Revised
ENVIRONMENTAL ASSESSMENT

FOR

OPERATIONS & MAINTENANCE DREDGING OF THE MOSS LANDING HARBOR FEDERAL CHANNELS
Moss Landing, Monterey County, California

PREPARED BY

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT

April 2007

U.S. ARMY CORPS OF ENGINEERS
SOUTH PACIFIC DIVISION
SAN FRANCISCO DISTRICT
FINDING OF NO SIGNIFICANT IMPACT
FOR THE OPERATIONS & MAINTENANCE DREDGING
OF THE MOSS LANDING HARBOR FEDERAL CHANNELS
MONTEREY COUNTY, CALIFORNIA

(A finding of no significant impact (FONSI) is anticipated being prepared and inserted at this point after agency and stakeholder comments to this draft Environmental Assessment.)

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SECTION 1 - INTRODUCTION

1.1 INTRODUCTION

The San Francisco District of the U. S. Army Corps of Engineers (SPN), as part of its Operations and Maintenance Program, is proposing to perform maintenance dredging of the Moss Landing Harbor Federal channel.

1.2 SITE DESCRIPTION

1.2.1 Location. Moss Landing Harbor is located approximately 80 miles south of San Francisco in the center of Monterey Bay, halfway between the cities of Santa Cruz and Monterey (Figure 1). The mouth of the Pajaro River is located three miles north of Moss Landing and the mouth of the Salinas River is four miles to the south. Moss Landing Harbor is located in the old Salinas River channel. Directly behind the sand spits is Elkhorn Slough, which extends 11 miles inland and has over 2,500 acres of open water-ways, mud flats, and salt marshes.

Two jetties and related shore protection revetments help maintain a stabilized entrance channel through the sand spits, into Moss Landing Harbor. The entrance to the harbor is located at the head of the Monterey Submarine Canyon. Moss Landing Harbor consists of two harbors: the North Harbor, utilized by approximately 154 recreational boats; and the South Harbor, utilized by approximately 446 commercial fishing and recreational boats. The Moss Landing Harbor District (MLHD) maintains about 600 berths and docking facilities.

1.2.2 Timing of Project. We anticipate dredging to commence on late June or July 2007, and extend over a period of about 45 days. Alternatively, the project may start on or about October 1, 2007. Timely notification of the starting date will be provided to stakeholders. Dredging operations may take place 24 hours a day.

1.2.3 Project Purpose. Moss Landing Harbor has experienced excessive shoaling in both the Federal channels and in dock and berthing areas maintained by the MLHD. Shallow depths especially in the Inner Lagoon Channel have limited the movement of the vessels. The proposed maintenance dredging of Moss Landing Harbor will increase the water depths in the Federal navigation channels of the north harbor to the Congressionally authorized depth of -15 feet Mean Lower Low Water (MLLW). Based on logistics of dredging operations, to achieve this depth, the contractor is permitted no greater than 1 foot of paid and 1 foot of unpaid overdepth. Approximately 13,500 cubic yards (CY) of material is expected to be used for beach nourishment (along 500 feet) and the remaining 31,500 CY is expected to be placed in SF-12.

1.2.4 Project Authorization. This project was authorized by the Rivers and Harbors Act of March 2, 1945, which allowed the dredging and maintenance of an Entrance Channel and Lagoon Channel at Moss Landing Harbor. The Federal maintenance dredging of the Federal channels at Moss Landing Harbor normally occurs on a three-year dredging cycle. The most recent dredging was completed in fiscal year 2003.

1.3 ENVIRONMENTAL ASSESSMENT PROCESS

This Environmental Assessment (EA) shall address potential impacts associated with implementing its discretionary actions as they relate to U.S. Army Corps of Engineers (USACE), San Francisco District, policies and those of other entities.

The USACE is the lead federal agency for this project. This EA is in compliance with the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321, as amended. The NEPA requires federal agencies to consider the environmental effects of their actions. When those actions significantly affect the quality of the human environment, an agency must prepare environmental documentation that provides full and fair discussion of impacts.

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

The USACE is required to comply with all pertinent federal and state policies; project compliance is summarized in Table 1. The proposed project will be in compliance with federal and state laws and policies.

Figure 1. Project Location

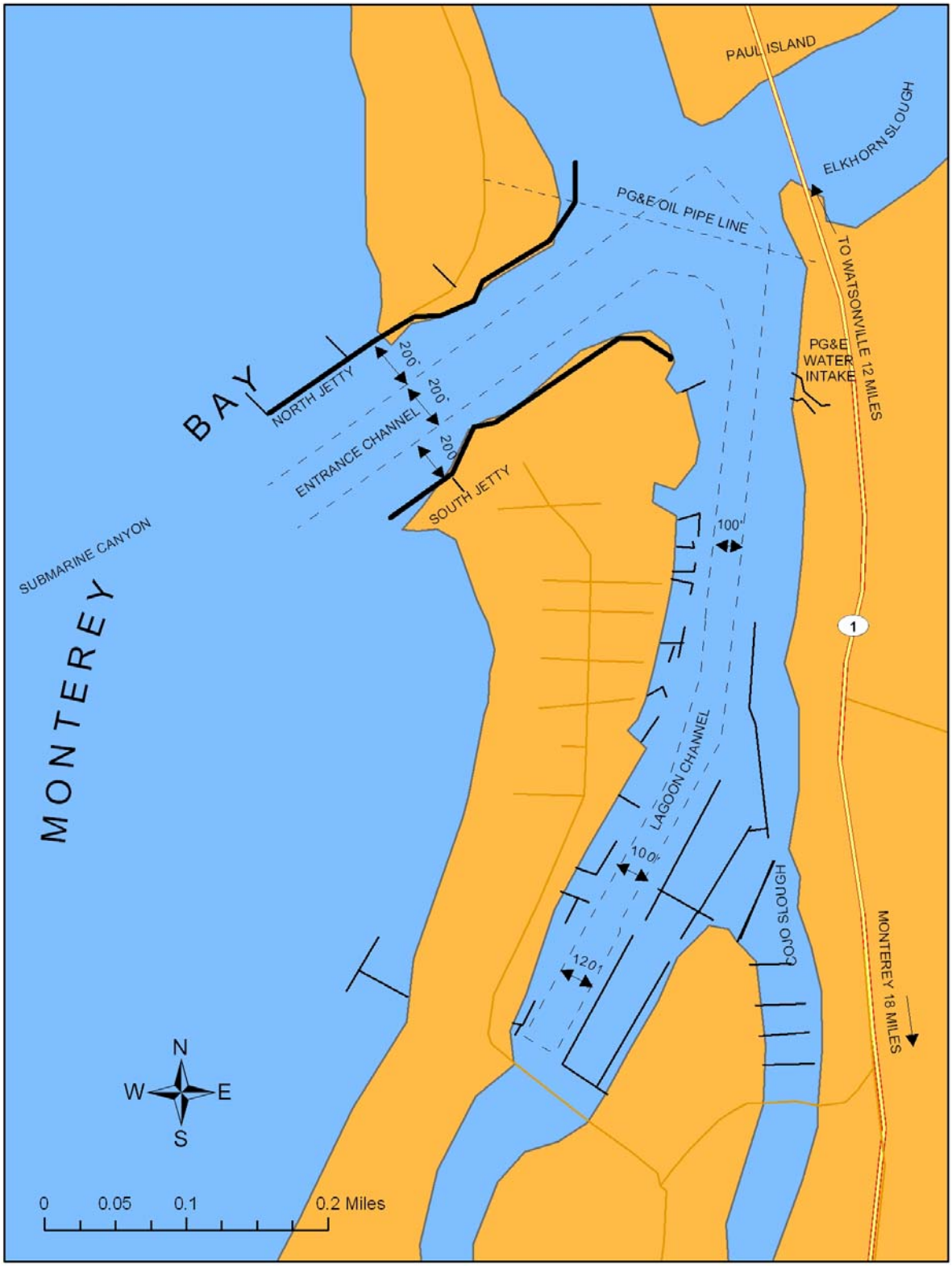

Figure 2. Project Area

Table 1. Summary of Environmental Compliance

Statute	Status of Compliance
National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 *et seq*) Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR 1500-1508) dated July 1986	An EA was prepared and submitted for agency and public review. All agency and public comments will be considered and evaluated. If appropriate, a FONSI will be signed with a conclusion of no significant impacts that completes compliance with the NEPA.
Clean Air Act (42 USC 7401 *et seq*)	Emissions from this Operation and Maintenance (O&M) project are considered to be de minimis as defined under the Clean Air Act and other Corps of Engineers implementing regulations.
Clean Water Act of 1972 (33 USC 1251 *et seq*) Rivers and Harbors Act of 1899 (33 U.S.C. 403) Executive Order 11990, Protection of Wetlands, (42 FR 26961, 1977)	Waste Discharge Requirement Order No. 01-007 was issued September 14, 2001. Sediment sampling results and dredging plan were provided and confirmation is pending from the Central Coast California Regional Water Quality Control Board. Compliance with requirements of the RHA is accomplished by this EA. No wetlands will be affected.
National Oceanic and Atmospheric Administration Federal Consistency Regulation (15 CFR 930) Coastal Zone Management Act of 1972, 16 U.S.C. 1451 *et seq* California Coastal Act of 1976	A Consistency Determination was prepared by USACE for concurrence by the California Coastal Commission prior to construction.
Endangered Species Act of 1973 (16 U.S.C. 1531, as amended) Fish and Wildlife Coordination Act (16 U.S.C. 661-666c) Magnuson-Stevens Fishery Conservation and Management Act Fishery Conservation Amendments of 1996, (16 USC 1801 *et seq*) – Essential Fish Habitat (EFH) Migratory Bird Treaty Act (16 U.S.C. 703-711) Marine Mammal Protection Act (16 U.S.C. 1361 *et seq)* National Marine Sanctuaries Act (16 USC 1431 *et seq*)	The USACE has determined that formal Section 7 Consultation pursuant to the Endangered Species Act is not required. The Corps is currently conducting an informal consultation with U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Coordination concerning environmental impacts will be completed with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. An EFH analysis has been completed. See Section 4.1.7. No impacts to migratory birds are expected from this project. No impacts to marine mammals are expected as a result of this proposed action. Coordination with the Monterey Bay National Marine Sanctuary will be completed.
National Historic Preservation Act (16 USC 470 and 36 CFR 800): Protection of Historic Properties Executive Order 11593: Protection and Enhancement of the Cultural Environment Archaeological and Historic Preservation Act of 1974, (16 USC 469 *et seq*)	Per 36 CFR 800.3(1), the proposed project has no potential to cause effects, and therefore the agency official has no further obligations under Section 106 of the NHPA.

Abandoned Shipwreck Act of 1987, (43 USC 2101 *et seq*) Submerged Lands Act, (Public Law 82-3167; 43 USC 1301 *et seq*)	

SECTION 2 – PROJECT ALTERNATIVES

2.1 PROPOSED PROJECT CRITERIA REQUIREMENTS

The Rivers and Harbors Act of 1958 authorized maintenance dredging of the federal channel to assure continued safe navigability within harbors.

2.2 Alternatives Eliminated from Further Consideration

This project consists primarily of maintenance dredging of existing channels. Proposed maintenance dredging is to restore a portion of the channel to Federallyl authorized depths. Alternative dredge footprints are therefore not feasible. Alternative disposal sites, including upland disposal sites were considered, but rejected as being too costly, and a non-beneficial use of the dredged materials.

2.3 ALTERNATIVES CONSIDERED

2.3.1 No Action Alternative

To comply with the NEPA, the Corps is required to consider the effects of taking no Federal action as an alternative to alleviate the shoaling problem at Moss Landing Harbor. The "No Action" Plan defines the "without project" condition. If no action were taken by either the Federal Government or the Moss Landing Harbor District to maintenance dredge the Entrance and Lagoon Channels, then sediment would continue to accrete resulting in navigational hazards and access limitations to Moss Landing Harbor. Specifically, commercial fishing boats, recreational boats, and the Monterey Bay Aquarium Research Institute's ocean-going research vessel would experience tidal delays in entering and exiting Moss Landing Harbor. This "No Action Plan" would also result in continued losses in commercial revenues and potential safety risks as shoaling continues to occur.

2.3.2 Alternatives Considered

Proposed Project.

Maintenance Dredging The last major dredging occurred from October to November of 2002 (FY 2003). The bottoms of the Entrance Channel and Lagoon Channel have shoaled in a number of areas, impairing the safe ingress and egress of vessels within Moss Landing Harbor. The proposed project is to remove approximately 45,000 cubic yards (CY) of accumulated material with a hydraulic cutter-head dredge, and/or a clamshell dredge. If physical, biological and chemical tests deem the dredged material suitable, it will be placed on the beach at the South Spit Beach Disposal Site or in the designated aquatic disposal site SF-12. Generally, sandy material (~ 13,500 CY) that contains at least 80 percent sand and free of contaminants is expected to be disposed along 500 feet of the beach hydraulically and dispersed using a bulldozer. Suitable finer material (~ 31,500 CY) will be disposed of at the SF-12 site.

The preferred alternative includes:
(1) Maintenance dredging of an estimated total 45,000 CY of material by hydraulic cutterhead

and/or a clamshell dredge. This and the following values include one foot of paid and one foot of unpaid overdepth and a multiplier to account for an estimated 15% infilling since the time the most recent survey was performed in March, 2007. There will be another survey performed shortly before dredging to verify these quantities although the expectation is the values will be very similar. Please see Appendix I– Dredging plan and disposal site location.
(2) Maintenance dredging of an estimated 13,500 CY of sandy material suitable for beach nourishment and disposal at the South Spit Beach Disposal Site. This material is from Stations 0+00 to 20+50 (figure 3A) adjacent to sample locations 2-1, 2-2, and 2-3. Data on suitability are found in Appendices B and H.
(3) Maintenance dredging of the estimated 31,500 CY of silty material suitable for unconfined aquatic disposal and disposal at SF-12. This material is from Stations 20+50 to 51+92.61 (figure 3B). Approximately 3000 CY of material will not be dredged due unsuitability based on possible toxicity. This area is shown in figure 3B. Data on suitability are found in Appendices B and H. Discussion of suitability is presented in Appendix H.

Beach Disposal Site. The site proposed for beach nourishment is located immediately to the north of the site of the former Sandholdt Pier, and is referred to as the South Spit Beach Disposal Site. See figure 3C. This beach was severely eroded by the storms of the 1982-83 winter and is currently in a severely eroded stage. Daily high tides appear to extend to the level of the seawall. The beach is presently comprised of medium sand. The land use shoreward of the site is light industrial. The South Spit Disposal Site was used for beach nourishment for the maintenance dredging of Moss Landing Harbor in FY 1984, 1987, 1990, 1993, 1996, 1998, and 2003. A sea wall abutting the South Spit Beach is currently being severe wave action and could be structurally compromised.

Disposal Site SF-12. This unconfined aquatic disposal site is located approximately 1,100 feet west northwest of the Moss Landing Marine Lab pier abutment. See figure 3C. The disposal site is an irregular quadrangle measuring 180 feet on the east side, 128 ft on the west side, 295 ft on the north side and 377 ft on the south side. The site location was corrected in 2005 to reflect its location approximately 900 feet farther offshore than was previously and incorrectly reported. It is also in deeper waters ranging from 100 to 150 feet deep, as opposed to the original 40 to 50 feet depth.

The site has been used periodically since 1947 for dredged material disposal. On January 1, 1993 the area in which SF-12 is located was designated as the "Monterey Bay National Marine Sanctuary." The use of SF-12 was grandfathered to allow usage as a dredged material disposal site, however, the location of the disposal site was later revised. In a letter dated May 5, 2005, to the Corps of Engineers from Mr. William Douros, Superintendant of the Monterey Bay National Marine Sanctuary (MBNMS), stated that the corrected location would not be considered to be a new disposal site. No new or different areas would be affected by discharged dredged material than has been the case in previous operations.

The 2001 Waste Discharge Requirements, Order No. 01-007, limits the ocean disposal window to between September 1 and June 1 when the natural seasonal sedimentary cycle is best for moving the sediments that tend to mound and persist until they are eroded by winter storms. This is also the period of lowest biological activity, including human usage of the beach. The bottom sediment at the site is predominantly fine sand. A survey of benthic fauna at a nearby site found that the fauna was dominated by crustaceans (mostly small mobile amphipods and ostracods). Material disposed

of at the site has been observed to mound on the bottom and persist until eroded by winter storms. However, verbal approval from RWQCB was given to place material at this location during the excluded period should the need arise.

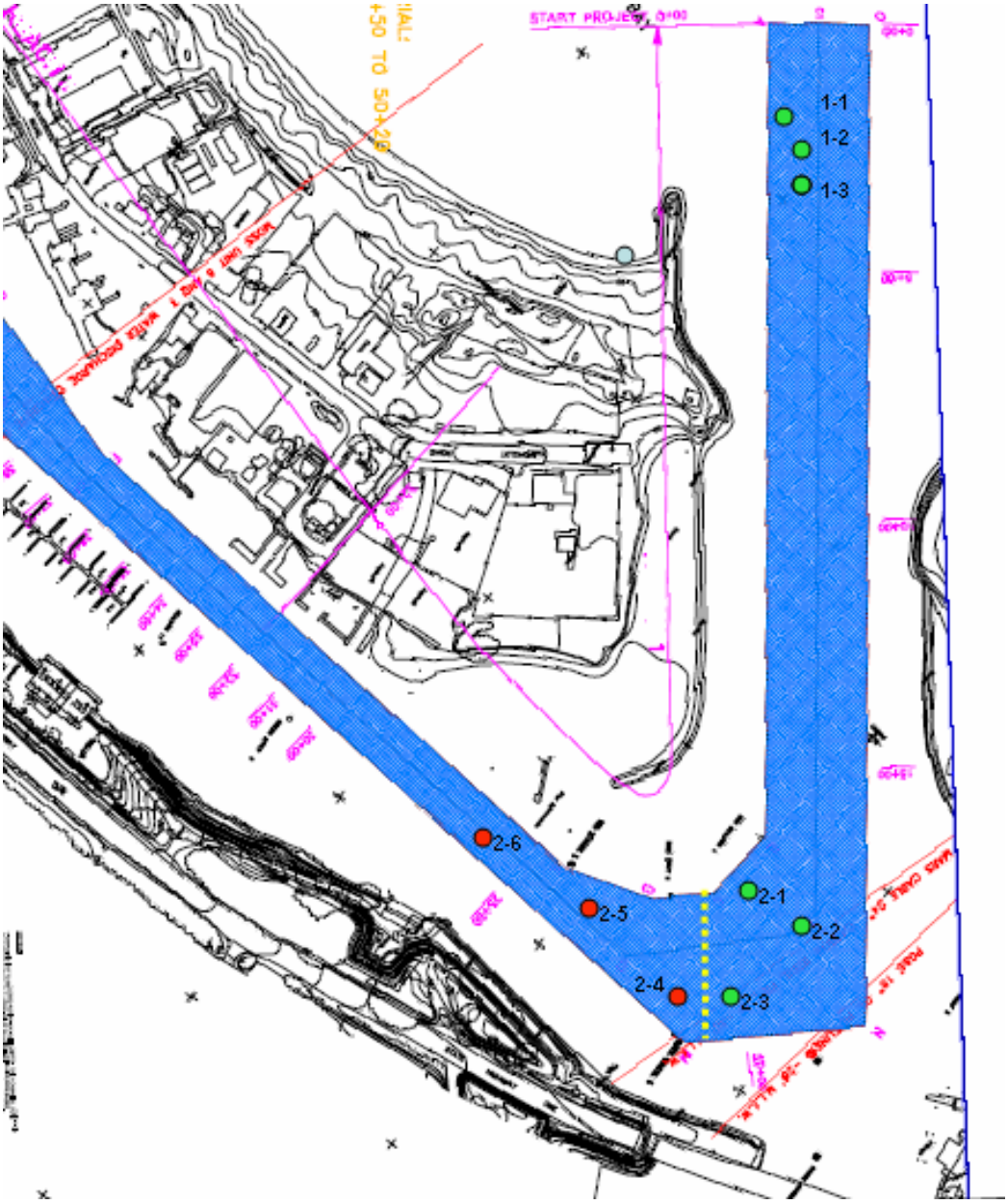

Figure 3A. Demarcation of areas for beach and offshore placement. Material from sample collection locations 1-1 to 1-3 and 2-1 to 2-3 meet the criteria for beach disposal (≥ 80% sand) and are indicated in green. The remaining samples, 2-4 to 2-6 and remaining (sample locations not indicated) do not meet such criteria; those which meet the criteria for offshore disposal will be placed at SF-12, the remainder will be left in place (see figure 3B). The dashed (yellow) line of is drawn mid-way between samples meeting the criteria for beach disposal and those which do not. Further details are found in the project plan map in Appendix I.

Figure 3B. Detail of area at South end of harbor showing area which is not to be dredged and locations where sediment samples were taken for testing. The fine red line represents the edge of the Federal channel. Shaded areas will not be dredged. Open circles (red) represent sediment samples within the Federal channel, triangles are locations of samples by Harbor District. Samples 7-1 and 7-4 were associated with toxicity; none of the other samples exhibited toxicity. Lines between areas to be dredged and not dredged were determined by taking mid-points between sample points. Further details are found in the project plan map in Appendix I.

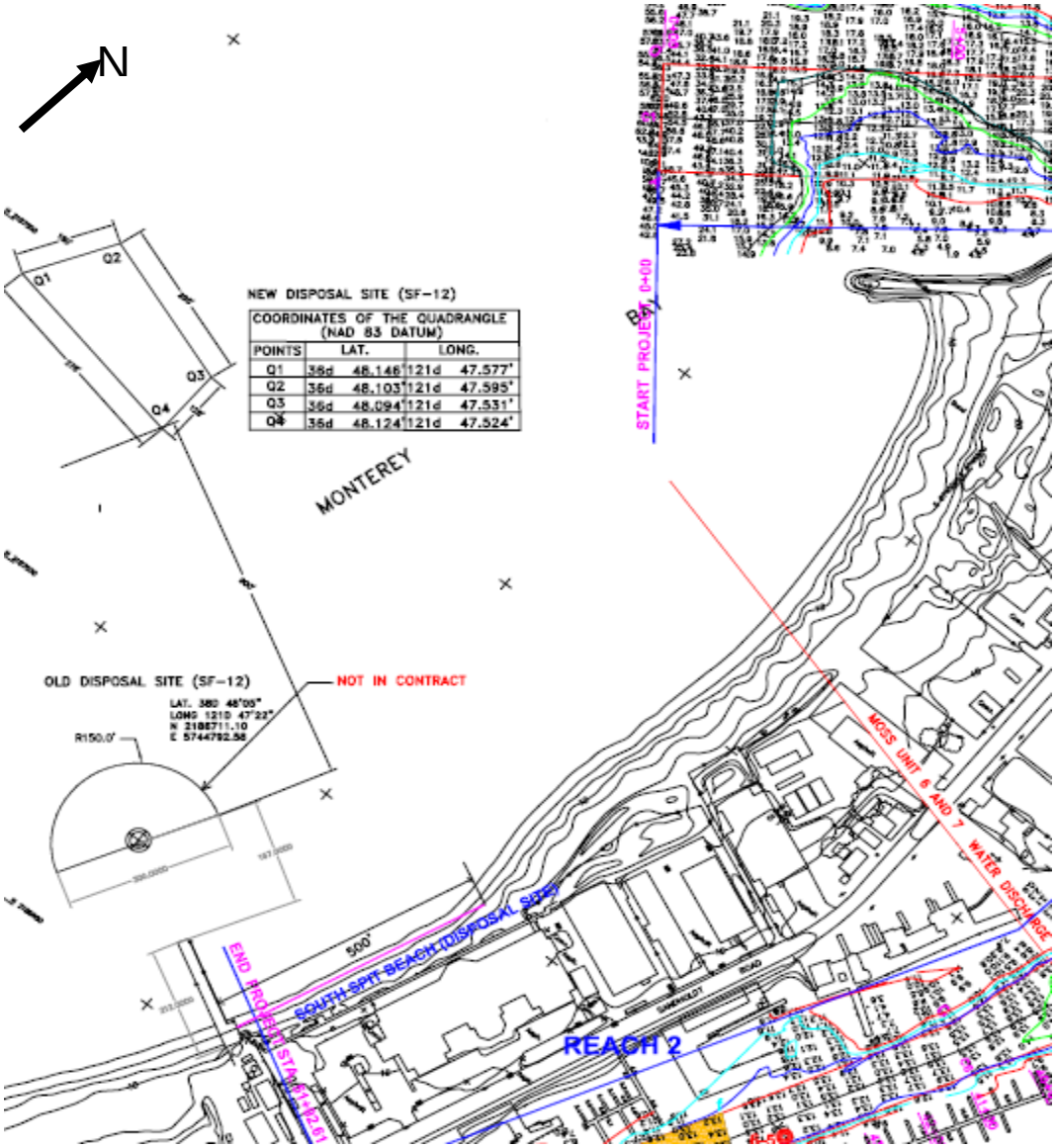

Figure 3C. Location of dredged material placement sites. The areas for beach nourishment, the current, and previous SF-12 are indicated. Note the base map is outdated (the Marine Laboratory location reflects the former rather than present location). Further details are found in the project plan map in Appendix I.

Alternatives Considered But Rejected. A former North Harbor upland disposal site was used for handling dredged material unsuitable for either aquatic discharge or beach replenishment. The site was closed in 2000 because its land use permit from Monterey County Planning Department expired. The Monterey Bay Harbor District has not identified another suitable upland site for dredged material handling.

SECTION 3 - ENVIRONMENTAL INVENTORY AND CONSEQUENCES

This section provides an assessment of potential impacts for the proposed project. If analyses show significant adverse impacts, then mitigation measures have been included to avoid the impact or reduce the level to insignificance

3.1 OCEANOGRAPHY AND WATER QUALITY

3.1.1 Affected Environment. The tides in southern California are mixed semi-diurnal with two unequal high tides and low tides per day. Tidal variations are caused by the passage of two harmonic tidal waves, one with a period of about 12.5 hours and one with a period of about 25 hours. This causes a difference in height between successive high and low waters. The result is two high waters and two low waters each day, consisting of a higher high water (HHW) and a lower high water (LHW), and a higher low water (HLW) and a lower low water (LLW). The mean tidal range for the project site is 3.5 feet.

Water quality in the inner harbor has been degraded by development within the region. Sources of contaminants are agricultural runoff, power plant discharges, septic tank leachate, marine bottom paints and illegal discharges of vessel sewage. Contaminants identified in the harbor include: oil, grease, zinc, copper, lead, cadmium, mercury, arsenic, chromium, polychlorinated biphenyls, DDT, DDE, toxaphene and endosulfan.

3.1.2 Environmental Consequences.

Criteria: An impact to Oceanography and Water Quality will be considered significant if:

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

Maintenance Dredging and Disposal. Dredging/placement activities will impact water quality by causing temporary, localized increases in turbidity, although required measures will reduce this impact. Based on the nature of the material to be dredged and the local conditions, it

is expected that the sediment plume will be relatively localized to the area in the immediate vicinity of the dredge. The duration of the plume is expected to be short; suspended solid concentrations will likely return to background levels within one hour after dredging stops. The placement of dredged materials on local beaches may also result in localized turbidity impacts.

During construction there may be minor inputs of contaminants from construction vessels; i.e. minor leaks and spills. Any such contaminants will be rapidly dispersed. Because no toxic materials will be used for dredging and disposal operations, a large spill of a toxic substance is extremely unlikely. Resulting impacts to water quality would be adverse but not significant. The only large spill that might occur would be a fuel tank rupture as a result of vessel collision. The construction contractor will be required to have a spill response plan in place for the proposed project. Mariners will be notified of the proposed activities and the project area will be appropriately marked with buoys. The chance of a collision between a vessel and a construction barge or placement scow is minute; it is not reasonable to expect a significant impact to occur. However, should a collision occur all appropriate measures will be taken by the construction contractor to mitigate any impacts and to notify in a timely fashion all required local, state, and federal agencies with response and/or compliance requirements (i.e. U.S. Coast Guard, the U.S. Environmental Protection Agency (EPA), National Marine Fisheries Service (NMFS), California Department of Fish and Game, etc.).

Grain Size Compatibility The San Francisco District's guidelines for sediment compatibility for beach nourishment state percent fines in a composite sediment sample from the dredge site should not consist of less than 80% sand.

Sediment Chemistry Compatibility Sediments will be assessed in accordance with the USACE and EPA Inland Testing Manual, and local guidance, including San Francisco's PN-01-01. Draft results from such testing are presented in Appendix H.

No action alternative. Dredging and Disposal impacts would not occur. Maintenance dredging would not occur, subsequent dredging would be required to maintain navigational depths that would be larger in scope and longer in duration resulting in more severe impacts. Navigational safety and the integrity of the South Spit sea wall may be severely compromised.

3.2 BIOLOGICAL RESOURCES

Affected Habitat. The proposed project area consists of the following types of affected habitats: coastal water habitat; sandy seafloor benthic habitat; and beach. Habitats near the project area that will not be affected include: coastal dune habitat near the north harbor and in the south harbor between the Old Salinas River channel and Monterey Bay; rocky intertidal habitat on the north and south jetties along the harbor entrance channel, and open water in Monterey Bay to the west of Moss Landing Harbor. There are no mudflat or marsh habitats present.

Coastal water habitat under full tidal influence is located in the outer Entrance Channel and inner Lagoon Channel, and at the SF-12 disposal site. The dredge would move through this habitat

while dredging is taking place. Invertebrates such as abalone and many varieties of jelly fish including spotted jelly live in this habitat. Coastal fish in this habitat include white sturgeon (*Acipenser transmontanus*) and sharks such as pajama catshark (*Poroderma africanum*). Birds such as brown pelican (*Pelecanus occidentalis*), western gull (*Larus occidentalis*), and common murre (*Uria aalge*) feed in coastal water habitat.

Sandy seafloor benthic habitat is located below the open water. Recently accumulated sediments would be dredged from this frequently disturbed habitat in the Entrance Channel and Lagoon Channel. The SF-12 disposal site is also located in this habitat. Invertebrates are the dominant type of species found in this habitat. Some species include spiny brittle stars (*Ophiothrix spiculata*), sand dollars (*Dendraster excentricus*), sea cucumbers (*Parastichopus parvimensis*) and globe crabs (*Randallia ornata*) which may feed and rest in or move through this habitat. Fish such as California halibut (*Paralichthys californicus*) and sanddabs (*Citharichthys* spp.) may be found in this habitat. No permanent vegetation occurs in this habitat that would be affected by the project. Eelgrass (*Zostera marina*) does not occur in the vicinity of the project.

Beach habitat is located at the south spit beach disposal site on the east side of the project area bordering Moss Landing Harbor. Invertebrates such as sand crabs (*Emerita analoga*) live in shifting beach sand. Birds such as snowy plovers (*Charadrius alexandrinus*) and killdeer (*Charadrius vociferus*) may nest, rest and feed in beach habitat. Fish such as topsmelt (*Atherinops affinis*) school near the shore. No permanent vegetation occurs in the immediate vicinity.

3.2.2 Environmental Consequences

Criteria. An impact to habitat will be considered significant if:

- There is a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or Area of Special Biological Significance;
- If the movement or migration of fish is impeded; and/or
- If there is a substantial loss in the habitat of any native fish, wildlife, or vegetation (a substantial loss is defined as any change in a population which is detectable over natural variability for a period of five years or longer).

Maintenance Dredging and Disposal.
Temporary increase in turbidity and suspended solids may decrease the amount of dissolved oxygen near the dredge site, thus affecting fish and other marine life within the area. Motile species are expected to relocate out of the area until dredging activities are finished. Some marine populations would be destroyed by dredging, but are expected to recolonize the area once dredging has ceased. Overall, dredging would be of short duration; therefore, no significant environmental impacts are expected on marine life in the dredge area.

No action alternative. Temporary and minor impacts to the habitats would not occur. Over time, shoaling would continue to occur and the beach nourishment site would continue to erode. Although the minor short term impacts would not occur, continued shoaling and erosion

would result in change in the existing habitat in the project area.

3.2.3 Affected Species

The following is a discussion of the typical species located in Moss Landing Harbor and at the beach nourishment site. Appendix D provides a more detailed discussion of endangered and threatened species that may occur in the area.

Vegetation. Vegetation is primarily absent from this water-based project. The shifting beach sands of the beach nourishment site do not support permanent vegetation, although vegetation grows in dunes outside of the project area.

Invertebrates. The most common invertebrate species occurring in the sandy bottom benthic habitat include the shore crab (*Hemigrapsis oregonensis*), the arthropod *Pachygrapsus crassippes*, the gastropod *Littorina scutulata*, and bivalves *Protothaca staminea, Tapes japonica,* and *Gemma gemma*. Sand crabs (*Emerita analoga*) are common to the beach environment. Taxa known to be distributed throughout Moss Landing Harbor include polychaetes such as *Streblospio benedicti* and *Capitella capitata*, and amphipods such as *Trasorchestia traskiana.*

Fishes. Numerous fish species are found in Moss Landing Harbor, including California halibut (*Paralichthys californicus*), rock fish (*Sebastes sp.*), speckled sanddab (*Cithrichthys stigmaeus*), northern anchovy (*Engraulis mordax*), shiner perch (*Cymatogaster aggregata*), Pacific herring (*Clupea pallasi*), starry flounder (*Platichthys stellatus*), and the Pacific staghorn sculpin (*Leptocottus armatus*).

Birds. Moss Landing Harbor provides loafing, foraging, and roosting areas for a variety of shorebirds and waterfowl. Species include the common loon (*Uria aalge*), brown pelican (*Pelecanus occidentalis*), western grebe (*Aechmosphorus occidentalis*), pelagic cormorant (*Phalacrocorax pelagicis*), mew gull (*Larus canus*), royal tern (*Thalasseus maximus*), and ruddy duck (*Oxyura jamacensis*).

Marine mammals. The only marine mammals expected in the dredging area would be Southern sea otter (*Enhydra lutris nereis*), California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*). Harbor seals and sea lions are expected to forage in the harbor and rest on the shore.

Threatened and endangered species which may occur at the project site include: California brown pelican (*Pelecanus occidentalis californicus*), Southern sea otter (*Enhydra lutris nereis*), the California least tern (*Sterna antillarum browni*), and the western snowy plover (*Charadrinus alexandrinus*). Appendix D provides a more detailed discussion of endangered and threatened species potentially in the project area.

3.2.2 Environmental Consequences

Criteria. An impact to Marine Resources will be considered significant if:

- The population of a threatened, endangered, or candidate species is directly affected or its

habitat is lost or disturbed;

- If there is a net loss in value of a sensitive biological habitat including a marine mammal haul out site or breeding area, seabird rookery, or Area of Special Biological Significance (ASBS);
- If the movement or migration of fish is impeded; and/or
- If there is a substantial loss in the population or habitat of any native fish, wildlife, or vegetation (a substantial loss is defined as any change in a population which is detectable over natural variability for a period of 5 years or longer).

Maintenance Dredging and Disposal.

Dredge impacts. Temporary increase in turbidity and suspended solids may decrease the amount of dissolved oxygen near the dredge site, thus affecting fish and other marine life within the area. Motile species are expected to relocate from the immediate area until dredging activities are finished. Some marine populations will be destroyed by dredging, but will recolonize once dredging has ceased. Overall, dredging will be of short duration; therefore, no significant environmental impacts are expected on marine life in the dredge area.

Disposal site. Some disturbances to macrobenthic fauna may occur at the disposal site, but these are expected to be short-term with recolonization occurring rapidly once disposal operations are finished. Restoration of the eroded beach will have beneficial affect on beach invertebrate habitat. The freshly nourished area may then attract more birds to the area to forage for food. These sites have all been nourished in the past. No sensitive marine habitats have been identified in conjunction with any of the proposed sites nor were any identified for the proposed project.

Threatened and endangered species. The USACE has determined that the proposed project will neither have a significant adverse affect nor jeopardize the continued existence of any federal listed threatened or endangered species. As of April 19, 2007, we are presenting evidence to FWS in regard the western snowy plover and contend that formal consultation pursuant to Section 7 of the Endangered Species Act is not required for project implementation. We report on informal consultation later in this document.

No action alternative. Construction impacts would not occur. Neither would there be any of the expected beneficial impacts to marine resources resulting from replenishment of eroded beaches. Dredge and disposal impacts would not occur at this time.

3.3 Air Quality

3.3.1 Affected Environment. The Moss Landing Harbor project area lies within the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The MBUAPCD consists of all of Monterey, San Benito, and Santa Cruz counties. Presently Monterey County is in "attainment" status or unclassified by the EPA for all National Ambient Air Quality Standards (NAAQS).

Although the project area lies within an attainment area, the Clean Air Act (CAA) Amendments of 1990 require that any federally funded project must comply (i.e. complete an analysis) with the air quality standards and regulations that have been established by federal, state, and local regulatory agencies, unless an exemption is applicable to that proposed action. This project is exempt because it is a routine maintenance dredging activity.

3.3.2 Environmental Consequences

Criteria. The CAA as amended specifies in Section 176(a) that no department, agency, or instrumentality of the federal government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve any activity which does not conform to an implementation plan after it has been approved or promulgated under Section 110 of this title. "Conformity" is defined in Section 176(c) of the CAA as conformity to the State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the NAAQSs and achieving expeditious attainment of such standards, and that the activity will not:

1. Cause or contribute to any new violation of a standard in any area;
2. Increase the frequency or severity of any existing violation of any standard in any area; or
3. Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The proposed project is a maintenance activity and results in minimal direct or indirect air emissions. This action in exempt under the *de minimis* levels specified in the General Conformity Rule, thus no further analysis by the Corps is required.

Dredge impacts. Emissions associated with the proposed dredging activities will come mainly from the dredge motor drive and the engine in the scows. This operation will cause some minor air quality impacts. Because of the temporary nature of the emissions and the offshore location of the dredge operation, it is not expected to have a significant impact on air quality in the area.

Beach disposal site. Emissions at the beach disposal site will come from construction equipment used to grade the newly placed sand. Because of the intermittent and short-term nature of expected emissions it is not expected to have a significant impact on air quality in the area. The disposal of dredged material will not produce dust since the material is primarily wet sand with small amounts of organic material. Air emissions for the combined maintenance dredging/disposal operations would result in insignificant impacts. *The contractor will be required to obtain all necessary air quality permits and comply with the APCD's guidelines.*

No action alternative. Emissions associated with the dredging project would not occur. However, the project's beneficial effects to the ecosystem would be lost.

3.4 Noise

3.4.1 Affected Environment. Dominant noise sources include waves, beach recreation activities, and vehicle noise on adjacent roads. The sound of wave action will vary with factors including wave height, period, frequency, angle of attack, season, and wind conditions.

3.4.2 Environmental Consequences

Dredge impacts. Project noise sources are limited to the dredge and to construction equipment to be used on the beach. Because of the temporary nature of the dredging and the offshore location of the dredge operation, it is not expected to have a significant impact on the area.

Disposal site. Given the general background noise levels, including those from existing boat and vehicular traffic, project noise impacts are not expected to be discernible from background noise levels. Impacts, thus, are expected to be less than significant.

No action alternative. Construction activities associated with the project would not occur. However, the project's beneficial effects to the ecosystem would be lost.

3.5 Cultural Resources

Federal agencies are required by statute to "take into account" the effects of their actions and undertakings on "historic properties." A historic property is the Federal term that refers to cultural resources (e.g., land-based prehistoric or historical sites, maritime historical resources, including shipwrecks, buildings and structures on the shore or in the water, and cultural artifacts) that are 50 or more years old, possess integrity, and meet the criteria of the National Register of Historic Places (NRHP). The NRHP eligibility criteria are found at 36 CFR Part 60.4. Taking into account the effects on historic properties derives from Section 106 of the National Historic Preservation Act; the implementing regulations of Section 106 are found at 36 CFR Part 800. To ensure that project effects to historic properties are adequately considered for a dredging and disposal project such as Moss Landing, one or more levels of investigation are carried out.

Maintenance Dredging Policy. The Corps has established policy and procedures for conducting underwater surveys for maintenance dredging and disposal activities.[1] The Corps is directed to make a reasonable and good faith effort to identify submerged archaeological resources that may be affected by project implementation. Typically the review of project documents and research of historical records and other sources is sufficient to determine what the potential is for submerged sites to be present and whether there would be an effect. The policy states that underwater surveys to identify historical archaeological sites (e.g., shipwrecks or other sunken maritime artifacts) are not required within the boundaries of previously dredged channels or previously used disposal areas unless the Corps determines that there is a good reason to believe that such resources exist and that they would be altered or destroyed as a result of project implementation.

There are two types of cultural resources of interest for the Moss Landing Harbor maintenance-

[1] "Dredging Guidance Letter No. 89-01." U.S. Army Corps of Engineers (13 March 1989).

dredging project: (a) archaeological sites from Native American settlement that may be situated on the shoreline or submerged on the continental shelf and (b) vessels that have sunk offshore and shoreline structures associated with the early 20th maritime industry. The investigation for this project consisted of reviewing the environmental documents from previous dredging projects, reviewing the archaeological survey reports and site records generated by the Corps and consulting archaeologists in the 1970s and 1980s for development projects in Moss Landing, and information on shipwrecks produced by the State Lands Commission and the Monterey Bay National Marine Sanctuary.

3.5.1 Affected Environment/Area of Potential Effects

The Area of Potential Effects (APE) is defined as the geographic area of a Federal undertaking within which changes in the character, or use of a historic property would occur. Typically an archaeological APE includes any area where project activities could affect the ground surface, either through excavation or deposition. The Moss Landing project APE has three components: (a) the existing ship channels, (b) the offshore aquatic-disposal site (designated SF-12), and (c) the beach-disposal area. A fourth area, an upland disposal site, may be used to place dredged material that could be found unsuitable for aquatic disposal.

It has been generally accepted that the initial construction of shipping lanes and maneuvering areas and the repeated maintenance dredging of these areas alter the seafloor to a point that submerged cultural resources, if present prior to the work, would be severely damaged or destroyed. The Moss Landing project would clearly fit this scenario. The Corps's previous environmental reports and project documents over the past 20+ years are silent regarding submerged cultural resources having been encountered during dredging operations. We therefore have no reason to believe that historic properties exist within the dredging part of the APE.

The ocean-disposal site that will be used for placement of the dredged sediment is designated SF-12. It has been recently confirmed as being located approximately 900 feet west of the aquatic disposal site historically used for placement of dredged material from the project. The historically used site, in shallow water at the end of the former Sandholt Pier, will no longer receive dredged material. The "new" location of SF-12 is situated at the head of the submerged Monterey Canyon at a depth of approximately 15 fathoms (90 feet). Because the location of SF-12 was only recently confirmed, the Corps has not had sufficient time to conduct a thorough assessment of the potential for submerged historic properties. The Corps will request funding to conduct additional research so that a more accurate assessment will be available before the next dredging episode occurs in 2009. It is proposed that initial research supplement the records and literature review already performed, and, based upon the results, provide a recommendation regarding the need to conduct a remote-sensing survey to identify historic properties.

Shipwreck preservation is better in offshore areas because of low-energy as opposed to destructive quality of the nearshore zone. The deeper-water areas are characterized as a sediment-starved environment. Since the placement of dredged sediment would only temporarily cover seafloor surfaces, given the dynamic factors operating in this ocean environment, any shipwreck remains that might exist there now would still be identifiable during

future remote-sensing surveys. The Corps therefore concludes that the disposal activities will have no adverse effect on historic properties.

Records and Literature Review. Two federal agencies maintain databases of shipwrecks that are available on the Internet. The California State Lands Commission's searchable database generated a list of 37 records of vessels lost off the Monterey County coastline.[2] Since the latitude and longitude coordinates are provided for each vessel, the remains of shipwrecks that may exist in the vicinity of the disposal site SF-12 were noted. An additional 19 records in the database, also listed by latitude and longitude coordinates for Monterey County, provided information which will be useful in future research for the project.

The National Oceanic and Atmospheric Administration maintains an online shipwreck database for the Monterey Bay National Marine Sanctuary (MBNMS).[3] The MBNMS database listed 30 shipwrecks by latitude and longitude coordinates, which represents a partial listing of lost vessels in the ocean waters between San Francisco and Point Sur. The MBNMS funded a submerged cultural resources study in 2001 that generated another database of over 400 shipwrecks; it is available on a compact disk.[4]

In addition, the Pacific coast region of California, Washington, and Oregon was studied in the late 1980s by the Minerals Management Service to identify submerged archaeological resources.[5] A database of shipwrecks numbering around 4,000 was generated as a result of this research. The Moss Landing project area is not represented in the database, although the study illustrates some interesting data. Mapped data of wreck locations showed that vessels tended to be lost at relatively high frequency in shallow water adjacent to the coast. Harbor approaches and inner-harbor waters are areas where vessel loses show a marked increase. Based upon the data, it is estimated that 80-90 % of wrecks occurred in depths around 5 fathoms (30 feet), referred to as the "nearshore zone."

The information acquired from the literature and database reviews allows the tentative conclusion that there are no historic properties within the APE. Submerged cultural resources would not have survived in the existing shipping channels. The beach-disposal area has been surveyed by an archaeologist for cultural resources and the results were negative. None of the plotted locations of known shipwrecks fall within the area of disposal site SF-12. Once additional research directed at identifying shipwrecks <u>not</u> represented in the above-listed databases is completed, the Corps will report its findings and conclusions to the State Historic Preservation Officer.

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[2] http://shipwrecks.slc.ca.gov
[3] http://channelislands.nos.noaa.gov
[4] "Monterey Bay National Marine Sanctuary Submerged Cultural Resources Study: 2001." Prepared by Underwater Archaeological Consortium (2003).
[5] "Minerals Management Service, Department of Interior. California, Oregon, and Washington Archaeological Resource Study." Prepared by Espey, Huston and Associates, Inc. (OCS Study MMS 90-0087).

3.5.2 Environmental Consequences

Dredging Impacts. Based upon the above discussion regarding the greatly modified conditions in the existing project channels, it is reasonable to conclude that there is little potential for historic properties to be adversely affected by the dredging.

Disposal Impacts. Referencing the negative findings of known shipwreck locations in Monterey Bay, and the absence of archaeological resources in the land portion of the APE (beach disposal area), it is concluded that no historic properties will be adversely affected by disposal activities.

3.6 Vessel Transportation and Safety

3.6.1 Affected Environment. The Monterey Bay and Moss Landing Harbor area is a heavily used recreational and small commercial vessel waterbody. Boat traffic, including commercial boats, fishing vessels, and recreational vessels, often traverse the proposed project site. Safe navigation is maintained by well-marked channels and the presence and activity of various law enforcement agencies (i.e. U.S. Coast Guard and California Department of Fish and Game).

3.6.2 Environmental Consequences

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

Dredging activities and disposal site. Given the general background vessel traffic levels project impacts are not expected to significantly increase vessel traffic levels. All vessels will be marked and lighted in accordance with U.S. Coast Guard regulations and notices will be published in Local Notice to Mariners warning boat users about times, durations, and locations of construction activities. Vessel traffic should be able to easily navigate around any short-term obstacles created by construction traffic. Dredging will not impede access to any channels or entranceways. Therefore, impacts to vessel traffic are considered to be insignificant.

No action alternative. Additional vessel traffic associated with the project would not occur. However, the project's beneficial effects would be lost.

3.7 Recreation Uses

3.7.1 Affected Environment. The project area is a mix of public and private recreational boating and commercial uses. The coastal waters provide for recreational boating and fishing.

3.7.2 Environmental Consequences

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

Dredge Impacts. Short-term impacts to recreational boaters will be negligible and insignificant. Long-term impacts will be beneficial. The dredging will maintain, sustain, and support recreational and commercial boating by keeping the approaches and entrance channels open and free of navigational hazards.

Disposal sites. Short-term beach closures during nourishment activities are considered to be an insignificant impact. Beach nourishment, over the long term, will result in wider beaches, yielding increased recreational opportunities on the nourished beaches. Overall**,** the proposed project will substantially and beneficially increase the recreational opportunities currently afforded to the area. The proposed project will not result in any permanent closures. Therefore, recreational impacts are considered to be insignificant.

No action alternative. The additional recreational benefits to boating and beach use would not occur.

3.8 Aesthetics

3.8.1 Affected Environment. The overall aesthetic character of the project area is composed of a mix of residential and water-oriented facilities. The beaches further add to the overall impression of a recreational-oriented visual setting. The area is well maintained. The natural resources in the area provide a visually attractive setting and relaxing atmosphere for residents and tourists.

3.8.2 Environmental Consequences

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

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

Disposal site. Dredged material is usually darker in color and its discharge on the beach will cause temporary adverse impacts. Once the sand dries, it will lighten to match existing beach sands. Equipment placed on the beach will also result in short-term adverse impacts. Considering the fall timing of these operations, the magnitude of these impacts to the general public will likely be minimal to the general viewing public. Short-term aesthetic impacts will be adverse, but not significant.

Long-term aesthetic impacts will be beneficial. The nourished beach will be wider and will consist of good quality sand. Aesthetically, the nourished beach will be far superior to the eroded beaches present at the start of each dredging cycle.

No action alternative. Beneficial impacts discussed above would be not be attained. Aesthetics of the area would remain unchanged.

3.9 Land/Water Uses

Affected Environment. Moss Landing Harbor is primarily characterized by recreational boaters, research vessels, and sports fishing operations.

3.9.2 Environmental Consequences

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

Dredge Impacts. The presence of the dredge and its supporting vessels will restrict vessel traffic to the harbor during dredging. Boat access will be maintained throughout all stages of construction. Boat traffic will, therefore, be at a minimum during all construction activities. Therefore, the proposed project is expected to result in adverse, but insignificant impacts.

Disposal site. Earth-moving equipment would be required to grade the beach. Activities will restrict use of sections (approximately 500 feet) of the beach. Nearby beaches would remain open and will be unrestricted. Beach nourishment, over the long term, will result in wider beaches, yielding increased recreational opportunities on the nourished beaches. Project benefits provide for long-term beach stabilization and protection of the sea wall.

No action alternative. Beneficial impacts discussed above would be not be attained. Over time, continued beach erosion will result in the loss of recreational use of project beaches.

3.10 Ground Transportation

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

3.10.2 Environmental Consequences

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

Maintenance Dredging. Construction will require the use of heavy equipment that requires manpower on the dredging vessel and a small crew to grade the sand at the beach disposal site. The project is expected to have no significant adverse impacts to ground transportation.

3.11 Cumulative Impacts

Federal dredging by the USACE generally takes place at Moss Landing on a three year schedule. Moss Landing Harbor District independently removes up to 60,000 cy or more every three to five years from berth areas and non-federal inner channels, although some areas are dredged less frequently (up to every 10 years). The demand for dredging can increase during heavy rainfall years as more shoaling occurs in the navigation channels. The most recent dredging conducted by the Harbor District started on April 17, 2007, and will be completed well before the Federal Channels are dredged. The spatial and temporal dredging discontinuities do not suggest any potential negative impact to resources of concern.

Dredged material suitable for beach replenishment had historically been placed north of the entrance jetty, and at an area between the Jetty Road tide gate and Zmudowski State Beach. Other disposal sites used in the past have been at SF-12 and at upland disposal sites. Several studies have been completed and are in the process of being completed to determine the effects of placing dredged material at SF-12. Dredged material which is placed at SF-12 is swept offsite fairly quickly, at least during most of the year, and thus does not accumulate from consecutive dredging cycles. Thus, the cumulative effects of past, present, and future activities in the vicinity of Moss Landing Harbor or at the disposal site will not create significant negative impacts to the project area. The cumulative effects of beach nourishment in the long term have a positive effect on recreational use at the harbor.

SECTION 4 - ENVIRONMENTAL COMPLIANCE AND COMMITMENTS

4.1 COMPLIANCE

4.1.1 National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 *et seq*)

This act requires that environmental consequences and project alternatives be considered before a decision is made to implement a federal project. NEPA established requirements for preparation of an Environmental Impact Statement (EIS) for projects potentially having significant environmental impacts, and an EA for projects with no significant environmental impacts.

A Draft EA and this recirculated EA have been prepared to disclose impacts and develop mitigation measures (if warranted) associated with the proposed maintenance project, as discussed in the CEQ regulations on implementing NEPA (40 CFR 1500-1508). This document presents sufficient information regarding the generic impacts of the proposed Operations and Maintenance (O&M) action at the Moss Landing Harbor to guide future studies, and is intended to satisfy all requirements of NEPA.

In accordance with NEPA, this EA provides further clarification and includes additional information on the changes as currently proposed. A letter notifying the interested public and the public agencies will be mailed to solicit comments prior to implementation of this proposed action.

4.1.2 Clean Water Act Of 1972 (33 USC 1251 *et seq*)

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Specific sections of the CWA control the

discharge of pollutants and wastes into aquatic and marine environments.

The specific section of the CWA that applies to the proposed project is Section 401, which requires certification that the permitted project complies with the State Water Quality Standards for actions within state waters. The Central Coast Regional Water Quality Control Board (CCRWQCB) has jurisdiction over Moss Landing Harbor. USACE is complying with Section 401 by adhering to the conditions in the CCRWQCB Waste Discharge Requirement Order No. 01-007.

Placement of approximately 13,500 CY of material on the beach for the purpose of beach nourishment constitutes discharge of dredged material into waters of the United States. The Corps is required to comply with the standards set forth in the Section 404(b)(1) Guidelines for discharge of dredged or fill material into Waters of the United States. This section of the beach does not include wetlands or other special aquatic sites. Nonetheless, an alternatives analysis was conducted and we have determined the proposed project to be in compliance with Section 404(b)(1) because it meets the following criteria:

- The proposed project is the least environmentally damaging practicable alternative;
- the work will not violate water quality standards;
- the work will not jeopardize the various physical and chemical components which characterize the non-living environment of the candidate site, the substrate and the water including its dynamic characteristics; and
- the work will not jeopardize continued existence of listed species or their critical habitat, or violate marine sanctuary protection.

The remaining 31,500 CY of material would be disposed in SF-12 which is beyond the 3-nautical mile limit, hence, not within territorial seas and this portion of the impacts are not considered under the requirements of the Section 404 of the Clean Water Act.

4.1.3 Endangered Species Act of 1973 (16 USC 1531 *et seq*)

The Endangered Species Act (ESA) protects threatened and endangered species by prohibiting federal actions that would jeopardize continued existence of such species or result in destruction or adverse modification of any critical habitat of such species.

A list provided by both the FWS and the NMFS of threatened, endangered, and candidate species of birds, reptiles, fish and amphibians in the study area and its immediate surroundings is presented in Appendix E. Although no impacts are expected to occur to any of these species or their critical habitat, a Biological Assessment was prepared for listed species and is included in Appendix D.

We have concluded that the proposed project will not adversely affect any federally listed endangered or threatened species, or their critical habitat, and formal consultation under Section 7 of the ESA is not required. We are currently conducting informal consultation with U.S. FWS and NMFS. All proposed minimization measures from U.S. FWS and NMFS will be included as requirements of the contract.

4.1.4 Coastal Zone Management Act of 1972

This Coastal Consistency Determination is submitted in compliance with 15 CFR Section 930.36

et seq of the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations (15 CFR 930).

The California Coastal Commission (CCC) has developed the California Coastal Management Program (CCMP) pursuant to the requirements of the Coastal Zone Management Act of 1972, as amended, (CZMA). The CCC's standard of review for Federal Consistency Determinations is the policies of Chapter 3 of the California Coastal Act of 1976, as amended, and not the Local Coastal Plan of the affected area. The "Monterey County's Local Coastal Program (LCP)," was originally approved and certified by the CCC in 1988. Although Monterey County's LCP governs coastal activities done by non-federal entities, the CCC has jurisdiction over federal activities located onshore and offshore. Therefore the applicable Chapter 3 policies/provisions are used in the Consistency Determination.

DETERMINATION

In accordance with the CZMA the U.S. Army Corps of Engineers has determined that the Moss Landing Harbor O&M dredging project is consistent to the maximum extent practicable with the CCMP, pursuant to the requirements of the California Coastal Act of 1976, as amended CCA. The environmental assessment included with the Consistency Determination in Appendix C provides the basis for this finding. USACE hereby requests concurrence with this determination.

4.1.5 Clean Air Act of 1969 (42 USC 7401 *et seq*); CAA Amendments of 1990 (PL 101-549)

The purpose of the Clean Air Act is to protect and enhance the Nation's air quality by regulating emissions of air pollutants, and to promote public health and welfare and the productivity of the population. Under this Act, the administrator of the EPA has established a set of NAAQS for six pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, sulfur dioxide. The EPA designates "attainment" areas if air quality measurements for all six pollutants are better than the NAAQS.

The Corps is exempt from preparing a "project conformity analysis" or "conformity determination" for the proposed Moss Landing Harbor O&M dredging activity because it involves routine maintenance dredging, no new depths, and the disposal will be at an approved disposal site. Finally, this action in exempt under the *de minimis* levels specified in the General Conformity Rule.

4.1.6 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires the USACE to consult with the U.S. Fish and Wildlife Service whenever the waters of any stream or other body of water are proposed to be impounded, diverted, or otherwise modified.

Specific comments are being solicited from the FWS and the NMFS concerning the proposed project. Coordination efforts will continue in order to fulfill the requirements of the FWCA; at this time we are in full compliance with its provisions.

4.1.7 Magnuson-Stevens Fishery Conservation and Management Act Fishery

Conservation Amendments of 1996, (16 USC 1801 *et seq)*

The Magnuson-Stevens Fishery Conservation and Management Act provides for the conservation and management of all fishery resources between 3 and 200 nautical miles offshore. The 1996 amendments to this act require regional fisheries management councils, with assistance from the NMFS, to delineate Essential Fish Habitat (EFH) in fishery management plans for all managed species. Federal action agencies which carry out activities that may adversely impact EFH are required to consult with the NMFS regarding potential adverse effects of their actions on EFH.

Pursuant to the Magnuson-Stevens Act, the USACE has conducted an assessment of EFH for the proposed project. EFH is defined as an area which consists of "waters and substrate necessary for spawning, breeding, feeding or growth to maturity" for certain fish species. The project is located within an area designated as EFH for three Fishery Management Plans (FMPs): the Pacific Coast Salmon Plan, the Coastal Pelagics Plan, and Pacific Groundfish Management Plan. Many of the 87 species federally managed under these plans are known to occur in the area, but are not expected to be adversely affected by the proposed project. The Monterey Canyon is listed as an "Area of Interest." Areas of interest are discrete areas that are of special interest due to their unique geological and ecological characteristics.

Impacts, such as turbidity associated with removing dredged material and disposing of the material at SF-12 would be temporary and insignificant. Therefore, the proposed action is in full compliance with this act. In compliance with the coordination and consultation requirements of the Act, the Draft EA will be sent to the NMFS for their review and comment.

4.1.8 Marine Mammal Protection Act, (16 USC 1361 *et seq)*

The Marine Mammal Protection Act (MMPA) provides protection to marine mammals in both the State waters (within 3 miles from the coastline) and the ocean waters beyond. As specified in the MMPA, the FWS is responsible for the management of polar bears, walrus, northern and southern sea otters, three species of manatees, and the dugong; the NMFS is responsible for all other marine mammals. The primary management features of the act include: 1) a moratorium on the "taking" of marine mammals; 2) the development of a management approach designed to achieve an "optimum sustainable population" for all species of marine mammals; and 3) the protection of species determined to be "depleted."

Three species of marine mammals sighted within the Monterey Bay National Marine Sanctuary area (the fin whale (*Balaenoptera physalus*), the southern population of the sea otter (*Enhydra lutris nereis*), and the humpback whale(*Megaptera movaeangliae*)) and three species or populations which are possible transients (the blue whale (*Balaenoptera musculus*), the sperm whale (*Physeter macrocephalus*), and the sei whale (*Balaenoptera borealis)*) are treated as "depleted" based on their listing as endangered or threatened species under the ESA. Marine mammal species located near or within the proposed Moss Landing Harbor O&M dredging project area are discussed in the Biological Assessment in Appendix D. Minimal and temporary disruption to the regular basking at the beach disposal site may occur to marine mammals, because seals, sea lions, and other marine mammals are sometimes known to haul out on the shore. If a marine mammal such as a California sea lion (*Zalophus californianus)* or Pacific harbor seal (*Phoca vitulina)* is encountered, disposal activities would immediately be halted.

4.1.9 Migratory Bird Treaty Act, (16 USC 703 *et seq)*

The essential provision of the Migratory Bird Treaty makes it unlawful except as permitted by regulations "to pursue, hunt, take, capture, kill…any migratory bird, any part, nest or egg," or any product of any bird species protected by the convention. Many of the bird species found within or near to the Moss Landing Harbor project area are discussed in the Biological Assessment in Appendix D. No bird species are expected to be impacted by this maintenance activity.

4.1.10 Executive Order 11990, Protection of Wetlands, (42 FR 26961, May 25, 1977)

Under this Executive Order, federal agencies are directed to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands. No impacts to wetlands or other special aquatic sites would occur; therefore this action is in full compliance with this Executive Order.

4.1.15 Rivers and Harbors Act of 1899, (33 USC 403 *et seq)*

This Act prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from the USACE. Since the dredging and maintenance of the Entrance and Lagoon Channels at Moss Landing Harbor were authorized by the Rivers and Harbors Act of 1945, the proposed O&M action would be in compliance with this act.

4.1.16 National Marine Sanctuary Act, (16 USC 1431 *et seq*)

The National Marine Sanctuaries Act authorizes the Secretary of Commerce to designate and manage areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities as national marine sanctuaries. Seabed alteration and disturbance to wildlife is prohibited by this act. The USACE has coordinated with the local governing agency, the Monterey Bay National Marine Sanctuary, to avoid impacts to the marine environment.

4.2 COORDINATION

This Draft Environmental Assessment will be provided to the California Coastal Commission, the California Department of Fish and Game, California Regional Water Quality Control Board – Central Coast Region, California State Historic Preservation Officer, Monterey Bay National Marine Sanctuary, National Marine Fisheries Service, Moss Landing Harbor District, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and various interested local individuals for review and comment. A Public Notice of Availability of the EA will be provided to other interested agencies, groups, and individuals.

4.3 PROPOSED REMEDIAL MEASURES

Following is a proposed summary of future commitments:

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

2. The contractor shall not dredge deeper than the authorized depth plus two feet of overdepth if needed for logistic reasons.

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

4. The Contractor shall properly maintain all construction equipment.

5. If cultural resources are discovered prior to or during work and cannot be avoided, work will be suspended in that area until resources are evaluated for eligibility for listing in the NRHP after consultation with the SHPO. If resources are deemed eligible for the NRHP, the effects of the project will be taken into consideration in consultation with the SHPO. The Advisory Council on Historic Preservation (ACHP) will be provided an opportunity to comment in accordance with 36 CFR 800.11.

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

7. The Contractor shall implement a Water Quality Monitoring Plan at the dredge and beach disposal sites consistent with the WDR.

8. The Contractor shall implement a Spill Prevention Plan at the dredge, beach disposal, and aquatic disposal sites.

9. According to the Central Coast Regional Water Quality Board's 2001 Waste Discharge Requirements, Order No. 01-007, ocean disposal shall only occur between September 1 and June 1. However, we have been granted an exemption should placement take place during this period.

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

11. The contractor shall mark the dredge and all associated equipment in accordance with U.S. Coast Guard regulations. The contractor must contact the U.S. Coast Guard two weeks prior to the commencement of dredging. The following information shall be provided: the size and type of equipment to be used; names and radio call signs for all working vessels; telephone number for on-site contact with the project engineer; the schedule for completing the project; and any hazards to navigation.

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

13. The Moss Landing Marine Laboratory will be notified prior to using SF-12 for dredged material disposal, as dredging may increase turbidity near their seawater intake.

14. Mariculture facilities will be notified prior to dredging operations which might affect

their water quality.

15. An Ecological Risk Assessment (ERA) has been prepared concerning dredging operations in Moss Landing Harbor. There are data pertinent to this EA contained ERA; however, it is still in draft form. Consequently, we are not presenting or relying upon any data or conclusions contained therein.

16. All movement of vehicles on the beach will be minimized by specifying ingress/egress routes for trucks or other equipment along the beach for the purpose of beach sand placement.

4.4 **CONCLUSION**

The proposed project is a maintenance project designed and scheduled to avoid and/or minimize probable effects on the environment. It is determined the proposed project will not have a significant impact upon the existing environment or the quality of the human environment, as documented in this EA. As a result, preparation of an EIS is not required.

SECTION 5 - REFERENCES

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Reissue Waste Discharge Requirements Order No. 01-007 for Moss Landing Harbor Dredging Operations, Moss Landing, Monterey County, Staff Report for Regular Meeting of May 18, 2001.

USEPA & USACE (U. S. Environmental Protection Agency & U. S. Army Corps of Engineers). 1998. Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual. EPA-823-B-98.

SECTION 6 - DISTRIBUTION LIST

Federal Agencies:	U.S. Environmental Protection Agency, Region IX U.S. Fish and Wildlife Service National Marine Fisheries Service Monterey Bay National Marine Sanctuary
State and Local Agencies:	California Coastal Commission California Department of Fish and Game California Department of Transportation California Regional Water Quality Control Board, Central Coast Region California State Prehistoric Preservation Officer Monterey County Planning Department Moss Landing Harbor District

SECTION 7 - ACRONYMS

ACHP.....Advisory Council oh Historic Preservation
APE.....Area of Potential Effects
ASBS.....Area of Special Biological Significance
CAA.....Clean Air Act
CCC.....California Coastal Commission
CCMP.....California Coastal Management Program
CCRWQCB.....Central Coast Regional Water Quality Control Board
CEQ.....Council on Environmental Quality
CWA.....Clean Water Act
CY.....Cubic yards
CZMA.....Coastal Zone Management Act
EA.....Environmental Assessment
EFH.....Essential Fish Habitat
EIS.....Environmental Impact Statement
EPA.....Environmental Protection Agency
ESA.....Endangered Species Act
FMP.....Fishery Management Plan
FONSI.....Finding of No Significant Impact
FWCA.....Fish and Wildlife Coordination Act
FWS.....U.S. Fish and Wildlife Service
FY.....Fiscal year
HHW.....Higher High Water
HLW.....Higher Low Water
LCP.....Local Coastal Program
LHW.....Lower High Water
LLW.....Lower Low Water
MBNMS.....Monterey Bay National Marine Sanctuary
MBUAPCD.....Monterey Bay Unified Air Pollution Control District
MLHD.....Moss Landing Harbor District
MLLW.....Mean Lower Low Water
MMPA.....Marine Mammal Protection Act
NAAQS.....National Ambient Air Quality Standards
NEPA.....National Environmental Policy Act
NHPA.....National Historic Preservation Act
NMFS.....National Marine Fisheries Service
NOAA.....National Oceanographic and Atmospheric Administration
O&M.....Operations and Maintenance
PL.....Public law
SHPO.....State Historic Preservation Officer
SPN.....San Francisco District
SQuiRT.....Screening Quick Reference Tables
USACE.....U.S. Army Corps of Engineers
WDR.....Waste Discharge Requirement

SECTION 8 - PREPARERS

8.1 Preparers

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APPENDIX B - WASTE

DISCHARGE REQUIREMENT (WDR)

Waste Discharge ID No. 3270703001 WDR No. 01-007 adopted September 14, 2001 covers dredging operations in harbor by ACOE, ML Harbor District and Duke Energy ML LLC. Section 2.3.2 in the body of this EA gives more details about quantities of material that will be dredged, and disposal sites.

Sediment testing results from samples taken June 29 – July 1, 2006, are presented in the following tables. Comparisons with NOAA SQuiRT (Screening Quick Reference Tables) values are provided. Values that exceed ERM values are highlighted. Data are taken from a draft report from Weston Solutions "Results of Chemical, Physical and Biological Testing of Sediments from Moss Landing Harbor, August 2006." Further sediment testing results and discussion are provided in Appendix H.

TABLE 1. Physical Characterization of Moss Landing Harbor Sediment Cores (based on Table 1 from draft sediment testing results) (continues on next page).

SITE	SEDIMENT DEPTH (FT)	SEDIMENT TYPE	ODOR	COLOR
ML1-1	0.0 - 1.0	Sand	None	Brownish gray
ML1-2	0.0 - 1.0	Sand	None	Brownish gray
ML1-3	0.0 - 1.0	Sand	None	Brownish gray
ML2-1	0 - 0.7	Aerobic medium sand	Slight hydrocarbon	Green brown
	0.7 - 2.3	Anaerobic medium sand		Gray brown
ML2-2	0.0 - 1.2	Aerobic medium sand	Phenolic	Dark olive
	1.2 - 2.6	Anaerobic medium sand	Sulfidic	Dark olive gray
ML2-3	0.0 - 0.7	Medium sand	Phenolic	Olive tan
	0.7 - 2.0		Fishy	Gray olive
	2.0 - 3.9		Sulfidic	Dark gray
ML2-4	0.0 - 0.5	Medium sand	Phenolic	Olive
	0.5 - 1.7		Fishy	Olive grey
	1.7 - 2.6		None	Dark olive
	2.6 - 3.0			
	3.0 - 3.9			Dark grey
	3.9 - 4.9	Silty sand		
ML2-5	0.0 - 0.3	Silty sand	None	Dark olive grey
	0.3 - 1.0			Dark grey olive
	1.0 - 2.0	Silty sand	Sulfur	
	2.0 - 2.6		None	
	2.6 - 3.4	Sandy Silt		Dark grey
ML2-6	0.0 - 0.5	Silty sand	Slight phenolic	Olive green
	0.5 - 1.2		None	Olive green grey
	1.2 - 2.0	Silty sand		
	2.0 - 3.0			Dark grey
	3.0 - 3.8			
ML3-1a	0.0 - 0.1	Clayey silt	None	Olive
	0.1 - 0.8			
	0.8 - 1.8			Dark gray olive
	1.8 - 2.7	Clayey silt		Dark gray
	2.7 - 3.1	Clayey sand		Dark gray olive
ML3-1b	0.0 - 0.5	Silt	None	Dark olive green
	0.5 - 1.9	Clayey silt		Dark gray olive
	1.9 - 2.6	Clayey sand		
	2.6 - 3.4	Clayey silt		Dark grey
ML3-2a	0.0 - 0.5	Silt	Sulfidic	Dark olive
	0.5 - 1.0	Clayey silt	None	Dark grey olive
	1.0 - 1.6		Sulfidic	
ML3-2a	1.6 - 2.0	Silty Clay		Dark grey
	2.0 - 2.7		None	
	2.7 - 3.0			
ML3-2b	0.0 - 0.5	Silt	None	Dark olive
	0.5 - 1.0	Clayey silt		
	1.0 - 1.7			Dark grey olive
	1.7 - 2.0	Silty Clay		
	2.0 - 2.9			Very dark grey
ML3-3a	0.0 - 0.6	Silt	Sulfidic	Dark grey olive
	0.6 - 0.8	Clayey Silt		Dark grey
	0.8 - 1.0			
	1.0 - 1.8		None	
	1.8 - 3.1	Silty clay		
ML3-3b	0.0 - 0.5	Clayey silt	None	Dark olive
	0.5 - 0.9			Olive grey
	0.9 - 1.6	Silty Clay		
	1.6 - 1.9			Dark olive grey
	1.9 - 2.5	Clayey sand		
	2.5 - 2.9	Silty sand		
	2.9 - 3.2	Coarse sand		Sandy olive

Table 1 (continues)

SITE	SEDIMENT DEPTH (FT)	SEDIMENT TYPE	ODOR	COLOR
ML3-4a	0.0 - 0.8	Silty sand	None	Dark olive
	0.8 - 1.2	Silty coarse sand		Sandy olive
	1.2 - 2.2	Clayey silt		Dark grey
	2.2 - 3.2	Silty clay		
	3.2 - 4.9	Clay		
ML3-4b	0.0 - 0.4	Clay sand	None	Dark olive
	0.4 - 1.0	Clay silt		Sandy olive
	1.0 - 1.6	Clay sand		Dark grey
	1.6 - 2.5	Clay silt		
	2.5 - 4.3	Clay		
ML4-1a	0.0 - 1.0	Silt	None	Olive grey
	1.0 - 2.0	Clay silt		
	2.0 - 3.0	Silty clay w/sand		Grey
ML4-1b	0.0 - 1.2	Clay silt	None	Olive grey
	1.2 - 2.2	Silty clay		
	2.2 - 2.8	Clay		Dark grey
ML4-1	0.0 - 1.0	Silty clay	None	Dark olive grey
	1.0 - 2.0			Dark grey
	2.0 - 2.7	Shell hash sand / mineral clay		
ML4-2a	0.0 - 0.6	Clay	None	Olive grey
	0.6 - 0.8		Hydrocarbons	
	0.8 - 3.5		None	Dark grey
ML4-3a	0.0 - 0.4	Clay	None	Olive
	0.4 - 1.7			Olive grey
	1.7 - 3.8			Dark grey
ML4-3b	0.0 - 0.3	Clay	None	Olive
	0.3 - 2.0			Olive grey
	2.0 - 3.5			Dark grey
ML5-1a	0.0 - 0.2	Silt	None	Olive green
	0.2 - 1.6	Clay silt		Olive grey
	1.6 - 3.2	Silty clay		
	3.2 - 4.9	Clay		Dark grey
ML5-1b	0.0 - 0.5	Silt	None	Olive
	0.5 - 2.2	Clay Silt		Olive grey
	2.2 - 4.1	Silty clay		
ML5-2a	0.0 - 1.0	Silt	None	Olive
	1.0 - 2.6	Clay silt		Olive grey
	2.6 - 5.1	Silty clay		Dark grey olive
ML5-2b	0.0 - 0.3	Silt	None	Olive
	0.3 - 1.9	Clay silt		Grey olive
	1.9 - 2.6	Silty clay		Dark grey olive
	2.6 - 3.9	Clay		Dark grey
ML5-3a	0.0 - 0.4	Silt	None	Olive tan
	0.4 - 2.0	Clay silt		Olive
	2.0 - 4.0	Silty clay		Olive grey
	4.0 - 4.7			Dark grey
ML5-3b	0.0 - 0.5	Silt	None	Olive tan
	0.5 - 2.5	Clay silt		
	2.5 - 4.2	Silty clay		Dark olive
	4.2 - 5.1	Clay		Dark grey
ML5-4a	0.0 - 0.2	Silt	None	Olive
	0.2 - 1.2	Clay silt		
	1.2 - 2.6	Silty clay		Olive grey
	2.6 - 3.3	Clay		Dark grey
ML5-4b	0.0 - 0.2	Silt	None	Olive tan
	0.2 - 1.9	Clay silt		Dark olive
	1.9 - 5.4	Silty clay		Olive grey

Table 1 (concluded)

Site	Sediment Depth (ft)	Sediment Type	Odor	Color
ML6-1	0.0 - 0.2	Silt	None	Olive tan
	0.2 - 1.9	Clay silt		
	1.9 - 3.0	Silty clay		Grey olive
	3.0 - 4.0	Clay		Dark grey
ML6-2	0.0 - 0.2	Silt	None	Olive
	0.2 - 2.1	Clay silt		
	2.1 - 3.7	Silty clay		Olive grey
	3.7 - 4.0	Clay		Dark grey
ML6-3	0.0 - 0.2	Silt	None	Olive grey
	0.2 - 1.7	Clay silt		
	1.7 - 2.0	Silty clay	Slight hydrocarbon	Olive green grey
	2.0 - 3.0		None	
	3.0 - 4.9	Clay	Sulfidic	Dark grey
ML6-4	0.0 - 0.2	Silt	None	Olive green
	0.2 - 2.0	Clay silt		
	2.0 - 3.0	Silty clay		Grayish olive green
	3.0 - 3.4			Dark grey
ML6-5	0.0 - 0.8	Silt	None	Olive grey
	0.8 - 2.2	Clay silt		Dark grey
	2.2 - 3.5	Silty clay	Petroleum	
ML7-1	0.0 - 1.0	Silt	None	Dark olive grey
	1.0 - 3.5	Clay silt		Dark grey
	3.5 - 4.9	Silty clay		
ML7-2	0.0 - 1.0	Silt	None	Dark grey olive
	1.0 - 2.5	Clay silt		
	2.5 - 4.6	Silty clay		Dark grey
ML7-3	0.0 - 2.0	Silt	None	Olive grey
	2.0 - 5.0	Clay silt		Dark grey
ML7-4	0.0 - 1.5	Silt	None	Olive grey
	1.5 - 4.0	Clay silt		Dark grey
	4.0 - 6.2	Silty clay		
ML8-1a	0.0 - 1.5	Silt	None	Olive brown
	1.5 - 3.5	Clay silt		Dark olive grey
	3.5 - 5.0	Silty clay		Dark grey
ML8-1b	0.0 - 1.5	Silt	None	Olive brown
	1.5 - 3.5	Clay silt		Dark olive grey
	3.5 - 5.4	Silty clay		Dark grey
ML8-2a	0.0 - 1.0	Silt	None	Olive brown
	1.0 - 5.0	Clay silt		Dark olive grey
	5.0 - 7.0	Silty clay		Dark grey
ML8-2b	0.0 - 1.0	Silt	None	Olive brown
	1.0 - 5.0	Clay silt		Dark olive grey
	5.0 - 6.5	Silty clay		Dark grey
ML8-3a	0.0 - 1.0	Silt	None	Dark olive
	1.0 - 4.5	Clay silt		Dark olive grey
	4.5 - 6.5	Silty clay	Petroleum hydrocarbon	Dark grey
ML8-3b	0.0 - 1.0	Silt	None	Dark olive
	1.0 - 4.5	Clay silt		Dark olive grey

Table 2. Results of Chemical and Physical Analyses of Moss Landing Harbor Sediment (based on Table 10 from draft sediment testing results) (highlighting indicates a value elevated over ERM)(continues on next page)

Analyte	ML1	ML2	ML3	ML4	ML5	ML6	ML7	ML8	SF-12 Levels		Previously Approved Levels[1]	ERLs/ ERMs[2]
									New	Old		
Conventionals												
Grain Size (%)												
GRAVEL	0.41	0.20	0.16	0.30	0.11	0.31	0.01	0.05	0.03	0.08	0.0 - 2.76	n/a
Sand	98.17	75.36	57.30	16.57	2.18	1.57	2.05	6.00	51.61	86.89	1.25 - 96.4	n/a
Clay	0.94	10.02	23.46	36.88	35.60	28.55	32.06	26.87	17.97	8.84	1.18 - 68.6	n/a
Silt	0.48	14.43	19.08	46.25	62.10	69.57	65.88	67.09	30.39	4.19	0.74 - 37.2	n/a
Total Organic Carbon (%)	0.043	0.52	0.66	1.74	2.13	2.28	2.39	2.30	0.29	0.51	0.08 - 2.80	n/a
Total Solids (%)	81.2	73.4	71.1	57.0	49.1	45.4	45.8	44.4	76.4	77.0	42.6 - 78.2	n/a
Total Soluble Sulfides (mg/kg)	<0.06	0.35	0.38	0.28	0.12	<0.11	<0.11	<0.11	<0.07	0.06	<0.1-<0.2	n/a
Total Sulfides (mg/kg)	0.7	103	126	242	131	281	251	163	2.0	2.6	21.2 - 541	n/a
Metals (mg/kg)												
As	NT	4.73	4.98	10.1	11.8	12.2	10.5	12.1	4.01	5.62	2.4 - 10.7	8.2 / 70
Cd	NT	0.573	1.58	1.37	1.35	1.52	1.32	1.19	0.35	0.46	0.2 - 1.10	1.2 / 9.60
Cr	NT	62.2	64.2	96.4	97.0	97.7	97.2	92.7	58.0	64.8	32.0 - 77.5	81 / 370
Cu	NT	8.59	18.2	25.8	30.3	34.1	38.2	34.3	2.22	8.81	6.3 - 41.4	34 / 270
Pb	NT	7.32	9.66	22.5	24.5	25.3	29.5	24.5	6.17	7.77	3.1 - 118	46.7 / 218
Hg	NT	0.03	0.05	0.10	0.10	0.14	0.13	0.64	0.16	0.11	0.03 - 0.19	0.15 / 0.71
Ni	NT	50.7	51.0	63.4	64.6	64.0	70.4	61.7	51.5	52.6	32.5 - 73.0	20.9 / 51.6
Se	NT	0.16	0.19	0.26	0.27	0.28	0.29	0.28	<0.10	0.13	0.4 - 1.2	n/a
Ag	NT	<0.14	0.22	0.18	0.21	<0.22	0.29	<0.23	<0.13	<0.13	<0.1 - <0.4	1 / 3.7
Zn	NT	61.1	69.3	157	170	197	183	212	60.9	61.0	26.8 - 149	150 / 410
PAHs (µg/kg)												
Acenaphthene	NT	<4.90	<5.06	<6.32	<7.33	<7.93	<7.86	<8.11	<4.71	<4.68	<4.6 - 18.8	n/a
Acenaphthylene	NT	<6.38	<6.58	<8.21	<9.53	<10.3	<10.2	<10.5	<6.13	<6.08	<6.0 - <11	n/a
Anthracene	NT	<8.58	<8.86	<11.1	<12.8	<13.9	<13.8	<14.2	<8.25	<8.18	<8.1 - 30.4	n/a
Benzo (a) anthracene	NT	10.1	<9.38	<11.7	18.9	<14.7	15.6	16.4	<8.73	<8.66	<8.5 - 98.7	n/a
Benzo (b) fluoranthene	NT	<12.1	<12.5	<15.6	<18.1	<19.6	<19.4	<20.0	<11.6	<11.5	<11.4 - 65.8	n/a
Benzo (k) fluoranthene	NT	<9.32	<9.62	<12.0	<13.9	<15.1	<14.9	<15.4	<8.95	<8.88	<8.7 - 33.6	n/a
Benzo (ghi) perylene	NT	<13.2	<13.7	<17.1	<19.8	<21.4	<21.2	<21.9	<12.7	<12.6	<12.4- <22	n/a
Benzo (a) pyrene	NT	<10.1	<10.4	<12.9	<15.0	<16.3	<16.1	<16.6	<9.66	<9.58	<9.4 - 46.9	n/a
Chrysene	NT	<5.40	<5.57	<6.95	8.59	<8.72	<8.65	<8.92	<5.18	<5.14	<5.3 - 86.1	n/a
Dibenz (ah) anthracene	NT	<12.5	<12.9	<16.1	<18.7	<20.2	<20.0	<20.7	<12.0	<11.9	<11.7- <22	n/a
Fluoranthene	NT	8.91	12.5	13.1	29.0	19.0	25.3	31.4	8.27	<7.48	<7.8 - 78.4	n/a
Fluorene	NT	<6.38	<6.58	<8.21	<9.53	<10.3	<10.2	<10.5	<6.13	<6.08	<6.0 - 13.0	n/a
Indeno (1,2,3-cd) pyrene	NT	<13.6	<14.1	<17.5	<20.4	<22.0	<21.8	<22.5	<13.1	<13.0	<12.8- <24	n/a
Naphthalene	NT	<2.60	<2.69	4.88	5.36	<4.21	<4.17	6.26	<2.50	3.32	<2.6 - 7.7	n/a
Phenanthrene	NT	9.60	<5.89	7.96	14.9	<9.23	10.8	17.5	7.50	<5.44	<5.7 - 35.5	n/a
Pyrene	NT	10.7	12.7	18.3	42.7	24.4	30.8	30.8	<7.96	<7.90	<8.2 - 99.4	n/a
Total Detected LMW PAHs	NT	9.60	0.00	12.8	20.3	0.00	10.8	23.8	7.50	3.32	ND - 71.6	n/a
Total LMW PAHs[3]	NT	38.4	35.7	46.7	59.5	55.9	57.0	67.1	35.2	33.8	<34.2 - 95.5	n/a
Total Detected HMW PAHs	NT	29.8	25.2	31.4	99.19	43.3	71.7	78.6	8.27	0.00	ND - 509	n/a
Total HMW PAHs[3]	NT	105.9	113.4	141.3	205.1	181.4	193.8	204.6	98.2	96.6	<101 - 570	n/a
Total Detected PAHs	NT	39.4	25.2	44.3	119	43.3	82.5	102	15.8	3.32	ND - 547	n/a
Total PAH[3]	NT	144.4	149.1	188.0	264.6	237.3	250.8	271.7	133.4	130.4	<135 - 639	4022 / 44792

Italicized analytes indicate LMW PAHs.

< Indicates concentrations are less than the corresponding method detection limit (MDL)

[1]Approved levels from most recent prior chemical characterization, includes results from the federal channel, MLHD, and Gravelle's Boatyard (MEC 2002, USACE 2002)

[2]Effects Range- Low (ERLs) lower tenth percentile concentration of screened sediment toxicity data, at which toxicity may begin Effects Range-Median (ERMs), median concentration of a compilation of toxic samples. (Long 1995)

[3]Total = Detected + Undetected at the achieved MDL.

Table 2 (continued).

Analyte	ML1	ML2	ML3	ML4	ML5	ML6	ML7	ML8	SF-12 Levels		Previously Approved Levels[1]	ERLs/ ERMs[1]
									New	Old		
PCB Aroclors (µg/kg)												
1016	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1221	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1232	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1242	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1248	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1254	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
1260	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	
Total	NT	<3.19	<3.29	<4.11	<4.77	<5.15	<5.11	<5.27	<3.06	<3.04	<3.0 - <5.4	45 / 360
Pesticides (µg/kg)												
Aldrin	NT	<0.71	<0.73	<0.92	<1.06	<1.15	<1.14	<1.18	<0.68	<0.68	<0.6 - <1.2	
Alpha-BHC	NT	<1.36	<1.41	<1.75	<2.04	<2.20	<2.18	<2.25	<1.31	<1.30	<1.3 - <2.4	
Beta-BHC	NT	<0.83	<0.86	<1.07	<1.24	<1.34	<1.33	<1.37	<0.80	<0.79	<0.8 - <1.4	
Gamma-BHC	NT	<0.86	<0.89	<1.11	<1.28	<1.39	<1.38	<1.42	<0.82	<0.82	<0.8 - <1.5	
Delta-BHC	NT	<0.83	<0.86	<1.07	<1.24	<1.34	<1.33	<1.37	<0.80	<0.79	<0.78 - 1.28	
Chlordane	NT	<3.24	<3.35	<4.18	<4.85	19.5	<5.20	16.1	<3.12	<3.09	<3.0 - <5.6	
2,4-DDD	NT	0.90	<0.86	2.93	3.98	7.50	6.45	7.23	<0.80	<0.79	<0.98 - 9.82	
4,4-DDD	NT	1.83	1.44	7.98	12.7	20.1	27.9	21.2	<0.80	<0.79	<0.78 - 20.2	
2,4 DDE	NT	<0.74	<0.76	<0.95	<1.10	<1.19	<1.18	<1.22	<0.71	<0.70	<0.85 - 9.88	
4,4 DDE	NT	3.92	4.34	21.0	34.3	89.6	91.3	104	1.95	1.68	<1.2 - 99.1	
2,4 DDT	NT	<1.36	<1.41	<1.75	<2.04	<2.20	<2.18	<2.25	<1.31	<1.30	<1.3 - <2.4	
4,4 DDT	NT	<1.36	<1.41	3.27	3.91	7.19	6.58	7.46	<1.31	<1.30	<1.3 - 3.5	
Total DDT[4]	NT	5.75	5.78	35.2	54.9	124	132	140	1.95	1.68	<150	1.6 / 46.1
Dieldrin	NT	<0.89	<0.91	<1.14	3.29	4.33	3.24	2.97	<0.85	<0.84	<0.8 - <1.5	0.02 / 8
Endosulfan I	NT	<1.12	<1.15	<1.44	<1.67	<1.81	<1.79	<1.85	<1.07	<1.06	<1.1 - <1.9	
Endosulfan II	NT	<1.16	<1.20	**<1.49**	**<1.73**	<1.87	<1.86	<1.91	<1.11	<1.10	<1.1 - <2.0	
Endosulfan sulfate	NT	<0.98	<1.01	<1.26	<1.47	<1.59	<1.57	<1.62	<0.94	<0.94	<0.9 - <1.7	
Endrin	NT	<1.04	<1.07	<1.33	<1.55	<1.67	<1.66	<1.71	<0.99	<0.99	<1.0 - <1.8	
Endrin aldehyde	NT	<1.10	<1.14	<1.42	<1.65	<1.78	<1.77	<1.82	<1.06	<1.05	<1.0 - <1.9	
Heptachlor	NT	<1.14	<1.18	<1.47	<1.71	<1.85	<1.83	<1.89	<1.10	<1.09	<1.1 - <2.0	
Heptachlor epoxide	NT	<1.13	<1.17	<1.46	<1.69	<1.83	<1.81	<1.87	<1.09	<1.08	<1.1 - <2.0	
Methoxychlor	NT	<2.03	<2.10	<2.61	<3.03	<3.28	<3.25	<3.36	<1.95	<1.94	NT	
Toxaphene	NT	<12.0	<12.4	<15.4	<17.9	<19.4	<19.2	<19.8	<11.5	<11.4	<5.9 - 19.6	
Organotins (µg/kg)												
Tetrabutyltin	NT	<1.21	<1.25	<1.56	<1.81	<1.96	<1.94	<2.00	<1.16	<1.16	<1.3 - 4.68	
Tributyltin	NT	<1.35	<1.39	<1.74	<2.02	<2.18	<2.16	<2.23	<1.30	<1.29	<1.3 - 28.6	
Dibutyltin	NT	<1.57	<1.62	<2.02	<2.34	<2.53	<2.51	<2.59	<1.51	<1.49	<1.7 - 1.7	
Monobutyltin	NT	<0.75	<0.77	<0.96	<1.12	<1.21	<1.20	<1.24	<0.72	<0.71	<0.70 - 1.15	

Italicized analytes indicate LMW PAHs.

< Indicates concentrations are less than the corresponding method detection limit (MDL)

[1]Approved levels from most recent prior chemical characterization, includes results from the federal channel, MLHD, and Gravelle's Boatyard (MEC 2002a, MEC 2002b)

[2]Effects Range- Low (ERLs) lower tenth percentile concentration of screened sediment toxicity data, at which toxicity may begin Effects Range-Median (ERMs), median concentration of a compilation of toxic samples. (Long 1995)

[4] DDT >150 used to determine threshold (EPA 1998).

Table 2 (addendum). Results of follow-up testing on sand component for station #2.

Station number	% sand
2-1	96.4
2-2	94.0
2-3	92.6
2-4	77.6
2-5	40.8
2-6	76.9

APPENDIX C - CONSISTENCY DETERMINATION

CONSISTENCY WITH THE PROVISIONS OF THE CALIFORNIA COASTAL ACT

PUBLIC ACCESS

Beach Access
Beach access will remain generally available, so the proposed project will not encroach upon the public's right of access to the sea. However, pipes conveying dredged material, equipment to contour the beach after dredged material placement, and safety fencing, may temporarily disrupt recreational use. Signs and/or fences so indicating will remain in place until dredged material placement is complete. The work period is expected to be approximately 45 days.

Traffic and Parking
There will be no disruption of either parking or traffic.

RECREATION

The proposed project will increase both safety and protection of recreational and commercial boaters using Moss Landing Harbor. Continued sedimentation would result in limitations to ingress and egress from the harbor entrance due to decreased depths and increased wave action. Proposed dredging of the harbor entrance and channel would alleviate this. The presence of the dredge, its supporting vessels, and ancillary equipment, may somewhat restrict vessel traffic during dredging. The presence of construction equipment will temporarily disrupt visual characteristics of both the south sandspit beach disposal site and moss landing harbor proper. Due to the presence of construction equipment and public safety concerns, the south sandspit beach disposal site may have temporary fencing (with signs) placed around it to prevent the public from entering the immediate site. Beach goers will still be able to access the coastline to the immediate north and south of the site. Therefore, aesthetics and recreational impacts are expected to be minimal and insignificant.

Since earth-moving equipment will be required to grade the beach, there will be minor disruptions to use of some sections of the beach. However, construction will take place during the fall months, when beach use is at a low point. Nearby beaches will remain open and will be unrestricted. Beach nourishment, over the long term, will result in wider beaches, yielding increased recreational opportunities.

The proposed Moss Landing Harbor Dredging O&M project will not impact recreational activities such birding at the Moss Landing Wildlife Observation area, or any activities associated with the Elkhorn Slough Reserve located nearby.

MARINE ENVIRONMENT
The extent to which the proposed Moss Landing Harbor, the placement areas, or adjacent areas is predicted to be minimal. See the Biological Resources description in Section 3.2 and the Biological Assessment in Appendix D for additional information about the marine environment. As noted in Section 2.3.2 the corrected location of the SF-12 disposal site located within the Monterey Bay National Marine Sanctuary has been approved by the marine sanctuary and the EPA. Possible impacts to the any of the habitats or ecosystems would be naturally restored due to quick immigration and/or recolonization of organisms.

LAND RESOURCES
This article does not apply to the Moss Landing Harbor Dredging O&M project.

DEVELOPMENT
This article does not apply to the Moss Landing Harbor Dredging O&M project.

INDUSTRIAL DEVELOPMENT
This article does not apply to the Moss Landing Harbor Dredging O&M project.

APPENDIX D - BIOLOGICAL ASSESSMENT

Proposed and Listed Endangered and Threatened Species and Critical Habitat
The U.S. Fish and Wildlife Service (FWS) Ventura Office provided a list of species currently listed or proposed as endangered, threatened, or a species of concern based on the Monterey County, California 7.5 minute quadrangle and county area. Designated and proposed critical habitat is also included. The list, included in Appendix C, contains all of the endangered (E); threatened (T); proposed endangered or threatened (P); candidate (C); species of concern (SC); species of local concern (SLC); critical habitat (CH); and taxa proposed for delisting that may be affected by projects conducted within the designated area. The list contains one mammal, six bird, three amphibian, two fish, one invertebrate, and nine plant species listed by US Fish & Wildlife Service, including critical habitat for five of these listed species.

This assessment describes the potential project impacts to proposed or listed as federally endangered and threatened species as well as designated or proposed critical habitat. This also serves as the Biological Assessment for the Moss Landing Harbor O&M dredging project. Additional detailed accounts of impacts to listed species are included in the 2002 USACE Environmental Assessment for Moss Landing Harbor Federal Channels O&M Dredging.

MAMMALS
Southern sea otter (*Enhydra lutris nereis)* (T) – Sea otters are typically found in nearshore marine environments, where they forage on invertebrates such as crabs, clams, and barnacles. Intermittent sightings of sea otters have been reported in Moss Landing Harbor, but no impacts are expected to this species. Sea Otters are highly mobile and capable of avoiding the dredging, placement, and beach nourishment activities, and the nearby jetties providing rocky intertidal habitat do not support kelp beds. Any sea otters in the vicinity of the dredging and disposal areas will be able to use the adjacent areas.

BIRDS
Bald eagle (*Haliaeetus leucocephalus)* (T and PD) - Bald eagles nest in large, old growth trees or other high perches, and prey upon fish, waterfowl, and animals on land. Bald eagles may forage in nearby sloughs outside of the project impact area. No impacts to bald eagles are expected because of their high level of mobility and the lack of nesting habitat nearby.

Brown pelican (*Pelecanus occidentalis)* (E) - At Moss Landing Harbor brown pelicans are common from June through November, rare to uncommon from December to May, and rare from March to April. Small numbers of non-breeders may remain at Moss Landing Harbor throughout the year. Pelicans forage in the winter in the open water within 15 km from shore.

Brown pelicans may feed in Monterey Bay and roost on the jetties at Moss Landing Harbor, but no nesting habitat occurs in the harbor. Pelicans are highly mobile and would avoid any of the dredging and disposal activities, so no significant impacts are expected to occur to this species.

California clapper rail (*Rallus longirostris obsoletus)* (E) – California clapper rails reside almost entirely in tidal salt marshes dominated by pickleweed and Pacific cordgrass. There is no foraging, cover, or nesting habitat suitable for clapper rails in the dredging or disposal areas. Clapper rails may fly over as they move to territory to the east, but no impacts would be expected to occur.

California least tern (*Sterna antillarum browni)* (E) – California least terns forage by diving into shallow to deep waters. Breeding season begins in mid to late April and ends by late August. Dredged material will not be deposited on the beach during breeding season. The CNDDB database does not list any nesting site in the area. No impacts are expected to occur to this species because of their absence from the project location.

Western snowy plover (*Charadrius alexandrinus nivosus)* (T and CH)– Western Snowy Plovers inhabit dry sand of the upper levels of open beaches. In 1989, snowy plovers were reported to be at Pacific Grove, located at the southern point of Monterey Bay. According to informal talks with the FWS at that time, approximately twenty pairs of snowy plovers nest on the beach area extending from Jetty Road in the north to the mouth of Old Salinas River in the south. The maintenance dredging and disposal project is not located within critical habitat area as of that time, which is located on the north side of the Entrance Channel, and three miles to the south. Both the beach disposal site and nearby remnant dune area to the north are highly disturbed sites, where campers, fishermen, dogs, and noise from the horn on the jetty frequently disrupt the site. Snowy plovers are more likely to nest in less disturbed dune habitat located to the south of the beach disposal site at Salinas River State Beach. Recent reconnaissance (March and April of 2007) of the placement site revealed no potential habitat for these organisms at the disposal site because daily high tides contacted the seawall. Further, examination in the area where the pipeline will be placed and areas nearby also revealed no signs of snowy plovers or their nests. The Corps has requested that FWS provide recent distribution information to determine the possibility that nests may become established in an area that could be affected by dredging activities. However, based on the absence of any signs of western snowy plovers, the Corps contents that no significant impacts are expected to occur. If the Corps places dredged material on the beach during nesting season and FWS requests specific measures, the Corp will comply.

Marbled murrelet *(Brachyramphus marmoratus)* (T and CH) – Successful nesting requires at least a 60 acre stand of old growth trees or a stand of mature trees with an old growth component. No impacts are expected to this species, since the proposed project area lacks suitable nesting habitat, and the marbled murrelet is highly mobile and can avoid any of the proposed dredging and disposal activities.

AMPHIBIANS AND REPTILES

California red-legged frog (*Rana aurora draytonii)* (T and CH) – California red-legged frogs most commonly frequent warm permanent fresh water ponds and slack water pools with

emergent vegetation surrounded by dense shrubs. Moss Landing Harbor is located within a critical habitat for this species, which encompasses privately owned lands, California Department of Parks and Recreation land, and the Elkhorn National Estuarine Research Reserve where the species has been observed. However, no impacts to the species are expected because the lack of suitable habitat for the red-legged frog in the immediate project area (i.e., dense riparian vegetation in contact with fresh water). Therefore, no negative impacts are expected to red-legged frogs that may reside further upstream in Elkhorn Slough.

Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum)* (E) – The Santa Cruz longtoed salamander inhabits temporary ponds for breeding and adjacent upland scrub and wooded areas during the nonbreeding season. It spends a substantial portion of its life underground in small mammal burrows and the root systems of plants in upland chaparral and woodland areas of coast live oak (*Quercus agrifolia*) or Monterey pine (*Pinus radiata*), and in strips of riparian vegetation such as arroyo willows (*Salix lasiolepis*), cattails (*Typha* spp.), and bulrush (*Scirpus* spp.) Eggs are laid singly on submerged stalks of spikerush (*Eleocharis* spp.) or other vegetation. This species has been observed in Bennet Slough, northeast of Moss Landing. However, there is no suitable habitat in the deep channels of Moss Landing Harbor, nor on the shores of the Federal channels, so no impacts are expected.

California tiger salamander (*Ambystoma californiense)* (T) - The species is restricted to grasslands and low foothill regions where lowland aquatic sites are available for breeding. They prefer natural ephemeral pools or ponds that are allowed to go dry. No impacts are expected because this type of habitat is not available in the project area.

INVERTEBRATES

Smith's blue butterfly (*Euphilotes enoptes smithi)* (E) – Smith's blue butterfly habitat occurs in scattered populations in coastal dunes, coastal srub, chaparral, and grasslands. They spend their entire lives in association with two buckwheat plants in the genus *Eriogonum.* Several sites along the Monterey Bay are now being managed for the preservation of Smith's Blue and its hostplants, including a preserve established by the U.S. Army at Fort Ord. This species would not be affected by this O&M project, because no suitable habitat exists at the beach disposal site.

PLANTS

Monterey Spineflower (*Chorizanthe pungens* var. *pungens)* (T and CH) – This species is endemic to dry sandy soils along the coast and inland, and has been found south of Moss Landing at Manresa State Beach and the dunes near Marina, and other sites along the coast in Monterey County. The USACE Environmental Assessment for Maintenance Dredging at Moss Landing dated September 2002 provided an account of previous field studies and consultation determining dredged material beach disposal impacts to this species. Based on these previous detailed studies, no impacts to the Monterey Spineflower are anticipated with disposal of sandy material suitable for beach nourishment at the beach disposal site.

Robust spineflower (*Chorizanthe robusta* var. *robusta)* (E and CH) – The robust spineflower is only known to occur on sandy and gravelly soils along and adjacent to the coast of southern Santa Cruz and northern Monterey Counties. This species is scattered on sandy soils within

coastal ponderosa pine/sand hill habitat. Populations along the coast exist northeast of the city of Santa Cruz near Sunset and Manresa State Beaches. No negative impacts are expected to occur to this species since no suitable habitat exists in the project area.

Menzies' wallflower (*Erysimum menziesii)* (E) – Menzie's wallflower occurs in coastal dunes, coastal strand, coastal dune scrub, and northern dune scrub in Monterey County. Existing populations in Monterey County are discontinuously distributed in coastal foredune communities in several places. There is no suitable coastal dune habitat in the immediate project area, including the beach nourishment disposal area, and therefore, no impacts are expected from beach nourishment activities.

Monterey gilia (*Gilia tenuiflora* ssp. *arenaria)* (E) – This species is restricted to isolated occurences within wind-sheltered, sparseley vegetated portions of the Monterey Bay and Monterey Penninsula dune systems in Monterey County. Monterey gilias inhabit the coastal foredunes and coastal dune scrub communities from Point Pinos to Point Joe. No impacts are expected to occur to this species since no suitable dune habitat exists on the beach disposal site, or elsewhere within the project area.

Beach layia (*Layia carnosa)* (E) – Beach layia is restricted to coastal and dunes. In Monterey County this species is only found in central dune scrub communities, and has very low population numbers due to invasive non-native plants and encroaching development. Since suitable dune habitat is not present in the project area, no negative impacts are expected to occur.

Tidestrom's lupine (*Lupinus tidestromii)* (E) – Tidestrom's lupine occurs from sea level to 25 feet on partially stabilized coastal dunes from the Monterey Peninsula in Monterey County northward to Pt. Reyes Peninsula in Marin County. The southernmost population is located at Pebble Beach in Monterey County. Negative impacts are not expected to occur to this species since the only known populations occur far away from Moss Landing Harbor.

Coastal dunes milk-vetch (*Astragalus tener* var. *titi)* (E) – Eleven colonies of this species are known to occur on the western edge of the Monterey Peninsula on relatively flat coastal terraces within 100 feet of the beach and 25 feet above sea level in loamy fine sands that support standing water in the winter and spring. No impacts are expected to occur to the coastal dune milk-vetch since the only suitable habitat occurs far away from Moss Landing Harbor.

Hickman's potentilla (or cinquefoil) (*Potentilla hickmanii)* (E) - Hickman's potentilla grows in loamy fine sandy soils within a closed-cone pine forest plant community, freshwater wetlands, meadows, and seeps along California's central coast. One existing population occurs on the western edge of the Monterey Peninsula on lands owned by the Pebble Beach Company. The proposed project area does not contain suitable habitat for this species, so no negative impacts are expected.

Santa Cruz tarplant (*Holocarpha macradenia)* (T and CH) – The Santa Cruz tarplant historically inhabited coastal prairie terraces and valley grassland communities below 330 feet in elevation from Monterey County north to Marin County. Only one population occurs in Monterey County

at Porter Ranch, just south of the Santa Cruz County line. No habitat for this species is available on the shores of the Federal channels or disposal site, so no impacts are expected.

FISH

Tidewater goby (*Eucyclogobius newberryi)* (E) - The Tidewater goby prefers water with low salinity, and low energy sand substrate. This species is known to inhabit an arm of Moss Landing Harbor well removed from dredging and potential dredging impacts as well Bennett Slough, located well north of Moss Landing Harbor. Therefore no negative impacts are expected to occur to this species.

Steelhead (*Oncorhynchus mykiss)* (T) - Steelhead is an anadromous species that spends part of its life in the ocean and part in freshwater streams. The project area lies within the South/Central California Coast Evolutionary Significant Unit (ESU). Steelhead in this ESU typically enter rivers in late November through March, and spawn from January to April. Only winter steelhead is included in this ESU. In informal consultation with NOAA Fisheries, it was concluded that although migrating steelhead may be in the ocean and Monterey Bay during the proposed maintenance dredging project, the project may affect but is not likely to adversely affect steelhead or their habitats since salmonids are highly mobile and can avoid any of the proposed dredging and disposal activities.

Green sturgeon (*Acipenser medirostris)* (T) -- The green sturgeon is a widespread species which has very recently been listed. There is very little information regarding the distribution, abundance, and behavior particularly in regard to dredged material management. We anticipate the outcome of informal consultation with NOAA Fisheries to be that although green sturgeon may be in the vicinity of the project, the project may affect but is not likely to adversely affect this species because of its mobility and ability to avoid any of the proposed dredging and disposal activities

Fishery Management Plans

The project is located within an area designated as EFH for three Fishery Management Plans (FMPs): the Pacific Coast Salmon Plan, the Coastal Pelagics Plan, and Pacific Groundfish Management Plan. Many of the 87 species federally managed under these plans are known to occur in the area. The dredging and dredged material placement may adversely affect EFH, though these effects would be minimal. Possible sources of impact include the following. Examples of adverse effects of increased turbidity and suspended solids may include increased metabolic costs, decreased ability to capture prey items or avoid predators, or cause avoidance behavior. Benthic food resources may be temporarily disrupted as material is removed or covered. However, both the dredging and placement sites are disturbed areas with resident fauna consistent of a disturbed habitat and will be quickly recolonized. Such quick recolonizaion is characteristic of benthic communities in disturbed habitats such as Moss Landing Harbor. Eelgrass is potentially a component of EFH which could be adversely affected by turbidity or sedimentation affecting light levels or burial, respectively, but is not in the project area. Eelgrass generally is limited to depths above that which will be dredged in this maintenance dredging project. Eelgrass populations occur on the East side of the US1 Bridge; any potential adverse impacts would be anticipated by monitoring stations near the bridge.

Summary of Biological Assessment

The proposed activities for the 2006 Moss Landing Harbor O&M dredging project are not expected to adversely affect any of the mammal, bird, reptile, amphibian, fish, invertebrate, or plant species listed in either the FWS's Monterey County Quad, nor any of the fish species or their habitats listed in the NOAA Fisheries FMPs. The proposed project is not expected to create any adverse impacts to any of the endangered, threatened, or proposed species, or their current or proposed critical habitats.

APPENDIX E - LIST OF THREATENED AND ENDANGERED SPECIES

LISTED SPECIES AND CRITICAL HABITAT WHICH MAY OCCUR IN THE MOSS LANDING U.S.G.S. 7.5 – MINUTE QUADRANGLE, MONTEREY COUNTY, CALIFORNIA

Mammals		
Southern sea otter	*Enhydra lutris nereis*	T
Birds		
Bald eagle	*Haliaeetus leucocephalus*	PD, T
Brown pelican	*Pelecanus occidentalis*	E
California clapper rail	*Rallus longirostris obsoletus*	E
California least tern	*Sterna antillarum browni*	E
Western snowy plover	*Charadrius alexandrinus nivosus*	T, CH
Marbled murrelet	*Brachyramphus marmoratus marmoratus*	T
Amphibians		
California red-legged frog	*Rana aurora draytonii*	T, CH
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	E
California tiger salamander	*Ambystoma californiense*	T
Fish		
Tidewater goby	*Eucyclogobius newberryi*	E
Steelhead trout	*Oncorhynchus mykiss*	*
Invertebrates		
Smith's blue butterfly	*Euphilotes enoptes smithi*	E
Plants		
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	T, CH
Robust spineflower	*Chorizanthe robusta* var. *robusta*	E, CH
Menzies' wallflower	*Erysimum menziesii*	E
Monterey gilia	*Gilia tenuiflora* ssp. *arenaria*	E
Beach layia	*Layia carnosa*	E
Tidestrom's lupine	*Lupinus tidestromii*	E
Coastal dunes milk-vetch	*Astragalus tener* var. *titi*	E
Hickman's potentilla	*Potentilla hickmanii*	E
Santa Cruz tarplant	*Holocarpha macradenia*	T, CH

Key:
E - Endangered T - Threatened CH - Critical habitat
PD - Taxa proposed for delisting
* Species for which the National Marine Fisheries Service has responsibility. For more information, call the Santa Rosa Field Office at (707) 575-6050 or go to http://swr/ucsd.edu

APPENDIX F - AGENCY LETTERS

APPENDIX G - RESPONSE TO COMMENTS

APPENDIX H – SEDIMENT TESTING RESULTS BASED ON DRAFT REPORT FROM WESTON SOLUTIONS "RESULTS OF CHEMICAL, PHYSICAL AND BIOLOGICAL TESTING OF SEDIMENTS FROM MOSS LANDING HARBOR" AUGUST 2006

This section presents an overview of sediment testing results. Some of this material was presented in Appendix B – waste discharge requirements. A final report, "Results of chemical, physical, and biological testing of sediments from Moss Landing Harbor federal navigation channel" has been provided to the California Department of Fish and Game, the Central Coast Water Board, the Monterey Bay National Marion Sanctuary, and the U. S. Environmental Protection Agency, Region IX. Additional copies are available on request.

Sediment samples were collected from the federally maintained main channel within Moss Landing Harbor, located near the center of Monterey Bay in Monterey, CA. Samples were analyzed for physical and chemical constituents and biological response in support of the U.S. Army Corps of Engineers dredge plans. All analytical methods were performed in accordance with the Sampling and Analysis Plan: Sampling and Analysis Plan: Moss Landing Harbor: FY 2006 O&M Dredging (USACE 2006).

Weston Solutions, Inc. (WESTON) conducted chemical, physical, and biological characterization testing with seven sediment composites created with 44 core samples collected from the Harbor's main navigational channel between June 29 and July 1, 2006. Test results were evaluated to assess the suitability of project dredged material for two disposal scenarios: placement at SF-12, or beach replenishment. Three samples were also collected and composited from the Harbor's entrance channel, but only analyzed for grain size distribution to confirm the material's historically sandy character. All analyses were performed in accordance with the Sampling and Analysis Plan: Sampling and Analysis Plan: Moss Landing Harbor: FY 2006 O&M Dredging (USACE 2006), referred to hereinafter as the SAP. Federal and regional guidance was followed during all aspects of the study as specified in Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (USEPA/USACE 1998) otherwise known as the ITM, and PN 01-01: Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region (USACE 2001).

Chemical and Physical Analyses

Results of the physical and chemical analyses of Moss Landing Harbor sediment samples required under PN 01-01 are summarized in Table 1. Reference sediment chemistry analysis

TABLE 1. Physical Characterization of Moss Landing Harbor Sediment Cores (based on Table 1 from draft sediment testing results) (continues on next page).

SITE	SEDIMENT DEPTH (FT)	SEDIMENT TYPE	ODOR	COLOR
ML1-1	0.0 - 1.0	Sand	None	Brownish gray
ML1-2	0.0 - 1.0	Sand	None	Brownish gray
ML1-3	0.0 - 1.0	Sand	None	Brownish gray
ML2-1	0 - 0.7	Aerobic medium sand	Slight hydrocarbon	Green brown
	0.7 - 2.3	Anaerobic medium sand		Gray brown
ML2-2	0.0 - 1.2	Aerobic medium sand	Phenolic	Dark olive
	1.2 - 2.6	Anaerobic medium sand	Sulfidic	Dark olive gray
ML2-3	0.0 - 0.7	Medium sand	Phenolic	Olive tan
	0.7 - 2.0		Fishy	Gray olive
	2.0 - 3.9		Sulfidic	Dark gray
ML2-4	0.0 - 0.5	Medium sand	Phenolic	Olive
	0.5 - 1.7		Fishy	Olive grey
	1.7 - 2.6		None	Dark olive
	2.6 - 3.0			
	3.0 - 3.9			Dark grey
	3.9 - 4.9	Silty sand		
ML2-5	0.0 - 0.3	Silty sand	None	Dark olive grey
	0.3 - 1.0			Dark grey olive
	1.0 - 2.0	Silty sand	Sulfur	
	2.0 - 2.6		None	
	2.6 - 3.4	Sandy Silt		Dark grey
ML2-6	0.0 - 0.5	Silty sand	Slight phenolic	Olive green
	0.5 - 1.2		None	Olive green grey
	1.2 - 2.0	Silty sand		
	2.0 - 3.0			Dark grey
	3.0 - 3.8			
ML3-1a	0.0 - 0.1	Clayey silt	None	Olive
	0.1 - 0.8			
	0.8 - 1.8			Dark gray olive
	1.8 - 2.7	Clayey silt		Dark gray
	2.7 - 3.1	Clayey sand		Dark gray olive
ML3-1b	0.0 - 0.5	Silt	None	Dark olive green
	0.5 - 1.9	Clayey silt		Dark gray olive
	1.9 - 2.6	Clayey sand		
	2.6 - 3.4	Clayey silt		Dark grey
ML3-2a	0.0 - 0.5	Silt	Sulfidic	Dark olive
	0.5 - 1.0	Clayey silt	None	Dark grey olive
	1.0 - 1.6		Sulfidic	
ML3-2a	1.6 - 2.0	Silty Clay		Dark grey
	2.0 - 2.7		None	
	2.7 - 3.0			
ML3-2b	0.0 - 0.5	Silt	None	Dark olive
	0.5 - 1.0	Clayey silt		
	1.0 - 1.7			Dark grey olive
	1.7 - 2.0	Silty Clay		
	2.0 - 2.9			Very dark grey
ML3-3a	0.0 - 0.6	Silt	Sulfidic	Dark grey olive
	0.6 - 0.8	Clayey Silt		Dark grey
	0.8 - 1.0			
	1.0 - 1.8		None	
	1.8 - 3.1	Silty clay		
ML3-3b	0.0 - 0.5	Clayey silt	None	Dark olive
	0.5 - 0.9			Olive grey
	0.9 - 1.6	Silty Clay		
	1.6 - 1.9			Dark olive grey
	1.9 - 2.5	Clayey sand		
	2.5 - 2.9	Silty sand		
	2.9 - 3.2	Coarse sand		Sandy olive

Table 1 (continues)

SITE	SEDIMENT DEPTH (FT)	SEDIMENT TYPE	ODOR	COLOR
ML3-4a	0.0 - 0.8	Silty sand	None	Dark olive
	0.8 - 1.2	Silty coarse sand		Sandy olive
	1.2 - 2.2	Clayey silt		Dark grey
	2.2 - 3.2	Silty clay		
	3.2 - 4.9	Clay		
ML3-4b	0.0 - 0.4	Clay sand	None	Dark olive
	0.4 - 1.0	Clay silt		Sandy olive
	1.0 - 1.6	Clay sand		Dark grey
	1.6 - 2.5	Clay silt		
	2.5 - 4.3	Clay		
ML4-1a	0.0 - 1.0	Silt	None	Olive grey
	1.0 - 2.0	Clay silt		
	2.0 - 3.0	Silty clay w/sand		Grey
ML4-1b	0.0 - 1.2	Clay silt	None	Olive grey
	1.2 - 2.2	Silty clay		
	2.2 - 2.8	Clay		Dark grey
ML4-1	0.0 - 1.0	Silty clay	None	Dark olive grey
	1.0 - 2.0			Dark grey
	2.0 - 2.7	Shell hash sand / mineral clay		
ML4-2a	0.0 - 0.6	Clay	None	Olive grey
	0.6 - 0.8		Hydrocarbons	
	0.8 - 3.5		None	Dark grey
ML4-3a	0.0 - 0.4	Clay	None	Olive
	0.4 - 1.7			Olive grey
	1.7 - 3.8			Dark grey
ML4-3b	0.0 - 0.3	Clay	None	Olive
	0.3 - 2.0			Olive grey
	2.0 - 3.5			Dark grey
ML5-1a	0.0 - 0.2	Silt	None	Olive green
	0.2 - 1.6	Clay silt		Olive grey
	1.6 - 3.2	Silty clay		
	3.2 - 4.9	Clay		Dark grey
ML5-1b	0.0 - 0.5	Silt	None	Olive
	0.5 - 2.2	Clay Silt		Olive grey
	2.2 - 4.1	Silty clay		
ML5-2a	0.0 - 1.0	Silt	None	Olive
	1.0 - 2.6	Clay silt		Olive grey
	2.6 - 5.1	Silty clay		Dark grey olive
ML5-2b	0.0 - 0.3	Silt	None	Olive
	0.3 - 1.9	Clay silt		Grey olive
	1.9 - 2.6	Silty clay		Dark grey olive
	2.6 - 3.9	Clay		Dark grey
ML5-3a	0.0 - 0.4	Silt	None	Olive tan
	0.4 - 2.0	Clay silt		Olive
	2.0 - 4.0	Silty clay		Olive grey
	4.0 - 4.7			Dark grey
ML5-3b	0.0 - 0.5	Silt	None	Olive tan
	0.5 - 2.5	Clay silt		
	2.5 - 4.2	Silty clay		Dark olive
	4.2 - 5.1	Clay		Dark grey
ML5-4a	0.0 - 0.2	Silt	None	Olive
	0.2 - 1.2	Clay silt		
	1.2 - 2.6	Silty clay		Olive grey
	2.6 - 3.3	Clay		Dark grey
ML5-4b	0.0 - 0.2	Silt	None	Olive tan
	0.2 - 1.9	Clay silt		Dark olive
	1.9 - 5.4	Silty clay		Olive grey

Table 1 (concluded)

Site	Sediment Depth (ft)	Sediment Type	Odor	Color
ML6-1	0.0 - 0.2	Silt	None	Olive tan
	0.2 - 1.9	Clay silt		
	1.9 - 3.0	Silty clay		Grey olive
	3.0 - 4.0	Clay		Dark grey
ML6-2	0.0 - 0.2	Silt	None	Olive
	0.2 - 2.1	Clay silt		
	2.1 - 3.7	Silty clay		Olive grey
	3.7 - 4.0	Clay		Dark grey
ML6-3	0.0 - 0.2	Silt	None	Olive grey
	0.2 - 1.7	Clay silt		
	1.7 - 2.0	Silty clay	Slight hydrocarbon	Olive green grey
	2.0 - 3.0		None	
	3.0 - 4.9	Clay	Sulfidic	Dark grey
ML6-4	0.0 - 0.2	Silt	None	Olive green
	0.2 - 2.0	Clay silt		
	2.0 - 3.0	Silty clay		Grayish olive green
	3.0 - 3.4			Dark grey
ML6-5	0.0 - 0.8	Silt	None	Olive grey
	0.8 - 2.2	Clay silt		Dark grey
	2.2 - 3.5	Silty clay	Petroleum	
ML7-1	0.0 - 1.0	Silt	None	Dark olive grey
	1.0 - 3.5	Clay silt		Dark grey
	3.5 - 4.9	Silty clay		
ML7-2	0.0 - 1.0	Silt	None	Dark grey olive
	1.0 - 2.5	Clay silt		
	2.5 - 4.6	Silty clay		Dark grey
ML7-3	0.0 - 2.0	Silt	None	Olive grey
	2.0 - 5.0	Clay silt		Dark grey
ML7-4	0.0 - 1.5	Silt	None	Olive grey
	1.5 - 4.0	Clay silt		Dark grey
	4.0 - 6.2	Silty clay		
ML8-1a	0.0 - 1.5	Silt	None	Olive brown
	1.5 - 3.5	Clay silt		Dark olive grey
	3.5 - 5.0	Silty clay		Dark grey
ML8-1b	0.0 - 1.5	Silt	None	Olive brown
	1.5 - 3.5	Clay silt		Dark olive grey
	3.5 - 5.4	Silty clay		Dark grey
ML8-2a	0.0 - 1.0	Silt	None	Olive brown
	1.0 - 5.0	Clay silt		Dark olive grey
	5.0 - 7.0	Silty clay		Dark grey
ML8-2b	0.0 - 1.0	Silt	None	Olive brown
	1.0 - 5.0	Clay silt		Dark olive grey
	5.0 - 6.5	Silty clay		Dark grey
ML8-3a	0.0 - 1.0	Silt	None	Dark olive
	1.0 - 4.5	Clay silt		Dark olive grey
	4.5 - 6.5	Silty clay	Petroleum hydrocarbon	Dark grey
ML8-3b	0.0 - 1.0	Silt	None	Dark olive
	1.0 - 4.5	Clay silt		Dark olive grey

results (current and former SF-12), previously approved levels, and Effects Ranges Low and Median values are also provided in the sediment chemistry tables for reference.

Project material collected from the mid to upper-reach spans of the Moss Landing Harbor main navigational channel (ML4-ML8) was predominantly fine-grained in composition, ranging from 83.1% to 98.1% fines (silts and clays). The lower-reach segment of the main channel

represented by ML2 and ML3 were comprised mostly of sand (75.4, and 57.3% sand, respectively), and the entrance channel sample (ML1) was 98.2% sand. As expected, material collected from the newly relocated SF-12 site was less sandy than the former SF-12 site, with the current and former SF-12 samples consisting of 51.6 and 86.9 % sand, respectively. TOC levels among federal channel samples reflected the grain size results with the ML4 through ML 8 samples ranging from 1.7 to 2.4%, and the ML1 through ML3 samples ranging from 0.43 to 0.66%. Total sulfides were detected at levels ranging from 0.7 mg/kg to 281 mg/kg. Dissolved sulfides ranged from <0.07 mg/kg to 0.38 mg/kg.

All Method Detection Limits (MDLs) were below SAP reporting limits, with the exception of slight exceedences observed with silver and zinc. Metals concentrations were greatest in the upper-reach sample composites where they were generally consistent with previously approved concentrations and the ER-L values. Exceedances of these reference values, however, were observed with nickel (all composites), zinc (ML5-ML8) and mercury (ML8). With the expected exception of nickel, no metals exceeded the ER-M values. The value of nickel detected is with the range of that otherwise found in Moss Landing Harbor and well below that of natural values for some other areas such as San Francisco Bay. There are generally not broadly accepted concerns over toxicity of marine or estuarine organisms with nickel at this level.

With the exception of a few nominal exceedances (up to 0.25 µg/kg for pesticides and 2.5 µg/kg for PAHs), the achieved MDLs were generally lower than the SAP reporting limits for all organic constituents. For the most part, PAHs were either not detected above MDLs or at levels consistent with current and former SF-12 sediment levels. Neither PCBs nor organotins were detected in any composite sample.

As expected, DDT was detected at levels above both current and former SF-12 sediment levels. However, concentrations observed in all samples were lower than the threshold limit for aquatic disposal suitability (150 µg/kg) promulgated for Moss Landing Harbor by the U.S. EPA Region IX (USEPA 1998). The threshold limit was based on a calculated available carbon tolerance of 7.5% DDT and assumes 2.0% TOC in Moss Landing sediments. Based on the observed federal channel sediment TOC concentrations, the normalized DDT levels are all under 6.1%. Other detected organochlorine pesticides include dieldrin (up to 4.33 µg/kg) and chlordane (up to 19.5 µg/kg).

Bioassay Testing

To determine disposal suitability of sediment proposed for dredging from the Moss Landing Harbor federal channel, benthic toxicity test results are compared to the current and former SF-12 reference sediment results and water column results were statistically evaluated to determine whether the Limiting Permissible Concentration (LPC) was exceeded.

Results of the *Ampelisca abdita* test are presented in Table 2 and a full data record for this test is provided in Appendix C. Mean survival rates observed with the current and former SF-12 reference treatment were 90% and 80%, respectively. With the exception of the ML7 treatment, mean survival rates calculated for the Moss Landing Harbor composite treatments ranged from 73 to 86%. These values were all within 20% of the survival rate observed with and not

significantly different from the both SF-12 reference samples. The survival rate of 62% in the ML7 treatment was found to be significantly different from the current SF-12 survival rate of 90%, and as a result, is considered significantly toxic.

In order to determine whether the toxicity observed with the ML7 composite sample is isolated in a discrete portion of the sediment present within the ML7 sample area, higher resolution testing was conducted by performing *A. abdita* tests with the four individual samples collected from ML7. The results of this additional testing are provided as an addendum to Table2.

Table 2. Summary of Benthic Toxicity Results

Species	Sample I.D.	% Survival (Mean ± SD)	% Survival per Replicate				
			1	2	3	4	5
A. abdita	Control	92 ± 9.7	95	75	100	95	95
	Current SF-12	90 ± 9.4	90	95	75	100	90
	Former SF-12	80 ± 5.0	80	75	85	85	75
	ML2	75 ± 3.5	75	70	75	80	75
	ML3	74 ± 5.5	75	65	75	80	75
	ML4	79 ± 13	75	100	65	75	80
	ML5	73 ± 7.6	85	70	70	65	75
	ML6	86 ± 9.6	95	85	90	70	90
	ML7	62 ± 17	90	45	55	55	65
	ML8	80 ± 9.4	75	70	80	95	80
N. caecoides	Control	92 ± 11	80	100	100	80	100
	Current SF-12	92 ± 11	80	80	100	100	100
	Former SF-12	84 ± 8.9	80	80	80	100	80
	ML2	100 ± 0.0	100	100	100	100	100
	ML3	92 ± 11	100	100	100	80	80
	ML4	84 ± 26	100	80	100	40	100
	ML5	72 ± 44	0	60	100	100	100
	ML6	80 ± 35	100	100	100	80	20
	ML7	80 ± 14	80	80	80	60	100
	ML8	68 ± 27	80	20	80	80	80

Table 2 (addendum). Results of follow-up testing on sand component for station #2.

Station number	% sand
2-1	96.4
2-2	94.0
2-3	92.6
2-4	77.6
2-5	40.8
2-6	76.9

Results of the *Nephtys caecoides* benthic test are presented in Table 2. Mean control survival for the 10-day *Neanthes* test was 92%, meeting the ITM test acceptability criterion of 90%. Mean survival rates observed with the current and former SF-12 reference treatment were 92% and 84%, respectively. Mean survival rates calculated for the Moss Landing Harbor composite treatments ranged from 68% to 100%. Although mean survival rates calculated for samples ML5 through ML8 were lower than the current SF-12 survival rate by more than 10%, they values were not significantly different statistically ($\alpha = 0.05$) from the SF-12 survival results, indicating that the dredged material from all sample areas meets the polychaete benthic toxicity criteria for ITM disposal suitability. With the exception of ML7, the reduced survival rates observed with samples collected from the upper-reach of the federal channel were skewed by a single under-performing replicate.

Water column bioassay

The water column toxicity test performed with *M. edulis* embryos did not meet the protocol passing criteria for normal development rate (61.3% observed vs. a 70% acceptable rate). Consequently, water column toxicity was retested. At the time retesting was to be initiated, reports from all West coast organisms suppliers indicated that there were no reliable spawning *M. edulis* populations available for collection. Therefore the test was conducted with embryos from the echinoderm *Dendraster excentricus* (sand dollar).

Results of the water column test with *M. edulis* are presented in Table 3.Percent survival among *M. edulis* embryos exposed to the site water control treatment was 61.0%. There was no statistically significant difference in survival or development rates between the two control treatments. With the exception of the ML3 50% elutriate dilution, statistically significant differences in normal development were detected between the site water control and all treatments greater than 10% elutriate. EC50 (median sublethal effects concentration) values ranged from 18.5 to 74.7%.

Table 3. Summary of *M. edulis* Water Column Toxicity Bioassay Results

Sample	Conc. (%)	Survival		Development	
		Mean % Survival	LC50 (%)	% Normal[a]	EC50 (%)
Lab Control	-	100	-	61.3	-
Site Water	-	98.4	-	61.0	-
ML2	1	92.3	94.9	63.1	41.1
	10	90.7		63.0	
	50	83.9		22.3	
	100	45.2		0.0	
ML3	1	100	<100	57.7	74.7
	10	99.7		56.4	
	50	98.4		47.7	
	100	84.9		12.0	
ML4	1	98.2	>100	56.6	56.0
	10	98.6		51.4	
	50	68.2		29.6	
	100	90.1		0.0	
ML5	1	9605	>100	54.4	27.9
	10	90.7		57.0	
	50	94.9		0.0	
	100	75.5		0.0	
ML6	1	98.5	>100	49.3	22.3
	10	90.4		51.9	
	50	94.2		0.0	
	100	96.1		0.0	
ML7	1	99.8	>100	51.4	18.5
	10	100		38.7	
	50	97.1		0.0	
	100	89.5		0.0	
ML8	1	100	>100	54.7	25.0
	10	91.1		48.1	
	50	98.0		0.0	
	100	89.7		0.0	

Table 4. Summary of *D. excentricus* water column toxicity bioassay results.

Sample	Conc. (%)	Survival		Development	
		Mean % Survival	LC50 (%)	% Normal[a]	EC50 (%)
Lab Control	-	97.9	-	86.5	-
Site Water	-	100	-	82.1	-
ML2	1	92.5	>100	81.3	>100
	10	99.3		82.6	
	50	100		78.4	
	100	86.9		57.3	
ML3	1	99.1	>100	78.8	>100
	10	99.8		78.8	
	50	100		81.0	
	100	100		77.8	
ML4	1	100	>100	81.7	>100
	10	100		78.4	
	50	100		74.5	
	100	88.7		42.2	
ML5	1	100	>100	82.8	91.5
	10	100		82.4	
	50	99.0		75.7	
	100	86.6		35.1	
ML6	1	100	>100	73.9	74.3
	10	100		77.7	
	50	99.1		55.0	
	100	90.9		27.4	
ML7	1	100	>100	77.1	72.4
	10	98.7		74.7	
	50	99.7		51.0	
	100	79.3		29.7	
ML8	1	99.3	>100	77.4	39.0
	10	100		76.7	
	50	76.1		28.7	
	100	68.2		14.0	

Limiting Permissible Concentration (LPC)
The estimated toxicity threshold for the liquid suspended phase (LSP) that will be created in the SF-12 aquatic disposal site by Moss Landing Harbor federal channel sediments (represented as 1% of the lowest elutriate EC50) is 0.185%. Using the mixing zone estimation model as described in the Green Book (USEPA/USACE 1991) to calculate the LSP for disposal sites exhibiting the new SF-12 site's water depth generally show the concentration to be lower than 0.185% by up to an order of magnitude. Since the hydraulic dredging is expected to be used for this project instead of clamshell deposits onto scows, this LSP would be even lower, and would therefore be substantially lower than the toxicity threshold. Consequently, results of the water column test show that the Moss Landing Harbor federal channel sediments meet the LPC criteria for open water disposal.

Bioaccumulation Potential
Due to the absence of chemical contaminant concentrations in Moss Landing Harbor federal channel sediments above levels of significant concern with respect to bioaccumulation potential, tissue chemistry analysis will not be performed. In order to provide ancillary data for future considerations, the USACE may submit one or more sets of sample tissues for DDT analysis.

APPENDIX I – DREDGING PLAN AND DISPOSAL SITE LOCATION

The map depicting the Moss Landing Harbor maintenance dredging is provided on the following page.

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