 ft. MLLW), and; Dredge Area 4 (Marina Channel, with an authorized design dredge depth of -15 ft. MLLW) extend southwest from Dredge Area 3 to the marina entrance at the western end of West Beach. Except for the advanced maintenance dredging area in Dredge Area 2, there is also two feet overdepth (- 2 ft. MLLW) that is added to the design dredge depth(s). The proposed dredge footprint extends along the channel from the offshore end of Stearns Wharf at the mouth of Santa Barbara Harbor to a point parallel to Bath Street at the western end of West Beach. The Federal entrance and navigation channels would be dredged to maintain the existing sand trap.

2. Discharge of Dredged Material

The dredged material would be discharged by a pipeline at points extending between approximately 2,300 feet and 6,300 feet downcoast of the harbor at the East Beach placement area (Figure 2). Typically, a pipeline would be placed to extend from the supratidal portions of West Beach, under Stearns Wharf, and along East Beach where the dredged material would be discharged. Depending on the location of the beach and available area, the pipeline would be placed on the beach or buried in the sand, or a combination on the beach and buried in the sand. Typically, the pipeline would be buried from the point where it first reaches the beach (the

harbor-side of Stearns Wharf) to the beginning of the dredged material placement area, with the exception of the area between Lower Mission and Laguna Creeks. Entrenched pipe would likely remain buried throughout the length of a dredging contract cycle, typically a three year period. Surface pipe may be laid within the authorized dredged material placement areas. Surface pipe would be buried or removed from the beach between dredge contract cycles. The placement of the dredged material piping would be coordinated in the field each year with the City of Santa Barbara Waterfront Department, the Corps, and the dredging contractor.

The dredged material placement is expected to be discharged above +6 feet MLLW typically from September 1 to March 1. From March 1 to April 30, the dredged material would be discharged into the surf zone using the single point discharge method described below in Section II.F.4. The dredged material placement area during this time period would be limited to a 500-foot area within the designated dredged material placement site. Surf zone dredged material placement would be used occasionally in fall and winter months as necessary, to control odor and debris.

Pipeline would be placed across both Lower Mission Creek and Laguna Creek (also referred to as the East Side Channel), to prevent flow diversion and pipeline damage. The dredging pipeline would be elevated across the lagoon to prevent blockage of the mouth of Mission Creek. Support piers will likely be required to elevate the pipe over Mission Creek. The base of these piers will be placed in such a way to avoid Mission Creek lagoon during installation. The lagoon frequently fluctuates in shape and size, and the piers may at times become inundated by the lagoon after placement. If the piers are within the lagoon when demobilization begins, the piers will be left in place until the lagoon recedes to the point that the piers can be removed without impacting the lagoon. The Mission Creek crossing will be installed at the start of the dredge contract cycle and left in place for the length of the cycle, typically 3 years. Removal and replacement between dredge contract cycles will only occur if maintenance is required to the piers/pipe, or if the contracts end or are otherwise terminated. It is anticipated that installation and removal of piers would occur twice during a six year period covered by this EA. Placement and removal of the pipe and Mission Creek lagoons piers will not occur within the waters of the lagoon.

A secondary beach dredged material placement area is located approximately 330 to 1,150 feet downcoast of the harbor, between Mission and Laguna Creeks, upcoast of the East Beach placement area. Dredged material placement at this beach site only occurs if specifically requested by the local sponsor, the City of Santa Barbara, when flooding and storm damage causes severe erosion to this portion of beach. Discharge to this location is not being considered as part of the current action and would be subject to additional environmental review.

3. Environmental Monitoring Program

a. Previous Monitoring

During the 1990's, the Corps completed a five-year grunion and snowy plover

monitoring program to assess potential effects to these species from surf zone dredged placement material (data analyzed by Southern California Marine Institute, December 1997; individual reports by Buckley and O'Neil 1993, 1994, 1995, 1997, and Impact Sciences, Inc., 1996). From March through June of each year, the beach dredged material placement and a control site were surveyed during each anticipated grunion run. Several abiotic measurements were taken, and egg fertilization and hatching success rates were determined. Plover surveys were limited to observations of the birds' location and behavior, whereas the grunion monitoring program evaluated multiple parameters. Statistical analyses were conducted on each of the parameters measured to determine how they relate to each other, and whether there were significant differences between beach zones, months, or years. Dredging and post-dredging data were also compared.

During this time, dredging and dredged material placement did not adversely affect the small snowy plover population. During on-site monitoring, Corps personnel observed snowy plovers feeding on insects and small crustaceans associated with debris washed up on the beach by high tide. Although some local experts have theorized that dredged material is not a valuable food source for most shorebirds (Mark Holmgren, UCSB, pers. comm., 2004), the discharge zone is a temporary haven for a majority of coastal birds from routine beach maintenance and recreation activities. Significant mounds of debris were limited to that portion of East Beach where the discharge pipeline was located. The remainder of the beach was regularly cleared by tractors (City of Santa Barbara). The Corps' pipeline seemed to offer protection from the elements and human encroachment, as the birds were usually observed roosting and foraging directly adjacent to the pipeline and discharge outfall. There was no evidence, however, of nesting or courtship behavior.

Statistical analyses of 1993-1997 grunion data indicate that March-April dredging and single-point surf zone dredged material placement do not significantly affect grunion (Southern California Marine Institute, 1997). This conclusion is based primarily on the fact that very little spawning occurred during dredging operations. Few fish were seen and no eggs were collected during March surveys, and densities were still low in April. Most spawning and egg deposition occurred in May and June during that five-year period, whereas dredged material placement was always completed by April 30. Recently deposited material may have resulted in a wider, healthier beach during the peak grunion runs. However, it is not known whether single-point discharge later in the grunion season (after April 30) would significantly affect spawning activities outside the 500-foot zone of operations.

Additional information on the statistical analyses, study results and conclusions were provided in the Corps' 1998 EA for the 6-Year Maintenance Dredging Project at Santa Barbara Harbor. Based on the 1997 report, and in coordination with the resource agencies, the Corps implemented a less intensive monitoring effort during the past six years of dredging. This same monitoring program, described below, would also be implemented for the next six years as part of the Corps' continuing maintenance project.

b. Existing Monitoring Program

The Corps proposes to conduct night surveys of grunion during March and April, if discharge is still occurring. Monitoring would occur on one night during each predicted run in March (probably the 2nd or 3rd night), and two nights during each predicted run in April. The purpose of this monitoring is to ensure that spawning is not beginning to peak earlier in the season due to unusually warm weather (i.e., El Nino events) or other factors. The monitor would walk the entire beach (Figure 5) twice, and would visually estimate the number of grunion observed using the Walker Scale for assessment of California grunion runs (Martin, 2014). The monitor would also assess grunion on an adjacent reference beach just west of Santa Barbara Harbor. If a significant grunion run were to occur in the project area (W-2 or higher on the Walker Scale), the avoidance measures described in Section VI. (Environmental Commitments) would be implemented.

A monitor familiar with snowy plover courtship and nesting habits would slowly walk along the entire extent of exposed sand from the end of the breakwater (on West Beach), to the discharge point on East Beach

Should the Corps determine that dredged material placement may affect the plover; such activities shall be immediately modified, or shall cease until it is determined that further action would have no impact. If necessary, consultation pursuant to Section 7 of the Endangered Species Act would be initiated.

Figure 5. Map of the grunion monitoring areas for Santa Barbara harbor dredging

Note. The red outlined green polygon on the southwestern edge of the map is the reference site, while areas A-D are the dredge monitoring sites. The blue polygon represents the approximate location of the 2015 dredge outfall. The red outlined polygon near Stearns Wharf indicates the location of the 2016 grunion run. Source: Corps, 2015a.

4. Surf-Zone Discharge Dredged Material Placement

As noted above, discharge of dredged material may occur in the surf-zone during the twice yearly dredging operations. The following steps would be adhered to during surf-zone discharge:

a. Pipeline Alignment

The Corp's contractor would realign the discharge pipe to allow surf-zone dredged material placement instead of beach placement be implemented within a 500-foot wide zone of operation (Figure 2). Depending on weather and beach conditions, the pipeline could be placed on top of the beach, buried underground, or a combination of both. The 500-foot zone of operations shall be located within the same general confines of beach placement, i.e., between 2,300 feet and 6,300 feet, downcoast of the harbor. The zone of operation shall be fixed and flagged prior to the first day of post-March 1 dredging. Unless direct access from the street or parking lot is available within the 500 foot zone of operations, heavy equipment may need to traverse the pipeline corridor outside of this zone for some distance. The nearest practical point of access, however, would be used. Beach grading and pipeline movement would not occur outside of this zone.

The discharge pipeline and its single point surf zone outfall shall be situated within the zone of dredged material placement operations below +6 ft. MLLW (or below Mean Higher High Water) and shall be position perpendicular to the ocean so that the dredged material shall immediately run down the face of the beach and not create ponds of water and “quicksand” in the intertidal zone. Figure 2 shows the proposed pipe positioning and configuration within the zone of dredged material placement area. The outfall and associated work would not occur in the area on the beach between Mission Creek and Laguna Creek. When mounding of dredged materials occurs in front of the discharge point of pipe at the dredged material placement area, extensions shall be added onto the pipes so as to bring the outfall closer to the ocean or lateral movement of the pipeline to reposition the discharge would be performed requiring moving pipes using heavy equipment.

Grading to move sand mounds would be allowed within the zone of discharge operations. Slotted or perforated pipes shall be used when additional pipe must be added to extend the pipeline closer to the ocean or lateral movement of the pipeline to reposition the discharge in order to discourage erosion of sand mounds supporting the dredged material placement pipeline. Location of the slotted pipes within the pipeline would be decided in the field by the Corps, dredging contractor and the City of Santa Barbara, and location selection based upon meeting the goal of ensuring the integrity of the supporting mound of sand. A bulldozer, an excavator, and a forklift would be used to pull and lay the pipeline on the beach or bury the pipeline and/or a combination of both, and, if necessary, move sand around the beach.

b. Discharge Volume

No more than 600,000 cubic yards of material shall be disposed annually.

c. Work Hours

Double workshift dredging and dredged material placement operations shall be performed so as to minimize the temporal impacts. Triple workshift, or 24 hours/day, dredging shall be permitted. (The contractor would be required to obtain all necessary permits, including for local noise ordinances).

G. ALTERNATIVES

The "Proposed Project Alternative", described fully in Section II. F. (above) is the recommended and preferred alternative for the Santa Barbara Harbor Federal maintenance dredging program. Legislation authorizes maintenance dredging at Santa Barbara Harbor to assure continued safe navigability within this harbor. Alternative dredging equipment, timing, and alternative dredged material placement area (also known as reference areas, beach nourishment areas, discharge areas, disposal areas) are analyzed below. Evaluation criteria have been established to evaluate potential alternatives. The criteria are: 1) timing; 2) technical feasibility and effectiveness; 3) environmental impacts; 4) acceptability by the general public; and 5) economic justification in accordance with current guidelines, policies, and legislation. Therefore, as discussed below, the Proposed Project Alternative is carried forward for evaluation and analysis in the DEA.

The "No Federal Action Alternative" assumes that no Federal action would be undertaken to address the shoaling of the Federal channel dredge areas in Santa Barbara Harbor. Although the Corps has been mandated and authorized by Congress to maintain safe navigation, the "No Federal Action" project Alternative is carried forward for evaluation and analysis in the DEA.

Because legislation directs dredging operations to occur specifically at Santa Barbara Harbor, no other alternative dredge area is considered viable. Therefore, no other alternative dredging areas are analyzed in detail.

1. Proposed Project Alternative

Dredging would occur twice a year. The first dredging operation in a year typically occurs in the fall or early winter that is expected to occur typically between October through January. The second dredging operation is expected to occur in the spring typically between February through April. Dredging would occur twice a year in the Federal channel dredge area(s), Approach Channel, Entrance Channel, Turning Area – Inside, Turning Area – Outside, and the Marina Channel. Dredging is expected to be performed typically using an electric powered hydraulic cutterhead dredge with pipeline. The dredged material placement would be discharged by a pipeline at points extending between approximately 2,300 feet and 6,300 feet downcoast of the harbor on East Beach placement area (Figure 2). From March 1 to April 30, the dredged

material is expected to be discharged into the surf zone using the single point discharge method. Each dredging operation is expected to last for approximately three weeks, or approximately six weeks a year. Weather conditions, performance of the dredging equipment, and funding levels can all influence the duration of the activities. Because of these uncertainties, a performance period of up to 60 days is allowed for each dredging operation, or approximately 120 days a year. Dredging could operate 24 hours a day, seven days a week for each dredging operation. (See Section II. F. Proposed Project Description, above, for additional details).

Dredging of the federal entrance and navigation channels, and sand trap at Santa Barbara Harbor could annually remove a maximum approximately 600,000 cy of sediment, or a potential maximum of 3,600,000 CY of material from September 1, 2016 through August 31, 2022.

Typically an electric cutterhead hydraulic dredge with a pipeline is utilized for dredging and dredged material placement.

Dredged material placement area occurs downcoast of the harbor on the East Beach placement area.

a. Equipment Alternative

The Proposed Project Alternative proposed dredging operations are expected to be performed typically using an electric-powered cutterhead hydraulic dredge with a pipeline.

b. Scheduling Alternative

Daily, seasonal, and long-term alternatives exist to the proposed dredging schedule and are described below.

1. Daily Schedule

   Dredging at night would only be implemented if double or triple shift work was necessary and after appropriate offices and agencies had been contacted. Regulations and procedures regarding dredging at night are described in Section G (Noise) of the Affected Environment Section III., Environmental Consequences Section IV., and Environmental Commitment Section VI.

2. Seasonal Schedule

   The five-year grunion monitoring program during the 1990s discussed above has shown that dredging may continue through April 30 without significantly affecting grunion. This enables the Corps to remove shoals deposited by late-winter storms. Dredging June through September was not proposed due to impacts to recreational use of East Beach. Peak recreational use of the beach occurs from May through September. If hazardous shoaling conditions exist in the harbor channel that require dredging during these months (May through August), the Corps would prepare new environmental documentation. The

contractor would coordinate dredged material placement pipeline and associated equipment with the Corps Contracting Officer and Waterfront Director for Santa Barbara.

3. Short-term Schedule (limited to one year)

A short term (one year) dredging program is not a cost effective option and it does not allow the Corps flexibility to adjust to weather related variability in shoaling rates and respond in a timely way to ensure safe navigation of the harbor. A one-year EA, therefore, is not proposed.

a. Dredged Material Placement Area Alternatives

The following are alternatives to the proposed project's beach dredged material placement area on East Beach: (1) surf (intertidal) zone dredged material placement, (2) secondary beach dredged material placement area; (3) sand-spit dredged material placement, (4) Leadbetter Beach dredged material placement, (5) nearshore dredged material placement, (6) ocean dredged material placement, and (7) upland dredged material placement.

1. Surf (Intertidal) Zone Dredged Material Placement

The goal of surf-zone dredge material placement is to supply sand to the littoral drift, which would ultimately result in sand accretion along the beach. The reason for employing this type of dredged material placement over direct beach dredged material placement is to avoid impacts to grunion spawning, and since grunion typically do not spawn prior to March, there is no practical reason to choose this alternative as the primary dredged material placement method prior to March 1. However, surf zone dredged material placement may be occasionally employed in the fall and winter months, if necessary, to control odor and debris. Note that surf-zone dredged material placement would be used during the months of March and April, as described in Section II.F.4 of this EA, to avoid impacts to grunions. Therefore, this surf zone dredged material placement is carried forward for analysis.

2. Secondary beach dredged material placement area

A secondary beach dredged material placement area is located approximately 330 to 1,150 feet downcoast of the harbor, between Mission and Laguna Creeks, upcoast of the East Beach placement area. Dredged material placement at this beach site would occur if and when specifically requested by the local sponsor City of Santa Barbara. The discharge point would be temporarily moved to this secondary beach area when flooding and storm damage causes severe erosion to this portion of beach. Discharge would not occur within the creeks. Berms would not be placed in such a way as to block flows or affect tidal exchange. It is anticipated that approximately 26,000 cy per year would be discharged at this location, probably during an approximate three week period in the

spring, which has occurred in past years. Dredged material placement in this area has the potential for impacts not contemplated under this analysis and would be subject to additional environmental review. Therefore, this dredged material placement area is not carried forward for analysis.

3. Sand-Spit Dredged Material Placement

   This alternative would entail dredged material placement on the sand spit which has formed off the seaward end of the main breakwater. During the past years, the greatest amount of shoaling has been in February when winter storms generally occur. Material from the sand spit is a source of harbor shoaling. Dredged material placement of additional sand material onto the sand spit could lead to quicker shoaling and require additional dredging; therefore, sand spit dredged material placement is not proposed.

4. Leadbetter Beach Dredged Material Placement

   Leadbetter Beach is located west of Santa Barbara Harbor and the yacht club and south of Cabrillo Boulevard. The beach has high recreational use, particularly during the summer months. Material placed on Leadbetter Beach would eventually be transported back into the federal channels by the littoral processes; therefore, dredged material placement at Leadbetter Beach is not proposed.

5. Nearshore Dredged Material Placement

   Dredged material placement could be placed in nearshore waters west (up-coast) of Santa Barbara Harbor in approximately -15 to -30 ft. MLLW of water. Dredged material placed in the nearshore upcoast of the harbor would eventually migrate back into the harbor channels and would not provide sediment to the beach area. This option, therefore, is unacceptable, and is not proposed.

   Material placed in the nearshore downcoast of the harbor could affect the commercial and small craft mooring/anchorage areas offshore, by creating submerged mounds from the discharge operations. This option, nearshore placement dredged material downcoast of the harbor may not be practicable; therefore, it is not proposed during the upcoming six year period. Due to potential large submerged mound created from the discharge operations that could affect commercial and recreational vehicles mooring/anchoring in areas offshore, the nearshore downcoast of the harbor is not carried forward for analysis.

6. Ocean Dredged Material Placement

   The material could be discharged at an approved USEPA dredged material ocean placement site. This alternative would eliminate all impacts at the beach dredged material placement site. Aside from being considerably more costly, this alternative would not be in compliance with Section 103 of the Marine Protection, Research and

Sanctuaries Act (MPRSA) of 1972, which requires the beneficial uses of the dredged material be considered first, and Section 30233 of the California Coastal Act, which requires the placement of suitable dredged material onto adjacent eroded beaches whenever feasible; therefore, ocean dredged material placement is not proposed.

7. Upland Dredged Material Placement

Upland (land) dredged material placement or the creation of islands or wetlands has been considered. However, this alternative was not found to be feasible to the Proposed Project because of prohibitive costs, physical restrictions, potential impacts, and the fact that Santa Barbara beaches would not receive needed replenishment with sand; therefore, upland dredged material placement is not proposed.

2. No Federal Action Project Alternative

Under the No Federal Action Alternative, dredging of the Federal channels and sand trap would not occur, resulting in continued shoaling of the harbor channels and sand trap areas. Beach erosion would accelerate because there would be no beach replenishment from the dredging operations to the dredged material placement area. A potential impact could also occur to recreational and commercial vessels if passage is not possible into Santa Barbara Harbor. Unsafe conditions for navigation would develop resulting in impassable channels. There is a high potential for danger to life and property if the harbor channels are not maintained at safe depths.

The “No Federal Action Alternative” assumes that no Federal action would be undertaken to address the shoaling of the Federal channel dredge areas in Santa Barbara Harbor. Although the Corps has been mandated and authorized by Congress to maintain safe navigation, the "No Federal Action" project Alternative is carried forward for evaluation and analysis in the DEA.

III. AFFECTED ENVIRONMENT

A. GENERAL MARINE ENVIRONMENT

1. Santa Barbara Harbor

Santa Barbara Harbor is on the coast of southern California, approximately 90 miles northwest of Los Angeles and approximately 320 miles southeast of San Francisco. The harbor is in the center of a broad indentation in the coastline extending from Point Conception to Port Hueneme. Although local physiographic features do not provide enough natural protection for a harbor in the region, the orientation of the coastline together with the screening effect of the Channel Islands of San Miguel, Santa Rosa, and Santa Cruz reduce the size and force of ocean waves reaching the Santa Barbara shore from most directions. The harbor comprises the sheltered area within the lee of a rubblestone breakwater projecting seaward from Point Castillo on the south side and bounded by Stearns Wharf on the northeast.

2. East Beach

The proposed discharge site (dredged material placement area) typically at East Beach is northeast of the harbor and immediately beyond the mouth of Mission Creek. The characteristic habitat type that could be subject to potential impact by dredged material discharge is semi-protected sandy beach. The creek discharges runoff from the City of Santa Barbara and surrounding hillsides. During storm conditions and flood events, freshwater input, from sources such as Lower Mission Creek and Laguna Creek, and storm surges from the Pacific Ocean, in and adjacent to the proposed project area, substantially and significantly alters water quality conditions, especially turbidity and bacteria.

B. BIOLOGICAL RESOURCES

1. Terrestrial/Marine Vegetation

The proposed dredge area does not support attached marine algae but may support meioflora (small phytoplankton) within or on the sandy substrate. Such phytoplankton is indicative of soft-bottom habitats in an early successional stage maintained from the frequency of dredging occurring within the entrance and navigation channels. Common algal species which are expected to be associated with the pilings at Stearns Wharf or substrates of the breakwater include *Ulva spp., Enteromorpha spp., Egregia laevigata*, and various red algal species.

The proposed dredged material placement site is a protected sandy beach. There is no coastal strand vegetation on the beach due to heavy human use. The terrestrial vegetation consists of non-native ornamental plants and grass located in a city-maintained green belt above the normal wave reach, between the beach and Cabrillo Boulevard.

No attached marine algae are expected to occur in the intertidal or offshore zone near the dredged material placement site, as little or no hard substrate exists for attachments. The closest kelp forest is located off Santa Barbara Point approximately one mile west of the harbor. Pieces of algae, including entire detached kelp (*Macrocystis pyrifera)* can be expected to wash up on the beach, especially after winter storms. These plants float in from other areas with suitable habitat. No seagrasses occur in nearshore habitats within the vicinity of discharge. Diatoms and other microalgae can be expected in both the intertidal and offshore sandy benthos.

Debris deposited on the beach by high tide consists primarily of woody material and dried kelp. This material provides camouflage, a roosting zone, and habitat for insects which are a food source for the western snowy plover.

2. Invertebrates

The organisms most likely present at the dredging site consist of mobile, invasive species such as polychaete worms, molluscs, echinoderms and crustaceans. Sandy-bottom succession dynamics are poorly known. The most recent surveys of biota of Santa Barbara Harbor, performed in 1972, indicated relatively low diversity and low densities of organisms within the harbor.

The pilings of Stearns Wharf and rocks of the breakwater at the margins of the harbor provide habitat for more diverse communities including poriferans, cnidarians, bryozoans, annelids, molluscs, echindoderms, and tunicates.

Organisms typical of sandy beaches and protected coastal waters are expected in the proposed placement area. The sedimentary habitats within the intertidal and nearshore zones are expected to support clams (*Macoma sp., Tellina modesta,* and *Donax gouldii*), polychaete worms, crabs (*Loxorhynchus grandis* and *Cancer* spp.), and echinoderms. Sand crabs (*Emerita analoga*), isopods (*Tylos punctatus*) and other crustaceans, bean clams (*Donax gouldii*) and other molluscs, and polychaete worms are expected to occur (Gotshall and Laurent, 1980).

Pismo clams (*Tivela stultorum*) may also occur within the proposed project area. Historically, they were found throughout southern California from the intertidal zone up to 80ft. deep in relatively sandy, flat areas of open coast. Very little recent Pismo clam data is available. While some surveys of southern California beaches indicate that stable populations exist in several places, including Coronado Beach and Channel Islands (CDFG, 2006), recent surveys from Carpinteria indicate that numbers may be much lower in the Santa Barbara area (Corps, 2013b).

3. Fish and Essential Fish Habitat

Fish expected in the dredging area include those typical of sheltered sandy and rocky areas. Common fish that are expected to occur in Santa Barbara Harbor are listed below (Love, 1991). Fish species that may occur in the surf zone and shallow, sandy habitat near the discharge site include surfperches or embiotocids; croakers and other sciaenids; jacksmelt and other atherinids, clupeids such as sardines and occasional sharks (Love, 1991; CA Fish and Game, 1987):

Scientific Name	Common Name
Atherinops affinis	top smelt
Amphistichus argenteus	barred surfperch
Seriphus politus	queenfish
Roncador stearnsi	spotfin croaker
Hyperprosopon argenteum	walleye surfperch
Engraulis mordax	northern anchovy
Cymatogaster agregata	shiner surfperch
Leuresthes tenuis	California grunion

A fish species of particular concern is the California grunion (*Leuresthes tenuis*) which utilize West and East Beaches of Santa Barbara Harbor for spawning from March through mid-September, with a peak in activity expected between May and June. Grunion deposit their eggs beneath the sand on the high intertidal portions of the beach during high tides associated with new and full moons. The eggs incubate in the sand and hatch during the ascending series of high tides before the following full or new moon, approximately 11-13 days later (Love, 1991).

During grunion monitoring on the night of 22-23 March 2015, which was the 3rd night of a predicted grunion run cited on the CDFW grunion website, a number of grunion were observed along the majority of East Beach. Using the Walker (W) Scale, W0-W5, to approximate the number of grunion observed, Table 2, shows the approximate beach location and magnitude of observed grunion spawning (Corps, 2015a). See Figure 5 for the 2015 grunion monitoring location map. As shown in Table 2, grunion were found in all zones A-D in 2015, but not in the reference area on West Beach. Grunion also entirely avoided the outfall area shown on Figure 5.

On 24 March 2016, grunion monitoring along East Beach identified a localized grunion run peaking at W-2 to W-3 on the Walker Scale (Corps, 2016b). This 2016 grunion run occurred only in the direct vicinity of Stearns Wharf in monitoring areas A-B, as shown in Figure 5.

Table 2. Grunion Data (22-23 March)

Location	Control	Zone A	Zone B	Zone C	Zone D
Time Observed 1.	1:55 am	1:45 am	11:45 pm	12:15 am	12:50 am
Time Observed 2.			12:15 am	12:45 am	1:15 am
Time Observed 3.			1:20 am		
Grunion Observed?	No	Yes	Yes	Yes	Yes
Walker Scale 1.	W0	W1	W2	W3	W3
Walker Scale 2.			W2	W3	W3
Walker Scale 3.			W3		

Source: Corps, 2015a.

Tidewater gobies occur in the Lower Mission Creek estuary, and steelhead trout may occasionally attempt to migrate up the creek to spawn. These species are protected by the Endangered Species Act (ESA) and are discussed in more detail in Section III (C), Threatened and Endangered Species.

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) has been be conducted for the proposed project area. For the Pacific region, EFH has been identified for a total of 89 species covered by three fishery management plans (FMPs) under the auspices of the Pacific Fishery Management Council. The proposed project is within an area designated as EFH for two of these FMPs: Coastal Pelagic Species Fishery Management Plan and Pacific Coast Groundfish Fishery Management Plan.

4. Birds

The Santa Barbara Harbor serves as both a feeding and resting area for shorebirds and waterfowl. The breakwater is used for daytime roosting by cormorants, gulls, and pelicans. The sandy habitat surrounding the breakwater is used for roosting and as feeding grounds at low tide by willet, godwit, sanderlings and others. The open-water areas associated with the harbor are used as habitat for waterfowl such as grebes and coots. A species list of birds commonly encountered during previous monitoring efforts is provided in Table 3. Of the birds frequently encountered within the proposed project area, only the western snowy plover is listed under the ESA.

Table 3. Bird species frequently encountered within the proposed project area.

Common Name	Scientific Name
Pacific Loon	*Gavia pacifica*
Common Loon	*Gavia immer*
Western Grebe	*Aechmophorus occidentalis*
Clark's Grebe	*Aechmophorus clarkii*
Pied-Billed Grebe	*Podilymbus podiceps*
Horned Grebe	*Podiceps auritus*
Eared Grebe	*Podiceps nigricollis*
Brown Pelican	*Pelecanus occidentalis*
Double-crested Cormorant	*Phalacrorax auritus*
Brandt's Cormorant	*Phalacrorax penicillatus*
Pelagic Cormorant	*Phalacrorax pelagicus*
Red-breasted Merganser	*Mergus serrator*
Bufflehead	*Bucephala albeola*
Mallard	*Anas platyrhynchos*
Ruddy Duck	*Oxyura jamaicensis*
American Coot	*Fulica americana*
Surf Scoter	*Melanitta perspicillata*
Black Skimmer	*Rynchops niger*
Elegant Tern	*Thalasseus elegans*
Royal Tern	*Thalasseus maximus*
Snowy Plover	*Charadrius nivosus*
Killdeer	*Charadrius vociferous*
Black-bellied Plover	*Pluvialis squatarola*
Whimbrel	*Numenius phaeopus*
Marbled Godwit	*Limosa fedoa*
Willet	*Tringa semipalmata*
Sanderling	*Calidris alba*
Least Sandpiper	*Calidris minutilla*
Western Sandpiper	*Calidris mauri*
Heermann's Gull	*Larus heermani*
Western Gull	*Larus occidentalis*
California Gull	*Larus californicus*
Ring-billed Gull	*Larus delawarensis*
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
American Crow	*Corvus brachyrhynchos*
Great-tailed Grackle	*Quiscalus mexicanus*
House Finch	*Haemorhous mexicanus*

5. Mammals

Several species of marine mammals have been observed in the general vicinity of the harbor, including the California sea lion (*Zalophus californiaus*), harbor seal (*Phoca vitulina*), northern elephant seal (*Mirounga angustirostris*), common dolphin (*Delphinus delphis*), southern sea otter (*Enhydra lutris nereis*), and the California gray whale (*Eschrichtius robustus*). The Eastern North Pacific stock of the gray whale was listed as endangered under the ESA from 1970 to 1994, when it was delisted due to recovery. The southern sea otter is currently listed under the ESA and discussed in more detail in Section III (C), Threatened and Endangered Species.

Small terrestrial mammals are relatively scarce with the exception of several adaptable rodents such as rats and mice. Opossum and raccoon are expected to be present in the area. The low diversity of mammals is the result of intense human activity in the area and limited space available for colonization. Marine mammals may occasionally haul out at night on East Beach for brief periods, but are unlikely to occur during daylight (construction) hours due to recreation use.

C. THREATENED AND ENDANGERED SPECIES

Four species listed under the ESA have occurred, or are likely to occur, in the proposed project area: southern sea otter (*Enhydra lutris nereis*), western snowy plover (*Charadrius alexandrinus nivosus*), tidewater goby (*Eucyclogobius newberryi*), and southern California distinct population segment of steelhead (*Oncorhynchus mykiss*).

1. Western Snowy Plover

The Pacific coast population of the western snowy plover is listed as threatened under the ESA. Western snowy plovers are known to occur year round within the proposed project area, and the proposed discharge site is located within designated critical habitat (Figure 6). This unit is an important wintering ground for western snowy plovers, some years supporting 100+ wintering birds. This unit contains the following primary constituent element (PCE): sandy beach above and below the high-tide line with occasional surf-cast wrack supporting small invertebrates and generally barren to sparsely vegetated terrain.

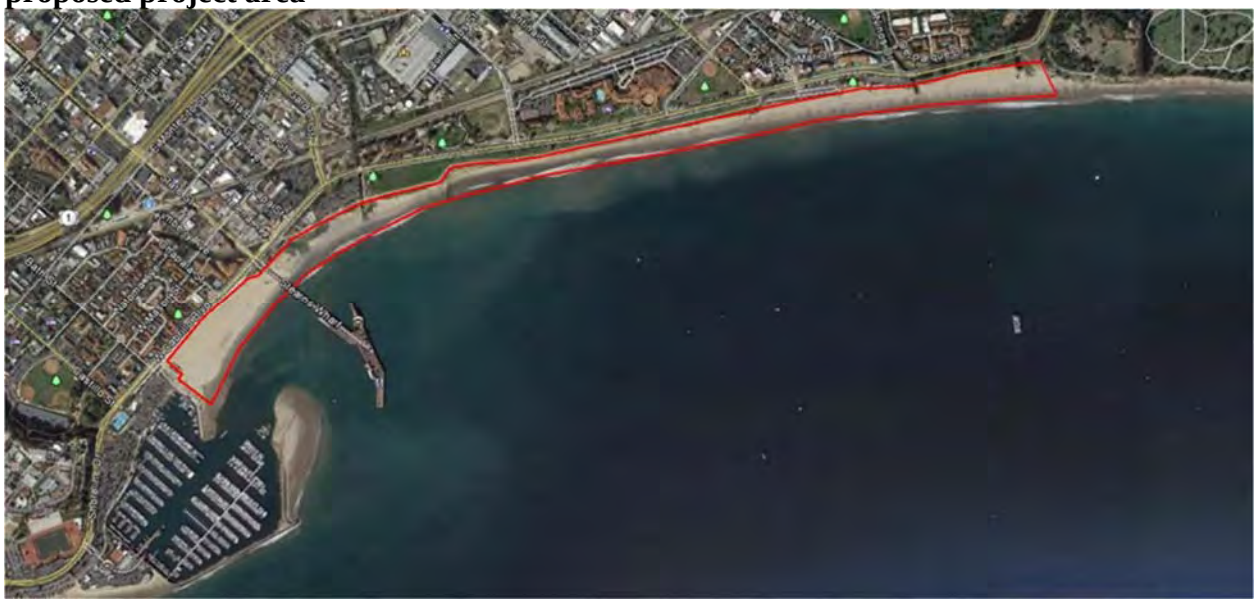
The western snowy plover's range extends along the Pacific Coast from southern Canada, through the western United States, and into northern Baja Peninsula. It forages primarily on the dry sand on upper levels of open beaches and in the debris left by high tide. Preferred nesting habitat is in low dunes above outer beaches. Although such dunes do exist on East Beach, they are currently overgrown with ornamental iceplant and are directly adjacent to a very busy recreational trail.

During the Corps' monitoring research study for grunion and plovers at Santa Barbara Harbor, the western snowy plover was observed roosting, but not nesting, in the harbor area. Other observers have reported seeing them on the sand spit associated with the breakwater. However,

there have been no documented nesting or breeding activities on any Santa Barbara beaches since 1928 (Lehman 1994, Page, et al., 1991; City of Santa Barbara monitoring reports for West Beach and Ledbetter Beach projects, 1998-2004).

Observations by Corps monitoring teams indicate that the pipeline may shelter plovers from the elements and human encroachment. Plovers have been observed roosting directly adjacent to the pipeline and discharge outfall. No signs of nesting activity have been observed to date.

Figure 6. Designated critical habitat for western snowy plover (outlined in red) within the proposed project area



2. Southern Sea Otter

The southern sea otters are classified as "threatened" under the federal Endangered Species Act, "depleted" under the Marine Mammal Protection Act, and as a "fully protected mammal" under California state law. The southern sea otter has been observed infrequently in the Santa Barbara Harbor area; however, they usually do not occur south of Pt. Arguello. Otters forage in shallow coastal waters on shellfish and echinoderms (Reidman, 1990).

3. Tidewater Goby

The tidewater goby is listed as endangered under the ESA. Tidewater goby is known to be present in Mission Creek and the associated lagoon. Portions of lower Mission Creek, as well as the lagoon, are designated as critical habitat. The Mission Creek unit contains 7 acres (304,920 square feet) of designated critical habitat for the tidewater goby (Figure 7), much of which is often beach and exposed mud. Of the established PCEs for tidewater goby critical habitat, only

one occurs within the proposed project area: substrate suitable for construction of burrows.

Adapted to both fresh and saltwater, this species was once found in the brackish water portions of streams from Humboldt County to San Diego County. The tidewater goby occurs in shallow water (less than 3 feet deep). They generally avoid areas with dense vegetation, preferring to forage along the muddy or sandy bottom searching for small invertebrates as prey items. Peak nesting activities commence in late April or early May. All life stages of tidewater gobies are found at the upper end of lagoons in salinities less than 10 parts per thousand. Draining lagoons and channelizing streams and lagoons, as well as destruction of wetland habitat, have been the major cause of population losses of this species. Introduced predators such as mosquitofish (which occurs in Lower Mission Creek), striped bass (*Morone saxatilis*), and largemouth bass (*Micropterus salmoides*) are additional threats in some areas.

Figure 7. Designated critical habitat for tidewater goby within the proposed project footprint.

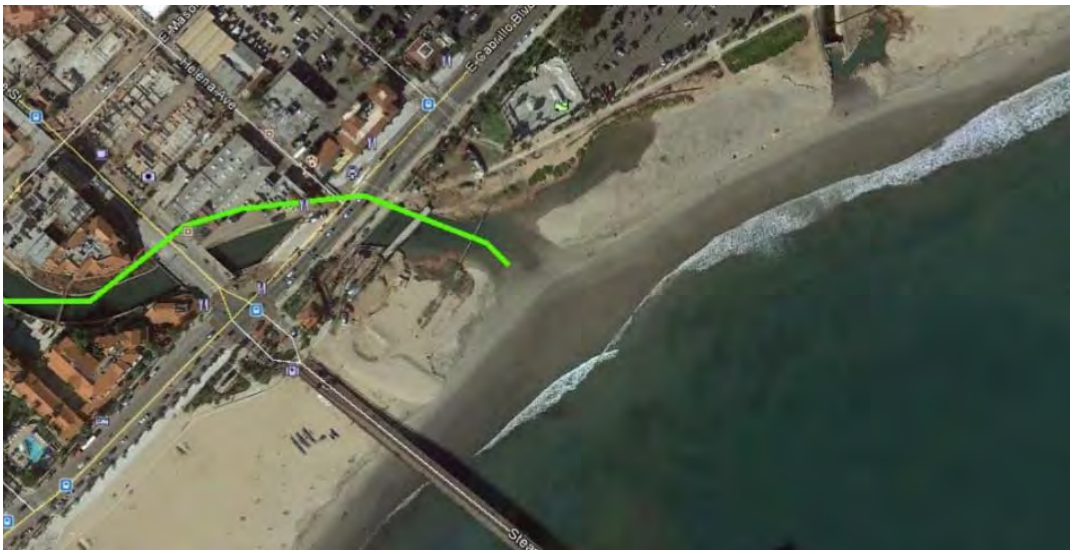
4. Steelhead

The southern California distinct population segment of steelhead is listed as endangered under the ESA. Portions of lower Mission Creek, including the lagoon, were designated as critical habitat in 2005 (Figure 8). The portions of lower Mission Creek and the associated lagoon within the proposed project area generally exhibit poor conditions to support steelhead. Of the established PCEs for steelhead, the Mission Creek lagoon provides only one: a freshwater migration corridor. No spawning or rearing occurs within the Mission Creek lagoon. While steelhead are known to utilize lagoons as nursery habitat, the Mission Creek lagoon does not

provide any of the cover elements described as necessary for suitable estuarine habitat. Steelhead also use deep low-velocity pools in streams as wintering habitat, and gravel substrates free of excessive silt for spawning habitat, but neither of these habitat types occur within the proposed project footprint.

The upper watershed of Mission Creek sustains reproducing populations of the non-anadromous rainbow trout which may occasionally produce anadromous steelhead trout (NMFS, 2009), which may attempt to migrate through the proposed project area. Adults also attempt to migrate upstream, traversing the project area to reach spawning grounds, but they are currently barred from reaching suitable spawning habitat in the upper watershed by impassable sections of lower Mission Creek. In recent years adults have unsuccessfully attempted to spawn in lower Mission Creek, and anecdotal evidence indicates that adult and/or juvenile steelhead have been seen in lower Mission Creek on a nearly annual basis over the past decade. Therefore, the potential exists for steelhead to occur in or near the Mission Creek lagoon.

Figure 8. Designated critical habitat for southern California steelhead within the proposed project footprint.



Increasing urbanization of the Mission Creek watershed creates a number of threats to steelhead ranging from increased road density to floodplain encroachment and the increased need for flood control structures. Structures such as levees and channelization also increase channel maintenance demands and disturbance (NMFS, 2009).

E. WATER QUALITY

Currents in the proposed project area are predominantly downcoast, i.e. towards Mexico, between Point Conception and the Santa Barbara County line. The current patterns and water

circulation are good. Ongoing receiving water monitoring of the Santa Barbara outfall, approximately 5 miles west of the site, is the only known continuous water quality data for the region. There are no known sources of pollutants other than potential leakages from offshore oil drilling and associated onshore pipelines or boats using the harbor. No major oil spills have occurred recently in Santa Barbara Harbor but the Refugio oil spill from a ruptured oil pipeline at Refugio State Beach, approximately 20 miles northwest of Santa Barbara, occurred on May 19, 2015, and spilled approximately 140,000 gallons of crude oil into the Pacific Ocean.

Water quality varies considerably from one water basin to another. In general, the water quality is being degraded due to agricultural runoff (fertilizers and pesticides); public and private sewage treatment systems (e.g., reclamation projects and septic tanks) and sea water intrusion from over pumping of aquifers. Discharges are also governed by regulations implemented by the Regional Water Quality Control Board (RWQCB). Water quality in the proposed project area is heavily influenced from Lower Mission Creek and Laguna Creek including flows from storm and flood events going into the harbor and the dredged material placement area(s). Regulatory authority over waste discharges from the Outer Continental Shelf platforms into the surrounding water lies with the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement and the USEPA.

The Corps has monitored/sampled the dredge area and discharge area(s) and measured water quality parameters including pH, turbidity, dissolved oxygen (DO), light transmittance, as well as monitored/sampled for fecal indicator bacteria (bacteria) [i.e., total and fecal coliforms and enterococcus] during dredging and dredged material placement operations since fall 2010 dredging operation through the recent spring 2016 dredging operation, as cited in the Clean Water Act (CWA) 401 Water Quality Certification (WQC) Number 34210WQ03 For Santa Barbara Harbor Maintenance Dredging Operations Project, Santa Barbara Harbor, issued by the Central Coast RWQCB for this project (Central Coast RWQCB, 2010). As cited in the CWA 401 WQC Number 34210WQ03, water quality is monitored and sampled daily and bacteria is monitored and sampled once a week for week 1 of dredging operation, and thereafter (week 2 of dredging, etc.) water quality is monitored and sampled twice a week and bacteria is monitored and sampled once a week. Other information gathered during water quality and bacteria monitoring include odors, discoloration, floating material, sheen, extent of turbidity plume, if any. Annual CWA 401 WQC Reports, which include water quality and bacteria monitoring/sampling results, daily activities, water quality monitoring observations, threatened and endangered species, and sensitive species observations, and problems incurred and actions taken, have also been submitted to the Central Coast RWQCB annually since 2011 through 2016. Starting with the late fall or early winter 2013 dredge operation through the most recent 2016 spring dredging operation, water quality and bacteria monitoring/sampling reports have been submitted to the Central Coast RWQCB during dredging of the twice a year, during the late fall or early winter dredging operation, and during the spring dredging operation.

F. AIR QUALITY

Air Quality

The project area is within the portion of the South Central Coast Air Basin (SCCAB) under the jurisdiction of the Santa Barbara County Air Pollution Control District (APCD). The APCD encompasses Santa Barbara County including the incorporated cities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria, and Solvang.

National Ambient Air Quality Standards

To protect the public health and welfare, the Federal government identified a number of criteria air pollutants and established ambient air quality standards through the Federal Clean Air Act for each. The air pollutants for which Federal standards have been promulgated via the National Ambient Air Quality Standards (NAAQS) include 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).

A region is given the status of “attainment” or “unclassified” if the NAAQS have not been exceeded. A status of "nonattainment" for particular criteria pollutants is assigned if the NAAQS have been exceeded. Once designated as nonattainment, attainment status may be achieved after three years of data showing non-exceedance of the standard. When an area is reclassified from nonattainment to attainment, it is designated as a “maintenance area,” indicating the requirement to establish and enforce a plan to maintain attainment of the standard. Federal attainment status designations for the SCAB are summarized in Table 4. The portion of the SCCAB under jurisdiction of the Santa Barbara ACPD is currently in attainment or unclassified/attainment for all criteria air pollutants.

Table 4. NAAQS Attainment Designations for Santa Barbara County

Pollutant	Attainment Status
Ozone	Unclassified/Attainment
CO	Attainment
NO_2	Unclassified/Attainment
SO_2	n/a[1]
PM_{10}	Attainment
$PM_{2.5}$	Unclassified/Attainment
Pb	Attainment

Source: http://www.ourair.org/air-quality-standards/

1. SBAPCD awaiting USEPA final attainment status

General Conformity Rule

The General Conformity Rule, established pursuant to Section 176(c) of the Clean Air Act requires Federal actions to comply with the NAAQS. A federal agency cannot issue a permit for, or support an activity within, a nonattainment or maintenance area that would cause or contribute to any new violation of a NAAQS; increase the frequency or severity of any existing NAAQS violation; or delay attainment of any NAAQS standard, interim emission reduction, or other milestone. As indicated above, the portion of the SCCAB under jurisdiction of the Santa Barbara ACPD is currently in attainment or unclassified/attainment for all criteria air pollutants. Furthermore, emissions associated with maintenance dredging is exempt from General Conformity Rule per 40 CFR 93.153(c)(ix). Thus, the General Conformity Rule is not applicable to the Proposed Project.

Regional Significance Thresholds

The Santa Barbara APCD has developed the following significance thresholds for evaluating estimated emissions (Table 5).

Table 5. Santa Barbara APCD Significance Thresholds[1]

Pollutant	Thresholds (lbs/day)
NO_X	240
VOC	240
PM_{10}	80
$PM_{2.5}$	n/a[2]
SO_x	240
CO	n/a[2]
Pb	n/a[2]

1. Source: http://www.ourair.org/apcd/land-use-frequently-asked-questions/#attainment
2. Thresholds have not been established for the pollutants. Pollutants are currently unregulated by SBAPCD or are in attainment status per NAAQS.

Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). GHGs are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). Currently, there are no Federal standards for GHG emissions and no Federal regulations have been set at this time, though the CEQ has issued draft guidance on the consideration of GHG emissions, entitled Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews, dated December 24, 2014, and published at 79 Federal Register 77801. This draft guidance

establishes a recommended reference point of 25,000 metric tons of annual CO2 emissions as warranting further review.

G. NOISE

In general, noise is defined as unwanted sound. The effects of noise on people range from annoyance to inconvenience to temporary or permanent hearing loss. Level of annoyance or impact produced by a sound depends on its loudness, duration, time of day, and land use. Sound measurements are usually expressed as decibels (dB) which equally weights all frequencies. However, the human ear is not equally sensitive to sounds at all frequencies. Therefore, the dBA scale which primarily weighs frequencies within the human range of hearing is used to assess the impact of noise on human hearing (USEPA, 1971, 1972, 1974). A range of noise levels in dBA are shown in Table 6 below.

Table 6. Range of Noises

Noise level (dBA)	Examples	Human Response
0	recording studio	hearing threshold
20	rustling leaves	
40	conversational speech	quiet
60	freeway at 50 feet	
70	freight train at 100 feet	moderately loud
90	heavy truck at 50 feet	
110	ambulance siren at 100 feet	very loud
120	jet engine at 200 feet	threshold of pain

Source: USEPA, 1971, 1972, 1974.

Many cities and counties have provision in their noise ordinance that addresses construction noise levels and time of operation. For a relatively long-term noise exposure resulting from construction activities, a CNEL (Community Noise Equivalent Level) up to 65dBA is generally acceptable for noise sensitive land uses, including residences, schools, hospitals, and churches. A CNEL up to 75 dBA is often considered acceptable for office building and other commercial activities. However, for short-term construction activities, levels considerably higher may be acceptable because of the temporary nature of the activity. A CNEL up to 90dBA for noise sensitive land uses and up to 100 dBA for offices and commercial activities would not be considered unacceptable and is in fact found in the vicinity of many construction sites in many urban areas throughout the country.

The use of earthmoving vehicles shall be restricted to the City construction hours of 7 am and 8pm. The Corps has coordinated with Michael Berman of the City of Santa regarding noise-related ordinance for the proposed dredging operation (personal communication between the Michael Berman and the Corps, April 2004). He indicated that short-term construction is not subject to any construction/noise standards. Therefore, dredging operations can occur for 24 hours. If construction work is needed at night (for double or triple shift dredging), the contractor

shall contact the Chief of Building and Zoning, City of Santa Barbara for permission and/or obtaining proper permits. Section 9.16.015 of the City's Municipal Code addresses the need for a special permit from the Chief of Building and Zoning for work conducted between the hours of 8:00 p.m. and 7:00 a.m. that would result from noise levels 5dBA higher than ambient levels at the nearest property line used for residential purposes. In granting the permit, the Chief of Building and Zoning shall consider if the construction activity would in fact be objectionable to neighboring communities and if the work is need at night due to public interest or other specific reasons outline in the code. A draft noise ordinance revision, Section 9.16.010, dated August 4, 2015, includes Noise Disturbance Prohibited (subsection 9.16.020 within a distance of fifty (50) feet from the noise source, Construction Work At Night Prohibited (subsection 9.16.040) that deletes the noise level created is in excess of the ambient noise level by 5 dBA at the nearest property line of a property used for residential purposes unless a special permit therefore has been applied for and granted by the Chief of Building and Zoning Official of the City of Santa Barbara. (City of Santa Barbara, 2015a).

The existing noise environment in the vicinity of the proposed project area in general is typical of most urban areas within southern California, characterized by a relatively high background or "ambient" noise level generated by vehicular traffic on nearby freeways and major thoroughfares, industrial activities, and a variety of other characteristic urban noise events, such as emergency vehicle sirens, barking dogs, car alarms, and loud stereos. Noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is usually the sound from individual local sources. These sources can vary from an occasional aircraft to virtually continuous noise from traffic on an adjacent street or highway. Noise environments would vary from city to city for some have less noise than others, but still have some of the typical ambient noises as most general areas.

H. LAND USE AND RECREATION

Land uses in the vicinity of the proposed dredging area consist of primarily recreational and commercial land uses.

Santa Barbara Harbor and East Beach are important recreational resources for the regional and local area. The Harbor complex includes Stearns Wharf, administration facilities, resort hotels, parking areas, a commercial fishing center, sportfishing centers, boat-repair yard, numerous restaurants, and marine hardware stores. Historic Stearns Wharf, California's oldest working wood wharf, was built in 1872 (City of Santa Barbara, 2015b). The Harbor was built in 1929. The harbor's open water area provides channels, turning basins, and mooring areas. Small and mid-size recreation power and sail boats operate within the harbor alongside larger commercial fishing boats. Fishing, boating, jet skiing, hiking, bicycle riding, walking, sun-bathing, and swimming, photography, and bird-watching are important recreational activities in the harbor area.

I. AESTHETICS

The scenic and visual resources of the proposed project area are primarily the harbor, marina, wharf, bay, estuary, beach, with the Pacific Ocean adjacent to the proposed project area. The aesthetic character of Santa Barbara Harbor and immediate vicinity is primarily comprised of recreational and commercial water-oriented facilities.

J. CULTURAL RESOURCES

The Harbor and sand traps have been dredged annually since 1972. The history of dredged sediment dredged material placement on East Beach is the same as the dredging history. A telephone conversation with the Santa Barbara Harbor Patrol officer, Bob Brandenburg, provided the information that the Harbor has been clear of shipwrecks since 1986 and that any sunken ship is immediately removed.

The entire Santa Barbara waterfront was monitored for a City of Santa Barbara water reclamation project in 1988 and was found to be negative for cultural resources (Wilcoxon et al. 1988).

K. VESSEL TRAFFIC & SAFETY

Santa Barbara is a heavily used recreational and small commercial harbor. The City of Santa Barbara Harbor Department provides monthly berthing for approximately 1,100 vessels (City of Santa Barbara, 2015c.) Additionally, the Harbor offers guest berthing for vessels 20’ to 170’ in length.

Commercial operations in the Harbor and Waterfront that provide fishing, boating, and water recreational facilities, restaurants and food services, as well as a sea center museum and a sea memorial. Santa Barbara Harbor and Waterfront also provides services to cruise ships (City of Santa Barbara, 2015d).

The Santa Barbara Yacht Club sponsors a Sailing Club Race program that brings approximately 300 yachts and approximately 5,000 visitors to the area annually (City of Santa Barbara, 2015b).

Santa Barbara Harbor has a Harbor Patrol. It enforces laws, educate the public and provide emergency fire, medical and ocean response services to facilitate the safe and orderly use of the Waterfront Area; provides emergency response seven days a week, 24 hours a day within the Waterfront jurisdiction; provide security and law enforcement in the Waterfront by patrolling the ocean and land areas; enforce state and local laws; coordinate operations with USCG, Santa Barbara Police, Santa Barbara Fire, California Department of Fish and Wildlife, and County Sheriff (City of Santa Barbara, 2015e).

The USCG, under the Department of Homeland Security (DHS), operates a USCG operation based in Santa Barbara Harbor. The USCG Cutter Blackfin, an 87 foot patrol boat that typically

support a crew of twelve (12) onboard including 1 officer and 11 enlisted personnel, is stationed out of Santa Barbara Harbor (Santa Barbara Navy League, 2015). The USGC Cutter Blackfin patrols an area of over 60,000 square miles of ocean along southern California's coastline as far north as Morro Bay and as far south as Dana Point. Its primary missions includes Drug and Migrant Interdiction; Search and Rescue; Ports, Waterways, and Coastal Security; Marine Environmental Protection; Enforcement of Laws and Treaties, and; Defense Readiness. The USGC Cutter Blackfin routinely works alongside Custom and Border Protection, Immigration and Customs Enforcement, California Fish and Wildlife, and the National Oceanic and Atmospheric Administration (NOAA) to complete its mission and build strong working relationships with its partner agencies.

L. GROUND TRANSPORTATION

Transportation and traffic routes in the vicinity of the proposed project area include the following:

- U.S Highway (Hwy) -101. U.S. Hwy is a four to six lane freeway that runs through the Cities of Montecito and Santa Barbara, and is one of the primary north/south roadways serving Santa Barbara County.
- East Cabrillo Blvd. East Cabrillo Blvd. a principal artery roadway, extends westerly from its interchange with U.S. Hwy 101 in Montecito to Castillo Street, along the City of Santa Barbara waterfront district [Federal Highway Administration (FHA), 2014]. West of Castillo Street, the roadway becomes a local street, Shoreline Drive. East Cabrillo Blvd. continues north on Castillo Street, west on Cliff Drive and north on Las Positas Road to an interchange with U.S Hwy 101. In the immediate vicinity of its interchange with U.S. Hwy 101 in Montecito, Cabrillo Boulevard is a two-lane roadway and runs parallel to East Beach. It widens to four lanes through the Santa Barbara waterfront, with several signalized intersections. More than providing an alternative to Highway 101, Cabrillo Boulevard distributes traffic to the tourist/commercial oriented Santa Barbara waterfront area, and serves as a main artery for the City College and Mesa residential areas of Santa Barbara. East Cabrillo Blvd. sometimes identified as State Route (SR) 225,
- State Street. State Street is a two-lane to four-lane primary surface street that runs through downtown Santa Barbara, and goes to Stearns Wharf in Santa Barbara Harbor.
- Milpas Street. Milpas Street is a main artery roadway in Santa Barbara and a major interchange with U.S. Hwy 101. It is located east of Santa Barbara Harbor. Milpas Street is sometimes identified as SR 144.

Annual Average Daily Traffic (AADT) capacities represent the general level of daily traffic that each roadway type can carry. Table 7 below shows the current (baseline) traffic volumes, for roadways in the vicinity of the proposed project area (CALTRANS, 2014; 2007).

Table 7. Current Traffic Volumes in the Proposed Project Area

Roadway Name	AADT
U.S. Highway (Hwy) 101 (at Milpas St.)	89,200
East Cabrillo Blvd/State Route 225 (at U.S. Hwy 101)	81,200
State Street (at State Route 154)	17,300
Milpas Street (at East Cabrillo Blvd).	94,200 *

Source: CALTRANS, 2014.
Source: CALTRANS. 2007 *.

M. ENVIRONMENTAL JUSTICE

The 1994 Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all Federal agencies to conduct "programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin." Section 1-101 of the Order requires Federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of programs on minority and low-income populations (EO, 1994).

The Federal Council on Environmental Quality (CEQ) identifies minority groups as Asian, American Indian and Alaskan Native, Native Hawaiian & Pacific Islander, Black or African American, and Latino (CEQ, 1997). CEQ further notes that a minority population may be present if minorities exceed 50% of the existing population within an area or if a minority group comprises a meaningfully greater percentage of the local population than in the general population (CEQ, 1997). A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds (CEQ, 1997). Both the EO and the CEQ definitions of environmental justice and minority groups assist in describing the existing without project demographic condition within the City of Santa Barbara Proposed Project Area. The City of Santa Barbara, the City of Goleta, the City of Santa Maria and Santa Barbara County serve as the environmental justice demographics reference for population, ethnicity, and low income (percentage below poverty threshold), as summarized in Table 8. The City of Goleta was selected as it is one of the cities located nearby the City of Santa Barbara, the City of Santa Maria was selected as it is one of the cities that has a total population comparable to the City of Santa Barbara, and Santa Barbara County was selected as it would presumably reflect an overall representative picture of the ethnicity and percentage below poverty threshold statistics for all of the residences in Santa Barbara County.

Table 8. Population, Ethnicity, Low Income

Population, Ethnicity, Low Income	City of Santa Barbara	City of Goleta	City of Santa Maria	Santa Barbara County
Total Population [1]	88,410	29,888	99,597	423,895
Poverty Data [2]				
Percentage Below Poverty Threshold	14.1%	9.1%	17.7%	14.3%
Ethnicity Data [2]				
White	75.1%	69.7%	56.2%	69.6%
Black	1.6%	1.6%	1.7%	2.0%
American Indian	1.0%	0.9%	1.8%	1.3%
Asian	3.5%	9.1%	5.1%	4.9%
Pacific Islander	0.1%	0.1%	0.2%	0.2%
Other	14.7%	14.0%	30.0%	17.4%
Hispanic	38.0%	32.9%	70.4%	42.9%

Source(s): [1] 2010 U.S. Census; [2] SBCAG, 2013.

Based on the Federal CEQ guidelines, the City of Santa Maria is considered a minority community.

IV. ENVIRONMENTAL CONSEQUENCES

This EA addresses dredging operations that would occur from September 1, 2016, through August 31, 2022. Impacts from the Proposed Project Alternative, and the "No Federal Action" Alternative are evaluated and analyzed below. Alternative schedules and dredged material placement sites that were considered impracticable are discussed in Section II.G. Alternatives.

A. GENERAL MARINE ENVIRONMENT

Significance Threshold
Based on the existing conditions discussed above, impacts would be considered significant if the alternative results in:

- A long term impact to the marine environment in the proposed project area

Proposed Project Alternative

The impacts of dredging on marine biological resources are discussed at length in LaSalle et al. (1991). That review provides summaries on much of the literature concerning impacts of the physical and chemical alterations associated with dredging on shellfish, fish, benthic organisms, seabirds, and marine mammals. That report describes in detail specific environmental consequences - such as, suspended sediments, sedimentation, dissolved oxygen (DO) reduction,

and entrainment - which are caused by dredging. That report is hereby incorporated by reference as per 40 CFR 1502.21.

The proposed discharge would not cause or contribute to the erosion of existing downcoast beaches and should result in temporary beach accretion because material would be returned to the intertidal zone. The primary dredged material placement site is above Mean Higher High Water level (+6 feet MLLW) and is the most desirable location for the purposes of beach nourishment and minimizing return of sediment into the harbor from the littoral processes. Disturbances resulting from dredge material discharge occurring once or twice per annum (and natural sediment deposition from Mission Creek and Laguna Creek) would not significantly degrade the value of intertidal and subtidal beach habitats. No significant long term or cumulative adverse effects on the terrestrial or aquatic ecosystems would occur as a result of the proposed project. The general marine environment would return to pre-project conditions upon completion of dredging. Based on the above, the Proposed Project Alternative would result in a less than significant impact to the general marine environment.

No Federal Action Alternative

Under the "No Federal Action" alternative, material would not be dredged from the harbor, nor discharged back to the beach for availability in littoral processes. There would be no change to the existing marine environment in the absence of dredging, and the “No Federal Action” alternative would result in a less than significant impact to the general marine environment.

B. BIOLOGICAL RESOURCES

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant if the alternative results in:

- permanent deterioration or contamination of aquatic or terrestrial habitats such that the ecosystem is substantially disrupted; or
- permanent impacts or reductions to populations of native flora and fauna.

Proposed Project Alternative

1. Terrestrial/Marine Vegetation

No discharge would occur in vegetated areas of the beach front. Little or no native coastal strand vegetation develops on the beach due to trampling associated with high public use. The only terrestrial plants anticipated to be impacted by the proposed project are iceplant and other weedy, exotic, or ornamental species growing adjacent to the existing bike trail above the high water line. Therefore, no significant impacts to terrestrial vegetation are expected.

The proposed project area does not contain any significant attached marine algae, but supports phytoplankton and smaller meioflora. Any attached flora within the immediate dredging area would be eliminated by the dredging activities, but this is expected to be minimal due to the history of harbor and navigation channel maintenance. No impacts to marine vegetation are expected due to material placement, as the sandy nearshore area has no suitable habitat. Seagrass and kelp communities are at such distance from the zone of discharge as to be beyond the area of impact (pers. comm., B. Hoffman, 10 April 1992). Therefore, any impacts to attached marine algae and other meioflora or phytoplankton would be localized, minimal, and not significant.

2. Invertebrates

Dredging inherently causes a disturbance and redistribution of bottom sediments which may persist for the duration of the operation. Some invertebrates are expected to be relocated, smothered, buried, or otherwise impacted. Temporary impacts may include clogging to gills and suspension feeding apparatuses, depressed filtration rates, increased mucous secretion, and increased susceptibility to disease. Impacts may result in direct or indirect mortality of organisms or temporary reductions in growth and reproduction. Some invertebrate mortality would provide food for opportunistic shorebirds or other aquatic organisms, while some relocated fauna will survive after relocation. Overall, impacts are expected to be temporary and minor since sediment is composed primarily of fine sands and few silts due to the frequency of dredging littoral drift sediments. Invertebrate populations are expected to recover from the disturbance upon completion of the project.

The potential biological and physical effects of placement of dredged material may include coverage and disturbance of invertebrates by dredged material, and temporary turbidity increases within the shallow subtidal and intertidal beach replenishment areas which can cause clogged gills and breathing apparatuses. The turbidity levels are expected to be low because the dredged material would be composed of predominantly sandy material with particle sizes larger than silts or clays; therefore, no significant impacts are expected because of turbidity.

Some invertebrates could thrive best in recently deposited sediment, but may have difficulty adjusting to beaches where sediments are graded frequently. The beaches would be graded whenever significant mounding (irregular topography) occurs to return beach profiles to normal, build the beach, decrease erosion impacts, and cover black, organically-rich dredged material to improve the overall aesthetics of the dredged material placement area. Given the temporary and minor nature of dredged material placement, no significant impacts are expected. Overall, impacts to marine and terrestrial invertebrates are expected to be minimal, temporary, and not significant.

While the status of Pismo clam on East Beach is unknown, this species does have the potential to occur at the placement site. Any clams present may be buried deeper by deposition of dredge material in the placement area. However, placement will be limited to a 500-foot area on East Beach, and the pipes will be placed so that sand does not settle in the intertidal zone.

Furthermore, wave action is expected to distribute the discharged material along the beach, reducing burying of any single area further. As such, impacts to Pismo clam are expected to be negligible and not significant.

3. Fish and Essential Fish Habitat

The proposed dredging project could affect fish resources in a variety of ways. The dredging process could result in direct loss of foraging habitat and temporary increases in turbidity. Dredging could also result in direct mortality of organisms via interactions with dredge equipment or burial with sediment. Although fish could theoretically be adversely affected by turbidity as a result of dredging or material placement, studies have shown that large-scale channel dredging operations in the 1980s and 1990s did not have long-term adverse effects on fish populations (Chambers 1998). Some fish may avoid the immediate proposed project area during dredging and placement operations because of the increased turbidity, noise levels, and oxygen depletion caused by dredging bottom sediment. Other fish species may be attracted to the surf zone to feed on mollusks, crustaceans, and other organisms which may have been caught up in, or exposed by, the dredged material. While turbidity at the placement site could be more extensive than that at the dredge location, the surf zone has naturally high turbidity due to wave action.

Dredged material placement is expected to typically occur from September 1 to April 30. Dredged material placement during this period should minimize effects to grunion and may enhance grunion spawning habitat by decreasing the effects of normal long-term erosion. Potential effects to grunion spawning on beaches after March 1 would be minimal and limited to burial of eggs that were in the immediate (500-foot) area of discharge. Additionally, spawning densities at East Beach appear to be significantly lower in March and April than in May and June.

Grunion surveys on East Beach performed in support of dredging operations in 2015-2016 identified grunion runs ranging from W-1 to W3 on the Walker Scale. However, grunion were virtually absent from the direct vicinity of the material placement area, indicating that grunion were able to actively avoid the ongoing work. Even in the event of a grunion run during dredging, any possible egg burial or nest disturbance will be minimal due to the avoidance behavior previously described. In addition, the Corps will continue to implement the grunion monitoring program described in Section VI. Environmental Commitment, which includes avoidance measures should a significant grunion run occur during dredging. Therefore, impacts to grunion as a result of the proposed project would be less than significant.

The dredging operation would be monitored to ensure that any substantial increases in turbidity or decreases in dissolved oxygen are restricted to the immediate area around the dredge, and that these impacts dissipate within 100 feet of the dredge. The monitoring program also includes reporting requirements and measures that would be taken if impacts exceed acceptable levels as discussed in Section VI. Environmental Commitments. Any such dredge-related impacts would be limited in extent and duration, and therefore insignificant. Greater potential for impacts

would exist if there were substantial amounts of fine sediments and organisms in the potential dredging areas; however, testing of samples of material to be dredged indicated that grain sizes are predominately fine to medium grain sands (Appendix A). This material settles quickly instead of remaining suspended in the water column. Furthermore, dredging could increase water circulation and indirectly benefit fish resources. Also, dredging activities may suspend additional fauna in the water column, temporarily enhancing fish feeding activities.

The proposed project is located within an area designated as EFH for two FMPs: Coastal Pelagic Species (CPS) Fishery Management Plan and Pacific Coast Groundfish (PCG) Fishery Management Plan. For CPS, EFH extends from the shoreline to the edge of the exclusive economic zone (EEZ) and for PCG it covers all areas from the mean higher high water line to depths of 3500 meters. Minor impacts to EFH may occur due to temporary disturbances during dredging and disposal. However, all impacts would be limited in extent and duration, and therefore, less than significant.

4. Birds

Dredging activities may temporarily degrade water quality and increase ambient noise levels, which could cause disturbances to some birds. Increased levels of activities within the harbor may decrease waterfowl use of the breakwater and other nearby structures for roosting. These effects are not significant because dredging operations would be temporary and localized. Birds and marine mammals are expected to rapidly acclimate to the dredge's monotonous, non-threatening noise (Climo 1987, Gentry 1990) and to return to the project site once construction is completed at the end of the day.

With the exception of nesting species, shorebirds utilizing the beach area are fairly adapted to human activity. Dredging activities attract many birds to the dredged material placement areas, as some invertebrates are caught up and exposed in the dredged material as it is deposited on the beach. Birds such as gulls, sanderlings, and godwits have been observed feeding in the slurry as it is discharged. No significant adverse impacts to birds are expected from this project.

5. Mammals

Santa Barbara Harbor does not constitute essential feeding or breeding habitat for any marine mammal species that may be present in the area, and few mammals are known to occur on East Beach. Sea lions and harbor seals generally do not haul out on the breakwater and would probably keep clear of the dredging activities, although it is feasible that marine mammals could be found offshore of the dredge material placement site. If marine mammals did appear in the nearshore habitat of East Beach, they are expected to avoid the work area. Proposed dredging operations are not expected to adversely affect sea otters, elephant seals, gray whales, or any other marine mammals. Any short-term disruptions to pre-dredge foraging or movement behaviors would be temporary and not significant, as wildlife activities would return to normal upon project completion.

No Federal Action Alternative

The impacts associated with dredging and dredge material placement would not occur under the "No Federal Action" alternative. Continued shoaling, however, could either necessitate an emergency (possibly larger scale) dredging project, or create a navigational hazard, increasing the likelihood of oil spills caused by boating accidents. Either condition would have the potential to affect biological resources within the harbor.

C. THREATENED AND ENDANGERED SPECIES

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant if the alternative results in:

- the loss of any rare, endangered, or threatened species; or
- permanent degradation of the habitat of those species.

Proposed Project Alternative

1. Western Snowy Plover

Western snowy plovers can occur year round within the proposed project area, primarily along East Beach. Abundance of snowy plovers is highest during winter, when over 100 individuals may be present. However, some wintering birds may represent migrants from the interior population of the snowy plover, which is not protected under the ESA. As the breeding season approaches, wintering birds tend to migrate to the breeding grounds and relatively few plovers (<10) tend to be present as March approaches. Nest site availability may be the most likely factor resulting in the limited number of plovers present outside of the winter season. If beach grooming, recreation, and other impediments to breeding were restricted, snowy plover abundance and beach use might differ during the breeding season.

Results of pre-dredge surveys, as well as monitoring during dredge mobilization and demobilization since 2012, indicate that snowy plover activity is primarily limited to the eastern end of the beach. During winter and spring prior to breeding, plovers typically congregate at the far eastern end of the beach beyond the volley ball courts. This area of the beach has the least human traffic and is likely the least disturbed area within this critical habitat unit. The area around Mission Creek has very high foot traffic and is a common stop for tour buses with large groups of tourists. Based on observations during previous years monitoring, it is likely that the proximity of the pier, frequent maintenance work and construction in the area, and heavy foot traffic contribute to plovers avoiding this area.

There is evidence that the Corps' dredging operations may provide a temporary food source for snowy plovers. During on-site monitoring, Corps personnel have occasionally observed snowy plovers feeding on insects and small crustaceans associated with debris washed up on the beach by high tide. Significant mounds of debris were limited to that portion of East Beach where the discharge pipeline was located. The remainder of the beach was regularly cleared by tractors as part of a routine beach maintenance operation (City of Santa Barbara). Small numbers of snowy plovers have been observed congregating in the discharge area, likely due to the presence of abundant food as well as the protection provided by the exclusion of beach-goers and pets from the placement area.

Several human factors can affect the quality and quantity of plover habitat (Stenzel et al., 1981), including the vehicular or pedestrian traffic in plover nesting or foraging habitat; destruction of eggs by pedestrian or vehicular traffic; and harassment of adults during egg-laying, incubation, and parental care. Regular beach grooming activities can also significantly impact the invertebrate prey populations (M. Holmgren, pers. comm., 2004, Dugan, 2001, Dugan et al, 2003). Since these impacts are not expected to be associated with either dredging or dredged material placement operations (with the exception of equipment required to occasionally maneuver pipe and grade the beach after dredged material placement), the proposed project will have no effect on snowy plover foraging or food sources.

The entirety of East Beach, including the area around Mission Creek lagoon, was designated as critical habitat for the western snowy plover in 2012. The revised PCEs for western snowy plover under the 2012 critical habitat designation are as follows:

Sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoils sites, with:

1) Areas below heavily vegetated areas or developed areas and above the daily high tides;
2) Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;
3) Surf- or water-deposited organic debris such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PCE 2 for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and
4) Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

While PCEs 1-3 described for western snowy plover are present within portions of the proposed project area along East Beach, the 4th PCE is never met within the proposed project area. The entire proposed project area is prone to nearly constant disturbance from humans, pets, vehicles, and human attracted-predators, greatly reducing the quality of the habitat.

A monitoring program would also be implemented for snowy plover. During mobilization and demobilization of dredge pipe on the beach, monitors ensure there are no plover present within the work area. Furthermore, pipe placement occurs above the wrack and high tide lines. Based on previous years of monitoring, snowy plover are rarely present in this area. Further plover monitoring during dredging will occur in March and April once plover breeding season commences as described in Section VI. Environmental Commitment.

Due to existing levels of near constant disturbance from humans, pets, and vehicles on East Beach, and through implementation of the described monitoring and avoidance measures, the Corps has determined that implementation of the proposed project will have no effect on western snowy plover and no effect on western snowy plover critical habitat. Therefore, the impacts to snowy plover are not significant.

2. Southern Sea Otter

Sea otters are not expected in Santa Barbara Harbor, as sea otters are found only infrequently south of Point Conception. The few individuals that may occur are expected to avoid work areas. Therefore, this project is expected to have no effect on the southern sea otter.

3. Tidewater Goby

Tidewater goby occur in lower Mission Creek and the associated lagoon. Designated critical habitat for the tidewater goby occurs within the lagoon and lower creek area. Of the established PCEs for tidewater goby critical habitat, only one occurs within the proposed project area: substrate suitable for construction of burrows. Surveys performed in 2005 showed the population in Mission Creek is most abundant in the spring, declining in summer, and are apparently absent by winter. While no dredging or material placement will occur in the lagoon, the dredging pipeline would be elevated across the lagoon so that it can reach the downcoast discharge location. Elevation of the pipe will prevent blockage of the mouth of Mission Creek and will avoid impacts to the lagoon itself. The pipeline would be supported using piers with base support plates. Due to the presence of tidewater goby in the lagoon, and the critical habitat designation, the supporting piers will be installed on dry ground outside of the wetted perimeter of the lagoon. This will avoid any potential impacts to the goby or its critical habitat. During the time period covered by this EA, it is anticipated that stanchions will have to be installed twice and removed twice, but will be left in place during the intervening periods.

The Mission Creek lagoon is subject to substantial variation in size and location. Therefore, it is possible that the pier supports could be installed in the dry, but be inundated by the lagoon when demobilization is scheduled to occur. If this situation were to occur, the entire extent of pipeline

outside of the lagoon would be demobilized but the piers and associated pipe segment would be left in place until the waters of the lagoon receded and the piers were dry in order to avoid any potential impacts.

To further minimize impacts from potential roosting birds on the pipe that may feed on goby, bird deterrents would be installed along the length of pipe crossing the lagoon. The installation and removal process of the pipe crossing will be monitored by a biologist to ensure no impacts to the lagoon occur. With implementation of the described avoidance and minimization measures, the Corps has determined that the proposed action will have no effect on tidewater goby and the proposed action would not destroy or adversely modify designated critical habitat.

4. Steelhead

In recent years, steelhead have been observed on a nearly annual basis in lower Mission Creek, and critical habitat for this species begins at the upstream portion of the lagoon. Lower Mission Creek does not generally support favorable conditions to sustain steelhead, but due to upstream barriers to migration, steelhead transiting through lower Mission Creek are barred from reaching the upper watershed and have attempted to spawn in generally unsuitable areas in lower portions of the creek.

The dredge pipeline will cross the lower Mission Creek lagoon. The dredge pipeline will be elevated across the lagoon to prevent blockage and allow for steelhead passage. The pier supports that elevate the pipe over the lagoon will be installed outside of the wetted perimeter of the lagoon, thereby avoiding any potential affects to individual steelhead. No construction equipment will enter the lagoon to install or remove the piers, and the piers will not block, hinder, or otherwise impact steelhead passage through the lagoon. To further minimize impacts from potential roosting birds on the pipe that may feed on steelhead, bird deterrents would be installed along the length of pipe crossing the lagoon. As previously described, a biologist will also oversee installation and removal of the pipe piers to ensure that the lagoon is not affected by the proposed action.

Due to the low likelihood of steelhead presence in the lagoon, the fact that the proposed action will not hinder migration, and with implementation of the described avoidance measures including elevating the pipeline and avoiding impacts to the lagoon, the Corps has determined that the proposed action will have no effect on the southern California steelhead DPS and the proposed action would not destroy or adversely modify designated critical habitat.

No Federal Action Alternative

No impacts to threatened or endangered species are anticipated under this alternative.

E. WATER QUALITY

Proposed Project Alternative

Temporary physical and chemical changes in water quality characteristics may result because of resuspension of bottom sediments during dredging activities. Any contaminants present could become ecologically active upon disturbance by these activities. Recent cores samples taken from the proposed dredging areas at Santa Barbara Harbor indicated that the average fines content among all primary core intervals was only about 5% (see Appendix A) [Corps, 2016a]. Previous core samples taken from the proposed dredging areas at Santa Barbara Harbor in November 2009 indicated fines of less than 10 % (see Appendix A). Contaminants do not typically adhere to large-grained sands; therefore, contaminants are not expected in the dredged material. Chemical testing conducted recently in November 2015, and previously in 2009, confirmed that contaminant levels in the sand are low, and within the range acceptable for beach dredged material placement. Because of both the general lack of pollutant sources typical of the larger commercial harbors, and the historical grain size of the littoral drift material, the effects of these activities are expected to be either minimal or absent. Water quality would return to pre-project condition upon completion of project. Impacts would be less than significant.

Dredging impacts may include temporary increases in turbidity and suspended solids levels along with the associated decreases in DO in the immediate vicinity of the dredging and dredged material placement operations. Increased turbidity would result in a decrease in light penetration and cause a general decline in aquatic primary productivity. Any appreciable turbidity increase may cause clogging of respiratory and feeding apparatuses of fish and filter feeders. Localized turbidity associated with dredging and temporary blackening of sand caused by dredged material placement of (chemically reduced) organic material onto the beach detracts from the aesthetics of the nearshore oceanic and beach areas. Temporary occasional odors during the winter months may occur due to dredging of vegetative matter and other debris that may be released. Motile organisms, however, would evacuate and avoid the dredging area and temporarily relocate to an undisturbed area. Due to the small percentage of fines, approximately 5 % average fines content all primary core intervals in the dredged material areas sampled, increases in turbidity would be minimal and restricted to the immediate vicinity of the operation. Water quality would return to pre-project condition upon completion of project. Impacts would be less than significant.

State of California and County health department including Santa Barbara County standards for safe contact recreational exposure to total coliform, fecal coliform, and enterococcus, are levels of 10,000 MPN/100 ml, 400 MPN/100 ml, and 104 MPN/100 ml respectively (MPN being units known as Most Probable Number). These bacteria standards are substantially higher than are detected during monitoring for dredging operations and at the dredged material placement area at the East Beach placement area for Santa Barbara Harbor maintenance dredging operations, which over an approximate six year period between the fall 2010 dredging operations to the spring 2016 dredging operations that included 123 days of bacteria monitoring/sampling test and 3 separate sampling location tests for each bacteria listed for each day, have approximate average readings of 213.6 MPN/100 ml for total coliform, 18.2 MPN/100 for fecal coliform, and 58.3

MPN/100 ml for enterococcus, respectively. Also, when in infrequent elevated bacteria readings had occurred during certain dredging operations, for example, for enterococcus during week 1 of dredging in the fall 2015 (week of December 7, 2015) dredging operation, tests results were at 260 MPN/100, 200 MPN/100, and 290 MPN/100. Subsequently, as part of the Corps responses to the elevated enterococcus readings, the Corps implemented management measures and BMPs including posting signs on the beach that the bacteria levels were elevated and advised the public to stay out of the water, as well as additional multiple enterococcus readings taken during week 2 of dredging to observe and evaluate the progress of the elevated enterococcus readings, that included a set of readings during dredging of 580 MPN/100, 360 MPN/100, 530 MPN/100, and at the reference site, 450 MPN/100, it was concluded since elevated enterococcus levels were occurring at all sampling location including the reference site, that the elevated enterococcus readings were likely a background condition not associated with the dredging activities (December 15, 2016, e-mail communication between Central Coast RWQCB and the Corps). It should be noted during the period starting from the fall 2010 dredging through spring 2016 dredging, there have been no long term (e.g., no more than two weeks) elevated bacteria readings and no longer term (e.g., no more than one week) water quality elevated Dissolved Oxygen (DO) readings during dredging operations, and all infrequent bacteria readings and DO readings have returned back to normal levels during dredging or during dredged material placement operations with the implementation of water quality environmental commitments discussed in Section VI. of the DEA or Best Management Practices (BMPs). Water quality would return to pre-project condition upon completion of dredging. Impacts would be less than significant. Therefore, dredging or dredged material placement area operations in Santa Barbara Harbor are not correlated to increased bacteria levels.

Additionally, according to a study performed by J.A. Babinchak, J.T Graikoski, S. Dudley, and M. F. Nitkowski (1977), the MPN of fecal coliforms in sediments was monitored at a New London dump site in Long Island Sound during dredging and deposition (dredged material placement area) of dredge spoil from the Thames River. Although the geometric mean for fecal coliforms at five stations in the river was 14,000 MPN/100 ml before dredging commenced, the deposition of this material did not increase the incidence of fecal coliforms at 17 spoil stations and 13 control stations in the disposal and surrounding areas. Fecal coliform appears to occur only in the surface sediment material and are diluted by the subsurface material during dredging operations. Fecal coliform analyses of bottom waters during high and low tides indicated that the flow of water from the Thames River played a major role in determining the MPN of fecal coliforms in the sediments of the disposal (dredged material sediment area) sediment. A similar scenario also exists in and adjacent to Santa Barbara Harbor Federal channel dredge areas and in the dredged material placement area due to flows coming through and out of the mouth of Mission Creek and Laguna Creek, immediately upstream of the East Beach placement area, and to a lesser degree, storm surges in the Pacific Ocean that are adjacent to Federal dredge areas and the East Beach placement area. Storm conditions, flood events, and freshwater input flow coming from Lower Mission Creek and Laguna Creek, and storm surges from the Pacific Ocean, in and adjacent to the proposed project area, substantially and significantly alters water quality conditions as well as degrade water parameters, especially turbidity and bacteria in the Federal channel dredge areas and the East Beach placement area. Therefore, dredging or dredged

material placement area operations in Santa Barbara Harbor are not correlated to increased bacteria levels.

Another factor varying bacteria test results is typically a minimum 72-hour delay between sampling and receipt of enumeration results. As such, this lack of real time results collection makes bacteria levels an impractical tool for making operational adjustments to the dredging. Collection of data not used to guide operations is against Corps' policy on conducting maintenance dredging operations. Therefore, based on the above, the Corps has concluded that dredging operations in Santa Barbara Harbor are not correlated to increased bacteria levels.

Dredging and dredged material placement activities have adhered to the requirements set forth by the Central Coast RWQCB cited in the 2010 CWA 401 WQC Number 34210WQ03 issued by the Central Coast Region RWQCB for the Proposed Project since the fall 2010 dredging through the recent spring 2016 dredging. Further, during the period starting from the fall 2010 dredging through spring 2016 dredging, there have been no long term (e.g., less than a week) elevated DO or elevated bacteria readings during dredging operations, and any infrequent elevated DO or bacteria readings have returned back to normal levels during dredging or during dredged material placement operations with the implementation of water quality environmental commitments in Section VI. of the DEA or Best Management Practices (BMPs). Under the Proposed Project, requirements of the CWA 401 WQC would continue to be met and environmental commitments and BMPs implemented. Water quality would return to pre-project condition upon completion of dredging. Impacts would be less than significant.

There have been no major oil spill accidents in the Santa Barbara Channel since the Union Oil blowout in 1969. The Refugio oil spill from a ruptured oil pipeline at Refugio State Beach, approximately 20 miles northwest of Santa Barbara, occurred on May 19, 2015, and spilled approximately 140,000 gallons of crude oil into the Pacific Ocean. Minute amounts of oil are presumed to come from natural fissures and natural seeps which have been in the harbor for over a decade. The implementation of a spill prevention plan would confine and reduce potential spread of spills coming from the dredge operation. There have been no accidental contaminated waste incidents in the harbor in over the past fifteen years. The bulk chemistry and physical analysis (i.e., compatibility determination) results finalized in June 2016 of the authorized federal dredged material area(s) and dredged material placement area(s) sediment sampled in November 2015 indicated the predominance of sand, approximately 90 to 95% sand, and found the sediments to be uncontaminated, suitable, and compatible for placement on the East Beach placement area. Water quality would return to pre-project conditions upon project completion. Based on the above, and with the implementation of a spill prevention plan environmental commitment discussed in Section VI. of the DEA, impacts to water quality would be less than significant.

No Federal Action Alternative

No adverse effects (turbidity or disturbance of contaminants) would occur under the "No Federal Action" alternative for dredging or dredged material placement. However, hazardous conditions caused by shoaling could result in more frequent boating accidents, which would likely involve spillage of oil, gas, and other hazardous substances.

F. AIR QUALITY

Significance Threshold

Impacts would be considered significant if the alternative:

- Exceeds Santa Barbara APCD daily emissions thresholds.

Proposed Project Alternative

Under the Proposed Project Alternative, an electric dredge would be used to dredge the Federal channel at Santa Barbara Harbor. Use of the electric dredge would not result in diesel emissions within the vicinity of the Santa Barbara Harbor. In general, dredging activities would require the use of off-road equipment for approximately 10 days per each dredging operation (once in the late fall or early winter and once in the spring during a year) for pipeline placement and removal, or approximately 20 days per year. Off-road equipment would include one rubber-tired loader, excavator, and forklift. Support harbor crafts would be used approximately 21 days (three weeks) per each dredging operation (once in the late fall or early winter and once in the spring during a year), or approximately 42 days a year. Harbor crafts would include a tugboat and crew boat. Air quality would return to pre-project conditions upon completion of dredging. Impacts would be less than significant.

The Proposed Project Alternative would result in periodic air quality impacts during each dredging operation (once in the late fall or early winter and once in the spring during a year). Impacts from emissions would be temporary. Furthermore, as shown below, estimated emissions would not exceed Santa Barbara APCD Significance Thresholds (Table 9). Appendix B discusses the air quality analysis for the estimated emissions. Thus, air quality impacts would be less than significant.

Table 9. Santa Barbara APCD Significance Thresholds[1]		
Pollutant	**Threshold (lbs/day)**	**Estimated Emissions (lbs/day)**
NO_x	240	117.54
VOC	240	11.23
PM_{10}	80	3.58
$PM_{2.5}$	n/a[2]	3.22
SO_x	240	0.13
CO	n/a[2]	91.49
Pb	n/a[2]	n/a[3]

1.Source: http://www.ourair.org/apcd/land-use-frequently-asked-questions/#attainment
2. Thresholds have not been established for the pollutants. Pollutants are currently unregulated by SBAPCD or are in attainment status per NAAQS.
3. Emission factor for Pb is not available.

Furthermore, as shown below (Table 10), GHG emissions would not exceed CEQ recommended reference point of 25,000 metric tons of annual CO2 emissions as warranting further review.

Table 10. Comparison of Estimated GHG Emissions to CEQ GHG Guidance	
CEQ GHG Guidelines (tons/year)	**Estimated Emissions (tons/year)**
25,000	593

No Federal Action Alternative

The No Federal Action Alternative would avoid impacts to air quality since there would be no maintenance dredging. There would be no diesel emissions from off-road equipment for dredging pipeline emplacement and removal. Likewise, there would be no diesel emissions from harbor craft supporting the electric dredge.

G. NOISE

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant if the alternative results in:

- Permanently elevates noise levels within the Federal channel.

Proposed Project Alternative

Noise (sound) is measured in units called decibels (dB). The dB level decreases with distance from the source, usually by a rate of 6 dB for every doubling of distance. Automobiles, recreational boats and vehicles, and small commercial fishing boats are the major contributors to the ambient noise environment at Santa Barbara Harbor and nearby beaches. Noise levels tend to increase during heavy summer recreational utilization [U.S Army Corps of Engineers (Corps 1984, 1985, 1986a, 1987].

Under the Proposed Project Alternative, the Federal channel would be dredged using a hydraulic cutterhead dredge with a pipeline. Operational noise of a hopper dredge, similar to noise from a hydraulic cutterhead dredge, has noise source ranges from 85 to 108 dBA (Bowes 1990). Furthermore, noise levels are atmospherically attenuated by a factor of 6 dB per doubling of the distance. Potential noise levels at various distances are shown in the Table 11 below.

Table 11.Potential Noise Levels At Various Distances

Distance from Construction Activities (ft.)	Noise Levels (dBA)
50	80 - 90
100	74 – 84
200	68 – 78
400	66 – 72
800	60 – 66

Source: USEPA 1971, 1972, 1974.

Ambient noise levels on the beach and within the Harbor are such that the electric powered dredge or a diesel dredge would not be a significant new noise source. Noise levels at hotels, motels, and restaurants on the inland side of Cabrillo Highway would not exceed existing highway-associated noise. Section 9.16.015 of the City's Municipal Code that the need for a special permit from the Chief of Building and Zoning for work conducted between the hours of 8:00 p.m. and 7:00 a.m. that would result from noise levels 5dBA higher than ambient levels at the nearest property line used for residential purposes. In granting the permit, the Chief of Building and Zoning shall consider if the construction activity would in fact be objectionable to neighboring communities and if the work is needed at night due to public interest or other specific reasons outlined in the code. The proposed project falls under this category for several

reasons: (1) the costs would be greater if the dredging activity were spread over a longer period of time; (2) the efficiency of the dredge operation would avoid potential public safety hazards due to beach erosion; and (3) beach replenishment would be in the local and public interest. Noise would return to pre-project conditions upon completion of dredging.

Based on the above and with the implementation of the noise permit environmental commitment in Section VI. of the DEA, impacts to noise would be less than significant. Noise levels would return to ambient conditions upon project completion. Therefore, impacts would be temporary and less than significant.

The dredge would be operating within the confines of the federal channel, equipment to mobilize and demobilize the pipeline on the beach and vehicles transporting materials to the staging area and periodic inspections of the pipeline would their limit operations to the dry portion of the beach to the extent practicable to ensure noise would be maintained at safe levels to sensitive receptors. As a result, noise impacts at sensitive receptors would be attenuated at the levels indicated above. Noise levels would return to baseline conditions upon completion of construction. Based on the above, impacts to noise would be less than significant.

No Federal Action Alternative

The No Federal Action alternative would avoid all noise impacts associated with the proposed project. However, a "No Federal Action" response may result in frequent emergency dredging operations to relieve dangerously shoaled conditions in the harbor.

H. LAND USE AND RECREATION

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant on land use if the alternative results in:

- Permanent changes incompatible with designated uses.

Proposed Project Alternative

Dredging, dredged material placement and the placement of dredge pipeline may temporarily interfere with land based and water based recreational activities within the immediate vicinity of the project. These activities include boating, fishing, and beach recreation. The potential environmental impacts and disturbances to such activities are expected to be minimal.

The utilization of heavy equipment would detract from recreational use (i.e. walking, jogging, sunbathing, etc.) of East Beach. Since beach dredged material placement would be completed before or by April 30, which is prior to the peak recreation use, the impacts to the beach area would be temporary, localized, and not significant. The dredge equipment and floating pipes

could obstruct recreational and commercial vessels. The navigational impacts could be minimized by properly marking the pipes and buoys so that boaters can safely avoid the immediate dredging area. The Corps has included recreational environmental commitment(s) in Section VI. of the DEA which requires in-field coordination between the contractor and the 11th USCG District. Land use and recreation would return to pre-project conditions upon completion of construction. Based on the above, and with the implementation of the recreational environmental commitment(s), impacts to recreational and commercial vessels would be less than significant.

The Corps may use surface dredged material placement pipeline over part of the sandy beach. Surface lain pipeline setting on the beach would allow for simplicity, cost efficiency, safety and readily allow for pipe maintenance. This could result in minor impacts to beach visitors attempting to cross the pipe, but sand ramps would be placed at appropriate intervals on the beach, roads, streets, highways, walking/bike trail, across Lower Mission Creek and Laguna Creek and the estuary, to ensure adequate pedestrian public access. The sand ramps could also be utilized for hauling of dredging equipment and construction work, ingress and egress, access to construction staging/storage area, periodic inspection of the pipeline during dredging, beach patrol by life guards or law enforcement vehicles, or emergency vehicles. Burying of the pipeline on the beach could also be an option, upon the request and approval of the local sponsor, Santa Barbara Harbor District. Beach public access would return to pre-project conditions after completion of dredging with removal of pipeline. The pipe itself would not cover a significant area of beach, and beach replenishment would enhance recreational use. Recreational uses are heaviest in the summer and are not expected to be significantly adversely impacted, since the dredging activities are expected to typically occur between September 1 and April 30. The Proposed Project would not include activities that would permanently change the designated land use of the terrestrial environment in Santa Barbara Harbor, and therefore result in less than significant impacts to land use. The Corps has included a recreational and land use environmental commitments in Section VI. of the DEA, which requires in-field coordination between the dredging contractor and the City of Santa Barbara regarding placement and removal of the dredged material placement pipeline. Land use and recreation would return to pre-project conditions upon completion of construction. Therefore, based on the above, and with the implementation of the recreation and land use environmental commitment, impacts on land use and recreation would be less than significant.

Modifications to the existing bottom topography should be expected as a result of the proposed dredging project. Local, but minor, changes to the bathymetry would result because of relocation of marine sediments. In addition, topographic changes to the existing land forms would occur from the dredged materials placement on East Beach above Mean Higher High Water (MHHW), which would nourish beaches, and from the slow effects of erosion. The beach is eroded annually. Beach dredged material placement /replenishment would, therefore, produce a benefit through probable increases in beach recreational usage following the completion of the project. The beaches would be graded to cover black organically-rich dredged material, to build the beach and to improve overall aesthetics on the beach. Potential impacts of the proposed activities affecting the existing land use would be localized to the immediate project vicinity and

are considered minor in nature. Land use and recreation would return to pre-project conditions upon completion of construction. Impacts would be less than significant.

No Federal Action Alternative

There are no significant benefits resulting from the "No Federal Action" alternative, except for avoidance of temporary disturbance to navigation and water-related recreation. Several adverse impacts would occur if the harbor was not dredged, and if sediment was not returned to the littoral system. Recreational and commercial boats entering or leaving the harbor would experience dangerous conditions, and eventually would be unable to use the harbor. Beaches would erode, and certain sections would become unusable.

I. AESTHETICS

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant on aesthetics if the alternative results in:

- A substantial modification of the scenic vista.

Proposed Project Alternative

Shoaled areas within the channel would be dredged using a hydraulic cutterhead dredge with a pipeline to maintain navigation safety. In general, dredging entails temporary construction activities. Therefore, the presence of the dredge and supporting vessels within Santa Barbara Harbor bay would not permanently affect views of the harbor, marina, wharf, bay, estuary, beach, or the Pacific Ocean. Heavy equipment used in placement and removal of pipes and beach grading may degrade aesthetics locally. The dredged material placement on the beach with a pipeline would experience temporary, localized impacts to aesthetics as the pipeline lying on the sand reduces a portion of the view of the beach. The aesthetic qualities of the proposed project area would not be substantially impaired as a result of the proposed project because the beach dredged material placement and surf-zone dredged material placement are prior to the peak period of human utilization beach activity that typically occurs after Memorial holiday. Impacts would be temporary, localized, and not significant. Beach replenishment provides wide, sandy beaches, enhancing the aesthetic character of the area, and provides a benefit for beneficial reuse of suitable sediment from dredge areas. Aesthetics including views of the beach, Pacific Ocean and surrounding harbor area would return to pre-project conditions upon completion of construction. Impacts would be less than significant impact.

No Federal Action Alternative

The "No Federal Action" alternative would avoid impacts from the sight of the dredge, pipeline, and associated equipment, or from dredge spoils. This alternative, however, would result in the narrowing and eventual disappearance of beach, as well as an abrupt shoreline that has no significant sand buffer, both of which are not as aesthetically pleasing as the Proposed Project.

J. CULTURAL RESOURCES

Proposed Project Alternative

The Corps has determined that the maintenance dredging of the Santa Barbara Harbor is the type of activity that does not have the potential to cause effects to historic properties (36 C.F.R. 800.3(1)). The Harbor and sand traps have been dredged annually since 1972. The undertaking is routine maintenance that has occurred on a biannual (twice a year) basis since at least 1996. It would not constitute a change in the setting or use of the harbor; nor would it alter the current setting or integrity of any historic properties that may be located within the Santa Barbara Harbor. Ground disturbance associated with this undertaking would be limited to soils deposited in the last one or two years with no potential to contain historic properties.

No Federal Action Alternative

The "No Federal Action" alternative would not affect cultural resources.

K. VESSEL TRAFFIC AND SAFETY

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant on vessel transportation and safety if the alternative results in:

- A navigational hazard to boat traffic or interfere with any emergency response or evacuation plans.
- Substantially changes vessel traffic or patterns.

Proposed Project Alternative

Under the Proposed Project Alternative, shoaled areas within the Federal Channel would be dredged typically using a hydraulic cutterhead dredge with a pipeline to maintain navigation safety. Dredged material placement that occurs on the downcoast beach east of the harbor would be discharged using a pipeline from the dredge, temporarily rendering the immediate area unsuitable for vessel traffic. To ensure safe transit during dredge construction activity, appropriate coordination would be maintained with the City of Santa Barbara and the USCG, and in- and egress lanes would be established and regulated. Information regarding dredging

operations would be published in Local Notice to Mariners, warning boat users about times, durations, and locations of construction activities. Construction would not impede access to any channels or entranceways, and would, therefore, not create a substantial reduction in navigation safety or create a navigational hazard to vessel traffic or interfere with local emergency/excavation response plans. Last, dredging would not change the number of slips and moorings. As a result, vessel traffic or patterns would remain unaffected. Vessel traffic and safety would return to pre-project conditions upon completion of construction. Impacts would be less than significant.

No Federal Action

There would be no maintenance dredging that under the No Federal Action Alternative. During a typical year, a boat with a 4-foot draft could not safely pass through the channel regularly after six months without dredging the Santa Barbara Harbor channels. The channels would not be navigable within three months following winter storms (USCG pers. comm. May 8, 1986). A similar scenario, though for a shorter period of time, occurred from the end of February 2013 thru the early part of March 2013 when winter storms brought in a large amount of littoral transport material that made the channels impenetrable and ultimately closed the harbor. The "No Federal Action" project alternative would require re-deployment of the U.S. Coast Guard (USCG) rescue vessels to another harbor, lengthening the response time to maritime emergencies off the coast of Santa Barbara County. There is a high potential for danger to life and property if the harbor channels are not maintained at safe depths.

Vessel traffic and traffic patterns would remain unchanged since the number of slips and moorings would remain unchanged. However, continued shoaling of the federal channel would compromise navigational safety. Furthermore, the inability of City of Santa Barbara Harbor Patrol or USCG vessels to transit could compromise emergency response and evacuation plans. It is likely that a limited and localized emergency dredging operation would be undertaken in the event that continued shoaling threatens navigational safety

L. GROUND TRANSPORTATION

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant on traffic if the alternative results in:

- A substantial increase in AADTs of main arteries used to access the site.

Proposed Project Alternative

Under the Proposed Project Alternative, shoaled areas within the Federal Channel would be dredged using a hydraulic cutterhead dredge with a pipeline to maintain navigation safety to

maintain safe navigation. A maximum of 36 individuals and 36 vehicles would utilize highways and streets for the approximately month long duration of construction. The increases in AADT associated with the alternative are shown in Table 12. Furthermore, the Alternative 1 would not require the closure of any roads. Traffic conditions would return to baseline levels upon completion of the proposed program construction. The dredge would be operating within the confines of the federal channel, equipment to mobilize and demobilize the pipeline on the beach and vehicles transporting materials to the staging area and periodic inspections of the pipeline would limit their operations to the dry portion of the beach to the extent practicable to avoid visitors on the beach and traffic in and around the harbor. Ground transportation would return to pre-project conditions upon completion of construction. Impacts would be less than significant.

Table 12. Comparison of Baseline AADT to Proposed Project Traffic Increases

Roadway Name	**AADT**	**Projected Increase in AADT**	**Percent Increase in Baseline AADT**
U.S. Highway (Hwy) 101 (at Milpas St.)	89,200	36	0.040%
East Cabrillo Blvd/State Route 225 (at U.S. Hwy 101)	81,200	36	0.044%
State Street (at State Route 154)	17,300	36	0.208%
Milpas Street (at East Cabrillo Blvd).	94,200 *	36	0.038%

Source: CALTRANS, 2014; CALTRANS. 2007 *

No Federal Action

There would be no maintenance dredging by the Corps under the No Federal Action Alternative. However, continued shoaling would prevent safe navigation through the bay. Emergency dredging would require removal of shoaled material from the federal channels. It is likely that emergency dredging would be limited in scope and duration. Emergency dredging could require the use of highways and streets above. Any traffic impacts would *de minimis* and short-term.

M. ENVIRONMENTAL JUSTICE

Significance Threshold

Based on the existing conditions discussed above, impacts would be considered significant on environmental justice if the alternative results in:

- A disproportionately high and adverse human health or environmental effect on minority or low-income populations.

Proposed Project Alternative

Based on the evaluation and analysis of the total population, low income (percentage below poverty threshold), and ethnicity data discussed on environmental justice in the Section III. (Affected Environment) analysis and evaluation discussed above, the minority population in the Proposed Project area (City of Santa Barbara) is comparable to the County's minority population, and significantly smaller than the minority population in the City of Santa Maria, and the poverty threshold in the City of Santa Barbara is comparable to the County of Santa Barbara's poverty threshold, and less than the poverty threshold in City of Santa Maria Therefore, the dredging would not result in disproportionate impacts to minority populations or low income populations. Therefore, there would be no impacts to environmental justice communities.

N. GROWTH INDUCEMENT AND CUMULATIVE IMPACTS

1. Growth Inducement

According to the U.S. Census estimates, population within the City of Santa Barbara was estimated to be 88,410 in the year 2010, employment was estimated at 62,900 jobs, and households were estimated at 35,000 (U.S. Census, 2010). The Santa Barbara Harbor is part of the Waterfront Department of the City of Santa Barbara and located within the regional planning area of the Santa Barbara County Association of Governments (SBCAG) [SBCAG, 2013]. The SBCAG region typically is comprised of cities in Santa Barbara County and the unincorporated portions of Santa Barbara County. In 2010, the SBCAG region's population was estimated to be 423,800, employment was estimated to be 197,400, and households were estimated to be 142,100. In 2012, the SBCAG adopted the SBCAG's Regional Growth Forecast 2010-2040 to provide a consistent economic and population growth forecast to the year 2040 for use in long-range comprehensive planning. SBCAG growth forecasts are projections used to plan for public infrastructure, housing, and employment throughout the region. The SBCAG region's 2040 projections indicate that population in the SBCAG is expected to grow to 520,000, an increase of approximately 22.7%, between 2010 and 2040; employment within the SBCAG region is expected to grow to 257,600 jobs, an increase of approximately 30% between 2010 and 2040, and new households within the SBCAG region is expected to grow to 183,600, an increase of approximately of approximately 29.2% between 2010 and 2040. The SBCAG 2040 projections also indicate that population in the City of Santa Barbara is expected to grow to 96,000, an increase of approximately 8.6%, between 2010 and 2040; employment in the City of Santa Barbara is expected to grow to 66,700 jobs, an increase of approximately 6.0% between 2010 and 2040, and; households in the City of Santa Barbara is expected to grow to 38,000, an increase of approximately 8.6%, between 2010 and 2040. There are no pending, new projects planned for the Waterfront, Santa Barbara Harbor, or the Proposed Project area that could potentially have impacts on growth inducement or on the above discussed environmental resources. The Proposed Project Alternative is an annual maintenance dredging required to support on-going operations at Santa Barbara Harbor. The Proposed Project Alternative is not part of planned infrastructure improvements that would result in additional growth. The

Proposed Project Alternative would not require additional employees other than temporary dredging laborers to perform the annual Federal dredging operations. The Proposed Project Alternative would not displace large numbers of people except for temporary disruption to the fishing and recreational vessels that would need to pass through the particular portion of the Federal channel(s) that are being dredged or for temporary disruption to the public accessing the portion of the beach with the pipeline placement and discharge onto the beach. Therefore, the Proposed Project Alternative annual Federal maintenance dredging project would not induce a significant impact on growth in the Proposed Project area. Impacts would be less than significant.

2. Cumulative Impacts

In 1972, the U.S. Federal Government started annual dredging and maintenance of the Santa Barbara Harbor. Since then, the Corps has performed maintenance dredging of the federal channels in Santa Barbara County, averaging approximately 342,000 cy, based on dredging history (1996 through 2016), as summarized in Table 1 above. For the upcoming six year period (September 1, 2016 through August 31, 2022), the Corps proposes to dredge twice a year, once in the late fall or early winter dredging operation, and once in the spring dredging operation, for a maximum total of 120 working days a year, for Santa Barbara Harbor Federal maintenance dredging program. The estimated approximate annual removal of dredged material would be between 250,000 cy to 600,000 cy per year during the six year program, with an annual potential maximum total of approximately 600,000 cy of dredged material, or a potential maximum of 3,600,000 cy of material over a six year period. The City is responsible for all dredging outside the Federal Channel, and dredge outside the Federal Channel about once every five years with proposed removal of approximately 30,000 cy within the next five years. The effects from the City dredging would be substantially less, due to a small volume of sediment to dredge and less frequent dredging; therefore, impacts would be less than significant to cumulative impacts.

The only new development work being performed in the Waterfront of Santa Barbara Harbor is the rebuild of the Marian One and at Sea Landing. Marian One Phases 1-6 have been completed and the final two Phases (7 and 8) are projected to be completed over the next two years. Phase 7 work involves adding four slips. Santa Barbara Harbor has approximately 1100 slips for harbor vessel berthing. The Sea Landing is adding a new gangway later in year 2016. With the small amount of new Phase 7 slip work that would increase approximately 0.4% to the existing number of slips in the Harbor, and compared to the active and year around uses of the Waterfront and Santa Barbara Harbor operations, impacts would be less than significant to cumulative impacts.

The Proposed Project Alternative avoids nesting season for coastal bird species, including listed species, and avoids the peak grunion spawning season. During March and April, single point surf zone placement from dredging is limited to a 500 foot area of the beach, reducing the spatial extent of potential impacts to the grunion. Since dredging operations do not occur from May 1 through August 31 of any year, impacts to nesting birds and peak grunion spawning periods are avoided. As a result, there are no cumulative impacts to coastal bird species or grunion. Cumulative impacts to other species, such as invertebrates, would be less than significant

because impacts would be temporary and localized, and these organisms are anticipated to be able recolonize immediately after discharge ends. The planktonic stage of these organisms' life cycles is expected to contribute greatly to the recolonization of this newly exposed substrate, as would contributions by the migration of juvenile and adult individuals from adjacent undisturbed areas. Oliver *et al* (1977) found that shallow water communities inhabiting naturally highly variable and frequently disrupted physical environments rebounded or recovered more quickly from experimental disturbances than those found in less variable and more benign conditions, and field studies of dredged areas have shown that recolonization begins as early as 2 weeks after dredging stops (McCauley, Parr, and Hancock 1977; Oliver et al 1977; Rosenberg 1977, Corps 1998). With the implementation of the Biological Resources Environmental Commitments in Section VI. of the EA, the cumulative impact of the Proposed Project Alternative on biological resources would be a less than significant impact.

Dredging and the discharge of dredged material placement would not result in significant impacts, individually and cumulatively, to littoral material, also known as substrate, because the littoral process is exposed to a high energy, turbulent water environment. Sand removed from the dredged footprint would be replenished via natural sediment transport. Sand deposited on the beaches would be dispersed by high energy waves and currents down-coast. Impacts would be less than significant.

Cumulative impacts from the Proposed Project Alternative on water quality [i.e., potential increase in turbidity; potential dissolved oxygen (DO) reduction] are expected to be temporary and localized. LaSalle (1991) reported that dredging-related turbidity impacts are expected to be limited to within 500 meters (1640 ft.) of the area excavated, with the maximum concentrations generally restricted to the lower water column, and decreasing rapidly with distance due to settling and dilution. Field observations of hydraulic dredging activities in southern California indicate that turbidity increases above background levels may be considerably more limited than those reported by LaSalle (1991), and are typically confined to within 70 to 170 meters of the activities (Corps 1994b, 1998). Water quality parameters would return to baseline levels upon completion of the dredging activity. With the implementation of the Water Quality Environmental Commitment in Section VI. of the DEA, the Proposed Project would not interfere with tidal circulation and fresh water inflows into or through the mouth of Mission Creek or Laguna Creek, and that the Proposed Project (Alternative 1) placement of suitable dredged material beach replenishment would not interfere the flows coming out through the mouth of Mission Creek or Laguna Creek. It has been concluded that the potential impacts from the Proposed Project Alternative 1 placement of suitable dredged material beach replenishment would be reduced to a level of less than significant impact. Therefore, it has determined that cumulative impacts from the Proposed Project Alternative 1 dredging on water quality would be a less than significant.

Under the current Federal dredging program, approximately 600,000 cy of dredged material could be removed annually from the Federal channels in Santa Barbara Harbor. Emissions for the Proposed Project Alternative would be below applicable Federal, state CARB, and

regional/local SBCAPCD ambient air quality standards [See Tables 9 and 10 above in the DEA, and see Appendix B – Santa Barbara Harbor Dredging Air Quality Appendix Dredging Total Emissions in Pounds/Day (Lbs/Day) and Tons/Year (Tons/Yr) for summary of air emissions]. The dredge is expected to be an electric hydraulic cutterhead with a pipeline, and would not be emitting diesel emissions. Diesel air emission analysis and discussion for per day emissions Lbs/day and Tons per year (tons/yr) generated from diesel vessels and construction equipment vehicles includes a tug boat, a crew boat, a rubber-tired loader, an excavator, a forklift during the proposed annual Santa Barbara Harbor maintenance dredging activities have been calculated and compared with emission criteria thresholds set by the SBCAPCD (i.e., 240 Lbs/Day of NOx; 240 Lbs/Day of NOx; 80 Lbs/Day of PM10; 240 Lbs/Day of SOx) and the Federal [e.g., 100 Tons/Yr of CO; 25 Tons/Yr of NOx; 25 Tons/Yr of ROC; 100 Tons/Yr of PM10] to determine project related (construction) impacts (see Table 9 and 10 above in the EA and the Tables in Appendix B of the EA, Daily Emissions (Lbs/Day) Table and Annual Emissions (Tons/Year). As shown in Tables 9 and 10 above in the DEA and in Appendix B, the air quality calculation analysis for the Proposed Project emissions (i.e., Lbs/Day; and Tons/Yr) generated by the proposed Santa Barbara Harbor maintenance dredging activity would be 117.54 Lbs/Day (or 9.64 Tons/Yr) for NOx; 11.23 Lbs/Day (or 0.881 Tons/Yr) for VOC; 3.58 lbs/day (or 0.08 Tons/Yr) for PM10; 3.22 lbs/day (or 0.27 Tons/Yr) for PM2.5; 0.13 lbs/day (or 0.01 Tons/Yr) for SOx, and; 91.49 Lbs/Day (or 7.23 Tons/Yr) for CO. From the air emission calculations and analysis performed on the Proposed Project Alternative, the Corps has determined that the air pollutants NOx, VOC, PM10, PM2.5, SO2, and CO Lbs/Day and Tons/Yr pollutant emission calculations generated for the Proposed Project are below the threshold levels and would not exceed the CARB, SBCAPCD or Federal construction threshold for each of the above listed pollutants of concern. The Corps has determined that the Proposed Project (Alternative 1) construction air emissions would be well below the thresholds levels and would not exceed any of the listed pollutants under the SBCAPCD, SCAQMD, state (CARB) or Federal emission thresholds, and that the Proposed Project would be a temporary and short term impact on air quality, and would be a less than significant impact on air resources. Therefore, it has been has determined that the Proposed Project area would not result in a cumulatively, considerably, substantial, or significant net increase during the six year program years, starting from the middle of September 1, 2016 through August 31, 2022 for any air criteria pollutant including those area(s) including SCCAB, for which the SBCAPCD region is in non-attainment under an applicable Federal, state, regional or local ambient air quality standard. Impacts would be less than significant.

Dredging of the channels in the harbor and discharge of dredged material placement area avoids to the extent practicable interruption of the vessel operations going through certain channels in the harbor, and recreational and commercial uses of the harbor and the beach due to the pipeline placement and discharge area. Therefore, the Proposed Project Alternative potential impact would be temporary and localized, and the potential cumulative impact would be less than significant to existing vessel operations in the harbor and to land or recreational uses and activities.

In the reasonably foreseeable future, there will be a need for annual dredging because

there is a harbor and because services need to be provided since there are commercial and recreational uses. Future dredging quantities would likely remain the same as past and current quantities, cited in Table 1 (Santa Barbara Harbor Dredging History, 1996-2016) of the DEA, since the Federal maintenance dredging areas would remain the same. No new development is expected in the Harbor or Waterfront, and therefore, there would be no cumulative significant impacts from new development. Biological resources impacts would remain the same in the future since all LEDPA factors that led to the beaches/nearshore (East Beach placement area; surf zone; nearshore) being designated as the placement of suitable dredged material area(s) would remain the same, though temporary biological resources and water quality turbidity would occur, they would achieve equilibrium after the placement of suitable dredged material, and would return to pre-project conditions after project completion. Littoral material (substrate) would remain the same in the future as it has been in the past and future in Santa Barbara Harbor, since the amount of littoral transport has remained relatively consistent over time that travels along the coastline from north to south in Santa Barbara Harbor. Air quality emissions would remain the same in the future since diesel ancillary equipment (tug boat; crew boat) and heavy equipment (loader; excavator; forklift) would continue to use diesel oil, and therefore, there would be no substantial increase in diesel air emission during the six year period. Temporary disruption to vessel operation traffic through the harbor and access by the public on a portion of the beach due to the pipeline corridor on the beach and discharge site but vessel operations, land use and recreation would not have a permanent change in operation or use due to the limited days of dredging operations that occur twice a year. Therefore, the Corps has determined that the cumulative impacts from the past, current, and future Santa Barbara Harbor Federal maintenance dredging project's including in the vicinity of Proposed Project area and at the East Beach placement area, would be temporary and localized, and that the cumulative impacts to water quality, air quality, land use and recreation, vessel operations, biological resources, would be less than significant impacts.

V. COORDINATION SUMMARY

The complete mailing list for copies of the DEA is included in Appendix E.

U.S. Fish and Wildlife Service (USFWS):
The Corps coordinated with the USFWS, Ventura Office, on the annual pre-notification on the start and completion of maintenance dredging since the spring of 2011 through spring 2016. In March 2015 and spring 2016, the Corps notified the USFWS regarding the observation of grunion and snowy plovers on the beach. In late winter/early Spring 2016, the Corps coordinated with USFWS on the removal of the pipeline crossing Mission Creek and Laguna Creek to avoid potential impacts to the tidewater goby and critical habitat in Mission Creek lagoon, as part of the proposed demobilization pipeline plan due to the completion of the three-year, dredging contract. In summer 2016, the Corps coordinated with USFWS on the Six Year DEA, and providing to the USFWS the Six Year DEA for review and comment.

National Marine Fisheries Service (NMFS):
The Corps coordinated with NMFS, Long Beach office, on the annual pre-notification on the start and completion of maintenance dredging since spring 2011 through spring 2016. In March 2015 and spring 2016, the Corps notified the USFWS regarding the observation of grunion and snowy plovers on the beach.

During an August 2016 discussion from the Corps with NMFS, Long Beach office, maintenance dredging point of contact (POC) regarding coordination of and input of the Six Year DEA on the Santa Barbara Harbor maintenance dredging program. The NMFS, Long Beach office, maintenance dredging POC would be the NMFS POC to receive the Six Year DEA and that the Six Year DEA would be disseminated to work colleagues in the NMFS, Long Beach office, for review and comment.

U.S. Environmental Protection Agency (USEPA):
The Corps coordinated with the USEPA, Region 9, San Francisco office and with the USEPA, Region 9, Southern California/Los Angeles office, and with the SC-DMMT, the Draft Sampling Analysis Plan (SAP), in support of the Six Year EA, by e-mail in October 2015 for review and comment prior to the monthly October 28, 2015 SC-DMMT meeting, and minor comments were provided by the USEPA and the SC-DMMT and incorporated into the Draft SAP. Due to minor comments provided by the SC-DMMT during the October 28, 2015 SC-DMMT monthly meeting, the Corps requested the review and comment of the revised and final SAP be coordinated with the SC-DMMT's pertinent agencies (USEPA; CCC; Central Coast RWQCB) by e-mail, and the USEPA concurred that the reviews on the revised and final SAP could be coordinated by e-mail. A modification to the SAP was coordinated by e-mail with the pertinent agencies comprised of the SC-DMMT on November 2, 2015 for review and comment, and the USEPA concurred with the revised SAP by e-mail on November 2, 2015. On November 6, 2015, the final revised SAP was sent to the SC-DMMT for review and comment. The Corp coordinated the final revised SAP for review and comment with the USEPA on November 9 and 10, 2016. On November 10, 2015, the USEPA concurred with the final revised SAP. On November 10, 2015, the Corps coordinated the final SAP with the SC-DMMT by e-mail.

The Corps coordinated with the USEPA, Region 9, San Francisco office and with the USEPA, Region 9, Southern California/Los Angeles office, and with the SC-DMMT, the Draft SAPR Report and Appendices, in support of the Six Year EA, by e-mail in February 2016 for review and comment prior to the monthly February 24, 2016 monthly SC-DMMT meeting. During the February 24, 2016 monthly SC-DMMT, review comments were provided by the USEPA and the SC-DMMT, and the Corps incorporated the USEPA and SC-DMMT review comments into the SAPR Report and Appendices. The revised SAPR Report and its Appendices, and the draft Compatibility Report, in support of the Six Year EA were coordinated with the USEPA and the SC-DMMT in March 2016 for review and comment prior to the monthly March 23, 2016 SC-DMMT meeting, and minor comments from the USEPA and the SC-DMMT were provided and incorporated into the revised SAPR Report, Appendices and draft Compatibility Determination. Due to minor comments provided by the SC-DMMT during the March 23, 2016 monthly SC-

DMMT meeting on the revised SAPR Report, its Appendices and the Draft Compatibility Determination Report, the Corps requested review and comment of the revised and final SAPR Report and Appendices, and Compatibility Determination Report be coordinated with the pertinent agencies (USEPA; CCC; Central Coast RWQCB) comprising the SC-DMMT using e-mail, and the USEPA concurred e-mail could be used to coordinate review and comment the revised and final SAPR Report and Appendices and the Compatibility Determination Report and to finalize the documents. On May 17, 2016, the Corps coordinated the revised SAPR Report and its Appendices, and the revised Compatibility Determination Report for review and comment by e-mail with the pertinent agencies comprising of the SC-DMMT. On June 1, 2016, the USEPA e-mailed and stated the USEPA reviewed the revised SAR (SAPR Report and its Appendices, and Compatibility Report) and concurred that the material tested is suitable for placement within the East Beach placement area. On June 7, 2016, the Corps finalized with the pertinent agencies comprising of the SC-DMMT the Final SAPR Report and its Final Appendices and the Final Compatibility Determination (Corps, 2016a) and coordinated the final documents with the pertinent agencies comprising of the SC-DMMT by e-mail.

California Coastal Commission (CCC):
The Corps coordinated with the CCC on the annual pre-notification on the start and completion of maintenance dredging since the spring of 2014 through spring 2016.

The Corps coordinated with the CCC, San Francisco office, and with the SC-DMMT, the Draft Sampling Analysis Plan (SAP), in support of the Six Year EA, in October 2015 for review and comment prior to the monthly October 28, 2015 SC-DMMT meeting, and minor comments were provided and incorporated into the SAP. Due to minor comments provided by the SC-DMMT during the October 28, 2015 SC-DMMT monthly meeting, the Corps requested the review and comment of the revised and final SAP be coordinated with the SC-DMMT's pertinent agencies (USEPA; CCC; Central Coast RWQCB) by e-mail, and the CCC concurred that the reviews on the revised and final SAP could be coordinated by e-mail. A modification to the SAP was coordinated by e-mail with the pertinent agencies comprised of the SC-DMMT on November 2, 2015 for review and comment, and the CCC concurred with the revised SAP by e-mail on November 2, 2015. On November 6, 2015, the final revised SAP was sent by e-mail to the SC-DMMT for review and comment. On November 10, 2015, the Corps coordinated the final SAP with the SC-DMMT by e-mail.

The Corps coordinated with the CCC, San Francisco office, and with the SC-DMMT, the Draft SAPR Report and Appendices, in support of the Six Year EA, in February 2016 for review and comment prior to the monthly February 24, 2016 SC-DMMT meeting, and comments were provided by the SC-DMMT and incorporated into the SAPR Report and Appendices. The revised SAPR Report and its Appendices, and the draft Compatibility Report, in support of the Six Year EA, were coordinated with the SC-DMMT in March 2016 for review and comment prior to the monthly March 23, 2016 SC-DMMT meeting, and minor comments from the SC-DMMT were provided and incorporated into the revised SAPR Report, Appendices and draft Compatibility Determination. Due to minor comments provided by the SC-DMMT during the March 23, 2016 monthly SC-DMMT meeting on the revised SAPR Report, its Appendices and

the Draft Compatibility Determination Report, the Corps requested review and comment of the revised and final SAPR Report and its Appendices, and Compatibility Determination Report be coordinated with the pertinent agencies comprising of the SC-DMMT by e-mail, and the CCC concurred e-mail could be used to coordinate review and comment the revised and final SAPR Report and its Appendices, and the Compatibility Determination Report, and to finalize the documents. On May 17, 2016, the Corps coordinated the revised SAPR Report and its Appendices, and the revised Compatibility Determination Report for review and comment by e-mail with the pertinent agencies comprising of the SC-DMMT. On June 3, 2016, the CCC e-mailed and stated the CCC concurred with the revised SAR (SAPR Report and its Appendices, and the Compatibility Determination Report) that material tested is suitable for placement within the East Beach placement area. On June 7, 2016, the Corps finalized with the pertinent agencies comprising of the SC-DMMT the Final SAPR Report and its Final Appendices and the Final Compatibility Determination Report (Corps, 2016a) and coordinated the final documents with the SC-DMMT by e-mail.

A February 2, 2016 coordination from the Corps with the CCC, San Francisco office, included a discussion on the pre-coordination of the Corps 2016 spring dredging operation, and a discussion about a Negative Determination (ND) for the upcoming Six Year maintenance dredging program. The CCC communicated to the Corps that a ND would be applicable for the upcoming Six Year maintenance dredging program and that the Corps should submit this year the ND for dredging that would commence in the fall of 2016 that would be covered under the new Six Year EA. The Corps has coordinated with the CCC a ND statement of determination and a copy of the Six Year DEA for review and comment.

California Department of Fish and Wildlife (CDFW):
The Corps has coordinated with the CDFW Region 5 office on the annual pre-notification on the start and completion of maintenance dredging since spring 2011 through spring 2016. In March 2015 and spring 2016, the Corps notified the CDFW regarding the observation of grunion and snowy plovers on the beach in Santa Barbara Harbor during dredging. In July 2016, the Corps contacted the CDFW regarding coordination of and discussion of the Six Year DEA. The Six Year DEA would be provided to the CDFW for review and comment.

Central Coast Regional Water Quality Control Board (Central Coast RWQCB):
The Corps has coordinated with the Central Coast Regional Water Quality Control Board (Central Coast RWQCB) office on the annual pre-notification on the start and completion of maintenance dredging since spring 2011 through spring 2016. Annual Reports on the water quality and bacteria monitoring/sampling report have been provided from the Corps to the Central Coast RWQCB, as cited in the CWA Section 401 Water Quality Certification (WQC) Number 32410WQ03 dated September 9, 2010 issued by the Central Coast RWQCB, and since the spring 2014, daily and weekly water quality and weekly bacteria monitoring/ sampling reports have been coordinated from the Corps to the Central Coast RWQCB.

The Corps coordinated with the Central Coast RWQCB office, and with the SC-DMMT, the Draft SAPR Report and Appendices, in support of the Six Year EA, the Draft Sampling Analysis

Plan (SAP), in support of the Six Year EA, in October 2015 for review and comment prior to the monthly October 28, 2015 SC-DMMT meeting, and minor comments were provided and incorporated into the Draft SAP. Due to minor comments provided by the SC-DMMT during the October 28, 2015 SC-DMMT monthly meeting, the Corps requested the review and comment of the revised and final SAP be coordinated with the SC-DMMT's pertinent agencies (USEPA; CCC; Central Coast RWQCB) by e-mail, and the Central Coast RWQCB concurred that the reviews on the revised and final SAP could be coordinated by e-mail. A modification to the SAP was coordinated by e-mail with the pertinent agencies comprised of the SC-DMMT on November 2, 2015 for review and comment, and the Central Coast RWQCB concurred with the revised SAP by e-mail on November 2, 2015. On November 6, 2015, the final revised SAP was sent by e-mail to the SC-DMMT for review and comment. On November 10, 2015, the Corps coordinated the final SAP with the SC-DMMT by e-mail.

The Corps coordinated with the Central Coast RWQCB office, and with the SC-DMMT, the Draft SAP Results (SAPR) Report and Appendices, in support of the Six Year EA, in February 2016 for review and comment prior to the monthly February 24, 2016 SC-DMMT meeting, and comments were provided by the SC-DMMT and incorporated into the SAPR Report and Appendices. The revised SAPR Report and its Appendices, and the Draft Compatibility Report, in support of the Six Year EA, were coordinated with the SC-DMMT in March 2016 for review and comment prior to the monthly March 23, 2016 SC-DMMT meeting, and minor comments from the SC-DMMT were provided and incorporated into the SAPR Report and its Appendices, and Compatibility Determination Report. Due to minor comments provided by the SC-DMMT during the March 23, 2016 monthly SC-DMMT meeting on the revised SAPR Report and its Appendices, and the draft Compatibility Determination Report, the Corps requested review and comment of the revised and final SAPR Reports and its Appendices, and Compatibility Determination Report, be coordinated with the pertinent agencies comprising of the SC-DMMT by e-mail, and the Central Coast RWQCB concurred e-mail could be used to coordinate review and comment the revised and final SAPRs and its Appendices, and the Compatibility Determination Report, and to finalize the documents. On May 17, 2016, the Corps coordinated the revised SAPR Report and its Appendices, and the revised Compatibility Determination Report for review and comment by e-mail with the pertinent agencies comprising of the SC-DMMT. On June 6, 2016 the Central Coast RWQCB sent an e-mail and stated Central Coast RWQCB staff had reviewed the SAPR Report and concurred that material tested is suitable for placement within the East Beach placement area. On June 7, 2016, the Corps finalized with the pertinent agencies comprising of the SC-DMMT the Final SAPR and its Final Appendices and the Final Compatibility Determination (Corps, 2016a) and coordinated the final documents with the SC-DMMT by e-mail.

The Corps coordinated with the Central Coast RWQCB office on February 29, 2016, on a request that the CWA Section 401 WQC Number 32410WQ03 dated September 9, 2010 be amended that surf zone discharge volume for dates 1 March – 30 April of any year be increased from 250,000 to 350,000 cy. On March 1, 2016, the Central Coast RWQCB responded rather than setting a specific volume for the spring dredging, it proposed amending the language under Water Board Mitigation Requirement No. 3 in the CWA Section 401 WQC Number

32410WQ03, as follows: No more than 600,000 cubic yards of dredge material shall be disposed of in the surf annually, and the Corps concurred, and the First Amendment CWA Section 401 WQC Number 32410WQ03 dated March 1, 2016 was issued by the Central Coast RWQCB.

The Corps coordinated with the Central Coast RWQCB office CWA 401 WQC POC for Santa Barbara Harbor maintenance dredging program in July 2016, regarding discussion of and input on the Six Year DEA. The Central Coast RWQCB CWA 401 WQC POC would be the Central Coast RWQCB POC to receive the Six Year DEA and that the Six Year DEA would be disseminated to work colleagues in the Central Coast RWQCB office for review and comment.

Santa Barbara Air Pollution Control District (SBCAPCD):
The Corps has coordinated with the SBCAPCD Engineering Division office and the Technology and Environmental Assessment Division office in March 2016 on the proposed project in the Six Year DEA. In June 2016, the Corps had a teleconference meeting with SBCAPCD Engineering Division office and the Technology and Environmental Assessment Division office on the proposed project. The Corps also coordinated with SBCAPCD Technology and Environmental Assessment Division office in July 2016 regarding SBCAPCD significance thresholds. SBCAPCD would be provided the Six Year DEA for review and comment.

VI. ENVIRONMENTAL COMMITMENTS

The following commitments were designed to minimize potential environmental impacts, to comply with environmental law and to comply with public agency recommendations during coordination and preparation of the Environmental Assessment. These environmental commitments would be incorporated into the project plans whenever they are within the responsibility of the contractor or Corps field representatives.

1. Project features shall not interfere with tidal circulation and/or fresh water inflows into and through the mouth of Mission Creek, the lagoon, or Laguna Creek (East Side Channel). Dredged material placement at the secondary placement site shall not occur.

2. Turbidity levels will be monitored throughout dredging/placement operations with prescribed actions to be taken (i.e. slowing dredge cycle times, use of silt curtains) should turbidity exceed action levels.

3. Spills would be cleaned up immediately. Standard dredge specifications include a Spill Prevention Plan, employee training, and the staging of materials on site to clean up accidental spills.

4. Between May 1 and August 31, dredging or discharge of dredged material is not expected to occur. If hazardous shoaling conditions exist in the harbor channel that require dredging during these months (May through August), the Corps would prepare new environmental documentation.

5. Noise levels of the dredge operation shall not exceed the limits established by the City of Santa Barbara noise element portions of the General Plan (i.e. 60 dBA (A-weighted decibel scale) for residential areas, 70 dBA for commercial areas. The dredging contractor shall obtain a noise permit from the City of Santa Barbara if the dredging contractor cannot stay within the approved and acceptable noise limits set by the City of Santa Barbara or the County of Santa Barbara. If double-shift or triple-shift dredging is required to ensure project completion by April 30, the contractor shall obtain a special permit from the City of Santa Barbara which would make working during evening hours permissible.

6. Conditions of Santa Barbara Air Pollution Control District (SBCAPCD) regulations shall be met.

7. Implement Best Management Practices (BMP) fugitive dust control, to ensure that dust is controlled.

8. At all times, idling of heavy-duty diesel trucks must be limited to five minutes; auxiliary power units should be used whenever possible. State law requires that drivers of diesel-fueled commercial vehicles:

a. Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location.

b. Shall not idle a diesel-fueled auxiliary power system (APS) for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle.

9. Operators of dredge equipment shall not harass any marine mammal or waterfowl in the proposed project area.

10. Installation (mobilization) and removal (demobilization) of dredged material placement pipeline and equipment shall be coordinated with the Corps, the City of Santa Barbara Waterfront Department, and the dredging contractor. Installation and removal of the dredge pipeline shall be overseen by a Corps' biologist.

11. The dredge operator shall move the dredge equipment for USCG and Harbor Patrol law enforcement and rescue vessels. The Contractor shall notify the USCG a minimum of two hours prior to temporarily closing the federal channel areas. (Channel closure is not expected.)

12. Contractor shall mark the dredge pipe area (i.e., a sign on the buoy using an arrow to indicate which side of the buoy the boats are to pass so that small boat traffic does not pass over the dredge pipe). This condition stems from USCG and Harbor Patrol concerns

about impacts from boaters who are unacquainted with dredge operation markers.

13. Contractor shall notify the Commander, 11th USCG District, at least 2 weeks before the start of activity or 30 days before if buoys are to be placed. This notification shall include the following:

a. The size and type of equipment that would be performing the work.

b. Name and radio call sign for working boats.

c. Telephone number for on-site contract with project engineer.

d. The schedule for completing the project.

Furthermore, the USCG shall be notified of any hazards to navigation.

14. To minimize impacts to grunion and avoid impacts to snowy plovers, the following constraints would be placed on dredging beginning March 1st:

a. Surf-zone dredged material placement using single-point discharge method, as described in Section II(F)(4).

b. Dredged material placement confined to a 500 ft. swath of operations within the 4,000 ft. designated dredged material placement zone.

c. Monitoring adult spawning grunion and snowy plover activity, as described in Section II(F)(3).

d. Minimal positional changes of the beach surface pipeline.

e. Snowy plover monitoring will be conducted by a qualified biologist. During plover monitoring, no disturbance to plover will occur. Plover will only be approached if necessary to verify nesting behavior.

f. If a significant grunion run is identified during monitoring (W-2 or greater), any dredge related activities outside of the placement area that could potentially disturb grunion eggs/nests shall be avoided for a period of two weeks following the run. This includes limiting all dredge-related vehicle traffic to above the intertidal line in any areas where significant grunion spawning occurred.

g. Monitoring results for grunion and western snowy plover will be coordinated with the resource agencies (California Coastal Commission, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service and National Marine Fisheries Service) via telephone or e-mail coordination.

15. The dredge pipeline will be elevated over Mission Creek. The support piers shall be placed outside of the wetted perimeter of the lagoon, and no equipment or personnel will work within the lagoon. If the pier supports become inundated due to variation in the location and size of the lagoon, the pier supports will not be removed until waters of the lagoon have receded to the point that all work can occur without impacting the lagoon or creek. Installation and removal of the pipeline across Mission Creek will be overseen by a biologist.

16. Bird deterrents will be installed on the dredge pipeline where it crosses Mission Creek.

17. The Contractor shall remove all trash, debris, and excess construction material from the beach or intertidal dredged material placement site and the staging area at the end of every 8-hour shift (at a minimum), and shall discard all such material at an acceptable dredged material placement site.

18. If previously unknown cultural resources are identified during dredging operations, all activity would cease in the area of the find. If during construction activities, items are observed that may have historic or archaeological value (e.g., anchors, shipwrecks, Native American human remains or associated objects are discovered), such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified. The Contractor shall cease all activities in the area of the find until the requirements of 36 CFR 800.11, *Properties Discovered During Implementation of an Undertaking* are met. The Contractor shall prevent employees from trespassing on, removing, or otherwise disturbing such resources.

19. If a sea otter is seen in the vicinity of ongoing dredging, all ships shall maintain a 50 foot avoidance buffer and reduce vehicle speeds to 3-5 knots. The project biologist, environmental coordinator, and project manager shall be notified immediately of any sea otter sightings.

VII. ENVIRONMENTAL COMPLIANCE

A. NATIONAL ENVIRONMENTAL POLICY ACT of 1969.

[National Environmental Policy Act of 1969. 42 United States Code (U.S.C.) 4321 et seq.; Council on Environmental Quality (CEQ) Regulations for Implementing NEPA, 40 Code of Federal Regulations (CFR) Parts 1500 et seq., USACE Regulations for Implementing NEPA, 33 CFR Part 230.]

The National Environmental Policy Act (NEPA) is the nation's primary charter for protection of the environment. It establishes national environmental policy which provides a framework for Federal agencies to minimize environmental damage and requires Federal agencies to evaluate the potential environmental impacts of their proposed actions.

CEQ Regulations for implementing NEPA establish the requirements and procedures by which Federal agencies fulfill their obligations under NEPA. The regulations also define such key terms as “cumulative impact”, “mitigation”, and “significant” (as it relates to impacts) to ensure consistent application of the terms in environmental documents.

Corps guidance for implementing NEPA is provided in Engineer Regulation 200-2-2, March 1988 and at 33 CFR Part 230. This regulation provides guidance for implementation of the procedural provisions of the NEPA for the Civil Works Program of the Corps. It supplements the CEQ regulations.

This DEA has been prepared to comply with the requirements of NEPA and the CEQ and Corps Regulations. In addition, the Corps coordinated with resources agencies (US Fish and Wildlife Service, NOAA/NMFS; Central Coast Regional Water Board Control Board; CCC; etc.) prior to the release of the public DEA for discussion and input. The proposed project will be in compliance with this Act upon completion of the NEPA process.

B. CLEAN WATER ACT (33 U.S.C. 1251 et seq.)

Section 401 of the Clean Water Act (CWA) requires every applicant for a Section 404 permit for an action that may result in a discharge of dredged or fill material into “waters of the United States” to obtain a State Water Quality Certification (Certification) or waiver that the proposed activity will comply with established effluent limitations and state water quality standards (i.e. beneficial uses, water quality objectives, and anti-degradation policy). The state of California’s Central Coast Regional Water Quality Control Board (Central Coast RWQCB) issues Section 401 Water Quality Certifications for activities within the Central Coast RWQCB Region 3 that includes the proposed project in Santa Barbara County.

Section 404 authorizes the Secretary of the Army acting through the Corps to issue permits for the discharge of dredged or fill materials into the waters of the United States, including wetlands at specified disposal sites. The selection and use of disposal sites must be in accordance with

guidelines developed by the Administrator of the USEPA in conjunction with the secretary of the Army and published in 40 CFR Part 230 (known as the 404(b) (1) guidelines). Under the Section 404(b) (1) guidelines, the Corps shall examine practicable alternatives to the proposed discharge and permit only the Least Environmentally Damaging Practicable Alternative (LEDPA).

The Corps does not issue permits to itself, but generally it demonstrates compliance with Section 404 through a Section 404(b)(1) Evaluation. In addition, the requirements and conditions of nation-wide permits and regional general permits may be applied to Corps projects and thus considered when addressing compliance under Section 404. All other entities must obtain a permit before undertaking any discharge of fill materials into waters of the United States. A Draft 404(b)(1) Evaluation has been prepared and is provided in Appendix C of the DEA.

The proposed project complies with the requirements of the California Regional Water Quality Control Board (RWQCB) under the CWA Section 401 Water Quality Certification (WQC) Number 32410WQ03 dated September 9, 2010 issued by the Central Coast RWQCB, pursuant to 33 USC 1341. On 1 March 2016, the Corps received an amendment to the WQC, removing seasonal dredge material volume limits but maintaining the 600,000 cubic yard annual dredge material limit. The proposed project complies with the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b)(1) of the Clean Water Act (CWA) 33 USC 1344).

C. COASTAL ZONE MANAGEMENT ACT of 1972

Under the Coastal Zone Management Act (CZMA), any federal agency conducting or supporting activities directly affecting the coastal zone must demonstrate the activity is, and proceed in a manner, consistent with approved State's Coastal Zone Management Program, to the maximum extent practicable. As no federal agency activities are categorically exempt from this requirement, the Corps will obtain concurrence from the California Coastal Commission (CCC) for the necessary consistency determination. A Negative Determination has been submitted to the California Coastal Commission for project concurrence along with the original DEA. The proposed project will be in compliance with this Act.

D. ENDANGERED SPECIES ACT OF 1972, SECTION 7(c)

As discussed above, and following informal coordination with the U. S. Fish and Wildlife Service and the National Marine Fisheries Service, the Corps has determined that the proposed maintenance dredging operations will have no effect on any species proposed or listed as threatened or endangered under the ESA, and will not result in the adverse modification of any designated critical habitat. Therefore formal consultation pursuant to Section 7 (c) of this Act is not required.

E. NATIONAL HISTORIC PRESERVATION ACT

The National Historic Preservation Act (NHPA) provides a regulatory framework for the

documentation, evaluation, and protection of cultural resources that may be affected by federal projects or by private projects operating under federal license, using federal money, or occurring on federally managed land. In accordance with Section 106 NHPA, the Corps has determined that the periodic maintenance of the Santa Barbara Harbor meets the definition of an undertaking as defined at 36 CFR 800.16(y). The Corps has further determined that it is the type of activity that does not have the potential to cause effects to historic properties (See Memorandum - Section 106 (National Historic Preservation Act) Review, Appendix D of the DEA). Pursuant to 36 CFR 800.3(a)(1), the Corps has satisfied its responsibilities to take into account the effects of this undertaking on historic properties and has no further obligations under Section 106 of the NHPA. The proposed project is in compliance with this Act.

F. MAGNUSON-STEVENS FISHERY MANAGEMENT AND CONSERVATION ACT

The DEA contains an EFH Assessment as required by the Magnuson-Stevens Act. Although construction will occur within Essential Fish Habitat, the Corps has determined that the proposed project would have less than significant effects to EFH. In compliance with the coordination and consultation requirements of the Act, the DEA will be sent to the National Marine Fisheries Service (NMFS) for their review and comment. The Corps will continue coordination efforts with the NMFS. The proposed project will be in compliance with this Act.

G. FISH AND WILDLIFE COORDINATION ACT (FWCA)

This Act requires Federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the fish and wildlife agencies of states where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted… or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "…preventing loss of and damage to wildlife resources." The intent is to give fish and wildlife conservation equal consideration with other purposes of water resources development projects. The Fish and Wildlife Coordination Act (FWCA) requires the Corps to consult with the U. S. Fish and Wildlife Service (USFWS) whenever the waters of any stream or other body of water are proposed to be impounded, diverted, or otherwise modified. Coordination efforts with the USFWS will continue. The proposed project is in full compliance with this Act.

H. CLEAN AIR ACT of 1970 (42 U.S.C. 7401 et seq.)

The 1977 Amendments to the Clean Air Act enacted legislation to control seven toxic air pollutants. The USEPA adopted National Emission Standards for Hazardous Air Pollutants, which have been designed to control Hazardous Air Pollutants and emissions to prevent adverse health effects in humans.
1990 Amendments to the Clean Air Act determine the attainment and maintenance of air basins for National Ambient Air Quality Standards (NAAQS) (Title I), motor vehicles and reformulation (Title II), hazardous air pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII).

Under Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990, the Lead Agency is required to make a determination of whether the Proposed Project "conforms" to the State Implementation Plan (SIP). General Conformity is defined in Section 176(c) of the CAAA as compliance with the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. However, if the total direct and indirect emissions from the Proposed Project are below the General Conformity Rule "de minimis" emission thresholds established at 40 C.F.R. 93.153(b)(1) for all criteria pollutants for which the air basin in in non-attainment or maintenance status, the Proposed Project would be exempt from performing a comprehensive Air Quality General Conformity Analysis, and would be considered to be in conformity with the SIP. As discussed in the DEA, Section IV. Environmental Consequences, F. Air Quality, the portion of the South Central Coast Air Basin (SCCAB) under jurisdiction of the Santa Barbara ACPD is currently in attainment or unclassified/attainment for all criteria air pollutants. Furthermore, emissions associated with maintenance dredging is exempt from General Conformity Rule per 40 CFR 93.153(c)(ix). Thus, the General Conformity Rule is not applicable to the Proposed Project emissions are summarized in Appendix B of the DEA, and are not expected to exceed "de minimis" levels established as a criteria for a finding of conformity. Therefore, the Proposed Project is consistent with the SIP and meets the requirements of Section 176(c).

Based upon a recent U.S. Supreme Court decision (Massachusetts v. EPA 549 U.S. 497 (2007)), the USEPA has been given the authority to regulate CO2 or GHG emissions as an air pollutant under the Federal Clean Air Act (42 U.S.C. §7602(g)). The USEPA has adopted 40 CFR Part 98 – Mandatory Reporting of Greenhouse Gases Rule which requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO2e emissions per year (USEPA, 2009) and 40 CFR Part 52 – Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule which mandates Prevention of Significant Deterioration (PSD) permitting to facilities whose stationary source CO2e emissions exceed 75,000 tons per year (USEPA, 2011). Neither of these regulations is applicable to the Proposed Project because it has no operating stationary emission sources that are subject to these regulations. In addition, the CEQ has published Revised Draft Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews at 79 Federal Register 77801, dated December 24, 2014. This draft guidance recommends emissions of 25,000 MTCO2e per year as a threshold where further analysis is warranted. Annual GHG emissions has been calculated and shown in Appendix B of the DEA and the estimated annual GHG emissions for the Proposed Project would not exceed 25,000 MTCO2e. The Proposed Project is in compliance with this Act.

I. ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
Executive Order 12898 was signed on February 11, 1994, directing Federal agencies to "…make achieving environmental justice part of its mission by identifying and addressing... disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the [U.S.]..." Section 5.13 addresses environmental justice. The proposed project is in compliance with this executive order.

VIII. CONCLUSION

The Federal maintenance dredging operations proposed for Santa Barbara Harbor have been designed and scheduled to avoid, minimize, and reduce the probable effects on the environment.

This Draft Environmental Assessment, and informal coordination with the appropriate public agencies, indicates that the proposed activity would not have a significant impact upon the existing environment or the quality of the human environment. As a result, preparation of an Environmental Impact Statement (EIS) is not required.

IX. LIST OF PREPARERS/REVIEWERS

Prepared by:

Kirk C. Brus, Environmental Coordinator, Physical Scientist, Regional Planning Section
Jesse Ray, Biologist, Regional Planning Section
Kenneth Wong, Environmental Coordinator, Physical Scientist, Environmental Policy Group
Danielle Storey, Archeologist, Ecosystem Planning Section

Reviewed By:

Tiffany Bostwick, Chief, Regional Planning Section
Jodi Clifford, Chief, Environmental Resources Branch
Scott John, Project Manager, PPMD Navigation Section

All of above are from the U.S. Army Corps of Engineers (Corps), Los Angeles District (LAD).

X. REFERENCES

Applied Environmental Technologies (AET), Inc., 2000, 2001, 2002, 2003, 2004. Summary of Evaluation, Three Years of Intertidal Biological Characterization, McGrath State Park Sandy Beach Ventura Harbor Dredging and Beach Replenishment, 2000. Annual Reports: 2001, 2002, 2003, 2004.

Babinchak, J.A., Graikoski, J.T, Dudley S., and Nitkowski, M. F. 1977. Effect of Dredge Spoil Deposition on Fecal Coliform Counts in Sediments at a Disposal Site. Applied and Environmental Microbiology, July 1977, p.38-41.

Berman, Michael. City of Santa Barbara. Personal communication noise related ordinance for dredging operations. April 2004.

Bowes, S.M and Corn M. (1990). Noise exposure reduction aboard an oceangoing hopper dredge. Journal of the American Industrial Hygiene Association. Retrieved from and accessed on October 8, 2015. http://www.ncbi.nlm.nih.gov/pubmed/2220564

Buckley, L.M.; O'Neil, T.J. 1993. Preliminary Report, Effects of Dredging of Santa Barbara Harbor on Spawning Success of the California Grunion, *Leuresthes tenuis* (Ayres 1860). Prepared for U.S. Army Corps of Engineers, Los Angeles District.

Buckley, L..; O'Neil, T. 1994. Final Report, 1994 Grunion Monitoring Project at Santa Barbara Harbor, Santa Barbara, California. Prepared for U.S. Army Corps of Engineers, Los Angeles District, by Coastal Environmental Consultants, Thousand Oaks, CA.

Buckley, L..; O'Neil, T. 1995. Final Report, 1995 Grunion Monitoring Project at Santa Barbara Harbor, Santa Barbara, California. Prepared for U.S. Army Corps of Engineers, Los Angeles District, by Coastal Environmental Consultants, Thousand Oaks, CA.

Buckley, L..; O'Neil, T. 1997. Final Report, 1997 Grunion Monitoring Project at Santa Barbara Harbor, Santa Barbara, California. Prepared for U.S. Army Corps of Engineers, Los Angeles District, by Coastal Environmental Consultants, Thousand Oaks, CA.

California Department of Fish and Wildlife (CDFW), 1987. Marine Sportfish Identification. 164 pp. Please note: CDFW has changed their name to California Department of Fish and Wildlife (CDFW).

California Department of Fish and Wildlife (CDFW). 2006. Annual Status of the Fisheries Report. Section 6: Pismo Clam. Please note: CDFW has changed their name to California Department of Fish and Wildlife (CDFW).

California Department of Transportation (CALTRANS). 2010. Final Corridor System Management Plan (CSMP). U.S. 101 – Santa Barbara/Ventura Corridor. 2007 Traffic Volume (Traffic Counts) Data.

http://www.dot.ca.gov/dist05/planning/sys_plan_docs/csmp/csmp_slo_101_vensb_plan.pdf
Accessed September 21, 2015.

California Department of Transportation (CALTRANS). 2014. 2014 All Traffic Volumes (Traffic Counts) on California State Highway System (CSHS).
http://traffic-counts.dot.ca.gov/docs/2014_aadt_volumes.pdf
Accessed September 23, 2015.

California Emissions Estimator Model (CalEEMOD). 2014. Version 2013.2.2.
California Energy Commission. 2012. City of Santa Barbara Sea-Level Rise Vulnerability Study. http://www.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=17711
Accessed September 17, 2015.

Caughman, M. and J. S. Ginsberg, 1987. California Coastal Resource Guide. California Coastal Commission, University of California Press: Berkeley. 384 p.

Central Coast Regional Water Quality Control Board (Central Coast RWQCB). 2010. Clean Water Act (CWA) 401 Water Quality Certification Number 34210WQ03 For Santa Barbara Harbor Maintenance Dredging Operations Project, Santa Barbara County.

City of Santa Barbara. 2015a. Draft Noise Ordinance 9.16.010 Revision.
http://civicaweb.santabarbaraca.gov/civicax/filebank/blobdload.aspx?BlobID=159775
Accessed September 15, 2015.

City of Santa Barbara. 2015b. Stearns Wharf.
http://www.santabarbaraca.gov/gov/depts/waterfront/admin/stearns_wharf.asp
Accessed September 17, 2015.

City of Santa Barbara. 2015c. Visitors Services. Guest Slips.
http://www.santabarbaraca.gov/gov/depts/waterfront/visitor/slips.asp
Accessed September 17, 2015.

City of Santa Barbara. 2015d. Waterfront.
http://www.santabarbaraca.gov/gov/depts/waterfront/
Accessed September 17, 2015.

City of Santa Barbara. 2015e. Harbor Patrol.
http://www.santabarbaraca.gov/gov/depts/waterfront/patrol/default.asp
Accessed September 17, 2015.

Climo, L. 1987. The effect of blast-generated noise on breeding seabirds at Saint George Island, Alaska. (unpublished report.) U.S. Fish & Wildlife Service Homer, AK.

Connor, J. and C. Baxter. 1989. Kelp Forests. Monterey Bay Aquarium: Monterey, CA. 65 p.

Dugan, J.E., D.M. Hubbard, M.D. McCrary, and M.O. Pierson. 2003. The response of macrofauna communities and shorebirds to macrophyte wrack subsidies on exposed sandy beaches of southern California. Estuar. Coastl. Shelf Sci. 58S:133-148.

Dugan, J. 2001. Ecological Impacts of Beach Grooming on Exposed Sandy Beaches. Coastal Ocean Research. R/CZ-174: 3.1.2001-2.29.2004. http://www-csgc.ucsd.edu/RESEARCH/PROJPROF_PDF/RCZ174.pdf

E-mail communication. December 2015. December 15, 2016 e-mail communication between Central Coast RWQCB and the Corps, Santa Barbara Dredging – Week 1 Bacteria Results.

Federal Highway Administration (FWA). 2015. Alternatives Analysis, Highway 101 Widening Project – Final Report. https://www.fhwa.dot.gov/planning/tmip/publications/other_reports/highway_widening/ch02.cfm#t26. Accessed September 23, 2015.

Gentry, R.L. 1990. Response to northern fur seals to quarrying operations. Marine Mammal Science 6(2):151-155.

Gotshall, D. W. and L. L. Laurent. 1980. Pacific Coast Subtidal Marine Invertebrates. Sea Challengers: Monterey, CA. 112 p.

Harrison, P. 1987. A Field Guide to Seabirds of the World. The Stephen Greene Press: Lexington, MA. 317 p.

Holmgren, Mark. Associate Director of the Museum of Systematics and Ecology, UCSB. Email communications April/May 2004

Hutchinson, E. S., Gary W. Page, and Philip E. Persons, 1987. The nesting of snowy plovers on Morro Bay sand spit during and after the 1987 maintenance dredging of Morro Bay Harbor. Nov, 1987 Report of Point Reyes Bird Observatory.

Impact Sciences, Inc., 1996. 1996 Final Report, Grunion Monitoring Project, Santa Barbara Harbor, Santa Barbara, California. Submitted to the Department of the Army, Los Angeles District Corps of Engineers.

Leatherwood, S. and R. R. Reeves. 1983. The Sierra Club Handbook of Whales and Dolphins. Sierra Club Books: San Francisco. 302 p.

Kolb, Howard, California Regional Water Quality Control Board, San Luis Obispo, 1990. Conversation with Dames and Moore. Cited in COE, 1991.

Larson, K.W. and C.E. Moehl. 1990. Entrainment of anadromous fish by hopper dredge at the mouth of the Columbia River, Oregon and Washington. Proceedings, workshop on the effects of dredging on anadromous fishes on the Pacific coast. Washington Sea Grant Program. Seattle, WA. pp 100-110.

LaSalle, Mark W., Clark, Douglas G., Homiziak, Jurij, Lunz, John D. and Fredette, Thomas J. 1991. A Framework for Assessing the Need for Seasonal Restrictions on Dredging and Disposal Operations, Technical Report D-91-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Lehman, P. 1994. The Birds of Santa Barbara Co., California. Museum of Systematics and Ecology, UC Santa Barbara.

Love, R.M. 1991. Probably More Than You Want to Know About the Fishes of the Pacific Coast. Really Big Press: Santa Barbara, CA. 214 p.

Martin, Karen. Grunion run equipment and The Walker Method. E-mail communication. July 15, 2014.

National Marine Fisheries Service (NMFS). 2000. Biological Opinion for the Mission Creek Flood Control Project

Orr, Robert T. and Robert C. Helm. 1989. Marine Mammals of California. University of California Press: Berkeley/Los Angeles/ London. 93 p.

Page, G.W. and Lynne E. Stenzel, 1981. The breeding status of the snowy plover in California. Western Birds 12: 1-40.

Page, G. W., Lynne E. Stenzel, David W. Winkler, and Christopher W. Swarth. 1983. Spacing out at Mono Lake: breeding success, nest density, and predation in the snowy plover. Auk 100: 13-24.

Page, G. W., L. E. Stenzel, W. D. Shuford, and C. R. Bruce, 1991. Distribution and abundance of the snowy plover on its western North American breeding grounds. J. Field Ornithol. 62(2)245-255.

Parr, T., D. Diener and S. Lacy, 1978. Effects of Beach Replenishment on the Nearshore Sand Fauna at Imperial Beach, California, U.S. Army Corps of Engineers Coastal Engineering Research Center Miscellaneous Report No. 78-4:125pp.

Peterson, R.T. 1961. A Field Guide to Western Birds. Houghton Mifflin Co.: Boston. 309 p.

Reidman, M. 1990. Sea Otters. Monterey Bay Aquarium: Monterey, CA. 81 p.

Santa Barbara County Air Pollution Control District (SBCAPCD). 2011. 2010 Clean Air Plan. Environmental Impact Report (EIR).
http://www.ourair.org/wp-content/uploads/Final-SBCAPCD-EIR-2010CAP.pdf
Accessed September 14, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD). 2015a. Meeting Air Quality Standards. http://www.ourair.org/air-quality-standards/ Accessed September 3, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD). 2015b. Days Exceeding Ozone and Particulate Standards Santa Barbara County.
http://www.ourair.org/days-exceeding-ozone-and-particulate-standards-santa-barbara-county/
Accessed September 8, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD) 2015c. 2013 Clean Air Plan.
http://www.ourair.org/clean-air-plans/ Accessed September 3, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD) 2015d. 2014 Annual Air Quality Report. http://www.ourair.org/2014-annual-air-quality-report/ Accessed September 8, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD) 2015e. Environmental Review Guidelines for Santa Barbara County Air Pollution Control District (SBCAPCD). Greenhouse gas threshold emissions.
http://www.ourair.org/wp-content/uploads/APCDCEQAGuidelinesApr2015.pdf
Accessed September 8, 2015.

Santa Barbara County Air Pollution Control District (SBCAPCD) 2015f. Land Use. Frequently Asked Questions.
http://www.ourair.org/apcd/land-use-frequently-asked-questions/
Accessed October 7, 2015.

Santa Barbara County Area of Governments (SBCAG). 2013. 2040 Santa Barbara County Regional Transportation Plan (RTP) and Sustainable Communities Strategy.
http://www.sbcag.org/uploads/2/4/5/4/24540302/reviseddrafteir.pdf
Accessed September 3, 2015; July 22, 2016.

Santa Barbara Navy League. U.S. Coast Guard (USCG) Cutter Blackfin (WPB 87317).
http://santabarbaranavyleague.org/units/blackfin/
Accessed September 17, 2015.

Southern California Marine Institute, December 12, 1997. Five Year (1993-1997) Summary Report on Grunion Monitoring Data from Santa Barbara Harbor, California - Final Report. Prepared for the U.S. Army Corps of Engineers, Los Angeles District.

Southern California Dredge Material Management Team (SC-DMMT). 2010. Coordination Principles & Procedures. http://www.spl.usace.army.mil/Portals/17/docs/regulatory/Projects/DMMT/SC-DMMT_coordination-principles_20100128_updated-poc.pdf. Accessed July 15, 2015.

South Coast Air Quality Management District (SCAQMD). 1993. California Environmental Quality Act (CEQA) Air Quality Calculations Handbook Estimations (with revisions through 2015) for emission factors and other activity assumptions (SCAQMD, 1993, with revisions through 2015).

Udvardy, M. D. F. 1989. The Audubon Society Field Guide to North American Birds. Alfred A. Knopf: New York. 856 p.

U. S. Army Corps of Engineers (Corps), Los Angeles District, 1986. Final Environmental Assessment of Santa Barbara Harbor Maintenance Dredging.

U. S. Army Corps of Engineers (Corps), Los Angeles District, 1986b. Environmental Assessment: Ventura Harbor Maintenance Dredging, Ventura County, California.

U. S. Army Corps of Engineers (Corps), Los Angeles District, 1988. Environmental Evaluation, Santa Barbara Beach Erosion control and Storm Damage Prevention. Santa Barbara County, California.

U. S. Army Corps of Engineers (Corps), Los Angeles District, 1991. Santa Barbara Harbor Preliminary Draft Feasibility Report.

U. S. Army Corps of Engineers (Corps), Los Angeles District, 1992. Operations Branch Site Monitoring Program for Santa Barbara Harbor Maintenance Dredging. Unpublished Data.

U.S. Army Corps of Engineers (Corps), July 1993. Final Environmental Assessment, Santa Barbara Harbor Maintenance Dredging (FY 94, 95, 96) Santa Barbara County, California.

U.S. Army Corps of Engineers (Corps), July 1995. Memorandum for Record and Negative Determination, Two-Year Extension of Santa Barbara Harbor Dredging EA.

U.S. Army Corps of Engineers, March 1997. Administrative Environmental Assessment and Negative Determination, Santa Barbara Harbor Maintenance Dredging Project, Temporary Change of Disposal Site.

U.S. Army Corps of Engineers (Corps), July 2004. Final Environmental Assessment, Six Year Santa Barbara Harbor Maintenance Dredging (September 2004 – August 2010).

U.S. Army Corps of Engineers (Corps), May 2010. Final Environmental Assessment, Six Year Santa Barbara Harbor Maintenance Dredging (September 2010 – August 2016).

U.S. Army Corps of Engineers (Corps), September 2013 (Corps, 2013a). Plans Sheet – Area Map.

U.S. Army Corps of Engineers (Corps). November 2013 (Corps, 2013b). Marine habitat surveys and mapping for the shoreline and nearshore waters of Carpinteria shoreline feasibility study. Final Report prepared by Merkel & Associates.

U.S. Army Corps of Engineers (Corps), November 2015. Corps, 2015a. Final Sampling and Analysis Plan (SAP).

U.S. Army Corps of Engineers (Corps), March 2015. Corps, 2015b. Grunion and snowy plover observations. 22-23 March 2015.

U.S. Army Corps of Engineers (Corps), June 2016. Corps, 2016a. Final Sampling and Analysis Plan Results (SAPR) Report, Compatibility Determination, and SAPR Report Appendices.

U.S. Army Corps of Engineers (Corps), March 2016. Corps, 2016b. Grunion and snowy plover observations. 24 March 2016.

U.S Census Bureau. 2010. Population, Poverty Level, Ethnicity. Accessed July 22, 2016. http://www.census.gov/quickfacts/table/POP010210/06083,0669196,0630378,0669070

U.S. Environmental Protection Agency (USEPA). (1971). Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Accessed on and retrieved on October 8, 2015. http://nepis.epa.gov/Exe/ZyNET.exe/9101NN3I.TXT

U.S. Environmental Protection Agency (USEPA). (1972). Noise Control Act. Accessed on and retrieved on October 8, 2015. http://www2.epa.gov/laws-regulations/summary-noise-control-act

U.S. Environmental Protection Agency (USEPA). (1974). Protective Noise Levels. Accessed on and retrieved on October 8, 2015. http://nepis.epa.gov/Exe/ZyNET.exe/20012HG5.TXT

U. S. Environmental Protection Agency (USEPA). 1985. USEPA AP-42, A Compilation of Air Pollutant Emission Factors (1985, with updates through 2015).

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

U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers Corps Dredging Operation Technical Standards (DOTS), November 1992. Dredged Material Assessment and Management Seminar [Notebook].

U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (Corps), November 1992. Evaluating Environmental Effects of Dredged Material Management Alternatives--A Technical Framework. EPA842-B-92-008. 72 p.

U.S. Environmental Protection Agency (USEPA). 2005 Best Practices in Preparing Port Emission Inventories.

Wilcoxon, Larry R., Rebecca Conard, Ronald Nye, Cynthia Bettin, and James Harman, 1988. A Cultural Resources Evaluation for the Santa Barbara Water Reclamation Project. Prepared for City of Santa Barbara, Department of Public Works.

APPENDICES

Appendix A –Sampling Analysis Plan (SAP), Sediment Analysis Plan Results (SAPR) Report and Appendices, and Compatibility Determination

Appendix B – Air Quality Analysis

Appendix C – 404(b)(1) Evaluation

Appendix D – Memorandum - Section 106 (National Historic Preservation Act) Review

Appendix E – Mailing List

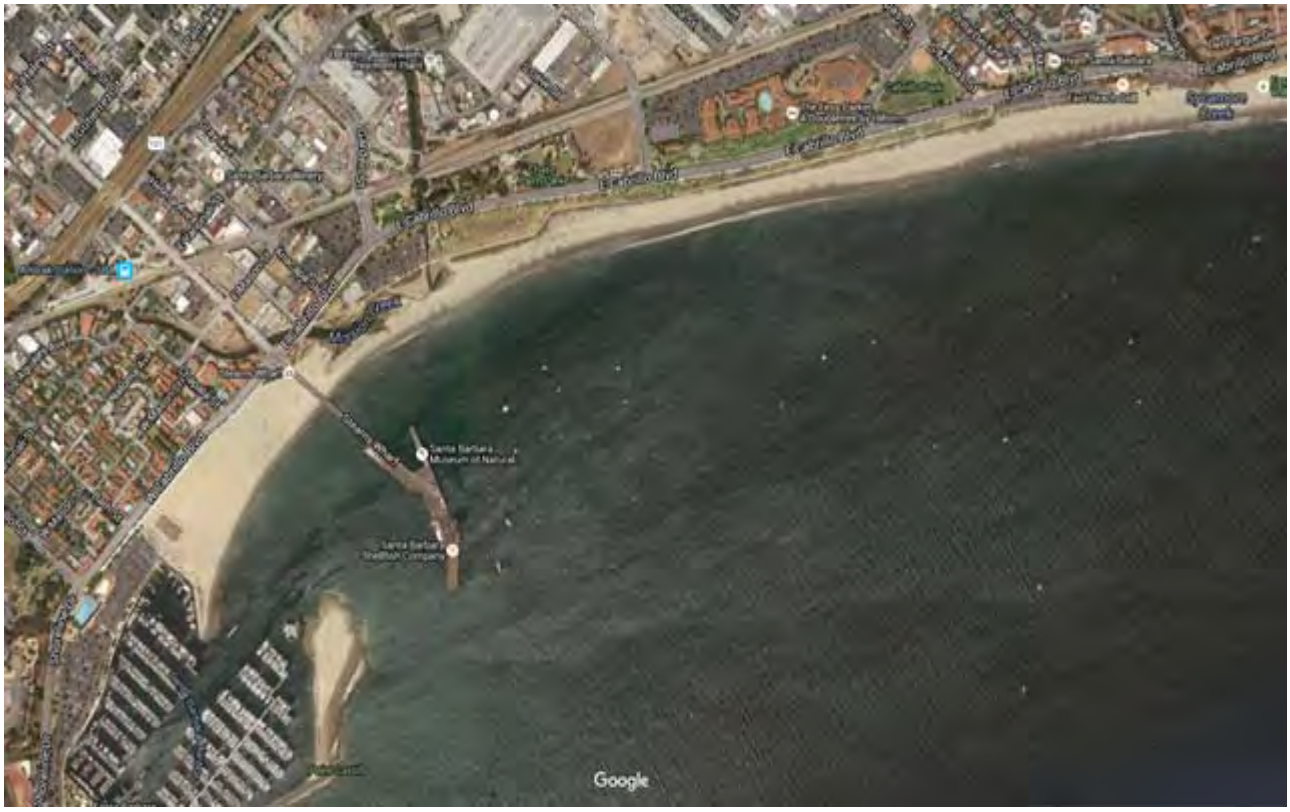
APPENDIX A

2015 SAMPLING ANALYSIS PLAN (SAP), 2016 SAMPLING ANALYSIS PLAN RESULTS (SAPR) REPORT and APPENDICES, and 2016 COMPATIBILITY DETERMINATION (APPENDIX B of 2016 SAPR REPORT)

US Army Corps
of Engineers

Los Angeles District
Geotechnical Branch
Geology and Investigations Section
915 Wilshire Blvd
Los Angeles, CA 90017

Grain Size Analysis and Compatibility of Dredged Sediment
Santa Barbara Harbor, Santa Barbara County, CA
March 2016



Dredge material placement compatibility analysis (Beach Compatibility) based on grain size analysis.

The sediment within the five Federal dredge footprint areas inside and at the entrance of Santa Barbara Harbor is routinely dredged by the Corps of Engineers Los Angeles District as part of its operation and maintenance activities for the Harbor. Past dredged sediment from these areas has been routinely used as beach fill by the Corps on and/or in the near shore area along the down coast beach, located east of Santa Barbara and the Stearns Wharf. This site is still designated for future dredged sediment placement by the Corps of Engineers.

The sediment within the dredged footprint areas was analyzed as to its suitability for use as fill material at the down coast beach placement site. The analysis is based on the grain size compatibility between the footprint and placement areas and was conducted according to Los Angeles District U.S. Army Corps of Engineers (USACELAD) Geotechnical Branch office guidelines. These guidelines are the same as the SCOUP (Sand Compatibility and Opportunistic Use Program). This analysis was performed by the Geology and Investigations Section, Geotechnical Branch, USASCELAD.

The USACELAD analysis is based on calculating the natural beach compatibility envelope of three gradation curves for each of the beach placement sites. These grain size curves are shown drawn as a final set of three grain size curve envelopes for each placement site and are commonly known as the “beach compatibility envelope”. These envelopes of curves are labeled “fine limit”, “coarse limit” and “average”. Once this is done, the weighted average grain size curve of each individual dredge footprint sediment vibratory core sample and the composite grain size curve from each of the three footprint areas are matched to see where they fit within the envelope. The vibratory core borehole sample collection locations for the footprint areas are shown in the general figures on Part C at the back of this report. For this analysis there are three separate sets of three beach grain size curve envelopes. Each set represents the grain size envelope for each of the three individual beach placement sites. All five areas of the Federal Channel dredge footprints (areas A1, A2, A3, A3R and A4) were analyzed for grain size placement compatibility based on both the individual vibratory borehole core samples for these areas, and the grain size weighted average as a whole (composite) of the total of all of the vibratory boreholes for each of these three areas.

All of these curves are shown in Parts A and B at the end of this report, for a total of 16 figures. Part A shows the dredge sediment footprint individual grain size weighted average curves comparison or compatibility to the envelopes. Part B shows the composite grain size weighted average curves comparison to the envelopes.

Results of dredge material placement compatibility analysis.

The grain size compatibility analysis was made according to the USACE LAD guidelines. These guidelines specify that individual sediment samples collected from each dredged footprint area and/or the composite gradation curve for the overall dredge footprint area can be no more than 10% above the finest limit gradation curve of the beach fill or placement area. The finest limit curve is one of the three curves representing the overall composite grain size gradation of the weighted average calculated profile or "beach compatibility envelope" of the placement area(s). The compatibility envelope is based on the weighted average of the finest, coarsest and average grain sizes from the individual beach profile samples. The "finest limit" gradation is based on a sample for a U.S. Sieve size no. 200 (0.08 mm) result. The guidelines also specify that the dredged sediment can be greater than the "coarsest limit" placement profile sample grain size composite curve, as long as aesthetic quality of the dredged sediment in this coarser size range is acceptable. The placement composite profiles samples for the down coast east of Santa Barbara beach were made up of three transects. These onshore composite profile sediment samples were collected from an elevation of plus 12 feet above MLLW (onshore) to offshore at the deepest elevation of -36 feet MLLW. The samples were collected approximately along a straight line, perpendicular to the coast along the three transect lines. All of these beach profile samples were surface grab type sediment samples collected by hand. The offshore samples, from -6 to -30 feet MLLW were collected via Ponar sampler device, while the onshore samples, from 0 to +12 feet MLLW were collected via hand trowel and bucket. The sample collection areas are shown on Plate C at the back of this report. The results of the analysis are summarized as follows:

Area 1, Entrance Channel-

The weighted average grain size of each of the five individual vibratory core borehole samples (SBHVC15-E1-15 to E1-19) collected from Area 1 fit well within the grain size compatibility envelopes for the down coast east of Santa Barbara beach placement area. The composite average grain curves (overall sediment gradation), for all five vibratory core samples collected from Area 1 fit within the grain size compatibility envelopes for Down coast east of Santa Barbara beach placement site. The soil classification for the sediment from Area 1 is predominantly poorly graded sand (SP), with some poorly graded sand with silt (SP-SM), with a range of grain sizes ranging from 0.8 to 0.06 mm diameter. This is equivalent to a fine to medium grained sand with some silt.

Area 2, Approach Channel

The weighted average grain size of four of the five individual vibratory core borehole samples (SBHVC15-A2-10 to A2-14) collected from Area 2 fits well within the grain size compatibility envelopes for the down coast east of Santa Barbara beach placement site. The

individual weighted average of fines in this borehole amounted to 37%, which was seven percentage points above the finest limit curve of 30% for the beach placement area. This means that the highest amount of fines allowable on the receiving beach is to be 30% or less. The amount of clay sediment sampled at the very bottom of vibracore borehole A2-11 is limited in extent to the dredge overdepth of 2 feet. Its total estimated volume is approximately 1,000 cubic yards. Any future maintenance dredging in this area will result in most or all of this clay being absorbed into the rest of the dredge material for the entirety of Area A2. Approximately 55,000 cubic yards remains to be dredged from all of Area A2, which means that less than 2% of the entire area is composed of clay, while the soil classification for the remaining 98% percent of the area is poorly graded sand (SP) with a lesser amount of poorly graded sand with some silt (SP-SM) and with grain sizes ranging from 0.8 to 0.05 mm diameter.

Area 3, Turning Basin Inside-

The weighted average grain size of each and all of the three individual vibratory core boreholes samples (SBHVC15-T3-05, T3-08 and T3-20) collected from Area 3 fit very well within the grain size compatibility envelopes for down coast east of Santa Barbara beach placement site. The composite grain size curves (overall sediment gradation), from all three of these vibratory core samples fit within the grain size compatibility envelopes for Down coast east of Santa Barbara beach. The soil classification for the sediment from Area 3, Turning Basin Inside, is poorly graded sand (SP), with a range of grain sizes ranging from 1 to 0.07 mm diameter. This is equivalent to a fine to medium grained sand.

Area 3R, Turning Basin Outside-

The weighted average grain size of each of the four individual vibratory core boreholes samples (SBHVC15-T3-04, T3-06, T3-07 and T3-09) collected from Area 3R fit very well within the grain size compatibility envelopes for down coast east of Santa Barbara beach placement site. The composite grain size curves (overall sediment gradation), from all four of these vibratory core samples fit well within the grain size compatibility envelopes for down coast east of Santa Barbara beach. The soil classification for the sediment from Area 3, Turning Basin Inside, is poorly graded sand (SP), with a range of grain sizes ranging from 1 to 0.07 mm diameter. This is equivalent to a fine to medium grained sand.

Area 4, Marina-

The weighted average grain size of each of the three individual vibratory core boreholes samples (SBHVC15-M4-01 to M4-03) collected from Area 4 fit within the grain size compatibility envelopes for down coast east of Santa Barbara beach placement site. The composite grain size curves (overall sediment gradation), from all three of these vibratory core samples fit within the grain size compatibility envelopes for down coast east of Santa Barbara beach. The soil classification for the sediment from Area 4 is predominantly poorly

graded sand (SP) with some silty sand (SM), with a range of grain sizes ranging from 0.6 to 0.06 mm diameter. This is equivalent to a fine to medium grained sand.

Summary results of grain size analysis.

The composite grain size curves for all five designated dredge footprint areas fit within the overall grain size envelope for down coast east of Santa Barbara beach placement area. One of the individual vibratory core borehole sample grain size curves did not fit within the overall grain size envelope for down coast east of Santa Barbara beach placement site. The one core sample was SBHVC15-A2-11. A2 was approximately 3 percentage points above the fine limits grain size curves for all 3 placement areas. A14 and A9 were approximately 7 percentage points above the fine limits grain size curve for down coast east of Santa Barbara beach. A2 is described according to Engineering Soil Classification, as a poorly graded sand with silt (SP-SM) with a lean clay (CL). It contained approximately 37% fines (non-sands of less than 0.065 mm diameter size).

Placement of sediment dredged from Santa Barbara Harbor.

The future disposition of dredged sediment from Santa Barbara Harbor by the Corps of Engineers will be made at down coast east of Santa Barbara beach placement site.. This site has been preselected for placement because sediment from the harbor has been placed at this area during past Corps of Engineers routine maintenance dredge events. The Corps preference for placement of future sediment from the harbor will be to down coast east of Santa Barbara beach because this site offers the maximum beneficial use of dredged material for the surrounding community.

All of the sediment within the 5 dredge footprint areas (A1, A2, A3, A3R and A4) is compatible for placement at down coast east of Santa Barbara beach based on the weighted average grain size <u>composite</u> curve of each footprint area as a whole (part B figures).

The sediment for all 5 footprint areas is also compatible for placement at down coast east of Santa Barbara beach based on the <u>individual</u> weighted average grain size curve and analysis from all but one of 20 individual vibratory borehole core sample locations. One of the 20 boreholes, sample location A2-11, is the exception, in that the “fines” (percentage of sediment passing a U.S. No. 200 sieve) content of the sediment is greater than 10% of the finest limit allowable for sediment placement to down coast east of Santa Barbara beach. This appreciable amount of “fines”, a clay (CL) was found in the bottommost 1/3rd (1.6 feet) of this borehole, while the upper 2/3rds (3.5 feet) consisted of coarse grained sediment of poorly graded sand (SP) with Silt (SM). The presence of fines within the lower 1/3rd of this borehole resulted in this entire borehole’s individual weighted average being calculated as 7 percentage points above the fine limits curve for down coast east of Santa Barbara beach. With adherence strictly to the calculation, the sediment within the entire borehole would appear to be <u>in</u>compatible for placement at down coast east of Santa Barbara beach.

Although incompatible, the amount of "fines" or clay (CL) layer of sediment present within the lowermost 1/3rd of borehole location A2-11 is small, when compared to the entire borehole. This amount becomes even smaller when this clay layer is compared to the rest of the four individual boreholes in the entire Area 2. These boreholes all contain sediment that is fine to medium grained, poorly grained sand (SP) with some small amount of poorly graded sand with silt (SP-SM). Thus clay layer found in the bottommost 1/3rd of borehole A2-11 is surrounded by sandy sediment and therefore is likely of limited extent.

In addition, the composite weighted average grain size curve for of all five of boreholes in Area 2 fits very well within the grain size compatibility envelopes for down coast east of Santa Barbara beach. This composite gradation calculation also includes the "fines" in the vicinity of the bottommost 1/3rd of vibratory core borehole A2-11. The final makeup of future sediment to be dredged from area A will consist of a composite gradation very similar to that found in these calculations (part B figures).

Recommendations.

The recommendations for disposition and beach compatibility of future Corps of Engineers dredged sediment from the harbor are based on this physical grain size analysis report and the bulk sediment chemistry test results. The recommendations based on physical analysis are that sediments from all five dredge footprint areas of Santa Barbara Harbor are compatible for placement directly on and/or in the nearshore area of a downcoast beach east of Santa Barbara Harbor.

Furthermore, the composite average grain size curves (overall sediment gradation), for all five core samples collected from Area 2 fit within the grain size compatibility envelopes for the receiving beach. The relatively small amount of clay will easily be dispersed as it is mixed with the sand during dredging. This will result in very little noticeable clay being actually placed on the beach.

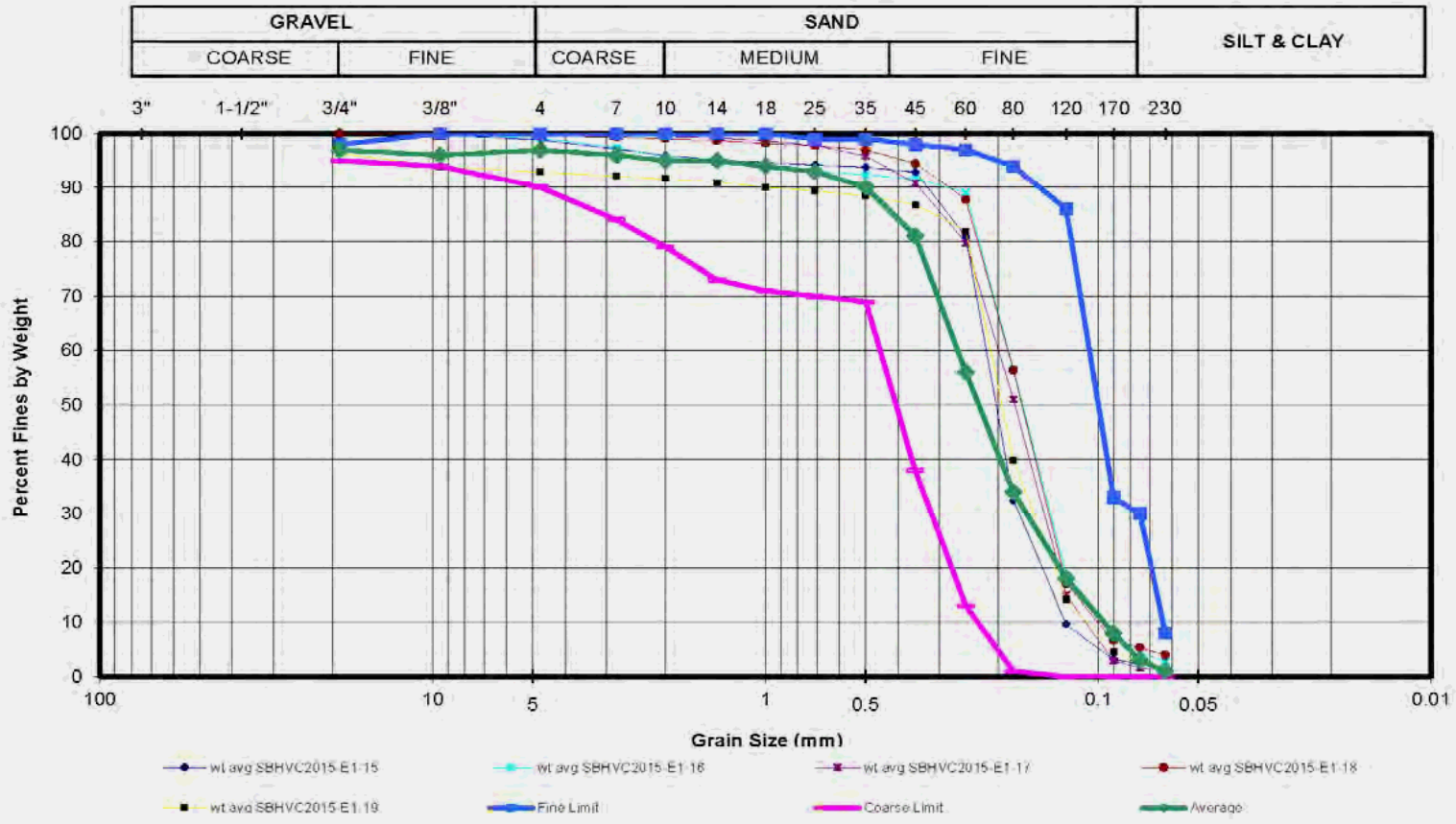
Description of dredge footprint sediment beyond overdredge depth limits.

Additional geotechnical descriptive logging, sampling and gradation analysis testing was performed for sediment beyond the overdredge depth limits for each of the dredge footprint areas. This was accomplished as part of the general investigation efforts for this project and was based on those portions of cores collected from beyond the overdredge depth limits from all vibracore boreholes drilled during the investigation. The soil classification description for the sediment from all of the footprint areas beyond the overdredge depths is poorly graded sand (SP) with some silty sand (SM) and very small amount of clayey sand (SC). The range of grain sizes for this type of sediment is from 0.9 to 0.05 mm diameter. This is equivalent to a fine to medium grained sand with some silt and very slight amounts of clay. Gradation sample results for this deeper sediment are seen in the figure table, Part C, within the back of this report. The figure is titled: "2015 Santa Barbara Harbor Geotechnical and

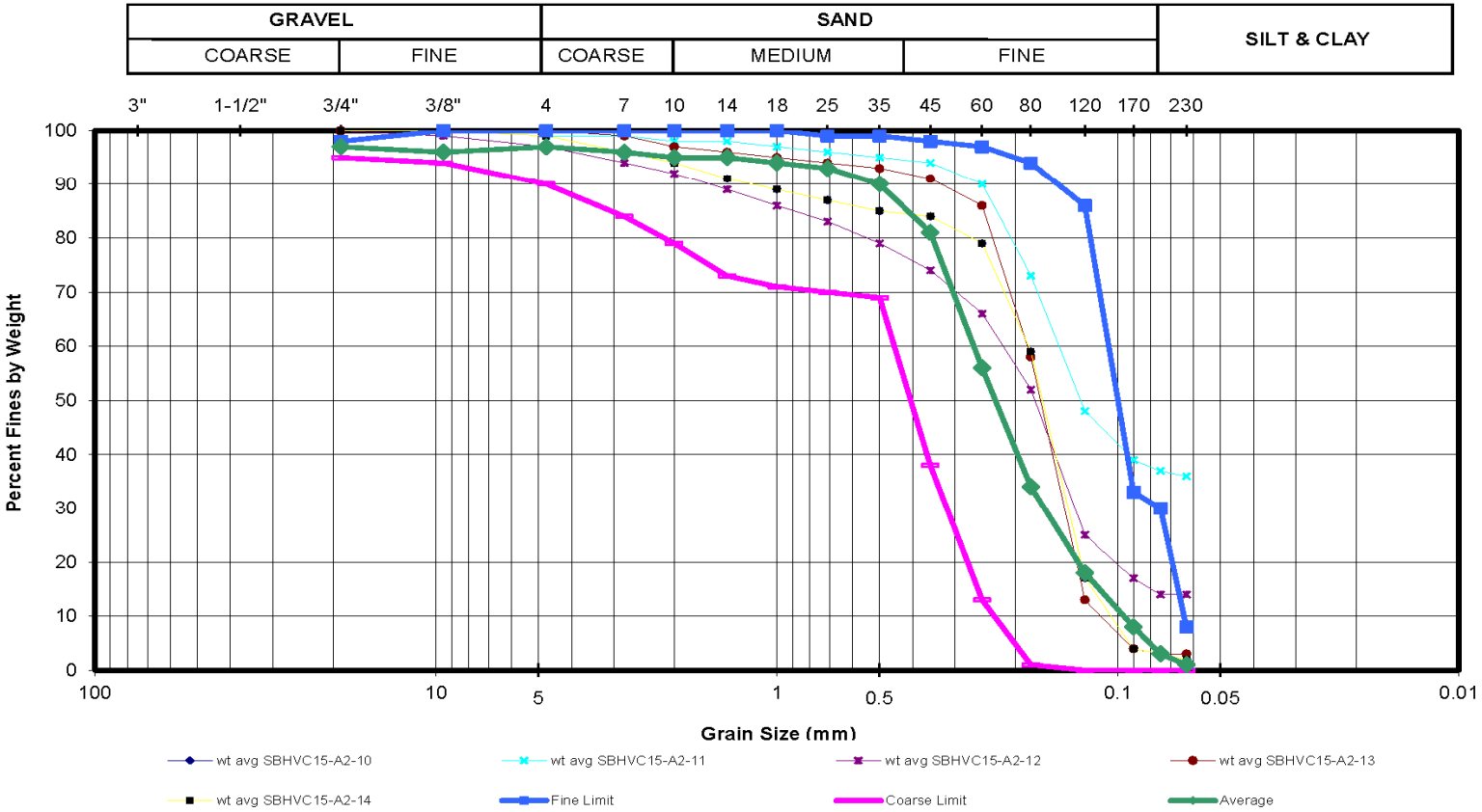
Environmental Investigation. Vibracore Sample Individual Locations Gradation Test Results, for all dredge areas beyond overdepth".

Part A Figures

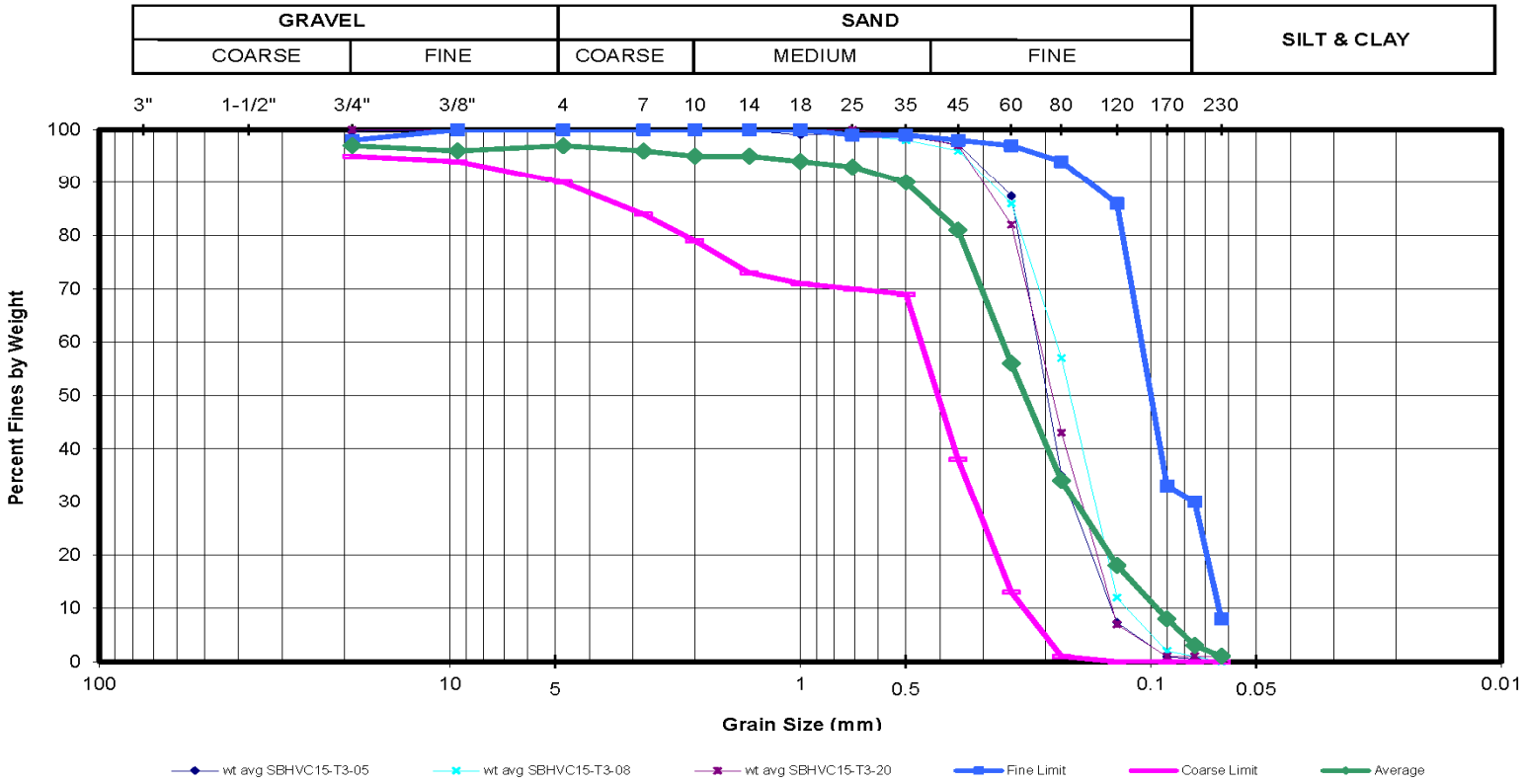
Grain Size Compatibility Analysis Graphs, showing individual weighted average curves



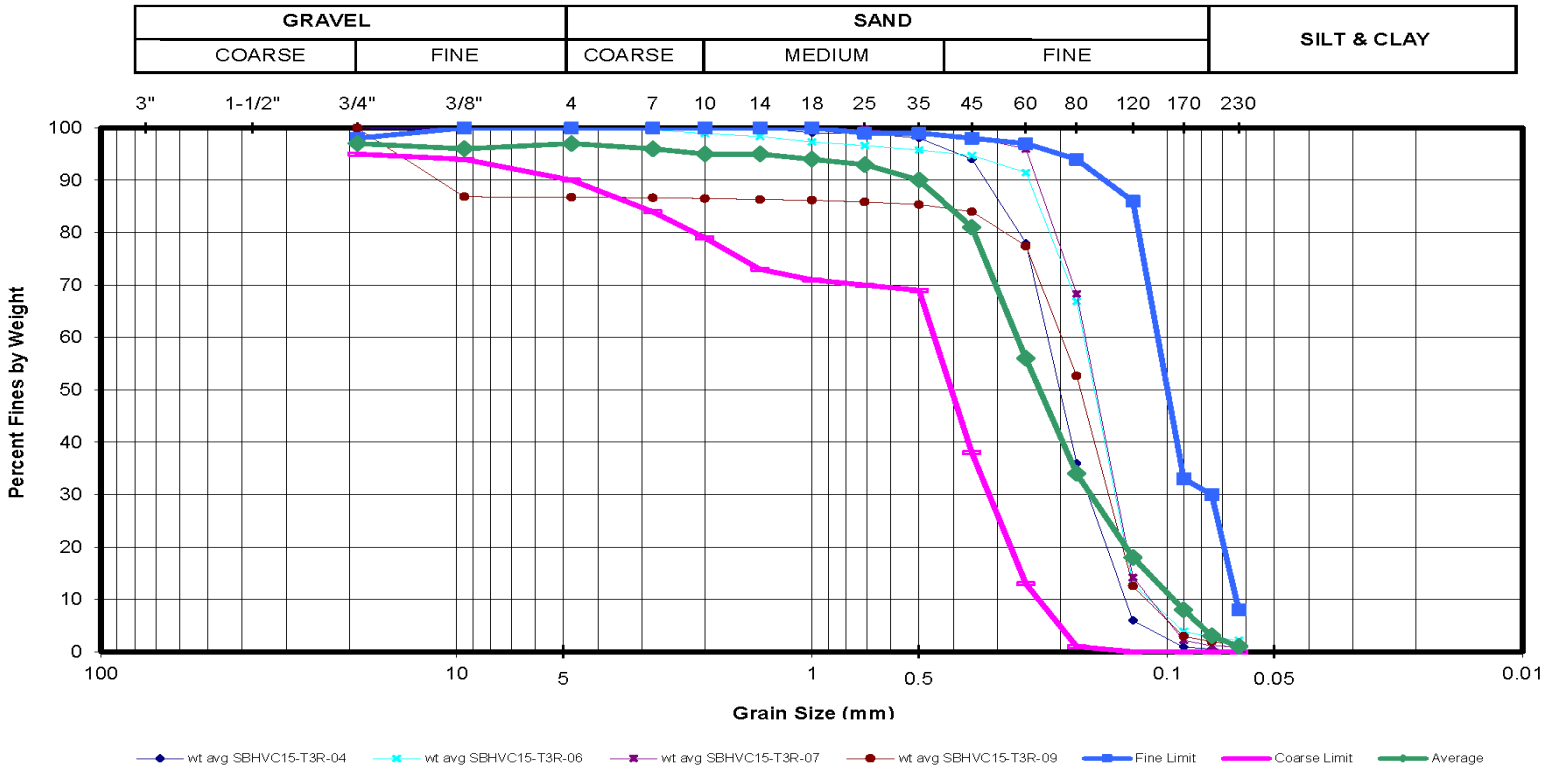
"Santa Barbara Harbor Entrance Channel, Area 1", 2015 vibracores 15 to 19. <u>Individual</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -20 and Over Dredge depth of -22 ft MLLW, compared to placement site.



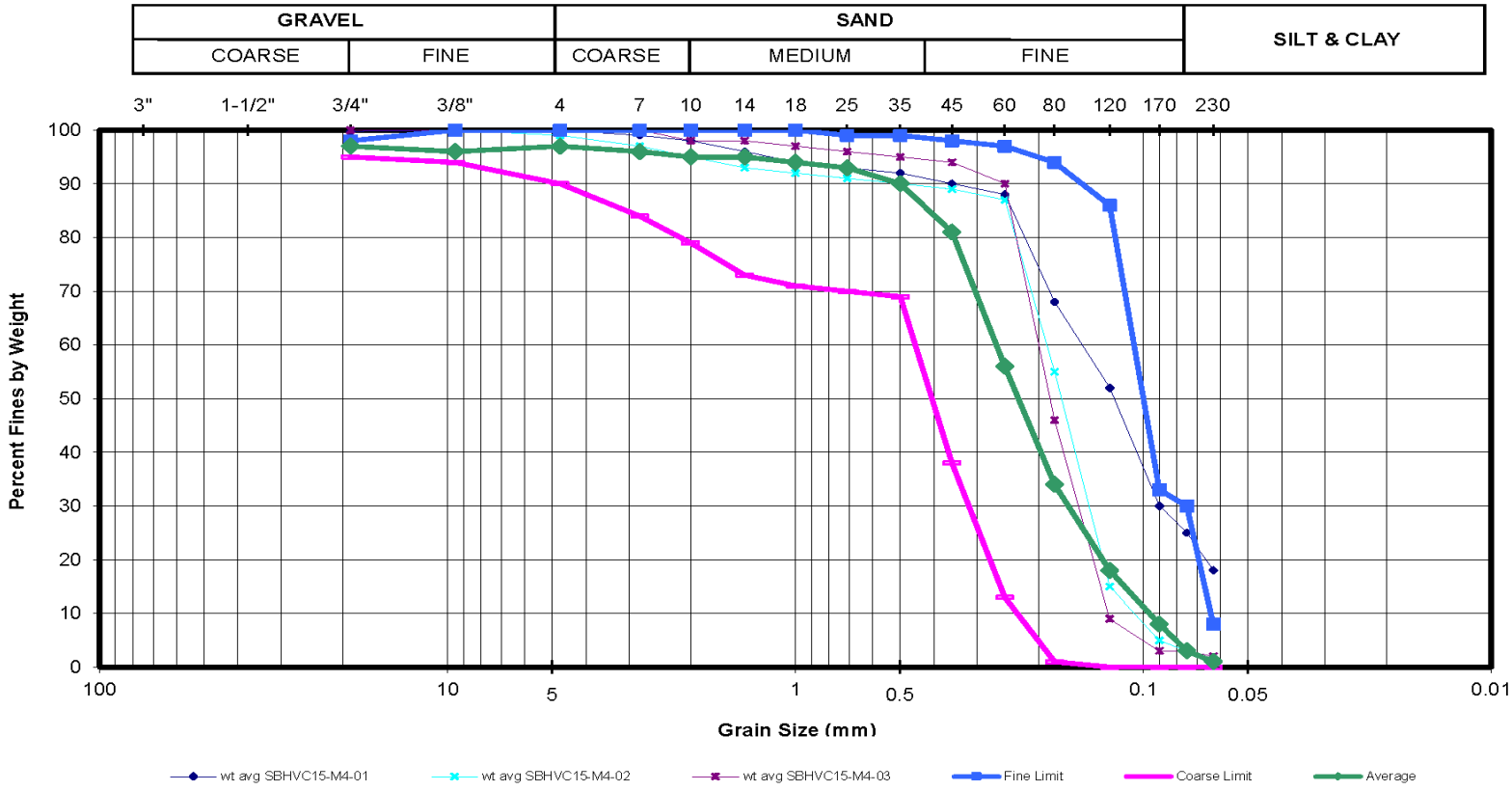
"Santa Barbara Harbor Approach Channel, Area 2", 2015 vibracores 10 to 14. <u>Individual</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -35 ft MLLW and Over Dredge depth of -37 ft MLLW, compared to placement site.



"Santa Barbara Harbor Approach Channel, Area 3, Turning Area Inside", vibracores 5, 8 and 20. <u>Individual</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -28 and Over Dredge depth of -30 ft MLLW, compared to placement site.



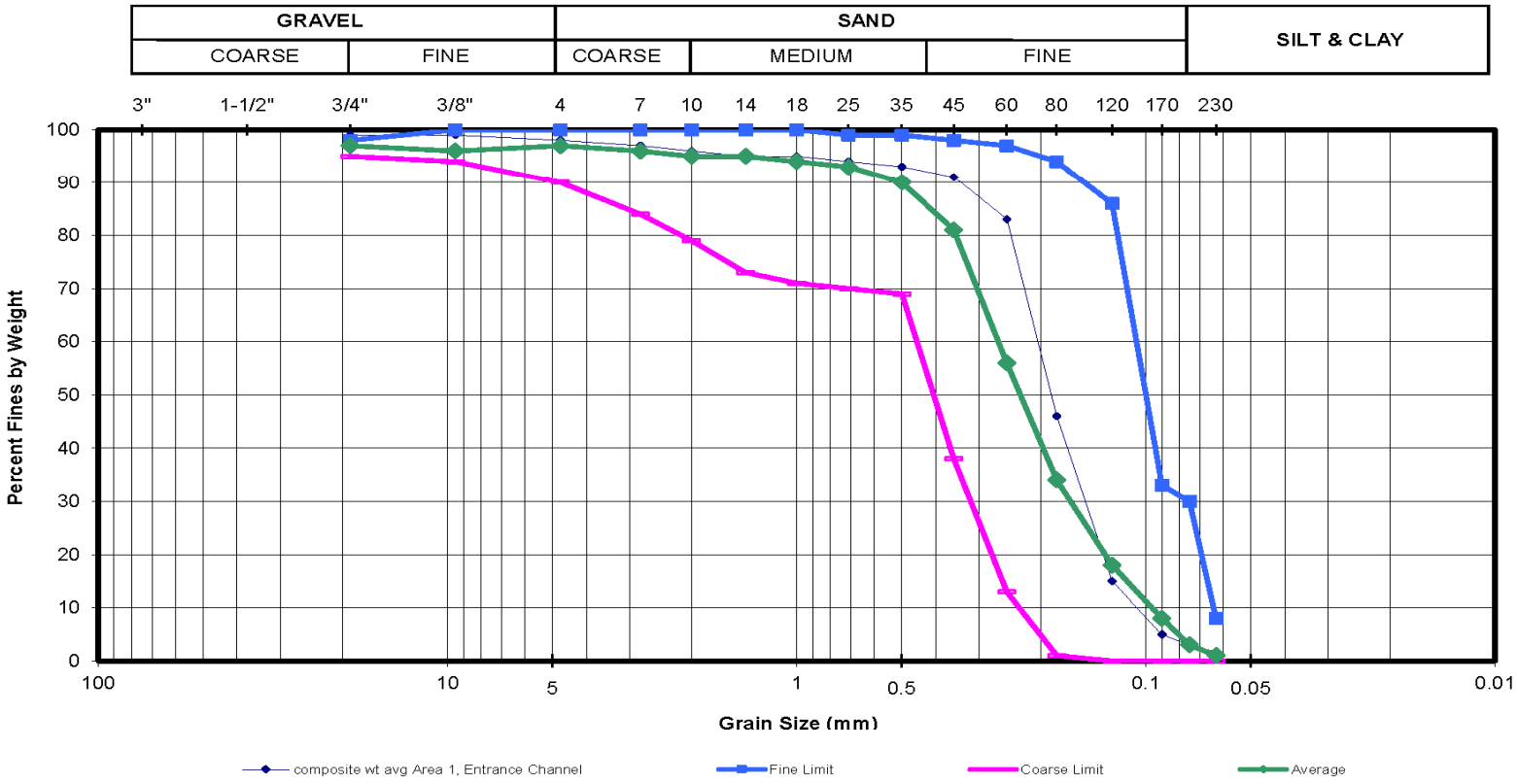
"Santa Barbara Harbor Approach Channel, Area 3, Turning Area Outside", vibracores 4, 6, 7 and 9. <u>Individual</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -20 and Over Dredge depth of -22 ft MLLW, compared to placement site.



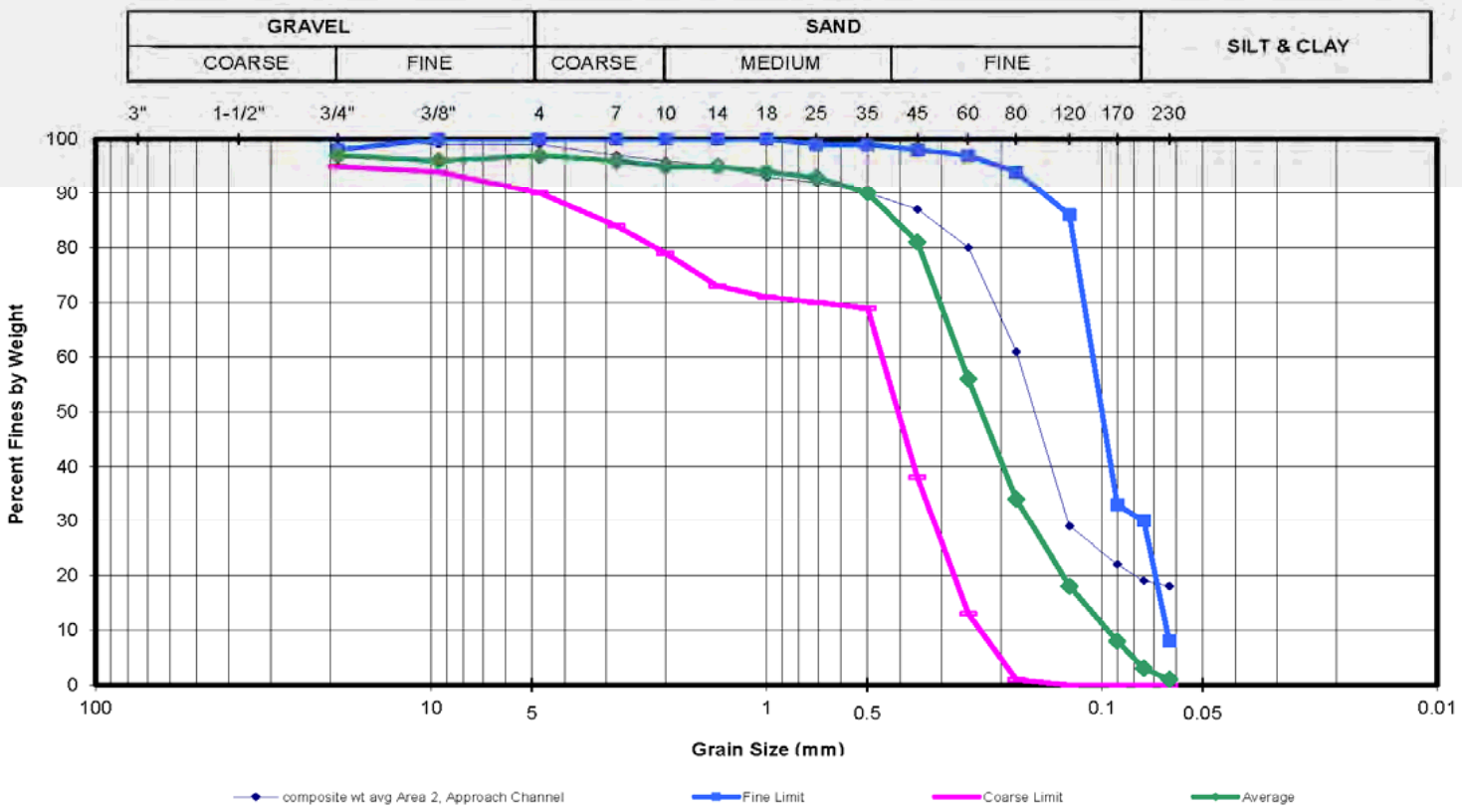
"Santa Barbara Harbor Approach Channel, Area 4, Marina", vibracores 1 to 3. <u>Individual</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -15 and Over Dredge depth of -17 ft MLLW, compared to placement site.

Part B Figures

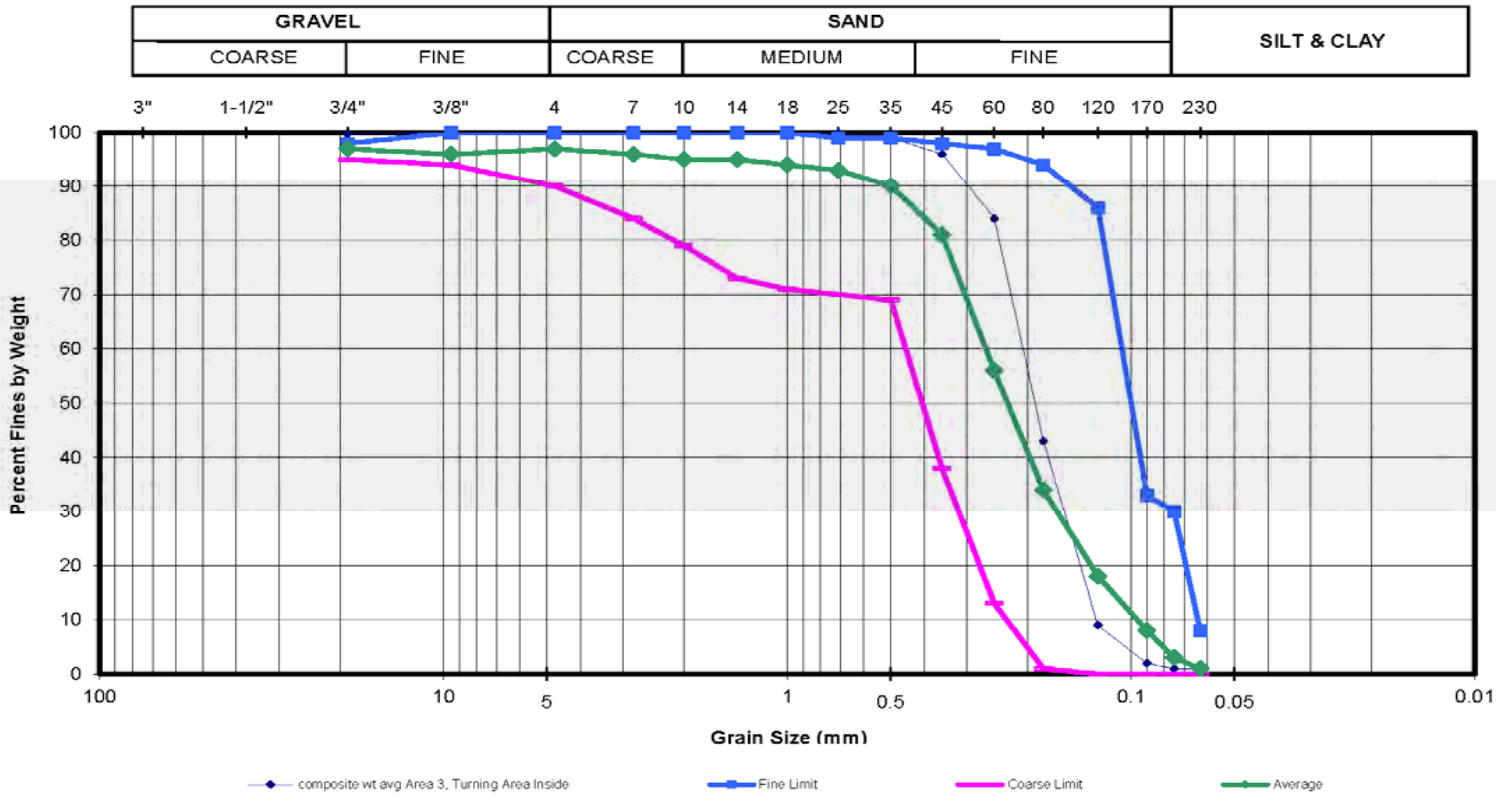
Grain Size Compatibility Analysis Graphs, showing <u>composite</u> weighted average curves



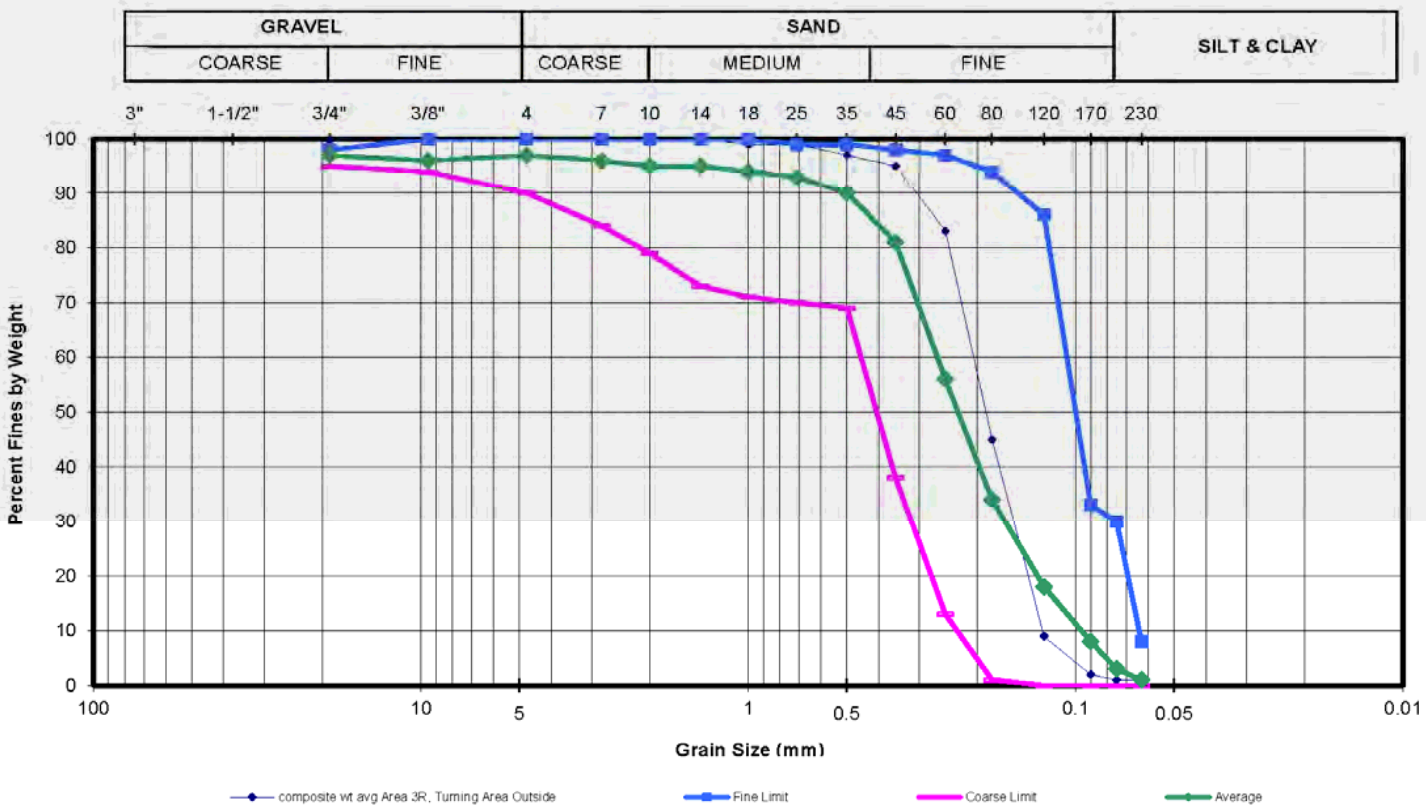
"Santa Barbara Harbor Entrance Channel, Area 1", 2015 vibracores 15 to 19. <u>Composite</u> weighted average Beach Compatibility Gradation Curves to Project Depth of -20 and Over Dredge depth of -22 ft MLLW, compared to placement site.



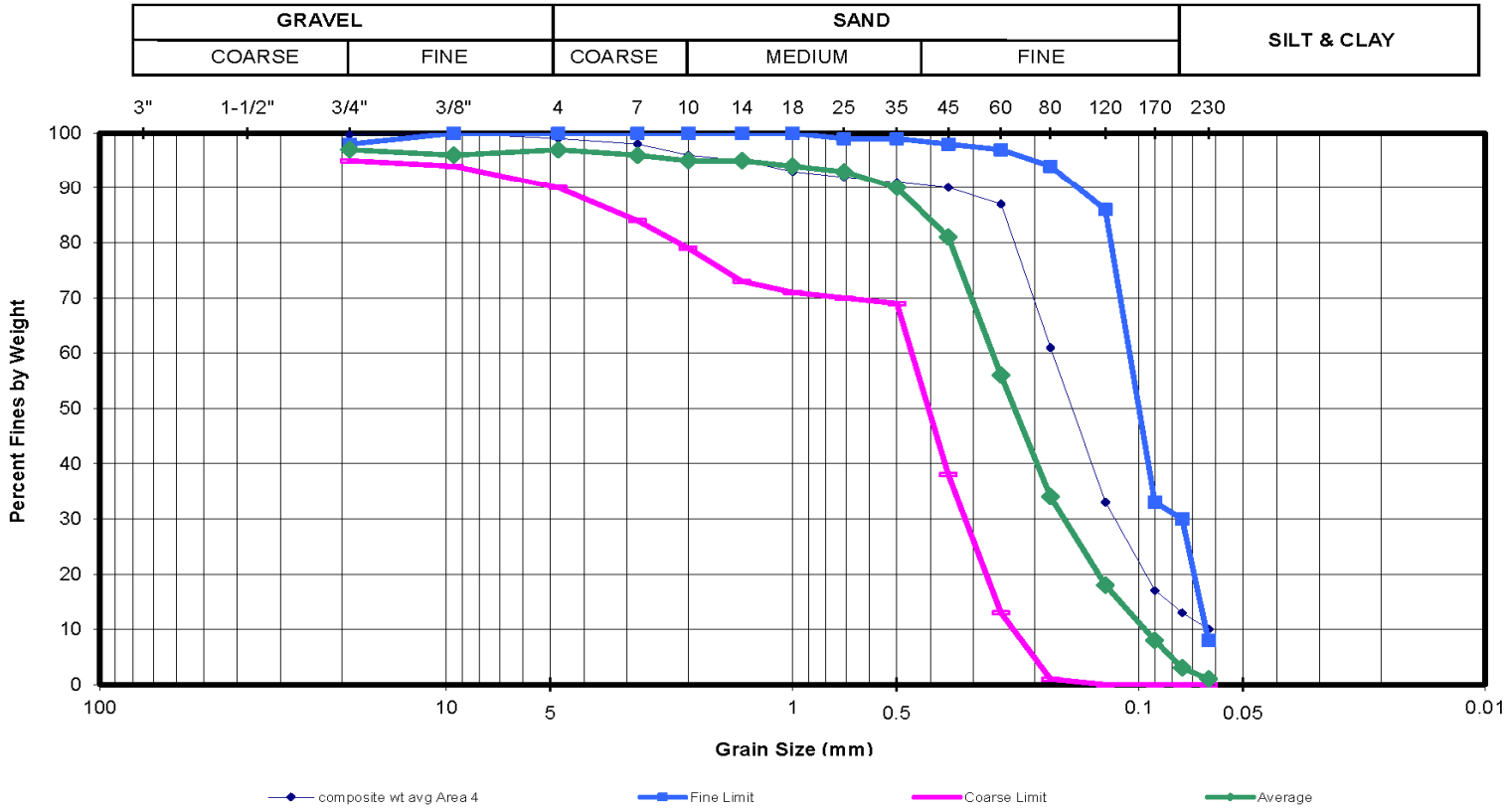
"Santa Barbara Harbor Approach Channel, Area 2", 2015 vibracores 10 to 14. Composite weighted average Beach Compatibility Gradation Curves to Project Depth of -35 ft MLLW and Over Dredge depth of -37 ft MLLW, compared to placement site.



"Santa Barbara Harbor Approach Channel, Area 3, Turning Area Inside", vibracores 5, 8 and 20. Composite weighted average Beach Compatibility Gradation Curves to Project Depth of -28 and Over Dredge depth of -30 ft MLLW, compared to placement site.



"Santa Barbara Harbor Approach Channel, Area 3, Turning Area Outside", vibracores 4, 6, 7 and 9. Composite weighted average Beach Compatibility Gradation Curves to Project Depth of -20 and Over Dredge depth of -22 ft MLLW, for placement site.



"Santa Barbara Harbor, Area 4, Marina", vibracores 1 to 3. Composite weighted average Beach Compatibility Gradation Curves to Project Depth of -15 and Over Dredge depth of -17 ft MLLW, compared to placement site.

Part C Plates

Vibratory Core Borehole Sample and Placement Site Sample Locations, and Gradation Test Results

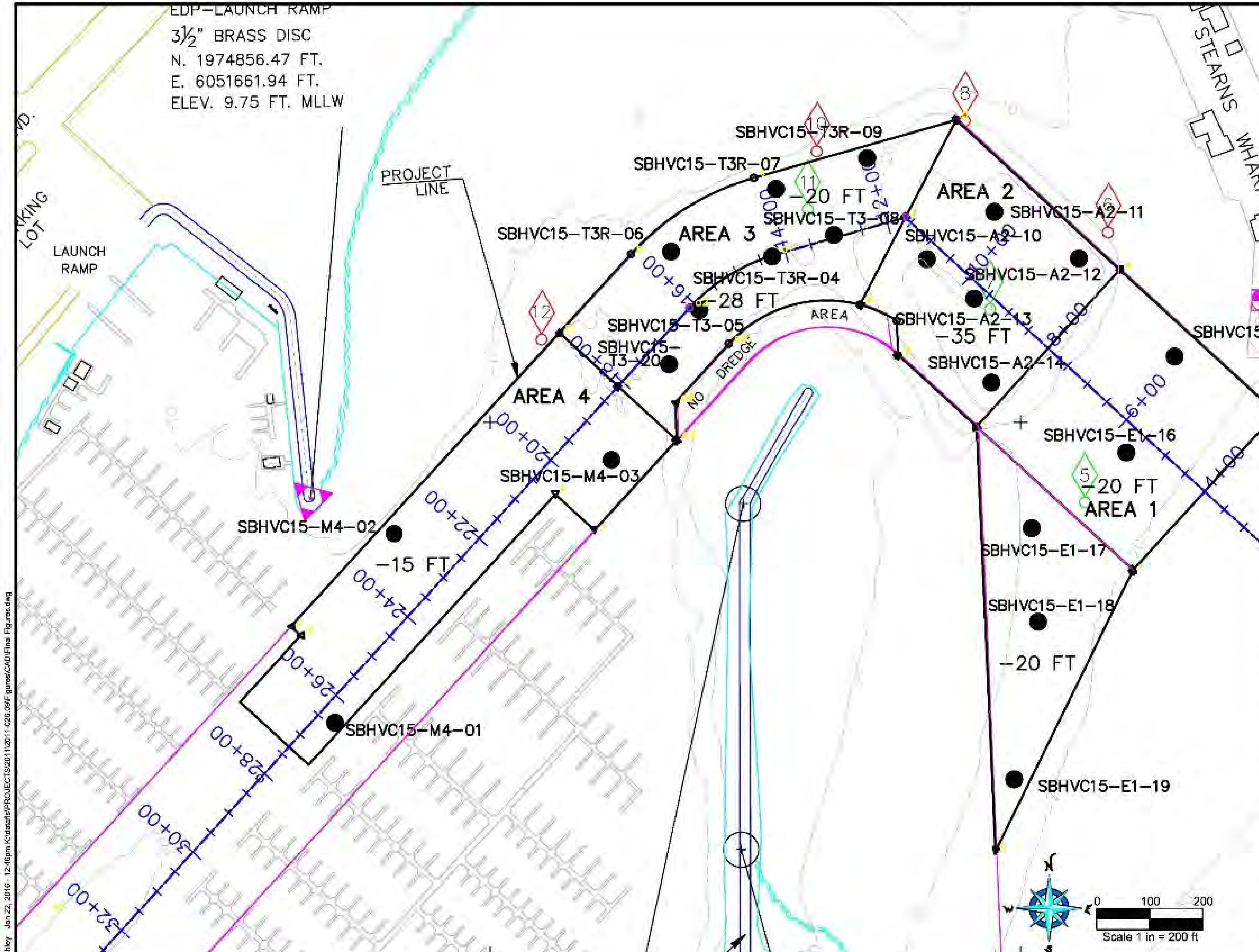


TABLE OF COORDINATES BOREHOLE LOCATION		
POINT	EASTING	NORTHING
SBHVC15-E1-15	6053287.872	1975123.6
SBHVC15-E1-16	6053199.382	1974943.098
SBHVC15-E1-17	6053020.996	1974800.502
SBHVC15-E1-18	6053033.124	1974624.381
SBHVC15-E1-19	6052987.937	1974327.894
SBHVC15-A2-10	6052823.372	1975307.312
SBHVC15-A2-11	6052950.567	1975396.17
SBHVC15-A2-12	6053109.975	1975308.57
SBHVC15-A2-13	6052912.625	1975233.019
SBHVC15-A2-14	6052945.173	1975074.753
SBHVC15-T3R-04	6052531.835	1975312.207
SBHVC15-T3-05	6052394.392	1975211.391
SBHVC15-T3-08	6052648.173	1975352.718
SBHVC15-T3-20	6052337.38	1975109.225
SBHVC15-T3R-06	6052340.946	1975321.481
SBHVC15-T3R-07	6052539.01	1975439.476
SBHVC15-T3R-09	6052710.933	1975497.253
SBHVC15-M4-01	6051707.609	1974434.331
SBHVC15-M4-02	6051819.183	1974790.362
SBHVC15-M4-03	6052228.769	1974929.064

Santa Barbara Harbor 2015 Final Vibratory Core Borehole Sampling Plan Locations.

Down coast east of Santa Barbara beach 2015 Final Grab Sampling Plan Locations.


Transect A
Transect B
Transect C

Down coast east of Santa Barbara beach Profile Transects.

2015 Santa Barbara Harbor Geotechnical and Environmental Investigation. Vibracore Sample Individual Locations Gradation Test Results, for all dredge areas beyond overdepth.

Dredge Footprint Area	Boring ID	Depth (ft)		Elevation (ft)		Fine Gravel		Coarse Sand			Medium Sand				Fine Sand						Silt	Atterberg Limits		Soil Classification
						U.S. Sieve Number/Sieve Results/Percent Passing																		
						3/4"	3/8"	4	7	10	14	18	25	35	45	60	80	120	170	200	230			
		Top	Bottom	Top	Bottom	19 mm	9.5 mm	4.75 mm	2.8 mm	2 mm	1.4 mm	1.0 mm	0.71 mm	0.50 mm	0.355 mm	0.250 mm	0.18 mm	0.125 mm	0.09 mm	0.075 mm	0.063 mm	LL	PL	
Area 1, Entrance Channel	SBHVC15-E1-15	5.1	8.1	-22	-25	100	100	100	100	100	99	99	98	96	95	92	80	44	19	13	9			SILTY SAND (SM)
	SBHVC15-E1-16	4.4	7	-22	-24.6	100	100	100	100	99	97	96	95	94	92	85	61	21	7	4	2			POORLY GRADED SAND (SP)
	SBHVC15-E1-16	7	11	-24.6	-28.6	100	100	100	100	100	100	98	97	96	95	92	84	66	38	20	9			SILTY SAND (SM)
	SBHVC15-E1-17	4.7	7.7	-22	-25	100	100	100	100	99	98	97	96	95	93	85	62	15	2	1	1			POORLY GRADED SAND (SP)
	SBHVC15-E1-18	3.2	6.2	-22	-25	100	100	100		98	97	96	96	94	93	86	63	19	4	2	1			POORLY GRADED SAND (SP)
	SBHVC15-E1-19	5.2	8.2	-22	-25	97	93	91	90	89	88	87	86	86	85	82	67	28	10	4	2			POORLY GRADED SAND (SP)
Area 2, Approach Channel	SBHVC15-A2-10	6.7	7.8	-37	-38.1	100	100	100	100	99	98	97	96	94	94	91	86	46	23	19	15			SILTY SAND (SM)
	SBHVC15-A2-10	7.8	9.7	-38.1	-40	100	100	100	100	99	98	97	96	95	91	83	50	13	3	2	1			POORLY GRADED SAND (SP)
	SBHVC15-A2-11	5.1	7.8	-37	-39.7	100	100	100	100	100	100	99	93	73	61	52	42	31	22	18	5			CLAYEY SAND (SC)
	SBHVC15-A2-12	5.5	7.2	-37	-38.7	100	98	96	90	84	79	74	70	64	58	48	38	28	20	18	3			CLAYEY SAND (SC)
	SBHVC15-A2-12	7.2	8.5	-38.7	-40	100	100	100	98	96	93	91	90	89	87	82	68	37	18	12	4			POORLY GRADED SAND WITH SILT (SP-SM)
	SBHVC15-A2-13	6.6	7.1	-37	-37.5	97	95	95	94	92	89	87	85	82	76	65	42	11	4	3	2			POORLY GRADED SAND (SP)
	SBHVC15-A2-13	7.1	9.6	-37.5	-40	100	85	80	75	69	65	62	59	55	52	48	45	42	40	28	15			SILTY SAND WITH GRAVEL (SM)
	SBHVC15-A2-14	7	8	-37	-38	100	100	100	99	98	97	97	96	94	91	81	44	11	2	1	1			POORLY GRADED SAND (SP)
Area 3, Turning Area Inside	SBHVC15-T3-05	9.3	11.6	-29.6	-31.9	100	100	100	100	100	100	100	99	97	93	86	79	72	55	51	45	51	32	SANDY ELASTIC SILT (MH)
	SBHVC15-T3-08	9	12	-30	-33	98	98	98	98	98	97	97	96	93	87	73	44	33	1	1	0			POORLY GRADED SAND (SP)
	SBHVC15-T3-20	10	12.4	-30	-32.4	100	99	99	99	99	99	99	99	98	94	74	27	3	0	0	0			POORLY GRADED SAND (SP)
Area 3, Turning Area Outside	SBHVC15-T3R-04	12	12.5	-30	-30.5	100	100	100	100	99	99	98	97	94	86	66	28	6	1	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3R-06	2.7	5.7	-22	-25	100	100	100	100	100	100	100	100	99	98	93	57	12	2	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3R-07	2.2	5.2	-22	-25	100	100	100	100	100	100	100	100	99	96	85	45	7	1	0	0			POORLY GRADED SAND (SP)
	SBHVC15-T3R-09	2.9	5.9	-22	-25	100	100	100	100	100	100	100	99	98	94	84	64	20	4	2	2			POORLY GRADED SAND (SP)
Area 4, Marina	SBHVC15-M4-01	1.9	4.9	-17	-20	100	100	100	100	100	100	99	99	98	97	94	86	42	22	16	10			CLAYEY SAND (SC)
	SBHVC15-M4-02	2.2	4.3	-17	-19.1	100	100	100	100	99	98	98	97	96	95	92	79	21	5	3	2			POORLY GRADED SAND (SP)
	SBHVC15-M4-03	0.7	3.7	-17	-20	100	100	100	99	97	95	93	92	91	90	87	57	14	4	2	2			POORLY GRADED SAND (SP)

2015 Santa Barbara Harbor Geotechnical and Environmental Investigation. Grab Sample Individual Locations, Gradation Test Results, for East Beach, beach profile transects A, B and C.

Dredge Footprint Area	Grab Sample ID	Depth (ft)		Elevation (ft MLLW))		Fine Gravel		Coarse Sand			Medium Sand				Fine Sand						Silt	Atterberg Limits		Soil Classification
						U.S. Sieve Number/Sieve Results/Percent Passing																		
						3/4"	3/8"	4	7	10	14	18	25	35	45	60	80	120	170	200	230			
		Top	Bottom	Top	Bottom	19 mm	9.5 mm	4.75 mm	2.8 mm	2 mm	1.4 mm	1.0 mm	0.71 mm	0.50 mm	0.355 mm	0.250 mm	0.18 mm	0.125 mm	0.09 mm	0.075 mm	0.063 mm	LL	PL	
East Beach Transect A	SBH-T1-1	0	1	12	11	100	100	100	100	100	99	99	99	97	89	59	29	5	1	1	0			POORLY GRADED SAND (SP)
	SBH-T1-2	0	1	6	5	100	100	100	100	100	99	97	94	90	80	27	6	1	0	0	0			POORLY GRADED SAND (SP)
	SBH-T1-3	0	1	0	-1	96	95	90	84	79	73	71	70	69	69	68	65	47	7	0	0			POORLY GRADED SAND (SP)
	SBH-T1-4	0	1	-6	-7	100	100	100	100	99	99	99	98	95	88	65	34	9	2	1	1			POORLY GRADED SAND (SP)
	SBH-T1-5	0	1	-12	-13	100	100	100	100	100	100	100	99	99	98	97	94	86	33	11	7			POORLY GRADED SAND WITH SILT (SP-SM)
	SBH-T1-6	0	1	-22	-23	100	100	100	100	100	100	100	99	97	92	81	62	39	33	20	8			SILTY SAND (SM)
	SBH-T1-7	0	1	-28	-29	100	100	100	100	100	100	100	100	100	98	96	94	92	90	74	47			SILT WITH SAND (ML)
	SBH-T1-8	0	1	-30	-31	100	100	100	100	100	100	100	99	96	92	87	82	77	73	54	47	NP	NP	SANDY SILT (ML)
East Beach Transect B	SBH-T2-1	0	1	12	11	100	100	100	100	99	99	99	98	92	74	38	13	2	1	0	0			POORLY GRADED SAND (SP)
	SBH-T2-2	0	1	6	5	100	100	100	100	100	100	100	99	98	92	66	17	1	0	0	0			POORLY GRADED SAND (SP)
	SBH-T2-3	0	1	0	-1	100	100	100	100	100	100	100	99	99	98	95	54	11	1	0	0			POORLY GRADED SAND (SP)
	SBH-T2-4	0	1	-6	-7	100	95	94	94	93	93	93	92	90	85	63	21	3	1	0	0			POORLY GRADED SAND (SP)
	SBH-T2-5	0	1	-12	-13	100	100	100	100	100	98	98	97	95	91	82	65	37	19	9	4			POORLY GRADED SAND WITH SILT (SP-SM)
	SBH-T2-6	0	1	-18	-19	100	100	100	100	100	100	100	99	98	96	89	70	41	33	25	14			SILTY SAND (SM)
	SBH-T2-7	0	1	-24	-25	100	100	100	100	100	100	100	100	99	96	90	82	73	67	55	31			SANDY SILT (ML)
	SBH-T2-8	0	1	-30	-31	100	100	100	100	100	99	99	97	93	89	82	74	65	62	50	33			SANDY SILT (ML)
East Beach Transect B	SBH-T3-1	0	1	12	11	100	100	100	100	99	99	99	99	99	95	48	14	1	0	0	0			POORLY GRADED SAND (SP)
	SBH-T3-2	0	1	6	5	100	100	100	100	100	99	98	97	95	88	64	20	2	0	0	0			POORLY GRADED SAND (SP)
	SBH-T3-3	0	1	0	-1	100	96	91	86	84	82	82	81	80	80	78	70	16	1	0	0			POORLY GRADED SAND (SP)
	SBH-T3-4	0	1	-6	-7	100	96	95	94	94	93	93	92	91	87	77	52	18	3	1	1			POORLY GRADED SAND (SP)
	SBH-T3-5	0	1	-12	-13	98	94	90	87	85	84	83	82	81	78	58	34	21	15	5	3			POORLY GRADED SAND WITH SILT (SP-SM)
	SBH-T3-6	0	1	-18	-19	100	100	100	100	100	100	100	100	100	99	97	93	83	79	50	25			SANDY SILT (ML)
	SBH-T3-7	0	1	-24	-25	100	100	100	100	100	100	100	100	99	98	93	88	79	71	45	33			SILTY SAND (SM)
	SBH-T3-8	0	1	-30	-31	100	100	100	100	100	100	100	100	99	99	96	90	78	75	68	58			SILT WITH SAND (ML)

2015 Santa Barbara Harbor Geotechnical and Environmental Investigation. Vibracore Sample Individual Locations Gradation Test Results, for all dredge areas from mudline to project depth, plus overdepth.

Dredge Footprint Area	Boring ID	Depth (ft)		Elevation (ft MLLW))		Fine Gravel		Coarse Sand			Medium Sand				Fine Sand						Silt	Atterberg Limits		Soil Classification
						U.S. Sieve Number/Sieve Results/Percent Passing																		
						3/4"	3/8"	4	7	10	14	18	25	35	45	60	80	120	170	200	230			
		Top	Bottom	Top	Bottom	19 mm	9.5 mm	4.75 mm	2.8 mm	2 mm	1.4 mm	1.0 mm	0.71 mm	0.50 mm	0.355 mm	0.250 mm	0.18 mm	0.125 mm	0.09 mm	0.075 mm	0.063 mm	LL	PL	
Area 1, Entrance Channel	SBHVC15-E1-15	0	5.1	-16.9	-22	100	100	99	97	96	95	95	94	94	93	81	32	10	3	2	2			POORLY GRADED SAND (SP)
	SBHVC15-E1-16	0	4.4	-17.6	-22	100	100	99	97	96	95	94	93	92	92	89	57	19	8	5	3			POORLY GRADED SAND WITH SILT (SP-SM)
	SBHVC15-E1-17	0	4.7	-17.3	-22	100	100	100	100	100	99	99	98	96	91	80	51	15	3	2	1			POORLY GRADED SAND (SP)
	SBHVC15-E1-18	0	3.2	-18.8	-22	100	100	100	99	99	99	98	98	97	94	88	56	17	7	5	4			POORLY GRADED SAND WITH SILT (SP-SM)
	SBHVC15-E1-19	0	5.2	-16.8	-22	96	94	93	92	92	91	90	89	88	87	82	40	14	5	2	2			POORLY GRADED SAND (SP)
Area 2, Approach Channel	SBHVC15-A2-10	0	3.2	-30.3	-33.5	100	100	99	97	95	93	92	92	90	89	73	36	9	2	2	1			POORLY GRADED SAND (SP)
	SBHVC15-A2-10	3.2	6.7	-33.5	-37	100	100	100	100	100	100	99	99	98	96	93	81	25	6	4	3			POORLY GRADED SAND (SP)
	SBHVC15-A2-11	0	1.4	-31.9	-33.3	100	99	98	97	95	93	91	89	87	85	80	72	37	19	16	12			SILTY SAND (SM)
	SBHVC15-A2-11	1.4	3.5	-33.3	-35.4	100	100	100	100	100	100	99	99	98	96	90	53	17	7	5	5			POORLY GRADED SAND WITH SILT (SP-SM)
	SBHVC15-A2-11	3.5	5.1	-35.4	-37	100	100	100	100	100	100	100	100	100	99	99	99	99	98	98	98	44	23	LEAN CLAY (CL)
	SBHVC15-A2-12	0	5.5	-31.5	-37	100	99	97	94	92	89	86	83	79	74	66	52	25	17	14	14			SILTY SAND (SM)
	SBHVC15-A2-13	0	6.6	-30.4	-37	100	100	100	99	97	96	95	94	93	91	86	58	13	4	3	3			POORLY GRADED SAND (SP)
	SBHVC15-A2-14	0	4.2	-30	-34.2	100	100	99	93	90	86	83	81	78	77	72	48	14	5	3	2			POORLY GRADED SAND (SP)
	SBHVC15-A2-14	4.2	7	-34.2	-37	100	100	100	100	99	99	98	97	96	95	89	74	21	2	1	1			POORLY GRADED SAND (SP)
Area 3, Turning Area Inside	SBHVC15-T3-05	0	9.3	-20.3	-29.6	100	100	100	100	100	100	100	99	99	97	87	35	7	1	1	0			POORLY GRADED SAND (SP)
	SBHVC15-T3-08	0	4	-21	-25	100	100	100	100	100	99	99	99	98	98	93	70	17	4	3	2			POORLY GRADED SAND (SP)
	SBHVC15-T3-08	4	9	-25	-30	100	100	100	100	100	100	100	99	98	94	80	47	8	1	0	0			POORLY GRADED SAND (SP)
	SBHVC15-T3-20	0	4.5	-20	-24.5	100	100	100	100	100	100	100	100	99	96	75	33	5	1	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3-20	4.5	5.9	-24.5	-25.9	100	100	100	100	100	99	99	98	97	95	84	64	21	3	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3-20	5.9	10	-25.9	-30	100	100	100	100	100	100	100	100	100	98	90	48	5	0	0	0			POORLY GRADED SAND (SP)
Area 3R, Turning Area Outside	SBHVC15-T3R-04	0	4.9	-18	-22.9	100	100	100	100	100	100	100	100	99	96	74	22	2	0	0	0			POORLY GRADED SAND (SP)
	SBHVC15-T3R-04	4.9	12	-22.9	-30	100	100	100	100	100	100	99	99	97	93	82	45	10	2	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3R-06	0	2.7	-19.3	-22	100	100	100	100	99	98	97	97	96	95	91	67	13	4	3	2			POORLY GRADED SAND (SP)
	SBHVC15-T3R-07	0	2.2	-19.8	-22	100	100	100	100	100	100	100	100	99	98	96	68	14	2	1	1			POORLY GRADED SAND (SP)
	SBHVC15-T3R-09	0	2.9	-19.1	-22	100	87	87	87	87	86	86	86	85	84	77	53	13	3	2	1			POORLY GRADED SAND (SP)
Area 4, Marina	SBHVC15-M4-01	0	0.9	-15.1	-16	100	100	100	98	96	93	91	89	87	85	83	46	44	23	18	12			SILTY SAND (SM)
	SBHVC15-M4-01	0.9	1.5	-16	-16.6	100	100	100	100	100	100	100	99	99	99	98	94	72	44	36	25	38	29	CLAYEY SAND (SC)
	SBHVC15-M4-01	1.5	1.9	-16.6	-17	100	100	100	100	98	97	95	94	92	89	86	80	43	25	23	6			CLAYEY SAND (SC)
	SBHVC15-M4-02	0	2.2	-14.8	-17	100	100	99	97	95	93	92	91	90	89	87	55	15	5	3	2	NP	NP	POORLY GRADED SAND (SP)
	SBHVC15-M4-03	0	0.7	-16.3	-17	100	100	100	100	98	98	97	96	95	94	90	46	9	3	3	2			POORLY GRADED SAND (SP)

APPENDIX B

AIR QUALITY ANALYSIS

Santa Barbara Harbor Dredging
Air Quality Appendix

Emissions were estimated using emissions factors from EMFAC 2011 Off-road Construction Equipment and Industrial Equipment module as well as load factors and horsepower from CalEEMod. Power ratings for marine propulsion and auxiliary engines were based Port of Los Angeles Air Emissions Inventory or actual power ratings from vessels used in previous dredging cycles at Santa Barbara Harbor.

Estimate of maximum daily emissions assumed all off-road and harbor vessels to be in operation concurrently. Off-road equipment include one rubber-tired loader, excavator, and forklift. Harbor crafts include a tugboat and crew boat. Off-road equipment would be operating 10 hours per day. Marine propulsion engines would be operating 16 hours per day while marine auxiliary engines would be operating 24 hours per day. Emissions factors along with power ratings, load factors, and number of equipment were multiplied in a linear fashion to estimate maximum emissions in pounds per day for comparison to Santa Barbara APCD daily thresholds.

Estimate of annual GHG emissions assumed two 3-week dredging cycles per year. Each cycle would require use of off-road equipment for approximately 10 days per each dredging cycle for pipeline emplacement and removal. Harbor crafts would be used 21 days per each dredging cycle. Annual emissions of CO_2, CH_4, and N_2O in metric tons were converted to metric tons of CO_2 Equivalent using the U.S. EPA's GHG Equivalencies Calculator at:

https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

ASSUMPTIONS

	Equipment		Engine	Engine	Load		Emission Factor										Notes
Equipment	Units	Engine Count	(kW)	(Hp)	Factor			Units	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	
Rubber Tired Dozer	1	1		480	0.4			g/hp-hr	0.043	0.043	2.58	0.0101	3.46176	0.60455	540.32537	0.031	0.0138	1,2
Excavator	1	1		211	0.38			g/hp-hr	0.043	0.043	2.58	0.01	3.46176	0.25122	532.94436	0.03	0.0136	1,2
Forklift	1	1		200	0.2			g/hp-hr	0.043	0.043	2.58	0.01	3.46176	0.49145	533.68728	0.03	0.0136	1,2
Tug Boat Propulsion	1	1	223		0.31			g/kw-hr	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	3
Tug Boat Auxiliary	1	1	34		0.43			g/kw-hr	0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03	
Crew Boat Propulsion	1	1	370		0.38			g/kw-hr	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	4
Crew Boat Auxiliary	1	1	55		0.2			g/kw-hr	0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03	

DAILY EMISSIONS (LBS/DAY)					Load	Hours per	HP-HR per	Kw-HR per	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Equipment	Units	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF										
Rubber Tired Dozer	1	1		480	0.4	10	1920		0.182	0.182	10.935	0.043	14.672	2.562	2290.121	0.130	0.058	5
Excavator	1	1		211	0.38	10	801.8		0.076	0.076	4.567	0.018	6.127	0.445	943.300	0.054	0.024	5
Forklift	1	1		200	0.2	10	400		0.038	0.038	2.278	0.009	3.057	0.434	471.247	0.027	0.012	5
Tug Boat Propulsion	1	1	223		0.31	16		1106.1	1.319	1.172	41.509	0.024	27.835	3.345	1591.974	0.073	0.073	5
Tug Boat Auxiliary	1	1	34		0.43	24		350.88	0.232	0.209	4.857	0.008	3.873	0.271	505.019	0.008	0.023	5
Crew Boat Propulsion	1	1	216		0.38	16		1313.3	1.565	1.392	49.284	0.029	33.049	3.972	1890.195	0.087	0.087	5
Crew Boat Auxiliary	1	1	34		0.32	24		261.12	0.173	0.156	4.110	0.006	2.882	0.202	375.828	0.006	0.017	5
Daily Emissions (lbs/day)									**3.586**	**3.225**	**117.539**	**0.136**	**91.496**	**11.231**	**8067.685**	**0.384**	**0.295**	

ANNUAL EMISSIONS (TONS/YEAR)					Load	Hours per	HP-HR per	Kw-HR per	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Equipment	Days/Year	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF										
Rubber Tired Dozer	20	1		480	0.4	10	38400		3.219	3.219	193.114	0.750	259.115	36.785	39946.769	2.269	1.017	
Excavator	20	1		211	0.38	10	16036		46.675	41.488	1469.383	0.864	985.351	118.415	56355.172	2.593	2.593	
Forklift	20	1		200	0.2	10	8000		4.104	3.693	85.767	0.137	68.395	4.788	8918.664	0.137	0.410	
Tug Boat Propulsion	42	1	223		0.31	16		46455	160.543	142.705	5054.121	2.973	3389.234	407.303	193840.424	8.919	8.919	
Tug Boat Auxiliary	42	1	34		0.43	24		14737	5.626	5.063	133.703	0.188	93.761	6.563	12226.418	0.188	0.563	
Crew Boat Propulsion	42	1	216		0.38	16		55158	436.590	392.638	14311.673	16.613	11140.633	1367.451	982329.827	46.776	35.931	
Crew Boat Auxiliary	42	1	34		0.32	24		10967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Annual Emissions (tons/year)									0.298	0.267	9.641	0.010	7.231	0.881	586.941	0.028	0.022	6

Annual GHG (CO2+CH4+N2O) emissions = 315 Metric Tons per https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

1. Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
2. HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
3. per past plans and specs tug boat is approximately 300 HP; 1 kW = 1.34 HP; thus 223 kW
4. crew boat HP approximately 290 HP ~ 216 kW per Port of LA Emissions Inventory
5. conversion factor pounds-grams: 453 grams/lb.
6. 1 metric ton = 2204 lbs

APPENDIX C

CLEAN WATER ACT 404(b)(1) EVALUATION

APPENDIX C

Santa Barbara Harbor Federal Maintenance Dredging Draft Clean Water Act Section 404(B)(1) Evaluation

1.0 Clean Water Act Section 404(b)(1) Regulatory Background

Section 404 of the Clean Water Act (CWA) governs the discharge of dredged or fill material into waters of the U.S. (waters of the US). Although the Corps does not process and issue permits for its own activities, the Corps authorizes its own discharges of dredged or fill material by applying all applicable substantive legal requirements, including application of the Section 404(b)(1) Guidelines, 33 C.F.R. 336.1(a).

Under the Section 404(b)(1) Guidelines, an analysis of practicable alternatives is the primary tool used to determine whether a proposed discharge is prohibited. The Section 404(b)(1) Guidelines prohibit discharges of dredged or fill material into waters of the US if a practicable alternative to the proposed discharge exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, as long as the alternative does not have other significant adverse environmental impacts (40 C.F.R. 230.10(a)). An alternative is considered practicable if it is available and capable of being implemented after considering cost, existing technology, and logistics in light of the overall project purpose (40 C.F.R. 230.10(a)(2)). The Section 404(b)(1) Guidelines follow a sequential approach to project planning that considers mitigation measures only after the project proponent shows no practicable alternatives are available to achieve the overall project purpose with less environmental impacts. Once it is determined that no practicable alternatives are available, the guidelines then require that appropriate and practicable steps be taken to minimize potential adverse effects on the aquatic ecosystem (40 C.F.R. 230.10(d)). Such steps may include actions controlling discharge location, material to be discharged, the fate of material after discharge or method of dispersion, and actions related to technology, plant and animal populations, or human use (40 C.F.R. 230.70-230.77).

Beyond the requirement for demonstrating that no practicable alternatives to the proposed discharge exist, the Section 404(b)(1) Guidelines also require the Corps to compile findings related to the environmental impacts of discharge of dredged or fill material. The Corps must make findings concerning the anticipated changes caused by the discharge to the physical and chemical substrate and to the biological and human use characteristics of the discharge site.

These guidelines also indicate that the level of effort associated with the preparation of the alternatives analysis be commensurate with the significance of the impact and/or discharge activity (40 C.F.R. 230.6(b)).

2.0 Basic and Overall Project Purpose

2.1 Basic Project Purpose

Where the activity associated with a discharge which is proposed for a special aquatic site (e.g., wetland, riffle pool, tidal marsh, etc.) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. The basic project purpose comprises the fundamental, essential, or irreducible purpose of the proposed project. For purposes of this evaluation, the basic project purpose is navigation, a water dependent activity. Because there are no special aquatic sites within the project area, the rebuttable presumptions do not apply.

2.2 Overall Project Purpose

The overall project purpose serves as the basis for the Corps' section 404(b)(1) alternatives analysis and is determined by further defining the basic project purpose in a manner that more specifically describes the goals and accounts for logistical considerations for the project, and which allows a reasonable range of alternatives to be analyzed. It is critical that the overall project purpose be defined to provide for a meaningful evaluation of alternatives. It should not be so narrowly defined as to give undue deference to the preferred alternative, thereby unreasonably limiting the consideration of alternatives. Conversely, it should not be so broadly defined as to render the evaluation unreasonable and meaningless.

The overall purpose of the proposed action is to maintain the federal navigation channel at Santa Barbara Harbor

2.3 Jurisdictional Determination of Waters of the US

Santa Barbara Harbor located within the Pacific Ocean. From the mean high tide line to three nautical miles seaward, the Pacific Ocean is a navigable waters of the US.

3.0 Alternatives Considered

Alternative 1

Under Alternative 1, uncontaminated, beach-compatible sand would be discharged by pipeline on in the surf zone, and in the nearshore of the Pacific Ocean in the vicinity of Santa Barbara Harbor. Approximately 600,000 cubic yards (cy) would be discharged annually. Approximately 3,600,000 cy would be discharged over a six year period. The dredged material would be discharged at the following areas:

1. Downcoast of the harbor on East Beach placement area: Beginning approximately 2,300 feet downcoast of Santa Barbara Harbor, extending east to approximately 6,300 feet downcoast of Santa Barbara Harbor.

2. In the nearshore parallel to East Beach placement area: Beginning approximately 2,300 feet downcoast of Santa Barbara Harbor, extending east to approximately 6,300 feet downcoast of Santa Barbara Harbor.

3. In the surf (intertidal) zone parallel to East Beach placement area: Beginning approximately 2,300 feet downcoast of Santa Barbara Harbor, extending east to approximately 6,300 feet downcoast of Santa Barbara Harbor. During March and April, due to potential grunion run activity, the surf zone discharge would be a single point discharge limited to a 500-foot area within the designated dredged material placement site.

Alternative 2

Under Alternative 2, uncontaminated, beach-compatible sand would transported by barge to EPA-designated offshore marine disposal sites (LA-2 or LA-3) located approximately 200 miles away. Alternative 2 would require approximately 6 barge trips annually based on 100,000 cubic yards (cy). Transport would result in additional air quality impacts relative to Alternative 1. Furthermore, request for ocean disposal of uncontaminated, beach-compatible material is unlikely to be approved by the EPA due to the agency's policy on beneficial reuse of uncontaminated, beach-compatible sand.

Alternative 3

Under Alternative 3, uncontaminated, beach-compatible sand would transported on land by trucks to an upland disposal site located approximately 26 miles north of the city of Santa Barbara. Alternative 3 would require approximately 2,400 trips to transport 600,000 cy of dredged material. Transport could result substantial additional air quality impacts relative to Alternative 1.

Alternative 4

Under Alternative 4, Santa Barbara Harbor would not be dredged. Alternative 4 would result in unsafe conditions for vessels navigating in and out of the harbor, and would not meet the overall project purpose.

Alternatives	Temporary Impacts to WoUS?	Practicable?	Least Environmentally Damaging?	Meets Overall Project Purpose?
Alternative 1	Yes	Yes	Yes	Yes
Alternative 2	Yes	Yes	No	Yes
Alternative 3	No	Yes	No	Yes
Alternative 4	No	Yes	Yes	No

Based on the above, Alternative 1 is determined to be the least environmentally damaging practicable alternative which meets the overall project purpose.

4.0 Environmental Effects

In accordance with the Section 404(b)(1) Guidelines, the potential short-term or long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment must be determined. The following discussion evaluates impacts of Alternative 1 on environmental resources identified in Subpart C through Subpart F of the Section 404(b)(1) Guidelines.

4.1 Potential Direct and Secondary Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)

Substrate

Under Alternative 1, uncontaminated, beach-compatible sand would be discharged by pipeline on the beach and in the surf zone. Sampling and analysis of material to be dredged was coordinated with the Southern California Dredged Material Management Team (SC-DMMT), the regional inter-agency regulatory body that reviews testing plans and results. The SC-DMMT reviewed the sampling results and deemed suitable the discharge of dredged sediment into the marine environment. Since sand is the predominant substrate within the beach, nearshore, and the surf zone, placement of beach-compatible sand within these areas would not change the substrate within the receiving areas.

Suspended particulates and turbidity

Under Alternative 1, uncontaminated, beach-compatible sand would be discharged by pipeline on the beach and in the surf zone. Sampling and analysis of material to be dredged was coordinated with the SC-DMMT. The SC-DMMT reviewed the sampling results and deemed suitable the discharge of dredged sediment into the marine environment. Placement of dredged material within the marine environment would temporarily increase turbidity. However, the dredged material is expected to settle out of the water column quickly since it is composed of sand, and the surf zone has naturally high turbidity due to wave action. Turbidity will return to pre-project levels upon completion of work.

Contaminants

Under Alternative 1, uncontaminated, beach-compatible sand would be discharged by pipeline on the beach and in the surf zone. Sampling and analysis of material to be dredged was coordinated with SC-DMMT. The SC-DMMT reviewed the sampling results and deemed suitable the discharge of dredged sediment into the marine environment. Since the dredged material consists of clean sand, placement of dredged material within the marine environment would not result in releases of contaminants into the water column.

Water Flow

Under Alternative 1, uncontaminated, beach-compatible sand would be discharged by pipeline on the beach and in the surf zone. The material is unconsolidated and would disperse within the water column.

There would be no permanent structural discharges that could permanently change velocity, water surface elevation, or circulation within waters of the US.

4.2 Potential Direct and Secondary Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

Threatened and Endangered Species

Three species listed under the ESA have occurred, or are likely to occur, in the vicinity of the dredge material placement area: the western snowy plover (*Charadrius alexandrinus nivosus*), tidewater goby (*Eucyclogobius newberryi*), and southern California distinct population segment of steelhead (*Oncorhynchus mykiss*). Designated critical habitat for both tidewater goby and the southern California steelhead occurs within Mission Creek and the associated lagoon, and the entirety of East Beach is designated critical habitat for the western snowy plover.

Western Snowy Plover
Western snowy plover occur year round at Santa Barbara. During mobilization and demobilization efforts on the beach where plover potentially occur, biological monitors will be present to ensure impacts to plover are avoided. While the material placement site is within designated critical habitat, the entire proposed project area is a highly popular public beach prone to nearly constant disturbance from humans, pets, vehicles, and human attracted-predators, greatly reducing the quality of the habitat. The Primary Constituent Elements of plover critical habitat includes:

> Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

Due to the constant disturbance present on the public beach, the placement area does not meet the PCEs required for plover critical habitat. Therefore, with implementation of the biological monitoring efforts, there will be no effect on western snowy plover or designated critical habitat.

Tidewater Goby
Tidewater goby occur in lower Mission Creek and the associated lagoon, which is also designated critical habitat. The project includes environmental commitments to avoid any work within Mission Creek or the associated lagoon. Due to implementation of these avoidance measures, the project will have no effect on tidewater goby or designated critical habitat.

Southern California Steelhead
Steelhead occur in lower Mission Creek and the associated lagoon, which is also designated critical habitat. The project includes environmental commitments to avoid any work within Mission Creek or the associated lagoon. Due to implementation of these avoidance measures, the project will have no effect on steelhead or designated critical habitat.

Other Wildlife (Reptiles, Birds, and Mammals)

A diverse group of shorebirds and waterfowl occur in the project area. Several species of marine mammal are known to occur offshore or in the vicinity of the harbor. Terrestrial mammals within the project area are scarce, and likely include only small rodents or species highly adapted to urban environments such as raccoons and opossums (See Section III.B of the EA). All marine mammals and coastal bird species are expected to avoid the direct placement area

and thus avoid any impacts from the deposition of sediment. While these species may be temporarily displaced, most species are expected to rapidly acclimate to the dredge operations and return to the site quickly after the completion of dredging. Dredging operations are scheduled to avoid the nesting season for coastal nesting species. Thus impacts to wildlife are expected to be temporary and insignificant.

Fish, Crustaceans, Mollusks and other Aquatic Organisms in the Food Web

Dredging inherently causes a disturbance and redistribution of bottom sediments which persist for the duration of the operation. Some invertebrates are expected to be relocated, smothered, buried, or otherwise impacted. Temporary turbidity increases within the shallow subtidal and intertidal beach replenishment areas can cause clogged gills and breathing apparatuses. However, all impacts are expected to be temporary, localized, and minor since sediment is composed primarily of fine sands and few silts due to the frequency of dredging littoral drift sediments. Invertebrate populations are expected to recover from the disturbance upon completion of the project. . Given the temporary and minor nature of dredged material placement, no significant impacts are expected.

The proposed dredging project could affect fish resources in a variety of ways. The dredging process could result in direct temporary loss of foraging habitat and temporary increases in turbidity. Dredging could also result in direct mortality of organisms via interactions with dredge equipment or burial with sediment. Although fish could theoretically be adversely affected by turbidity as a result of dredging or material placement, studies have shown that large-scale channel dredging operations do not have long-term adverse effects on fish populations. Other fish species may be attracted to the surf zone to feed on mollusks, crustaceans, and other organisms which may have been caught up in, or exposed by, the dredged material.

Dredged material placement is scheduled primarily during winter seasons, avoiding most impacts to the California grunion (*Leuresthes tenuis*), which utilize West and East Beaches of Santa Barbara Harbor for spawning from March through mid-September. The grunion monitoring program will continue to occur beginning in March for any predicted runs if dredging is still occurring, which includes avoidance measures should a significant grunion run occur during dredging. Therefore, impacts to grunion as a result of the proposed project would be less than significant.

Vegetation

The proposed dredge and dredge placement areas do not support any significant amount attached marine algae such as eelgrass or kelp. The proposed dredged material placement site is on a sandy beach with no coastal strand vegetation due to heavy human use. The terrestrial vegetation consists of non-native ornamental plants and grass located in a city-maintained green belt above the normal wave reach, between the beach and Cabrillo Boulevard. No discharge would occur in vegetated areas of the beach front. The only terrestrial plants anticipated to be impacted by the proposed project are iceplant and other weedy, exotic, or ornamental species growing adjacent to the existing bike trail above the high water line, which may be impact by vehicle use during

mobilization and demobilization efforts. Therefore, no significant impacts to terrestrial vegetation are expected and no impacts to attached marine vegetation are expected due to material placement.

4.3 Potential Direct and Secondary Impacts on Special Aquatic Sites (Subpart E)

Sanctuaries and Refuges

There are no sanctuaries or refuges designated under state or federal laws within the proposed project area.

Wetlands

There are no wetlands in the proposed project area.

Mudflats

Mudflats are generally found in intertidal, estuarine or near-shore habitats, in deltas, or at river mouths. None of these conditions occur in the project area. The mouths of Mission Creek and Laguna traverse across a beach to hydrologically connect with the Pacific Ocean.

Vegetated shallows

Vegetated shallows are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as sea grasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems. Vegetated shallows are not present in the proposed project area. The designated receiving areas for the dredge materials are in the open marine environment exposed to tidal energies. Thus, discharge of the dredged material would not directly or indirectly affect vegetated shallows.

Coral Reefs

Coral reefs consist of skeletal deposits, usually of calcareous or silicaceous materials, and occur in marine environments, which does not exist in the proposed project area. Thus, discharge of the dredged material would not directly or indirectly affect coral reefs.

Riffle and Pool

Streams are sometimes characterized by riffle and pool complexes. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. The designated receiving areas for the dredge materials are in the open marine environment. There are no tide pool complexes within the receiving areas. Thus, discharge of the dredged material would not directly or indirectly affect riffle and pool complexes.

Cumulative Impacts

There are no special aquatic sites, sanctuaries or refuges within the marine environment. Thus, past, present, and discharges of dredged material in the foreseeable future would not result in significant cumulative impacts.

4.4 Potential Direct and Indirect Effects on Human Use Characteristics (Subpart F)

Municipal and Private Water Supplies

The receiver areas are located within an open ocean environment and is not a source for municipal or private water supplies. Thus, discharge of the dredged material would not directly or indirectly result in impacts to municipal and private water supplies.

Recreation and Commercial Fisheries

Recreational fishing does occur in the intertidal and nearshore areas. However, the receiver areas do not support commercial fisheries. During discharge operations, the beach at the receiver area would be fenced off from the public with construction tape and fencing. Furthermore, noise, kinetic energy, and turbidity associated with discharge operations would likely cause fish to avoid the water column at the receiver areas. Upon completion of construction, the beach would be reopened for public use. Wave action would disperse the uncontaminated, beach-compatible sand and the beach profile would be restored shortly upon completion of construction. Turbidity associated with the discharge of dredged material would return to pre-project conditions upon completion of construction, allowing fish to reoccupy the water column. Thus, the discharge of dredged material would temporarily affect recreational fishing. There would be no long-term impacts to recreational and commercial fisheries.

Water-related recreation

The receiver areas are located within a public beach which supports water-related recreation such as swimming, surfing, body boarding, and sailing. During discharge operations, the beach at the receiver area would be fenced off from the public with construction tape and fencing. Thus, water-related recreation would be temporarily impacted during discharge operations. Upon completion of construction, the beach would be reopened for public use. There would be no long-term impacts to water-related recreation.

Aesthetics

Currently, the viewshed is composed of a non-linear sloping beach with monochromatic beige hues and homogeneous textures. The marine environment consists of monochromatic green/blue hues. A distinct nonlinear boundary is present at the interface between the beach and the marine environment. There would be presence of earth moving equipment as well as construction fencing within the discharge area during construction. Thus, there would be temporary impacts during construction. The discharge consists of uncontaminated, beach-compatible sand. Thus, the material would be visually consistent with the existing beach substrate. Earth moving equipment would push the dredged material into the surf zone. Wave action would redistribute sediment along existing contours and patterns. There would be a temporary increase in turbidity during discharge operations. Turbidity associated with the discharge of dredged material would return to pre-project conditions upon completion of construction. Thus, discharge operations would result in temporary impacts to aesthetics.

Parks, national and historical monuments, national seashores, wilderness areas, and research sites

With the exception of Homolovi State Park, there are no parks, national and historical monuments, national seashores, wilderness areas, and research sites within the vicinity of the project area.

4.5 Evaluation and Testing (Subpart G)

The dredged material to be discharged has been tested per 40 C.F.R. 230.60(b). The SC-DMMT has reviewed the sampling results and deemed suitable the discharge of dredged sediment into the marine environment.

The composite grain size curves for all designated discharge of fill material footprint areas fit within the overall grain size envelope for beach and nearshore dredged material placement areas (Corps, 2016a). Based on the sediment, grain size compatibility, and bulk chemistry analyses of composite sediment samples and comparison to sediment screening values for the protection of benthic organism, the Santa Barbara Harbor sediments from all of the Federal maintenance dredging areas are deemed to be suitable and compatible for beach replenishment/nourishment action(s) for the placement of suitable dredged material area(s) on the downcoast beach east of Stearns Wharf (downcoast of the harbor) and/or parallel to the beach in the nearshore at East Beach (Corps, 2016a). The dredged material proposed for discharge is uncontaminated. Prior to the February 24, 2016 monthly Southern California-Dredged Material Management Team (SC-DMMT) meeting, the Draft SAPR report and its Appendices were sent out by e-mail for review and comment, and during the February 24, 2016 monthly SC-DMMT, review comments were provided by the SC-DMMT, and the Corps incorporated the SC-DMMT review comments into the SAPR report and Appendices, and the USEPA stated the bulk chemistry were okay yet needed to review physical compatibility report before making final. Prior to the March 23, 2016 monthly SC-DMMT meeting, the SAPR reports, its Appendices and Draft Compatibility Determination were provided for review and comment to the SC-DMMT. During the March 23, 2016 SC-DMMT monthly meeting, the SAPR report and its Appendices, and the Draft Compatibility Report, the SC-DMMT provided minor review comments, and the Corps incorporated the SC-DMMT review comments into the SAPR report, its Appendices and the Draft Compatibility Report. Due to minor comments provided by the SC-DMMT during the March 23, 2016 monthly SC-DMMT meeting on the SAPR report, its Appendices and the Draft Compatibility Report, the Corps requested review and comment of the revised and final SAPR, its Appendices and Compatibility Report using e-mail to coordinate with the SC-DMMT, and the SC-DMMT stated e-mail could be used to coordinate review and comment on the revised and final SAPR, its Appendices and the Compatibility Report and to finalize the documents. On May 17, 2016, the Corps coordinated for review and comment the revised SAPR report and its Appendices, and the Compatibility Determination Report, by e-mail with the SC-DMMT. On June 1, 2016, the USEPA e-mailed and stated the USEPA had reviewed the revised SAR, dated May 2016, and concurred that material tested is suitable for placement within the East Beach placement area. On June 3, 2016, the California Coastal Commission (CCC) e-mailed and stated the CCC concurred that material tested is suitable for placement within the East Beach placement area. On June 6, 2016 the Central Coast RWQCB e-mailed and stated the Central Coast RWQCB staff had reviewed the SAPR Report and concurred that material tested is suitable for placement within the East Beach placement area. On June 7, 2016, the Corps finalized with the SC-DMMT by e-mail the Final SAPR and its Final Appendices and the Final Compatibility Determination Report (Corps, 2016a).

5.0 Measures to Minimize Adverse Impacts (Subpart H)

1. Project features shall not interfere with tidal circulation and/or fresh water inflows into and through the mouth of Mission Creek, the lagoon, or Laguna Creek (East Side Channel). Dredged material placement at the secondary placement site shall not occur.

2. Turbidity levels will be monitored throughout dredging/placement operations with prescribed actions to be taken (i.e. slowing dredge cycle times, use of silt curtains) should turbidity exceed action levels.

3. Spills would be cleaned up immediately. Standard dredge specifications include a Spill Prevention Plan, employee training, and the staging of materials on site to clean up accidental spills.

4. Between May 1 and August 31, there shall be no discharge of dredged material. Noise levels of the dredge operation shall not exceed the limits established by the City of Santa Barbara noise element portions of the General Plan (i.e. 60 dBA (A-weighted decibel scale) for residential areas, 70 dBA for commercial areas. The dredging contractor shall obtain a noise permit from the City of Santa Barbara if the dredging contractor cannot stay within the approved and acceptable noise limits set by the City of Santa Barbara or the County of Santa Barbara.

5. If double-shift or triple-shift dredging is required to insure project completion by April 30, the contractor shall obtain a special permit from the City of Santa Barbara which would make working during evening hours permissible.

6. Conditions of Santa Barbara Air Pollution Control District (SBCAPCD) regulations shall be met.

7. Implement Best Management Practices (BMP) fugitive dust control, as stated in SBCAPCD Rule 345, to ensure that dust is controlled and kept below daily APCD and annual Federal air thresholds.

8. At all times, idling of heavy-duty diesel trucks must be limited to five minutes; auxiliary power units should be used whenever possible. State law requires that drivers of diesel-fueled commercial vehicles:

   a. Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location.

   b. Shall not idle a diesel-fueled auxiliary power system (APS) for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle.

9. Operators of dredge equipment shall not harass any marine mammal or waterfowl in the proposed project area.

10. Installation (mobilization) and removal (demobilization) of dredged material placement pipeline and equipment shall be coordinated with the Corps, the City of Santa Barbara, Waterfront Department, and the dredging contractor. Installation and removal of the dredge pipeline shall be overseen by a Corps' biologist.

11. The dredge operator shall move the dredge equipment for USCG and Harbor Patrol law enforcement and rescue vessels. The Contractor shall notify the USCG a minimum of two hours prior to temporarily closing the federal channel areas. (Channel closure is not expected.)

12. Contractor shall mark the dredge pipe area (i.e., a sign on the buoy using an arrow to indicate which side of the buoy the boats are to pass so that small boat traffic does not pass over the dredge pipe). This condition stems from USCG and Harbor Patrol concerns about impacts from boaters who are unacquainted with dredge operation markers.

13. Contractor shall notify the Commander, 11th USCG District, at least 2 weeks before the start of activity or 30 days before if buoys are to be placed. This notification shall include the following:

a. The size and type of equipment that would be performing the work.

b. Name and radio call sign for working boats.

c. Telephone number for on-site contract with project engineer.

d. The schedule for completing the project.

Furthermore, the USCG shall be notified of any hazards to navigation.

14. To minimize impacts to grunion and avoid impacts to snowy plovers, the following constraints would be placed on dredging beginning March 1st:

a. Surf-zone dredged material placement using single-point discharge method, as described in Section II(F)(4).

b. Dredged material placement confined to a 500 ft. swath of operations within the 4,000 ft. designated dredged material placement zone.

c. Monitoring adult spawning grunion and snowy plover activity, as described in Section II(F)(3).

d. Minimal positional changes of the beach surface pipeline.

e. Snowy plover monitoring will be conducted by a qualified biologist. During plover monitoring, no disturbance to plover will occur. Plover will only be approached if necessary to verify nesting behavior.

f. If a significant grunion run is identified during monitoring (W-2 or greater), any dredge related activities outside of the placement area that could potentially disturb grunion eggs/nests shall be avoided for a period of two weeks following the run. This includes limiting all dredge-related vehicle traffic to above the intertidal line in any areas where significant grunion spawning occurred.

g. Monitoring results for grunion and western snowy plover will be coordinated with the resource agencies (California Coastal Commission, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service and National Marine Fisheries Service) via telephone or e-mail coordination.

15. The dredge pipeline will be elevated over Mission Creek. The support piers shall be placed outside of the wetted perimeter of the lagoon, and no equipment or personnel will work within the lagoon. If the pier supports become inundated due to variation in the location and size of the lagoon, the pier supports will not be removed until waters of the lagoon have receded to the point that all work can occur without impacting the lagoon or creek. Installation and removal of the pipeline across Mission Creek will be overseen by a biologist.

16. Bird deterrents will be installed on the dredge pipeline where it crosses Mission Creek.

17. The Contractor shall remove all trash, debris, and excess construction material from the beach or intertidal dredged material placement site and the staging area at the end of every 8-hour shift (at a minimum), and shall discard all such material at an acceptable dredged material placement site.

18. If previously unknown cultural resources are identified during dredging operations, all activity would cease in the area of the find. If during construction activities, items are observed that may have historic or archaeological value (e.g., anchors, shipwrecks, Native American human remains or associated objects are discovered), such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified. The Contractor shall cease all activities in the area of the find until the requirements of 36 CFR 800.11, *Properties Discovered During Implementation of an Undertaking* are met. The Contractor shall prevent employees from trespassing on, removing, or otherwise disturbing such resources.

19. If a sea otter is seen in the vicinity of ongoing dredging, all ships shall maintain a 50 foot avoidance buffer and reduce vehicle speeds to 3-5 knots to avoid impacts. The project biologist, environmental coordinator, and project manager shall be notified immediately of any sea otter sightings.

6.0 Compensatory Mitigation for Losses of Aquatic Resources (Subpart J)

The proposed discharge of uncontaminated, beach-compatible sand would not result in permanent loss of waters of the US. The discharge would not substantially alter existing fish

and wildlife habitat. The discharge would not impound flows; redirect flows; or change circulation patterns. Based on the above, and with the implementation of avoidance and minimization measures, the proposed discharge would not result in loss of aquatic functions to a degree that would require compensatory mitigation.

APPENDIX D

MEMORANDUM FOR RECORD
Section 106 (National Historic Preservation Act) Review

CESPL-PD-RN 19 July 2016

MEMORANDUM FOR RECORD

SUBJECT: 2016 Santa Barbara Dredging Section 106 (National Historic Preservation Act) Review

1. This memorandum documents the Corps' determinations for Section 106 of the NHPA as required at 36 CFR 800.11(a). Pursuant to 36 CFR 800.3(a)(1), this Corps has satisfied its responsibilities to take into account the effects of this undertaking on historic properties and has no further obligations under Section 106 of the NHPA.

2. As part of the periodic maintenance program for the six year period from September 1, 2016 to August 31, 2022, the U.S. Army Corps of Engineers, Los Angeles District (Corps), proposes to perform maintenance dredging within Santa Barbara Harbor, Santa Barbara County, California, to include maintenance of the federal entrance and navigation channels, and the sand trap within the channels. The equipment envisioned to conduct the proposed dredging project is an electric powered cutterhead hydraulic pipeline dredge but could include a combination of electric dredge platforms such as electric cutterhead hydraulic pipeline dredge, electric hopper dredge, and/or electric clamshell (bucket) dredge. All dredge material would be placed on the downcoast beach east of Stearns Wharf or parallel to the beach in the nearshore typically at East Beach. The dredged material would be discharged above +6 feet MLLW or into the surf zone using the single point discharge method.

3. Dredging of the Santa Barbara Harbor and dredged placement onto the beach and/or nearshore has been occurring since 1972. The Corps has dredged the harbor in the exact same manner as currently proposed and deposited dredge materials above + 6 feet MLLW since 1998.

4. In accordance with Section 106 of the National Historic Preservation Act (NHPA), the Corps has determined that the periodic maintenance of the Santa Barbara Harbor meets the definition of an undertaking as defined at 36 CFR 800.16(y). The Corps has further determined that it is the type of activity that does not have the potential to cause effects to historic properties. The undertaking is routine maintenance that has occurred on a biannual basis since at least 1996. The undertaking does not constitute a change in the setting or use of the harbor. The undertaking would not alter the current setting or integrity of any historic properties that may be located within the Santa Barbara Harbor, assuming them to be present (36 C.F.R. 800.3(1)). Ground disturbance associated with this undertaking would be limited to soils deposited in the last one or two years with no potential to contain historic properties.

Danielle Storey

Danielle Storey
Archaeologist
Ecosystem Planning Section

APPENDIX E

MAILING DISTRIBUTION LIST

APPENDIX E: MAILING LIST

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
501 West Ocean Blvd. Suite 4200
Attn: Mr. Bryant Cheney
Long Beach, CA 90802-4221

U.S. Department of the Interior
Fish and Wildlife Service
Ecological Enhancement Office
2493 Portola Road, Suite B
Attn: Mr. Chris Dellith
Ventura, CA 93003

U.S. Environmental Protection Agency
Region 9
Water Division, Mail Code:WTR-2-4
75 Hawthorne Street
Attn: Mr. Allan Ota
San Francisco, CA 94105

U.S. Environmental Protection Agency
Region 9
Southern California Field Office
600 Wilshire Boulevard, Suite 1460
Attn: Ms. Melissa Scianni
Los Angeles, CA 90017

U. S. Coast Guard
MSD Santa Barbara
111 Harbor Way
Attn: Supervisor
Santa Barbara, CA 93109

CDR,11th U.S. Coast Guard (DPW)
ATTN: Local Notice to Mariners
Coast Guard Island Building 50-2
Alameda, CA 94501-5100

U.S. Coast Guard, Sector LA-LB
1001 S. Seaside Ave., Bldg. 20
Attn: Waterways Management
San Pedro, CA 90731

Office of Planning and Research
1400 10th Street
Attn: Ken Alex
Sacramento, CA 95814

California Coastal Commission
45 Fremont St., Suite 2000
Attn: Mr. Larry Simon
San Francisco, CA 94105-2219

California Department of Parks and Recreation
Channel Coast District
Attn: Rich Rozzelle
911 San Pedro Street
Ventura, CA 93001-3744

California State Lands Commission
100 Howe Ave. Suite 100 South
Attn: Jennifer Lucches
Sacramento, CA 95852-8202

California Natural Resources Agency
1416 Ninth Street
Attn: John Laird
Sacramento, CA 95814

State Clearinghouse
1400 Tenth Street
Attn: Ken Alex
Sacramento, CA 95814

Regional Water Quality Control Board
Central Coast Region
Attn: Ms. Paula Richter
895 Aerovista Place Suite 101
San Luis Obispo, CA 93401-7906

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

Native American Heritage Commission
1550 Harbor Blvd, Suite 100 West
Attn: Cynthia Gomez
Sacramento, CA 95691

California Department Fish & Wildlife
3883 Ruffin Road
Attn: Ms. Loni Adams
San Diego, CA 92123

California Div. Boating & Waterways
One Capitol Mall - Suite 500
Attn: Lynn Sadler
Sacramento, CA 95814

CALTRANS District 5
50 Higuera St.
Attn: Timothy Gubbins
San Luis Obispo, CA 93401

CA. Department of Water Resources
Attn: Mark Cowin
1416 9th Street
Sacramento, CA 95814

Santa Barbara APCD
260 North San Antonio Road, Suite A
Attn: Carly V. Barham, Technology Div.
Santa Barbara, CA 93110

Santa Barbara APCD
260 North San Antonio Road, Suite A
Attn: Michael Goldman, Engineer. Div.
Santa Barbara, CA 93110

City of Santa Barbara
Waterfront Department
132A Harbor Way
Attn: Mr. Karl Treiberg
Santa Barbara, CA 93109

City of Santa Barbara
Parks and Recreation Div.
P.O Box 1990
Attn: Jill Zachary
Santa Barbara, CA 93102-1990

City of Santa Barbara Public Library
Reference Department
P.O. Box 1019
Attn: Brent Field
Santa Barbara, CA 93102-1019

BEACON
105 East Anapamu Suite 201
Santa Barbara, CA 93101