US Army Corps
of Engineers
Los Angeles District

F-I-N-A-L

ENVIRONMENTAL ASSESSMENT

FOR

LOS ANGELES RIVER ESTUARY MAINTENANCE DREDGING

LONG BEACH, CALIFORNIA

Prepared by:

Department of the Army
Corps of Engineers, Los Angeles District

July 1997

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS

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FINDING OF NO SIGNIFICANT IMPACT
LOS ANGELES RIVER MAINTENANCE DREDGING

I have reviewed the attached Environmental Assessment prepared for proposed maintenance dredging at the mouth of the Los Angeles River, in Los Angeles County, California. The project includes removal of approximately 100,000 cubic yards of littoral material from the river mouth to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. The proposed project is required to restore and ensure safe navigability in the river estuary.

Material dredged from this site in 1995 was placed in an excavated "borrow pit" offshore of Island Grissom. It is recommended that this procedure be repeated for the proposed project. The material will be dredged using either a hopper dredge, a cutterhead-hydraulic dredge, a clamshell dredge, or a combination of dredge types. If a clamshell dredge is used for this project, a silt curtain will be placed around the construction site, and a closed bucket attachment used to minimize turbidity during dredging operations.

The materials dredged from the estuary will be disposed within the borrow pit and left "uncapped", because it has been determined that the level of contamination in the proposed dredge material is similar to that in the borrow pit. It is the Corps determination therefore, that confinment of this material within the borrow pit without a "cap" would not have an adverse impact on the surrounding environment. It is the Corps' intention, moreover, to further investigate and evaluate the borrow pit's effectiveness as a sand trap, subject to the Corps' budgetary constraints and Congressional appropriation.

Resources potentially affected by the proposed river dredging project include: cultural, biological (including endangered wildlife species), water, air, navigation, and recreation resources. Potentially adverse environmental impacts from this project have been avoided or minimized to negligible levels through the implementation of environmental constraints and special conditions, as outlined in the attached Environmental Assessment.

I have considered the available information contained in the Environmental Assessment and it is my determination that impacts from the Los Angeles River dredging project will not have a significant adverse effect upon the existing environment or the quality of the human environment. Preparation of an Environmental Impact Statement (EIS), therefore, is not required.

16 July 1997
DATE

Robert L. Davis
Colonel, Corps of Engineers
District Engineer

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1.0 INTRODUCTION

1.1 Project Scope

The Los Angeles District, Corps of Engineers (Corps), as a part of its continuing program of regular maintenance dredging, proposes to remove approximately 100,000 cubic yards (cy) of sediment from the mouth of the Los Angeles River (LAR) estuary, and to dispose of this material in an existing borrow pit offshore of Island Grissom, also at the mouth of the Los Angeles River. **Dredging and disposal operations are expected to occur between September 1, 1997 and April 15, 1998.**

The Corps collected sediment samples within the proposed dredge site; chemical analysis of these samples determined that the physical properties and level of contamination present were similar to those in the borrow pit (see APPENDIX A). The Corps has therefore determined to leave the proposed disposal material "uncapped". Sampling and testing conducted in 1997 indicated that material from the dredge area is not suitable for beach or nearshore disposal in the littoral zone, due to physical or chemical incompatibility with sediment in those areas.

The Corps initially proposed to use disposal at the borrow pit as an opportunity to evaluate and refine disposal techniques and practices for contaminated sediment before proceeding with any large scale, regional operations. The Corps has determined however, that further investigative study of the estuary and borrow pit should be pursued under a seperate study.

1.2 Site History (pre-1995)

The Los Angeles River Estuary has been historically silted in with sediments delivered from the Los Angeles River Watershed through the Los Angeles River Flood Control Channel. The flood control channel, designed as a sediment diversion channel, was constructed between 1919 and 1923, with funds from bond issues, and the Federal and State governments, at a total cost of about $5.5 million (Moffatt & Nichol, 1996). Sediment discharge from the Los Angeles River shoaled significantly in the estuary soon after the flood control channel was constructed. This shoaling has persisted over the years, and has created a navigation hazard for recreation and commercial vessels that use such facilities along the estuary as the Golden Shore Boat Ramp and the Queen's Way Marina.

The City of Long Beach previously used what is called the LAR borrow pit, offshore of Island Grissom, as a disposal site for material dredged from the river estuary. Approximately 5,000 cubic yards was disposed on that site, per year, from 1989 to 1994. The City's permit for such use expired February 1994.

The Corps, while given authority to maintain navigation channels within the Harbor, is still defining specific navigation channel limits within the river estuary. Before this project

can be completed, however, it is necessary to dredge within the general channel boundaries in the estuary or those set in previous dredging episodes, to remove obstructing shoals, and restore navigability to the area.

The Corps is also conducting baseline studies to assess potential multi-user, contaminated sediment disposal areas. The North Energy Island (NEI) borrow pit is one potential site for designation. A detailed plan for this is expected to be ready for approval in 1999. In the meantime, marginally contaminated sediment from the LAR estuary must be dredged and disposed of as expeditiously as possible. The proposed designation of the LAR borrow pit for contaminated sediment disposal will utilize an existing disposal site that: 1) has similiar sediment chemistry characteristics and 2) is a minimal distance from the the proposed dredging operations.

1.3 1995 Emergency Dredging and Capping Operation

During February and March, 1995, the Corps conducted emergency dredging operations at the Los Angeles River Estuary to re-open the navigation channel leading to Queen's Way Marina (City of Long Beach). The project entailed the removal of 300,000 cy of sediments, and disposal of these sediments in the LAR borrow pit offshore of Island Grissom.

Potential impacts of emergency dredging in the LAR estuary and disposal in the borrow pit were briefly analyzed in a Memorandum For Record (MFR), and practicable mitigation measures were implemented during construction (USACOE, 1995). The Draft Environmental Assessment (DEA) prepared in May, 1995 after the project was completed, provided additional analysis. It was determined during review of that document that further mitigation was required, since no cap had yet been placed on materials disposed in the borrow pit. A "cap" of clean sediment was placed over this material in August/September of that year, to improve existing conditions at the borrow pit.

Sediment sample test results of the dredged area indicated that a portion of the dredged sediments contained elevated levels of Polyaromatic Hydrocarbons (PAH's). However, because of the emergency nature of the project, Tier III biological testing of the sampled sediments was not accomplished. It was never ascertained, therefore, whether or not these sediments were suitable or unsuitable for unconfined open water disposal. Because of this uncertainty, the dredged sediments deposited within the Los Angeles River Estuary Borrow Pit were treated as materials unsuitable for unconfined open water disposal.

Through coordination with the California Coastal Commission and USEPA, Region IX, it was agreed that the sediments deposited within the estuary would require capping to isolate and confine potential contaminants, and that capping materials would be obtained from "projects of opportunity". Such an opportunity developed in September 1995, when the Port of Long Beach needed to dredge approximately 175,000 cy of sediment for their Pier J Access Channel. Rather than placing these sediments within the LA-2 Ocean Disposal Site,

the Port of Long Beach agreed and was permitted to deposit the Pier J Access Channel sediments within the Los Angeles River Estuary Borrow Pit as capping material for the Los Angeles River Estuary dredged sediments. The capping method and sequencing was designed by the Corps of Engineers (Los Angeles District) using computer modeling techniques, and provided to the Port of Long Beach for implementation. The objective of the design was to uniformly cover the disposal mound with a 0.9 m (3 ft) cap thickness, without displacing the contaminated sediments. The Port of Long Beach accomplished the capping project over a two week time span in September 1995.

Some of the material deposited in the borrow pit formed a mound that extends to the top of the pit. Existing data indicate that this material is still at a minimum depth of -30 ft. Mean Lower Low Water (MLLW). Some agencies had expressed concern, however, that this material, as well as the cap that covers it, would be more likely to migrate or become resuspended than material within the confines of the pit. The Corps has since obtained further hydrographic data on the mound, and has concluded that no such migration has occurred.

In March 1996, the Corps of Engineers issued a Sediment Profile Imaging (SPI) Survey contract to delineate the extent of the new cap material within the Los Angeles Estuary Borrow Pit. Because SPI surveys can only document the top 30 cm (1.0 ft) of sediments, maximum cap thicknesses normally cannot be obtained from this type of survey. However, the SPI survey technology is an excellent tool to delineate the areal extent of disposal and capped mounds. From the subject survey report (USACOE, 1996), it was concluded that:

- The distribution of cap material roughly mirrored the shape of the borrow area, and covered the entire target placement area. The total thickness of the cap deposit could not be determined because it was thicker than the depth to which the SPI camera could penetrate. (Subsequent vibracore samples have determined the cap is 2-2.3 ft. thick.)

- Based on bathymetric records of the area, the average annual accumulation of sediment ranges from 20 to 50 cm (0.6 to 1.6 ft). Maximum accumulations documented in the SPI survey were consistent with these findings, ranging from 20 and 24 cm (0.7 and 0.8 ft).

- Given that up to 24 cm (0.8 ft) of sediment has been deposited on the cap since September 1995, the cap appears to be stable with little chance of erosion or bioturbation. The large scale seasonal deposition appears to exert a significant impact on the borrow area, as it completely buries the resident infaunal community. It is possible that the quality of the native sediment influx also is not conducive to the establishment of a successful benthic habitat.

In summary, the borrow area now appears to be functioning as a large sediment trap at the mouth of the Los Angeles River. Assuming 20 to 50 cm (0.7 to 1.6 ft) average deposition rate and no consolidation of sediments, the borrow area will approach grade, increasing in elevation by 5 m (16.4 ft), in the next 10 to 25 years.

2.0 SITE DESCRIPTION

This section describes the general geographic setting of Los Angeles River Estuary. Issues specifically related to the purposes of the project are discussed in detail in later sections.

2.1 Project Location

The Los Angeles River Estuary is located in the City of Long Beach, California, approximately 20 miles south of downtown Los Angeles (see Figure 1). Figures 1 and 2 show the location and features surrounding the estuary. Also known as the Queen's Way Bay, the estuary connects the Los Angeles River channel with San Pedro Bay within the limits of Long Beach Harbor. Flows from the Los Angeles River enter nearly from due north into the estuary, and discharge into San Pedro Bay in a southeasterly direction. The area of the estuary which receives periodic dredging extends from Queen's Way Marina into Long Beach Harbor (see Figure 2).

Located at the heart of one of the largest urban-seaport complexes (Los Angeles Harbor/Long Beach Harbor), the Los Angeles River Estuary is surrounded by recreation and commercial facilities including Golden Shore Boat Ramp, Queen's Way Marina, Pacific Terrace Harbor, and Downtown Marina, along the north shore of the estuary. The Queen Mary has a permanent berth on the south shore, near the estuary mouth.

Development of a new waterfront commercial/recreation/retail area in the Los Angeles River Estuary, known as the Queen's Way Bay Development, is currently underway. Features of this development include expansion of the Shoreline Lagoon to accommodate commercial vessel traffic, and conversion of the Golden Shore Boat Ramp into an environmental mitigation area.

The existing LAR borrow pit is located at the mouth of the estuary, about 1,600 feet offshore of Island Grissom (see Figures 2 and 2a). It currently has a capacity of approximately 900,000 cubic yards. Dimensions of the borrow pit are approximately 600'-by-600', with a maximum depth of approximately -50' MLLW. Figures 2, 3, and 4 show previous and proposed disposal sites.

2.2 Project Purpose and Need

The Los Angeles River Estuary serves as part of the transportation corridor for coastal cruise liners transiting from Queen's Way Marina, in the City of Long Beach, to

Santa Catalina Island. The Los Angeles District, Corps of Engineers (COE-LAD) is responsible for maintaining navigable depths in the channels and basins within Los Angeles and Long Beach Harbors. The Corps is also responsible for maintaining a navigable channel within the Estuary to provide waterborne access to Queen's Way Marina. However, authorized federal channel limits have not been established for the Estuary's navigation channel. As a result, channel dimensions have varied heretofore for each dredging episode. The lack of established channel dimensions and suitable disposal sites for contaminated dredged sediments has prohibited development of a routine maintenance dredging cycle for the Estuary. This, in turn has restricted the Corps' ability to obtain necessary funds to maintain the estuary's navigation channel through the normal federal budgetary process. Because of this, funds have often been made available only on an emergency basis; thus precluding opportunities to conduct necessary long-term planning of channel boundaries and disposal options.

Winter storms regularly cause shoaling in the Queen's Way Marina area. The water in this area at such times becomes extremely shallow, and can cause significant disruptions to boat traffic, which necessitates dredging. When shoaling occurs to the degree it did in 1995, the resultant temporary closure of the Marina area affects businesses in the Marina and on Catalina Island, which depend on tourist trade; particularly during the winter whale-watching season.

The proposed maintenance dredging activities within Los Angeles River Estuary will serve a three-fold purpose: (1) as a preventative measure to alleviate the need for emergency dredging of this area; while (2) assuring continued safe navigation for various commercial harbor crafts entering and traversing Queen's Way Marina; and, at the same time (3) preserving natural resources and the environment.

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 Authorization

Maintenance dredging of Los Angeles Harbor is authorized by the 1896 River and Harbor Act, and subsequent River and Harbor Acts. The Corps has both the responsibility and authority to maintain the LAR estuary for flood control and navigation under the 1988 Water Resources Development Act. Congress specifically authorized the Corps to propose channel limits and depths within the Los Angeles River mouth that would ensure safe navigability. The Corps is in the process of doing this, however, the situation requires immediate attention before the channel limits can be finalized.

3.2 Project Description

The Corps proposes to dredge a channel within the LAR estuary through shoaled material to allow for unobstructed passage of vessels in and out of Queen's Way Marina (see Figure 2). Approximately 100,000 cubic yards of sediment will need to be dredged to

provide a minimum depth of approximately -27' MLLW at the upstream end of the channel. This portion of the channel will be approximately 250 feet in width. To fully restore the entire navigation channel to authorized depths and provide an advanced maintenance area, ideally, more material would need to be dredged. Funding is not available, however, to accomplish a project of this scale. Dredging and disposal will probably be accomplished with a hopper dredge, cutterhead/pipeline, and/or a clamshell/barge, and is expected to be completed by April 1998. A hopper bin will probably be used to dispose of dredged material in the LAR borrow pit.

The Corps proposes to dispose of the dredged material in the LAR borrow pit adjacent to the Downtown Shoreline Marina, offshore of Island Grissom (see Figures 2 and 2a). The borrow pit was created to supply fill material for offshore oil rig islands such as Island Grissom. This site has a remaining disposal capacity of approximately 900,000 cubic yards and can accommodate the materials from this project. The disposal site is approximately 20 to 30 feet deeper than the surrounding area, and the top of the mound is expected to occur at a depth of -36 ft MLLW. The material will be left "uncapped", because it has been determined that the level of contamination in the proposed dredged material is similar to that in the borrow pit. Material is expected to remain confined because of the borrow pit's depth, and no strong currents are expected to transgress this area (see Appendix A). Studies also show that the disposal site is depositional. Marginally contaminated sediment will continue to settle over the disposal mound, thereby canceling any benefits that would be provided by a cap.

Test results detailed in Appendix A indicate that sediment from the disposal site and dredge site are similar in quality and grain size. Environmental impacts associated with relocation of this material to the borrow pit, therefore, are not expected to be significant. It is also the Corp's determination that confinement of this material within the borrow pit without a "cap" would not have an adverse impact on the surrounding environment. It is the Corps intention, however, to further investigate and evaluate the borrow pit's effectiveness as a sand trap, subject to the Corps' bugetary contraints and Congressional appropriation.

This project includes long-term bathymetric monitoring to ensure that the disposed material remains in place. Absence of strong currents and waves indicates that the material is not likely to migrate, but biannual monitoring will be conducted over the next two (2) years to verify this assumption. Bathymetric monitoring would detect noticeable changes in the bottom profile, and, in turn, movement of the original disposal mound. As discussed above, a post-placement SPI survey was conducted in 1995 and the summer of 1996, of the disposal/capping mound, which showed no movement of the mound at that time.

3.3 Alternatives

A. No Action. No Action is defined as "no dredging at this time". "No Action", however, will probably result in an emergency dredging episode during the coming winter season to restore navigability to Queen's Way Marina. This has occurred in the past.

B. Beach or Nearshore Disposal. The Coastal Zone Management Act (CZMA) requires that Federal activities be in compliance to the maximum extent practicable with the State's Federally-approved coastal management program. Section 30233 of the California Coastal Act (California's Federally-approved coastal management program), in turn, essentially mandates disposal of dredged material onto adjacent beaches whenever and wherever feasible. Due to the probable nature of the materials to be dredged in this case, however, beach or nearshore disposal would not be environmentally acceptable. The subject sediments are not either physically or chemically compatible with such use. This alternative, therefore, will not be analyzed in this document.

C. LA-2 Disposal Site. LA-2 is an ocean disposal site designated by the Environmental Protection Agency (EPA) for dredged material from LA/LB; the site was officially designated for disposal of dredged material in 1991. LA-2 is located near the edge of the continental shelf, 7.7 miles (6.7 nautical miles) south of the San Pedro Breakwater (see Figure 3). The area of the site is approximately 2.38 square miles, and the water depth varies from 387 to 1,050 feet. This site is used for material that is too silty for disposal within the littoral zone. Use of this site would probably require biological testing to confirm sediment suitability. This alternative will, nonetheless, be carried forward for further analysis.

E. Upland Disposal. Another alternative is to dispose some of the material in an upland location (see Figure 4). It has been determined, however, that the very significant expense of moving material to an upland site is not justified, since environmental impacts would not be significantly reduced (see Appendix A for further details). This alternative, therefore, will not be carried forward for further analysis.

F. Borrow Pit Disposal. The LAR borrow pit is located approximately 1,600 feet offshore of Island Grissom (see Figure 2). It is proposed that this site be used this year, and possibly next year, as a disposal site for contaminated materials. A new EA will be prepared next year (1998) if dredging is necessary at that time. After 1998, it is anticipated that a regional solution for contaminated sediment disposal will have been adopted. As stated previously, the LAR disposal site has a capacity of approximately 900,000 cys, and can accommodate the materials from this project. The dimensions of the pit are approximately 600'-by-600', with a maximum depth of approximately -50 ft. MLLW. The borrow pit is approximately 20 to 30 feet deeper than the surrounding area, and the top of the mound is expected to occur at a depth of about -36 ft. MLLW. Material is expected to remain confined in this site because of its depth, and because no strong currents are expected to transgress this area. Because of the proximity of the borrow pit to the dredge site, sediment from both areas are similar in both quality and grain size (as confirmed by recent testing). The environmental impacts of relocating this material to the borrow pit, therefore, are not expected to be significant.

G. Dredged Material as Fill. Various projects ongoing or proposed the LA/LB Harbors (including the Pier S project) require fill material. Historical records and initial

analysis of LAR estuary material, however, indicates that it is not structurally suitable for this use. This alternative, therefore, will not be carried forward for further analysis.

4.0 AFFECTED ENVIRONMENT

4.1 Land and Water Uses

Los Angeles and Long Beach harbors are two independent commercial ports located within San Pedro Bay. The harbors consist of about 1,800 acres of water in the inner navigation channels, 5,700 acres of landfill, and 6,000 acres of water (sheltered anchorages and navigation channels) between the landfills and the nine miles of Federally constructed and maintained breakwaters. The U.S. Navy's Long Beach Naval Shipyard and Naval Station are located between the two ports.

Long Beach Harbor includes about 3,000 acres of landfill and 4,600 acres of water. Long Beach Harbor land uses are divided into eight categories. Of these, primary port (34% of land); oil and gas production (24%); federal land (17%); and port-related industries and facilities (10%) are considered major uses. Minor uses include commercial/recreation facilities (5%), utilities (4%), non-port-related facilities (4%), and hazardous-cargo facilities (2%).

The western bank of the Los Angeles River mouth is bordered by Interstate Highway 710, Queen's Way Drive, and the Port of Long Beach. The eastern bank is fronted by the Golden Shore Boat Launch Basin, Queen's Way Marina, Shoreline Aquatic Park, and the Downtown Shoreline Marina. The LAR shoreline, within the project area, consists of rock rip-rap. Surrounding land uses include tourist attractions (the Queen Mary), marinas, and shipping, and cargo handling.

Recreation activities account for most of the land and water uses in the general area, especially outside the immediate harbor areas. Recreation uses encompass onshore and nearshore activities. Onshore recreation resources include beaches, parks, recreation facilities, and other visitor-serving attractions such as the Queen Mary. Shoreline Village, public campgrounds, fishing areas, hotels, and restaurants are located along Queen's Way Bay (the mouth of the LAR). Recreation opportunities involve passive activities such as sightseeing, sunbathing, beachcombing, and picnicking. Active uses in the harbor are swimming, body and board sailing, shoreline and pier fishing, and beach volleyball. Shoreline and nearshore uses that depend on land-based operations include such activities as sportfishing, commercial cruises, tour boats, boating, and sailing. Within the LA/LB Harbor complex, several major charter boat companies provide and charter service to Avalon and Isthmus Cove on Santa Catalina Island, including Catalina Cruises in Queen's Way Marina. These recreation charters also serve specialized activities, including sportfishing, scuba diving, whale watching, and harbor touring.

Commercial fishing within LA/LB is limited to a live-bait fishery, while a variety of commercial fisheries occur outside the harbors. Trap fisheries extend offshore from just outside the harbor breakwaters, while set and drift nets are restricted to beyond 3 miles from shore. Trawling occurs in deeper offshore waters. Primary target species from the various fishing operations include anchovies, squid, California halibut, rockfish, crab, and lobster.

Commercial fishing in the vicinity of LA-2 targets primarily the following pelagic species: Pacific bonito, Pacific mackerel, jack mackerel, northern anchovy, and market squid. Purse seiners and gill net fishermen use the general area. The only bottom fishery operating in the area is a trap fishery for spot prawns. Because of its distance from shore and its depth, sportfishing and boating are the only two recreation activities that occur in the vicinity of LA-2. LA-2 is located along the route recreation boaters take from Los Angeles and Long Beach harbors to the offshore islands. The site is located within a mile of the southbound lane of the Santa Barbara Channel vessel traffic separation scheme established by the U.S. Coast Guard.

4.2 Littoral Transport

The beaches along the central and southern coasts of California are dynamic in nature, with near constant and continual longshore and onshore/offshore sediment transport. These processes vary seasonally in intensity, depending on both local and regional eastern Pacific oceanographic and weather conditions. Particles of sediment that moved in this manner are typically suspended into the water column by wave or current action; transported some distance by longshore currents; and finally deposited on adjacent beaches. The voids (or erosion) left behind by this movement are normally replenished by similar depositions of sediment eroded from yet another beach area. Although present the impression of being stationary, the sediment comprising beaches are in a state of constant movement.

When sediment is transported past or into the protected low-energy waters of Long Beach Harbor, in contrast, the suspended material settles and is only rarely resuspended. Long Beach Harbor, and virtually all harbors for that matter, that is, intercept longshore transport of sediment, which otherwise would continue upcoast or downcoast. Over time, this settling of material results in the shoaling of navigation channels within harbors, necessitating periodic maintenance dredging to ensure safe navigation conditions. The quantity of material, and the periodicity and extent of maintenance dredging activities in Long Beach Harbor, is dependent on the highly variable local oceanographic conditions in the area; and, specifically, on the frequency, intensity, and duration of longshore currents, wind, storms, and other wave actions.

4.3 Water and Sediment Quality

Water resources in the project area include Los Angeles and Long Beach Harbors, the Los Angeles and San Gabriel Rivers, the Dominguez Channel, and the Pacific Ocean. Because of past dredging and filling, construction of breakwaters and other structures, plus

intensive use of the area, the chemical character of constituent waters has been significantly altered. River flows have also been greatly altered through flood control projects and discharges.

Reduced water quality in the LAR and adjacent waters has resulted from the discharge of industrial effluents, and untreated run-off, from upstream storm drains. Spills from marine traffic accidents, and petroleum and chemical transfer operations, also contribute to reduced water quality. These sources of contamination result in elevated levels of trace metals and organic chemicals in some areas of the harbor complex.

Although the waters in the vicinity have been degraded, water quality is improving, and many species of fish and wildlife utilize the area (USFWS 1989). Continued improvement is anticipated to result from ongoing programs to increase the level of municipal-sewage treatment, provide pre-treatment of industrial effluents, and control untreated run-off.

The Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA) and the Clean Water Act of 1972 (CWA), both require an evaluation of the quality of sediment to be dredged and disposed of. This quality determination can be obtained through physical, chemical, and biological testing, or simply by an analyzing existing data; depending on the likelihood of contamination and the location of the disposal site. Regulatory agencies, including the Corps of Engineers and the Environmental Protection Agency, have developed procedures for various levels, or "tiers," of testing that may be required. Evaluation criteria state, in essence, that disposal of dredged materials into the ocean waters shall not unduly degrade any aspect of the marine environment, or its resources.

In some non-commercial harbors, where sources of significant contamination are not present, and channels are dredged frequently. Associated sediment consists primarily of coarse-grained sand, which does not retain contaminants to the extent of silty material. Because of this, chemical and biological testing is not always required. "Tier 1" analysis, basically a review of existing data, is usually sufficient to determine that such material is not contaminated. Commercial harbors like Long Beach, however, have a high potential for accumulation of oil, grease, and other industrial pollutants. These contaminants often adhere to silty materials within the harbor, especially in areas that are not dredged frequently. Bioassay and bioaccumulation sediment tests are often necessary therefore, to determine potential impacts of dredged material disposal on the environment. Results are compared to reference and control data.

In compliance with the MPRSA and the CWA, testing of material taken from proposed dredge sites in the LAR (see Figure 5 for core sample locations) will occur in January 1997. Per the sampling and analysis plan closely coordinated with the EPA, Sediments will be characterized through a variety of physical, chemical, and biological tests. Because sediment will be sampled from the approximate area of testing in 1994, (the summary of 1994/95 test data can be found in Appendix A) the results are expected to be

similar, since the sources of contamination have not changed. The results of that testing (MEC 1994) indicated that the bulk of the material (over 50%) was too silty, and that LPC requirements were exceeded. High levels of toxicity here also evidenced, render this material unsuitable for disposal at LA-2.

The proximity of the borrow pit disposal site to the river mouth dredge site indicates that sediment from both areas are probably similar in quality and grain size. Previous testing confirmed that sediments from the dredge site and disposal site were similar, and moreover, that most sediments from both sites were not excessively contaminated (see summary of results in Appendix A). The general pattern was that the lowest levels of contamination were observed in the upstream top samples.

Long and Morgan (NOAA 1990) and Long, et. al. (1995) presented a compilation of data that compared levels of chemical contamination of metals and organic compounds with biological effects. They defined two levels of contamination - the ER-L (Effects Range Low) and ER-M (Effects Range Median). These two levels describe three ranges of data. Levels of contamination below the ER-L are in a "minimal" effects range, contamination amounts between the ER-L and ER-M are in a "possible" effects range, and concentrations above the ER-M, are in a "probable" effects range. Contaminants in most samples of LAR sediment were below the ER-L values, but a few were in the "possible" or "probable" effects ranges.

EPA review of the 1995 chemistry data indicated particular concern with elevated levels of Polyaromatic Hydrocarbons (PAHs). Only one sample, A-B, indicated elevated levels of both phthalate esters and PAHs. At station A-B, two compounds, pyrene and Benz(a)anthracene were detected above the ER-M and seven compounds were above the ER-L. Sites D-B, DT, E-T, and F also contained levels of fluorene and/or Phenanthrene that exceeded ER-L values. In general, the bottom samples A-B, from the upstream site contained higher amounts of phthalates and PAHs than the top section of the upstream site and the downstream site. All other sites where PAHs were detected were below the ER-L values. The disposal site was not re-tested after the project was completed, so it is not known whether levels of contaminants in the upper layers of the disposal mound exceed acceptable limits.

The EPA would not have permitted this material for open-water disposal in a non-emergency situation, and recommended that the Corps design and place a cap to cover the potentially contaminated sediments. The Corps complied with this recommendation to the extent that clean sediments from dredging projects undertaken at the Port of Long Beach and/or the Port of Los Angeles were approved for use as capping sediments. The site will continue to be monitored to assess the value of this capping operation as a permanent solution to isolate potentially contaminated sediments in the borrow pit.

4.4 Biological Resources

A. Marine Habitat. Marine habitats include natural open water and sandy-bottom benthic habitats, as well as artificial habitats created by harbor structures. Because the navigation channels within the harbors and the LAR consist of unconsolidated sediment which is dredged periodically, they do not support vegetation. The breakwaters and jetties within the harbor complex support algal growth typical of rocky subtidal and intertidal communities. Breakwaters and jetties characteristically are populated by green algae (Ulva sp. and Enteromorpha sp.), several species of red algae, and perhaps some kelps such as the feather boa kelp (Egregia menziesii), giant kelp (Macrocystis pyrifera), and Japanese kelp (Sargassum muticum).

Plankton occurring within marine environments includes phytoplankton, which are drifting plants such as diatoms and dinoflagellates, and zooplankton, slightly mobile animals such as small crustaceans, swimming mollusks, jellyfish, and free-swimming larvae of fishes and benthic invertebrates. Fauna also includes many marine invertebrates and fish. Numerous marine birds and occasional marine mammals also rest and feed in the marine habitat.

Approximately 130 species of fish have been reported from San Pedro Bay, with about 70 species considered common (see Table 1). Seven species tend to dominate in abundance: white croaker (Genyonemus lineatus); queenfish (Seriphus politus); white seaperch (Phanerodon furcatus); northern anchovy (Engraulis mordax); shiner perch (Cymatogaster aggregata); tonguefish (Symphurus atricauda); and speckled sanddab (Citharichthys stigmaeus). Other less abundant but ecologically-important species present are: California halibut (Paralichthys californicus); barred sandbass (Paralabrax nebulifer); kelp bass (Paralabrax clathratus); California corbina (menticirrhus undulatus); Pacific bonito (Sarda chiliensis); Pacific barracuda (Sphyraena argentea); white seabass (Cynoscion nobilis); jacksmelt (Atherinopsis californiensis); and several species of rockfish, sharks and rays.

Fish populations are characterized by seasonal fluctuations in numbers and composition. Adult and juvenile individuals of most species are more abundant during the summer than in the winter. The outer harbor area serves as a nursery for a variety of nearshore marine fishes, especially in the spring and early summer. The species diversity of the ichthyofauna of San Pedro Bay may be attributed to its protected nature, adequate circulation, abundant food supply, and variety of substrates.

California grunion (Leuresthes tenuis) are found seasonally in nearshore waters of Southern California. Spawning occurs from March through mid-September, with a peak in activity between April and June. These schooling fishes, which are members of the silversides family (Atherinidae), lay their eggs on sandy beaches during nighttime spring tides. The eggs are buried in the sand and hatch when the next spring tide occurs (approximately 14 days). California grunion is a species of concern due to its unique

spawning behavior, and is carefully managed as a game species by the California Department of Fish and Game.

The migratory bird community is dominated by coastal water birds, shorebirds, and waterfowl. The LAR and adjacent harbor habitats are used during annual migrations and for overwintering. Some have also become year-round residents. The diverse bird community is made up of about 150 species (Table 2). The inner harbor is a major resting area for water birds while the deeper, open water areas of the outer harbor are used relatively little.

Feeding and roosting are two principal activities in the project vicinity. Avifauna utilizing sheltered waters within the harbor for feeding and resting include loons, grebes, surf scoters, and lesser scaup. The sheltered waters offer mollusks and fish that are preyed upon by these species. Rip-rap shoreline is preferred by spotted sandpipers, surfbirds, willets, and pelagic cormorants. The small intertidal mudflat at Shoreline Aquatic Park (adjacent to the LAR) is important foraging habitat for western sandpipers, semi-palmated plovers, and marbled godwits. This habitat is also used extensively by mew, ring-billed and California gulls as a loafing area. Buoys, barges, and pilings are primary roosting sites for double-crested cormorants, gulls, and brown pelicans.

Several species of marine mammals have been observed inside the breakwaters and in the general vicinity of San Pedro Bay. They include California sea lions (Zalophus californianus), harbor seals (Phoca vitulina), Pacific bottlenose dolphins (Tursiops truncatus), and common dolphins (Delphinus delphis). Sea lions can be found year-round in the harbor, particularly on the outer harbor breakwaters. They utilize these isolated breakwaters for haul-out and resting activities. The presence of pinnipeds in the harbor area along with the known abundance of prey fish indicates a foraging use. The California gray whale (Escherichtius robustus) sometimes comes close to shore during its annual migrations, between November and May. Although migrating whales generally pass well outside the harbor mouth, approximately three or four whales enter the harbor complex every year, probably by accident. These whales generally stay within the harbor for less than a day before moving on (Chambers Group, 1996). Marine mammals and sea turtles are also transient visitors to the LA-2 disposal site.

B. Estuarine Habitat - Los Angeles River. Prior to urbanization and port development (circa 1870), the Los Angeles and San Gabriel Rivers commingled in a large estuary - approximately 3,450 acres of slough, mudflats, and salt marsh. By the 1930's, harbor-oriented channelization and landfill projects had largely reshaped the lagoon into Los Angeles and Long Beach Harbors. The LAR underwent extensive industrial, commercial, and residential development, and its ecological value is now extremely limited. The ecological importance of the estuary has significantly increased over time due to the scarcity of estuarine resources in the Southern California Bight.

Benthic invertebrates within the project area include mollusks, polychaete worms and crustaceans. Dissolved oxygen was at one time depleted from the harbor waters and resulted

in the elimination of the macrofauna (USFWS 1989). However, the benthic fauna has substantially improved since 1970 when national and state regulations were implemented to improve biota diversity and water quality. A benthic survey was conducted in the mouth of the LAR between March and December 1983 (MEC 1984). Table 3 lists the most abundant species captured at that time. Polychaete worms dominated species abundance, numbers of species, and biomass. Molluscs, amphipod and ostracod crustaceans and nemertean worms were also common. Bird and fish species potentially occurring in the LAR may be similar to those species described in Section A, above.

C. Deep-Ocean Habitat (LA-2 Disposal Site). An EIS prepared for the LA-2 site provides extensive data for the area (EPA 1988). The following data briefly summarizes that report. The benthic habitats present in or adjacent to the LA-2 site are mainland shelf, continental slope, and basin. Mainland shelf habitats generally have a higher species abundance and biomass than the other two habitats. At depths of 56 to 786 feet, the San Pedro Shelf habitat was found to be dominated by polychaetes and mollusks with echinoderms, crustaceans, and nemerteans also present; in deeper waters polychaetes were dominant with lesser numbers of mollusks, crustaceans, and echinoderms (EPA 1988). The LA-2 site is located partly on the shelf and partly on the continental slope. The dominant infaunal groups were polychaetes, crustaceans, mollusks, and echinoderms. Survey data from 1990 indicated that low successional stage species (small, surface dwelling infaunal invertebrates) were common at the LA-2 site. Such opportunistic species are indicative of disturbed conditions, whether natural or man-made (MEC 1994).

Epifauna of the shelf and slope generally increase in abundance with depth. Trawl sampling in 1983-1984 at depths of 426 to 1,026 feet at the LA-2 site found the urchin Allocentrotus fragilis and the shrimp Sicyonia ingentis to be the dominant species. A total of 70 species were collected. More intensive trawling in the general area by the Southern California Coastal Water Research Project found 500 species.

Flatfish and rockfish dominated the demersal (bottom) fish population at the LA-2 site. Slender sole (Lyopsetta exilis), Pacific sanddab (Citharichthys sordidus), and shortspine combfish (Zaniolepis frenata) were the most abundantly caught species (EPA 1988). Pelagic fish were not sampled at the LA-2 site, but common species in the region include northern anchovy, Pacific saury (Cololabis saira), jack mackerel (Trachurus symmetricus), yellowtail (Seriola dorsalis), and California barracuda. These and other common pelagic fish are of sport and commercial importance. These species feed on zooplankton and other pelagic fish (EPA 1988). Deep-sea pelagic fish often perform periodic vertical migrations and may be found at several depths. The most commonly collected species are California smoothtongue (Leuroglossus stilbius), northern lampfish (Stenobrachius leucopsarus), and Triphoturus mexicanus (EPA 1988).

Several species of marine mammals pass through the LA-2 area, primarily whales and dolphins. Seals and sea lions are generally found in shallower waters along the coast or at the offshore islands, but the California sea lion and harbor seal could be present at times. A

variety of sea birds occur in coastal and offshore areas. They forage over the water and may use the water surface for resting. Common species include loons, grebes, shearwaters, gulls, terns, double-crested cormorant, surf-scoter, brown pelican, and black storm-petrel (EPA 1988).

D. Borrow Pit. The borrow pit disposal area is composed of soft-bottom habitat under open water (a minimum of -35 feet MLLW). No site-specific benthic infaunal data are available for the Island Grissom borrow pit. Benthic communities in the mouth of the LAR are described above, and may be similar to this disposal site. Colonization of the pit after it was dredged would have occurred from organisms along the edges moving inward as well as from settlement of larvae from the water column. The species of larvae available for recruitment would be predominantly the common species present in the general area. The fine grain size and any pollutants present from industrial activities in the area could influence the species colonizing the pits, shifting the community towards more pollution/disturbance tolerant species such as Capitella capitata. Biological surveys of similar borrow pits in Long Island Sound revealed that the biological communities in such areas are extremely limited due to anoxic conditions (Personal communication, John Hanlon, USFWS).

Fish species such as white croaker and northern anchovy are expected, based on the results of trawling data for nearby locations. No marine mammals are expected to occur in this area.

The larger, deeper, North Energy Island (NEI) borrow pit, located east of the Island Grissom borrow pit, was recently surveyed, and various physical, chemical, and biological parameters were measured (Chambers Group, 1996). This study concluded that conditions in the NEI pit were generally characteristic of outer Long Beach Harbor. However, the pit appears to accumulate organic material and contaminants, mostly from the LAR. Despite elevated contaminant levels within the pit, the infaunal community of the NEI pit is typical of infaunal communities on the shelf within outer Long Beach Harbor (see Table 4). The slopes of the pit, however, appear to be unstable and support a lower density, but higher diversity, of infauna than the pit and the shelf. The Island Grissom borrow pit, located closer to the LAR mouth, may support a similar infaunal community.

4.5 Threatened and Endangered Species

Federally-listed threatened or endangered animal species that may occur in the project area include: California brown pelican (Pelecanus occidentalis californicus); California least tern (Sterna antillarum browni); peregrine falcon (Falco peregrinus); marbled murrelet (Brachyramphus marmoratus); and the western snowy plover (Charadrius alexandrinus nivosus). Several species of marine mammals and sea turtles may be transient visitors to the harbor and the LA-2 disposal site, but are not expected to be affected by this project. Special status and endangered species potentially occurring in the vicinity are listed in Tables 5 and 6.

1. **California Brown Pelican.** California brown pelicans (Pelecanus occidentalis californicus) frequent San Pedro Bay, and have been observed resting and feeding within the harbor complex. Pelicans occur year-round in the project area, although their numbers fluctuate seasonally due to an influx of post-breeding birds in the summer. The highest densities of brown pelicans occur between July and November. Brown pelicans primarily forage on surface-feeding fish in nearshore waters. This species is considered to be very tolerant of human activity near its daytime roosts, and readily utilizes various man-made shoreline structures (i.e., piers, breakwaters, groins, marine vessels, buoys) as roosting sites. The California brown pelican has been designated as endangered by the U.S. Department of Interior and the State of California because of reproduction failures caused by the collapse of thin-shelled eggs during incubation. These thin-walled eggs have been attributed to food chain accumulation of DDT. Breeding areas are on Islas Coronados (Coronado Islands), Anacapa Island, Santa Barbara Island and Scorpion Rock off Santa Cruz Island.

2. **California Least Tern.** The Federally- and State-listed endangered California least tern (Sterna antillarum browni) is a migratory bird that frequents the southern California coast from April to mid-September. The birds breed in open, unvegetated sandy areas, and forage on small fish such as topsmelt and anchovy in nearshore waters near their breeding colonies. Breeding adults catch and deliver small fish to the newly hatched flightless young. Reproductive success is closely related to the availability of undisturbed nest sites and nearby waters with adequate supplies of prey. The least tern is endangered because most of its breeding areas have been disturbed by human use of beaches and by predation on nests from cats, foxes, and other predators.

The tern in known to forage along the banks of the LAR, but no suitable habitat is located in this area for nesting. Of the three tern colonies in the region, the closest one is located on Terminal Island, approximately 4 miles from the proposed dredging and disposal areas. This site was located in the southeastern corner of Pier 300 in 1987 but was moved northward to near the Seaplane Anchorage through a Relocation Plan undertaken by the Port of Los Angeles under a Memorandum of Agreement (MOA) with the USFWS and the CDFG, as amended in 1991. A permanent relocation of the colony away from areas to be developed is still being considered. The other two colonies are located at Seal Beach National Wildlife Refuge and the Bolsa Chica State Ecological Reserve. Terminal Island is sometimes used as a renesting site for least terns from other colonies and occasionally serves as a post-breeding congregation area (Massey and Atwood 1985).

The number of nesting pairs in this colony and their reproductive success have fluctuated considerably from year to year. Fourteen nests were observed in 1973, the first year of documentation. The number of nesting pairs ranged from 0 in 1978, 1979, and 1980 to 109 in 1984, and the average number of fledglings per pair varied from 0.13 in 1987 to 1.5 in 1975 (Keane 1986, 1987). This variability is related in part to the influence of predation on eggs, chicks, and adults by crows, kestrels, and feral cats as well as to changing levels of human activity at the nesting sites. In 1989, six nests at the Seaplane Anchorage site sheltered six fledglings. The new colony site appears suitable, and

approximately 32 pairs established nests in 1990, with 12 young fledged. No young survived in 1991 or 1992, probably due to kestrel predation. Eight young fledged in 1993, while in 1994, 37 pairs nested, but only 2-4 young fledged. Last year, only 16 pairs of birds nested on Terminal Island, but 6-12 fledglings survived.

Adult California least terns observed in the Outer Harbor in 1986 and 1987 were feeding in shallow water areas adjacent to Terminal Island. Some were observed feeding just inside the Middle Breakwater. After chicks hatched, foraging was more concentrated in the shallow waters (less than 20 feet deep) adjacent to the colony.

Least tern foraging and nesting behaviors at Los Angeles Harbor were studied annually from 1978 to 1985 (Atwood, et al 1978; Massey and Atwood, 1979-1980; Minsky 1981; Massey and Atwood 1982-1985). Data gathered in 1985 showed terns nesting at two sites on Terminal Island (Reeves Field and Ferry Street Landfill). Nesting began in mid-May. There were fewer nests than in 1984, but the survival rate was considered high. Food availability did not appear to be a limiting factor in reproductive success. Northern anchovy was the dominant prey item. Terns are opportunistic feeders, and will probably forage in almost any area where local conditions create concentrations of suitable prey items (Massey and Atwood 1985).

Most foraging by least terns nesting on Terminal Island occurs in the shallow water portion of Los Angeles Harbor, immediately adjacent to the nesting areas (Massey and Atwood 1982). In 1985, most feeding activity occurred in early morning and late afternoon. Two sites immediately adjacent to the Ferry Street nesting area were identified as important least tern feeding areas, through several years of surveys (see Figure 6). Additional foraging areas occasionally used throughout the Los Angeles Harbor are identified in Figure 7. Harbor Lake is used extensively as a post-breeding foraging site. As stated above, least terns are also known to forage within the LAR estuary during their nesting season.

3. **Peregrine Falcon.** Peregrine falcons, which are listed on both Federal and State of California endangered species lists, forage in the project area. Since 1987, peregrines have nested in the City of Long Beach. Three or four pairs nest within one mile of Los Angeles Harbor. The nesting season for peregrine falcons extends from January to July, with critical parenting periods in May and June. Falcons maintain distinct territories, and forage over vast areas in both wetland and upland locations. They are primarily hunters of birds. DDT-caused eggshell thinning remains a problem for the peregrine falcon. Housing developments along the coast displace falcons from preferred nesting sites and reduce their prey. Collisions with power lines, shootings, and poaching have also contributed to their decline in population.

4. **Marbled Murrelet.** This small seabird, listed as threatened by the USFWS, occasionally winters in southern California, but is not known to nest south of Santa Cruz (USFWS, 57 FR 45328, 10/1/92). Its habitat includes coastal waters and bays, where it feeds on fish and invertebrates. It breeds inland on mountains near the coast, mainly high on

limbs of mossy conifers. The marbled murrelet is threatened by the loss and modification of its nesting habitat, primarily due to commercial timber harvesting. Mortality associated with oil spills and gill-net fisheries (in Washington) are lesser threats adversely affecting the marbled murrelet. This bird is not expected to be affected by this project.

5. **Western Snowy Plover.** The western snowy plover is listed as threatened by the USFWS (U.S. Department of the Interior, 1993). Nest sites typically occur in flat, open areas with sandy or saline substrates. Vegetation and driftwood are usually sparse or absent. Nest site selection and pair bond formation occur from early to mid-March, and eggs of the first clutch are usually laid by early April. Snowy plovers forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone; in dry, sandy areas above the high tide; on salt pans; and along the edges of salt marshes and salt ponds.

Studies in California, Oregon, and Washington indicate that the coastal breeding population has declined significantly in recent years (Page and Stenzel 1981; Wilson 1984). Fewer than 1500 birds, and 28 nesting sites, remain in the three states. The subspecies of plover has disappeared as a breeding bird from most of California beaches in and south of Los Angeles. Development has eliminated the plover as a breeding species from many other coastal areas, as well. No nesting has been documented in the project area, although small numbers of wintering or migrant birds may occur in the vicinity (Chambers Group, 1996). Dune stabilization by introduced beach grass has also modified much formerly open coastal sand flat habitat. Evidence exists that human activity (i.e. recreation, beach cleaning), is responsible for some of the coastal decline, as well as predation by pet dogs, crows, foxes, skunks, and other animals (Federal Register Vol. 57, January 14, 1992).

6. **Sensitive Species.** Sensitive species (previously referred to as Candidate species) are those species for which available information indicates the probable appropriateness of listing, but for which sufficient information is not presently available to biologically support a proposed rule. Six sensitive species may occur in the project area. These species are: (1) **loggerhead shrike** (Lanius ludovicianus); (2) **long-billed curlew** (Numenius americanus); (3) **reddish egret** (Egretta rufescens); (4) **white-faced ibis** (Plegadis chihi); (5) **elegant tern** (Sterna elegans); and **harlequin duck** (Histrionicus histrionicus).

4.6 Air Quality

San Pedro Bay is located in the southwestern coastal area of the South Coast Air Basin (SCAB). The SCAB consists of the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties and all of Orange County. The potential for adverse air pollution conditions in the SCAB is high, particularly during the period from June through September. Poor ventilation caused by generally light winds and shallow vertical mixing is frequently insufficient to adequately disperse the large quantities of emissions generated in the basin. During the summer, these factors together with the long hours of sunlight result in the formation of high concentrations of ozone. During the winter, the same factors produce stagnant air that allows pockets of high concentrations of carbon monoxide to form.

High pollutant impacts can occur when land breezes transport onshore emissions over the ocean, then return them with the onset of the sea breeze to recombine with local emissions. This "sloshing" effect is known to produce high ozone concentrations in the SCAB during the warmer months of the year.

Air quality at a given location is described by the concentration of various pollutants in the atmosphere. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate Federal and/or State ambient air quality standard. The standards represent the allowable atmospheric concentrations at which the public health and welfare are protected and include a reasonable margin of safety to protect the more sensitive individuals in the population. These standards are presented in Table 5. The pollutants of most concern within the Bay area include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter smaller than 10 microns in diameter (PM_{10}).

The largest contributors to air pollutants in the SCAB are mobile sources. On-road motor vehicles account for 52.4% of the volatile organic compounds (VOC), 57.2% of the nitrogen oxides (NO_x), and 79.2% of the CO emitted in the SCAB. Other sources of pollution include off-road vehicles; industries; petroleum processing, storage, and transfer; fuel combustion; and solvent use.

4.7 Noise Levels

Noise in and around LA/LB results from a wide variety of sources at the harbors and in the surrounding communities. Primary noise sources at the harbor complex include bulk coal-loading facilities, cranes to load and unload containers, bulk metal dumping, truck traffic, ships, and occasional trains. Those who reside, work, or frequent this area, including wildlife, are exposed to a diverse range of steady state, fluctuating, and intermittent sounds. Among examples of steady state sources are electrical sub-station activity as well as turbines of various kinds. Fluctuating sound is represented by numerous processing or manufacturing activities, moderate to heavy automobile traffic, and many kinds of recreation noise such as that generated by inboard and outboard watercraft. A multitude of industrial noises encountered in construction work, shipbuilding, maintenance and repair, light vehicular traffic, occasional overhead aircraft, and the sounds of horns, whistles, bells and loudspeakers are typical of intermittent sound audible in the harbor area. Outside the breakwater, noise sources would primarily include wind and wave activity and vessel traffic.

The land uses closest to the harbor dredge site are primarily commercial or industrial in character. No sensitive receptors (such as residences, schools, and hospitals) are expected to be affected by this project. The nearest residential neighborhoods are in San Pedro and Wilmington, which at closest proximity are at distances of 1,000 ft. to 1,500 ft. from the harbor. The Queen Mary and associated recreation facilities are located near the borrow pit disposal site at the mouth of the LAR.

The LA-2 site is located in the ocean, approximately 7.7 miles offshore. Noise sources in that area are primarily natural. No sensitive receptors are in its vicinity. Any biological resources in the area would be acclimated to the noise of existing vessel traffic near LA-2, including vessels like a hopper dredge.

4.8 Cultural Resources

The LAR area of potential effects (APE) was cleared for cultural resources for the last Environmental Assessment in a letter from the State Historic Preservation Officer dated February 1, 1989. Recently the estuary was dredged on an emergency basis because excessive sediments had built up preventing the Catalina Island cruise ship from leaving its berth at the Port of Long Beach. Material dredged from the estuary was deposited at the borrow pit that was created when Island Grissom was constructed. The Island was named for the astronaut Virgil Grissom and thus is far too recent for any concerns over cultural resources.

The ocean dredged material disposal site, LA-2 has been used for these activities since 1991 while ocean dredging in the area has happened since 1978. The site was designated for dredged material for a five year span.

5.0 ENVIRONMENTAL EFFECTS

The proposed LAR estuary maintenance dredging project could result in the environmental impacts described below. Most alternative methods of operation would result in similar impacts, unless otherwise stated. The impacts of the "No Action" alternative are also addressed.

5.1 Land and Water Uses

Dredging Activities

Modifications to existing bottom topography are expected as a result of the proposed dredging of the river estuary, since excavation of this area is the stated project purpose. Local, but minor, changes to bathymetry will result due to relocation of marine sediments. The potential impacts of the proposed activities affecting the existing land use will be localized to the immediate project vicinity (including the upland disposal site) and are considered minor and insignificant in nature. Environmental impacts and disturbance to recreation-related activities due to project construction are also expected to be minimal and insignificant, with an ultimately positive effect of enhancing navigation.

The dredging operation would be conducted such that obstruction to navigating vessels is minimized. The operation would be bounded by buoys and other markers to ensure that navigators are aware of the operation and can safely avoid the area. The dredge operator shall move the dredge for law enforcement and rescue vessels whenever necessary.

This project could have a small impact on commercial or recreation fishing, due to fish either avoiding the work areas, or being entrained in the dredge. This impact would be temporary and insignificant.

Disposal Activities

"LA-2 Disposal Site"

Impacts from the deposit of suitable material at LA-2 would be negligible, considering the frequency of discharge and the fact that only a small area would be affected at any one time.

Several years of site monitoring data at LA-2 indicate that dredged material disposal has no discernable impact on commercial or recreation fisheries in the area (MEC 1994). Disposal has occurred in the area since 1978. Commercial fish catch statistics were analyzed over the 16-year period from 1970 to 1985 to evaluate the significance of fish resources at LA-2 and surrounding areas, and to determine if dredged material disposal has had a discernable impact. The recreation fish catch was similarly evaluated over a 10-year period. Based on these analyses, the proposed 1997 dredging and disposal project is also expected to have no effect on commercial or recreation fisheries at LA-2.

The recreation activity most likely to be affected by use of the LA-2 disposal site is pleasure boating, particularly for boats traveling from Los Angeles and Orange County harbors to Santa Catalina Island. However, the dredge would dump its load quickly at the LA-2 site and so, for the most part, would be just one other vessel moving about in the offshore area. Sportfishing in the area is rare due to the depth, so there should be little or no impact on that activity.

"Borrow Pit Disposal"

The use of this disposal site would not significantly reduce the level of impacts to this resource. Beneficial and minor adverse impacts to navigation and water-related recreation would occur primarily at the dredge sites within the LAR. Elevations at the disposal site would not be raised high enough to interfere with boat traffic.

"No Action"

This alternative offers no beneficial results, except for avoidance of temporary disturbance to navigation and water-related recreation. Several adverse impacts would occur if the river estuary were not dredged. Recreation and commercial boats entering or leaving the Queen's Way Marina would experience dangerous conditions, and eventually would be unable to use the channel. This would result in substantial economic losses to the area. No action at the LAR will most probably result in closure of Queen's Way Marina, until such time that the City of Long Beach is able to clear any or all shoal obstructions.

5.2 Littoral Transport

Dredging Activities

Dredged material would not be available for littoral transport along the shoreline, whether disposal occurs at LA-2, the borrow pit, or an upland site. There is very little potential for material deposited at the LA-2 site to move towards shore, or to be resuspended once it settles on the sea floor (MEC 1994). Some of the material dredged from the LAR in the past was predominantly sand, and, may have been suitable for beach nourishment. It is impractical, however, to attempt to separate that material from silty, potentially contaminated material in the time frame required, since the physical or chemical nature of most of this material is not acceptable for beach replenishment. Also, due to the depth and configuration of Long Beach Harbor, and the absence of wave action, this material would not likely be available for beach nourishment. Therefore, removal of this material from the littoral zone is not a significant impact.

Disposal Activities

"LA-2 Disposal Site"

Use of the LA-2 site for the placement of dredged material was evaluated in the Final Environmental Impact Statement for the Los Angeles/Long Beach (LA-2) Ocean Dredged Material Disposal Site Designation (EPA 1988). It was determined that placement of dredged material at this site would lead to the accumulation of sediment on the slope between the mainland shelf and the San Pedro Basin. This sediment accumulation could lead to slumping of material down the slope's gradient. As a natural occurrence and important process in transporting sediments to the deeper ocean basins, any additional slumping caused by the placement of dredged material is considered insignificant.

"Borrow Pit Disposal"

Littoral materials, if deposited at the borrow pit, are expected to remain at that site, because currents and wave action are very weak in this area, thus preventing sediment from entering the littoral zone.

"No Action"

The Los Angeles River, Los Angeles and Long Beach Harbors are not significant sources of beach nourishment under "natural" conditions. The "No Action" alternative, therefore, would not significantly benefit that resource.

5.3 Water and Sediment Quality

Dredging Activities

Temporary physical and chemical changes in water quality characteristics may result due to resuspension of bottom sediments during proposed dredging activities. Any contaminants present in the sediments could potentially become ecologically active, and available, upon disturbance by the proposed dredging activities. This impact would be minimized by limiting the turbidity plume created by dredging and open-water disposal operations, and by disposing contaminated material in an upland site.

Dredging and disposal impacts would also include temporary increases in turbidity and suspended solids, along with associated decreases in dissolved oxygen. These water column conditions may contribute to a decrease in light penetration. Most such impacts would be confined to the immediate vicinity of dredging activities, with turbidity levels dissipating rapidly through resettlement. The high percentage of silts would cause some sediments to remain suspended in the water column for a period of time. Average surface water column concentrations in the vicinity of a dredge are generally less than 100 mg/l (LaSalle, 1991). Oceanic currents at the LA-2 disposal site would aid in dilution and dispersal of the turbidity plume.

An estimated "worse-case" turbidity plume diameter of about 1000 ft, at 100% depth, can be expected for a clamshell dredge. The visible surface plume usually dissipates within an hour or two after the operation ceases, depending upon the type of material being dredged (LaSalle, 1991). Turbidity plumes at the dredge site are not normally associated with cutterhead dredges. The proposed dredging and disposal project is not expected to cause significant impacts to water quality within the LAR or Long Beach Harbor, since dredging and disposal operations will be conducted in accordance with California Regional Water Quality Control Board (CRWQCB) standards. A turbidity monitoring program will be implemented, as described in Section 8.0 - Environmental Commitments.

Disposal Activities

"LA-2 Disposal Site"

Impacts resulting from disposal operations at the LA-2 site would be similar to those discussed above.

"Borrow Pit Disposal"

Impacts resulting from disposal operations at the borrow pit area would be similar to those discussed under dredging activities. Any contaminated materials deposited at the pit area expected to remain at this site (current and wave action is weak in this area), and would

not affect adjacent harbor areas. This stability will be further insured through bathymetric monitoring.

"No Action"

There would be no adverse effects from turbidity or disturbance of contaminants under this alternative. Hazardous conditions caused by shoaling could however result in more frequent boating accidents. An increase in boating accidents would likely involve spills of oil, gas, and other hazardous substances.

5.4 Biological Resources

Dredging and Disposal Activities

"Borrow Pit"

The most direct impact of dredging and disposal will be the elimination of sedentary and slow-moving benthic organisms which have recolonized the project areas since the last dredging episode. A secondary impact of dredging and disposal will be the redeposition of suspended sediments on adjacent areas. Impacts would be short-term and insignificant since effects would be either diffuse over the site or concentrated in a small area. If the rain of fines is minimal (if sediment is distributed slowly and evenly, minimizing suspended sediments), adjacent animals may work their way up through the sediment (Soule and Oguri 1976). Disposal will be controlled to ensure that material is placed only within specified limits; adjacent areas, therefore, should not be significantly affected. However, significant decreases of benthic infauna abundance immediately after maintenance dredging in Coos Bay, Oregon, have been found to extend at least 100 meters from the site of actual dredging (McCauley, Parr, and Hancock 1977).

After the termination of the dredging and disposal, the affected area would be recolonized. The planktonic stage of these organism's life cycles is expected to contribute greatly to the recolonization of newly exposed substrate, as will contributions by the migration of juvenile and adult individuals from adjacent undisturbed areas. Field studies of dredged areas have shown that recolonization occurs within 2 weeks to 3 years after dredging stops (McCauley, Parr, and Hancock 1977; Oliver et al 1977; Rosenberg 1977).

Planktonic organisms in the water column may suffer some short-term, localized stress from the turbidity created during dredging and disposal. Some planktonic organisms would also be stressed or killed by entrainment in the water used to hydraulically move the sediment. There may be a general decline in aquatic primary productivity due to temporary loss of phytoplankton populations. However, planktonic species are adapted to large losses from naturally high mortality. Because of the localized and short-term disturbance of bottom sediment associated with dredging and because of the transitory nature and high reproduction

rates of marine plankton, impacts of dredging and disposal on phytoplankton and zooplankton are expected to be insignificant.

Dredging and disposal of contaminated sediments can cause the redistribution and remobilization of toxicants adsorbed to the sediments (USFWS 1987). The consumption of fine suspended sediment absorbed with contaminants by larvae of benthos, fish, and infauna would tend to bioaccumulate in the food chain. Methods to control turbidity (to be implemented if water quality monitoring indicates such controls are needed) would reduce this impact to a level of non-significance by ensuring that high levels of suspended solids are restricted to the immediate dredge and disposal areas. Suspended sediments occur routinely during storm events and other natural movement of material, and through disturbance caused by routine boat traffic. In addition, sediment chemistry results indicate that the level of contamination within the borrow pit is similar to the quality of sediment to be dredged. Disposal within the borrow pit will not increase the overall level of contamination.

The noise and activity associated with dredging and disposal could disturb bird populations in the project vicinity. Visually-feeding birds would be prevented from foraging in the immediate vicinity of the dredge because of the increased turbidity. Disturbance of feeding or roosting birds would probably result in temporary dispersal away from the dredging area. Birds would be expected to return after the termination of dredging. During dredging and disposal there may be some increased foraging at the fringe of the turbidity plume due to resuspension of benthic invertebrates.

Any marine mammals which happened to be within the project area could also be disturbed by the noise and activity of dredging and disposal, and would be prevented from foraging in waters adjacent to and immediately downcurrent of the dredge by the turbidity plume. These mammals would probably avoid the dredging and disposal areas during project activities, but these areas would again be conducive to occasional use by seals, sea lions, and pinnipeds as soon as dredging stopped. Impacts to marine mammals from the dredging would, thus, be insignificant.

Impacts of dredging on fish populations will largely be limited to temporary avoidance of the dredging and disposal areas and localized loss of some food resources. Any appreciable turbidity increase may clog the respiratory and feeding apparatuses of fish and filter feeders. Motile organisms, however, would most probably evacuate and avoid the dredging and disposal areas, or temporarily relocate to adjacent undisturbed areas. Lethal effects of suspended sediment on fishes are not anticipated; although fish mortality from clogging of gills due to storm induced turbidity has been observed and could conceivably occur during dredging. Fishes exposed to suspended sediment in the laboratory have been shown to suffer mortality as well as sub-lethal signs of stress (Soule and Oguri 1976, O'Connor et al 1977). Mixing and flushing in the dredge area would probably dilute the suspended sediment below lethal or even sublethal concentrations.

"LA-2 Site"

Sediment testing indicates that this material is not likely to be suitable for disposal at LA-2. However, if bioassay and bioaccumulation tests (not currently proposed) were used to demonstrate that contaminant levels would not affect the surrounding ecosystem, then the impacts from disposal at this location would be similar to those discussed above. The dredging portion of the project would not change. Birds, fish, and marine mammals at LA-2 (or encountered in route between the two areas) could be disturbed by suspended sediments, noise and activity associated with disposal, and may be prevented from foraging in waters adjacent to and immediately downcurrent of the turbidity plume. Individuals would probably avoid the disposal area during project activities, but this area would again be conducive to use as soon as disposal stopped. Benthic infauna within the affected area would be buried, but recolonization would eventually occur. Impacts to biological resources from disposal at LA-2 would, thus, be insignificant.

"No Action"

None of the adverse impacts discussed above would occur, although continued shoaling may eventually necessitate emergency dredging procedures.

5.5 Threatened and Endangered Species

Dredging Activities and Disposal Activities

"Borrow Pit"

Brown pelicans and **least terns** occur within the dredging area. Both prefer shallow foraging areas, such as the mouth of the LAR. The noise and activity of dredging could temporarily displace pelicans that rest on the nearby breakwater and jetties; however, this species is generally tolerant of such human activities. Turbidity from dredging and disposal could prevent both pelicans and least terns from foraging in the immediate vicinity of the dredge, although both species may find suitable foraging habitat near the fringe of any turbidity plume that may form. Turbidity may also alter fish distribution and behavior. The fish may dive deep or scatter and become unavailable to foraging pelicans and least terns, which depend on concentrated forage fish. Pelicans would find other areas in the harbor and offshore to forage and would not be affected by the dredging. These birds do not breed in the area, and are not held to a relatively-limited geographic area as are locally-nesting birds.

Dredging and disposal operations are expected to be completed prior to the least tern's nesting season. Unavoidable delays due to storms or mechanical breakdowns, however, could result in activities continuing beyond April 1. Interference with least tern foraging could be a concern if turbidity from dredging impacted surface water clarity over a substantial portion of preferred foraging areas during the breeding season. Atwood and Kelly (1984) found that reduced food availability affected tern reproductive success.

Although most foraging occurs within two miles of nest sites, the estuary may attract greater numbers of terns than would otherwise forage so far from Terminal Island. The USFWS has confirmed that terns do forage within the LAR, although the relative importance of this site compared to other areas has not been documented (Mark Pavelka, pers. comm., 1996). Previous studies on tern foraging behavior have not included surveys of the LAR, but as discussed in Section 4.5, it appears that most foraging occurs closer to Terminal Island (see Figures 11 and 12). This project is not expected to affect food availability or nesting success. Least terns would continue to forage in the unaffected portions of Los Angeles and Long Beach harbors, the LAR, and nearshore, and would **probably** not be affected by the temporary disturbance caused by dredging the mouth of the LAR. The deeper water in the area of the borrow pit is also not an important or frequently used foraging site.

The lack of field data regarding the frequency of least tern foraging within the LAR requires the Corps to assume that this site is an important feeding area for least terns. Therefore, although the Corps does not expect this project to adversely affect least terns, the Corps will commit to implementing a turbidity monitoring program in the event that dredging and disposal occurs during the tern's nesting season (April 1-September 1).[1] The intent of this monitoring program is to ensure that any turbidity plume that may be formed is minimized, and that significant turbidity does not extend beyond 100 feet of the dredge. The specific procedure is outlined in Appendix D, and summarized below.

Secchi disk readings taken 100 feet from the dredge will be compared to "background" readings taken at least 500 ft. from the dredge, outside of any visible turbidity plume. If significant increases in turbidity as a result of dredging are determined to occur, corrective actions will be immediately implemented, and such actions will be coordinated with the USFWS and other appropriate resource agencies. These actions may include using a silt curtain, dredging at a slower rate, limiting the timing of dredging to ebb tide cycles so that turbidity is drawn out of the harbor complex by tidal flushing, or even the complete shutdown of dredging operations should no other alternative be identified that would reduce turbidity to insignificance.

As discussed in Section 4.5, other Federally-listed threatened, endangered, and candidate species are not expected to be affected. Marine mammals and sea turtles would avoid the project areas. The proposed dredging and disposal operations would not affect the **western snowy plover**. This species nests and forages on sandy beaches. Operations would

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[1]The USFWS typically requires restriction of activities, or slowing operations through turbidity controls, until September 15. In this case, however, the Corps needs to complete operations before the end of the fiscal year (September 30), and work is expected to take up to 30 days to complete. Therefore, the USFWS has agreed to allow dredging to begin on September 1, without requiring implementation of the turbidity monitoring program (Appendix D).

not occur on the beach, and would not interfere with the supply of sand for nesting beaches. The **peregrine falcon** would continue to forage in the area, as the presence of a dredge near major commercial harbors would not significantly add to the level of disturbance.

The Corps of Engineers has determined that this project will not affect any Federally-listed threatened or endangered species, and that formal consultation (pursuant to Section 7 of the Endangered Species Act) is not required at this time. The USFWS has informally concurred with this determination.

"LA-2 Site"

Disposal at LA-2 would also have no impact on Federally-listed threatened, endangered, or candidate species. Marine mammals (including Federally protected whale species) may be present in the area, but would avoid the site, thereby avoiding impacts, during disposal activities.

"No Action"

The "No Action" alternative would also have no impact on Federally-listed threatened, endangered, or candidate species. If emergency dredging is required in the future, activities would not commence until coordination with the USFWS has determined that activities would not affect endangered species.

5.6 Air Quality

Dredging Activities

The dredging and disposal equipment to be used for dredging activities would consist of one or more of the following dredge types: a hydraulic cutterhead dredge, a hopper dredge, or a mechanical dredge. Equipment needed to place material if an upland site were used, in addition to the dredge, would likely include a barge, a backhoe to remove material from the barge, and dump trucks. Emission levels from different dredges could vary substantially, even if they are the same dredge type, due to differences in size, engine type, and other parameters. Emissions from any dredge type (and from support equipment) are expected to cause minor short-term adverse impacts on air quality. The overall impact of the project on local ambient air quality, however, is not expected to be significant, for the following reasons:

a) The proposed dredging activities would be temporary in nature, and subject to Federal, State, and County air quality regulations and standards. The air quality standards established and enforced by the South Coast Air Quality Management District (SCAQMD) will be observed by the Corps' contractor. The contractor will be responsible for complying with all applicable SCAQMD rules and regulations, and shall obtain necessary permits before construction begins.

b) Construction equipment will be properly maintained to reduce emissions.

c) Emissions associated with the proposed dredging activities derive almost exclusively from the dredge motor drive. The mobile nature of a dredge is such that no receptors are exposed to any significant on-shore concentrations of equipment exhaust for any length of time. By the time the exhaust plume from the dredge stack reaches the nearest shoreline receptor, in-stack pollutant concentrations will be so dilute as to be immeasurably small.

d) Compared to the hundreds of tons of pollutants emitted in Los Angeles County each day, the limited levels of dredge drive exhaust pollutants are small, but still adverse. Impacts, however, would be temporary, and would be mitigated as necessary by measures required by the SCAQMD. Such measures may include (1) retarding injection timing of diesel-powered equipment for NO_x control, and (2) using reformulated diesel fuel to reduce reactive organic compounds (ROC) and sulfur dioxide (SO_2).

Disposal Activities

"LA-2 Disposal Site"

Impacts to air quality resulting from the disposal of materials at the LA-2 site would be similar to those discussed above, under dredging activities. Impacts would be minimized however, due to dredge and disposal activities taking place during the winter, when overall pollution in the Southern California Air Basin (SCAB) near a minimum. However, this positive benefit may be offset by the increased travel time required when using this disposal site. Shorter distances to alternative disposal areas would also shorten the total project schedule, resulting in a decrease in overall emissions.

"Borrow Pit Disposal"

Depositing sediment dredged from LAR estuary at the borrow-pit would likely result in similar air quality impacts as disposal at LA-2. Emissions from the dredge would cause minor short-term adverse impacts on air quality. Less travel time is required for the dredge to reach the borrow-pit, however, than LA-2. Overall, the dredge is expected to operate for approximately the same length of time, resulting in similar levels of emissions. Impacts to air quality would remain insignificant because the contractor would still be responsible for properly maintaining the dredge, obtaining a permit from the South Coast Air Quality Management District (SCAQMD), and complying with all applicable SCAQMD rules and regulations.

"No Action"

This alternative would avoid all impacts to air quality, unless it resulted in frequent emergency dredging operations to relieve dangerously shoaled conditions, as has occurred in the past.

5.7 Noise Levels

Dredging Activities

This project may result in a minor noise impact on visitors to the Queen Mary. This impact was not significant, however, due to the distance of the Queen Mary from the disposal site and the fact that operations occurred outside of the summer tourist season. The Queen Mary is approximately 500 feet from the closest edge of the borrow pit disposal site, and approximately 2,400 feet from the farthest edge of the borrow pit. A breakwater surrounds the Queen Mary at a distance of approximately 300 feet. This structure likely attenuated some of the project noise.

The City of Long Beach Noise Ordinance does not set a decibel limit on construction activities and its regulations regarding when construction activities may occur do not apply within the Long Beach Harbor District boundaries.

Disposal Activities

"LA-2 Disposal Site"

The use of this alternative disposal site would not substantially reduce or increase project related ambient noise. As discussed in the above paragraphs for dredging activities, noise from dredging and disposal is not a significant impact

"Borrow Pit Disposal"

Impacts to ambient noise quality are likely to be similar to those discussed above.

"No Action"

This alternative would avoid all noise impacts, unless it resulted in frequent emergency dredging operations to relieve dangerously shoaled conditions, which has occurred in the past.

5.8 Cultural Resources

As there are no National Register listed or eligible cultural resources in the APE that will be affected by the proposed dredging and disposal project, there will be no project

related impacts. The Los Angeles River Estuary has been dredged on several occasions, most recently during an emergency episode in the winter of 1995. Cultural resources were not involved during past dredging episodes, nor would they be involved in future episodes within the LAR estuary site.

6.0 COORDINATION

The principle agencies with which this project has been, and will continue to be coordinated, include: U.S. Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, State Historic Preservation Office, California Coastal Commission, California Department of Fish and Game, California Regional Water Quality Control Board (Los Angeles Region), South Coast Air Quality Management District, the City of Long Beach, and the Port of Los Angeles. Pertinent written records of coordination conducted to date are included in Appendix E. An updated list of Federally-listed endangered, threatened, and candidate species that could occur in the project area has been received from the U.S. Fish and Wildlife Service. Due to the aforementioned absence of an effect to any listed threatened or endangered species, no formal Section 7 consultation process is required at this time (see Section 7.4).

All cultural resources documentation will be sent to the State Historic Preservation Officer (SHPO) for review and comment. No documentation on the current proposed project has been sent to the SHPO yet. Correspondence will be prepared which will state that the project, as planned, will not involve National Register or listed properties. Upon concurrence from the SHPO, the project may proceed. All coordination with SHPO shall be conducted pursuant to 36 CFR 800.

7.0 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

National Environmental Policy Act of 1969 (NEPA)

This Final EA was prepared in compliance with NEPA guidelines. Full compliance will be complete with the signing of a Finding of No Significant Impact (FONSI).

Clean Water Act Section 404(b)(1) Guidelines

The proposed Los Angeles River Estuary dredging project, including disposal within the Island Grissom borrow bit, complies with the guidelines promulgated by the Administrator, Environmental Protection Agency, under the authority of Section 404(b)(1) of the Clean Water Act (33 USC 1344). Appendix B contains a 404(b)(1) evaluation prepared pursuant to this Act.

Marine Protection, Research and Sanctuaries Act of 1972

Section 103 of this Act requires that bioassays be performed on material that is to be disposed in the ocean unless this material meets certain exclusion criteria. Disposal at LA-2, however, is not the preferred alternative, therefore, no bioassy is required at this time.

Coastal Zone Management Act of 1972 and California Coastal Act of 1976

The proposed project activities have been determined to be consistent with the California Coastal Act to the maximum extent practicable, as required by the Coastal Zone Management Act of 1972. Maintenance dredging, and the disposal of dredged material, requires a Consistency Determination due to the possibility of effects to resources in the coastal zone. A Coastal Consistency Determination (CCD) prepared for the proposed project (see **Appendix C**) concludes that the proposed dredging and disposal activities are consistent to the maximum extent practicable with the California Coastal Act of 1976. The California Coastal Commission has concurred with the Corps Determination of Consistency (CS-005-97).

Endangered Species Act of 1973

Current endangered species information was requested from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in compliance with Section 7 of the Act. Based on recent lists of threatened and endangered species that may occur in the project area, the Corps has determined that no Federally-listed species would be affected by the proposed maintenance dredging program. Formal consultation with the USFWS pursuant to Section 7(c) of the Endangered Species Act of 1973 is not required at this time.

National Historic Preservation Act of 1966, as amended

National Historic Preservation Act of 1966. Prior to the initiation of dredging and disposal, the project elements, as proposed will be required to be in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800). Any changes to the proposed project will need to be coordinated before they may be implemented. At this time, no formal coordination has been initiated with SHPO. A letter has been sent to the SHPO stating that the project, as planned, will not involve National Register listed or eligible properties. Upon receipt of a letter from SHPO concurring with our determination, the project will be in compliance with Section 106 and may proceed.

Fish and Wildlife Coordination Act

The proposed project, with the above environmental commitments, has been coordinated with the USFWS, NMFS, and CDFG, in accordance with the Fish and Wildlife Coordination Act.

Clean Air Act Amendments of 1977

Emissions generated by this project are expected to be temporary, and insignificant. Furthermore, the contractor must obtain a permit from the South Coast Air Quality Management District prior to commencement of work. The Corps has determined, therefore, that the proposed dredge and disposal project is in compliance with the following sections of the Clean Air Act Amendments of 1977 (PL 95-95, H.R.6161, August 7, 1977):

- Title I Amendments relating primarily to stationary sources, Section 109 New Source Standards of Performance.

- Title II Amendments relating primarily to mobile sources, Section 204 emission standards from heavy duty vehicles or engines, and from certain other vehicles or engines.

- Title III Miscellaneous Amendments, Section 303 Delegation to Local Government under the Federal Plan, and Section 313 Air Quality Monitoring by EPA.

8.0 ENVIRONMENTAL COMMITMENTS

The Corps and contractors commit to avoiding, minimizing, or mitigating for adverse effects during construction activities. Based on the information available to the Los Angeles District Corps of Engineers and recommendations of public agencies, the following environmental commitments are needed to minimize potential environmental impacts. Applicable environmental commitments will be incorporated into the project plans and the contract specifications.

General

- The contractor shall observe all environmental protection specifications, including but not limited to Federal, State, and local water, air, and noise quality standards.

- The Corps will continue to coordinate all aspects of the proposed project with concerned agencies and document that coordination, as appropriate.

Water Quality

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

- The contractor shall implement a water quality monitoring plan at the dredge and disposal site. Monitoring shall be conducted at 3 points (100 feet upcurrent of the dredge, 100 feet and 300 feet downcurrent of the dredge) for dissolved oxygen, light

transmittance, pH and suspended solids. Background readings shall be obtained a minimum of 500 feet from the dredge. Water quality shall be monitored daily for the first seven days and then once weekly throughout the project. Turbidity monitoring shall not be required if the contractor opts to place a silt curtain around the dredge and disposal site, no more than 250 feet from the dredge.

- If turbidity exceeds 20% of baseline readings (indicating a spread of material), operations shall be modified to reduce turbidity to ambient levels. Modifications may include: use of a silt curtain; using an enclosed clamshell bucket; lowering the bucket into the water (rather than dropping material into the water); and slowing or temporarily stopping operations. If excess turbidity is due to a problem in a limited area, such as shallow water or fine sediments, the restrictions may be lifted after dredging of that problem area had been completed, and if monitoring shows that surface turbidity is no longer significant.

- If a clamshell dredge is used, a floating debris boom (silt curtain) will be placed no more than 250 feet from the dredge and a closed clamshell bucket will be used. The debris boom skirt shall extend a minimum depth .45 meters below the water surface. The boom shall be placed in a manner that will prevent spills, floating objects, and suspended sediments from drifting away from the site.

Fish and Wildlife Resources

- Operators of dredge or other heavy equipment shall not harass any marine mammals or waterfowl in the project area.

- If operations are expected to extend into the lest tern's nesting season (April 1 though September 1), the contractor shall implement the Water Quality Monitoring Plan recommended by the USFWS (see Appendix D). Background sampling will begin March 20, 1997.

Air Quality and Noise

- The contractor shall obtain a Permit to Operate from the South Coast Air Quality Management District prior to commencement of work, pay all associated fees, and follow all permit requirements.

- Dredges and other construction equipment will be properly maintained in order to minimize release of diesel and hydrocarbon effluent into the atmosphere. The contractor will follow all air quality standards, including those regarding emissions, fuel use and fuel consumption.

- o Noise levels of the dredge operation shall not exceed the limits established by the City of Long Beach's noise ordinance. If double or triple-shifts are utilized, the contractor will first obtain all necessary permits or exemptions from the City of Long Beach.

- o Dredges and construction equipment will be properly maintained and scheduled in order to minimize unsafe and nuisance noise effects to sensitive biological resources, residential areas, and the socio-economic environment.

Harbor and Land Use

- o The dredge and associated equipment must be marked in accordance with U.S. Coast Guard provisions. The contractor must contact the Eleventh Coast Guard District, Aids to Navigation Branch, two weeks prior to commencement of dredging. The following information shall be provided to the Coast Guard:

    1. The size and type of equipment to be used in the work.

    2. Names and radio call signs for working vessels.

    3. Telephone number for on-site contact with project engineer.

    4. The schedule for completing the project.

    5. Any hazards to Navigation.

- o The dredge operator shall move the dredge equipment for Coast Guard and Harbor Patrol law enforcement and rescue vessels.

Cultural Resources

- o No environmental commitments are required since the APE has no known cultural resources located within it. But if potentially historic properties are encountered during execution of the Main Channel dredging the provisions of 36 CFR 800.11, for "Properties discovered during implementation of an undertaking", will be enacted.

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FIGURES

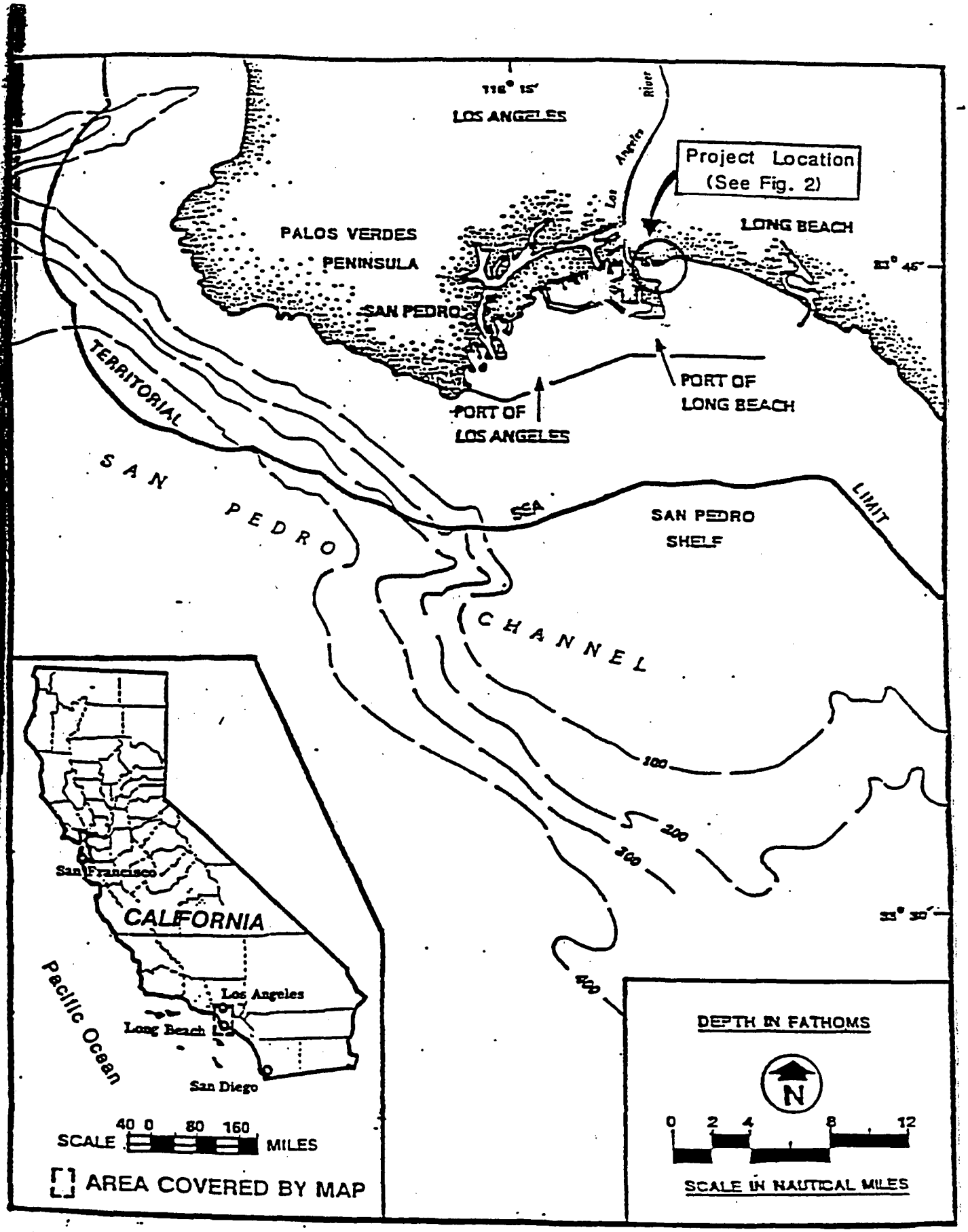

FIGURE 1 PROJECT VICINITY

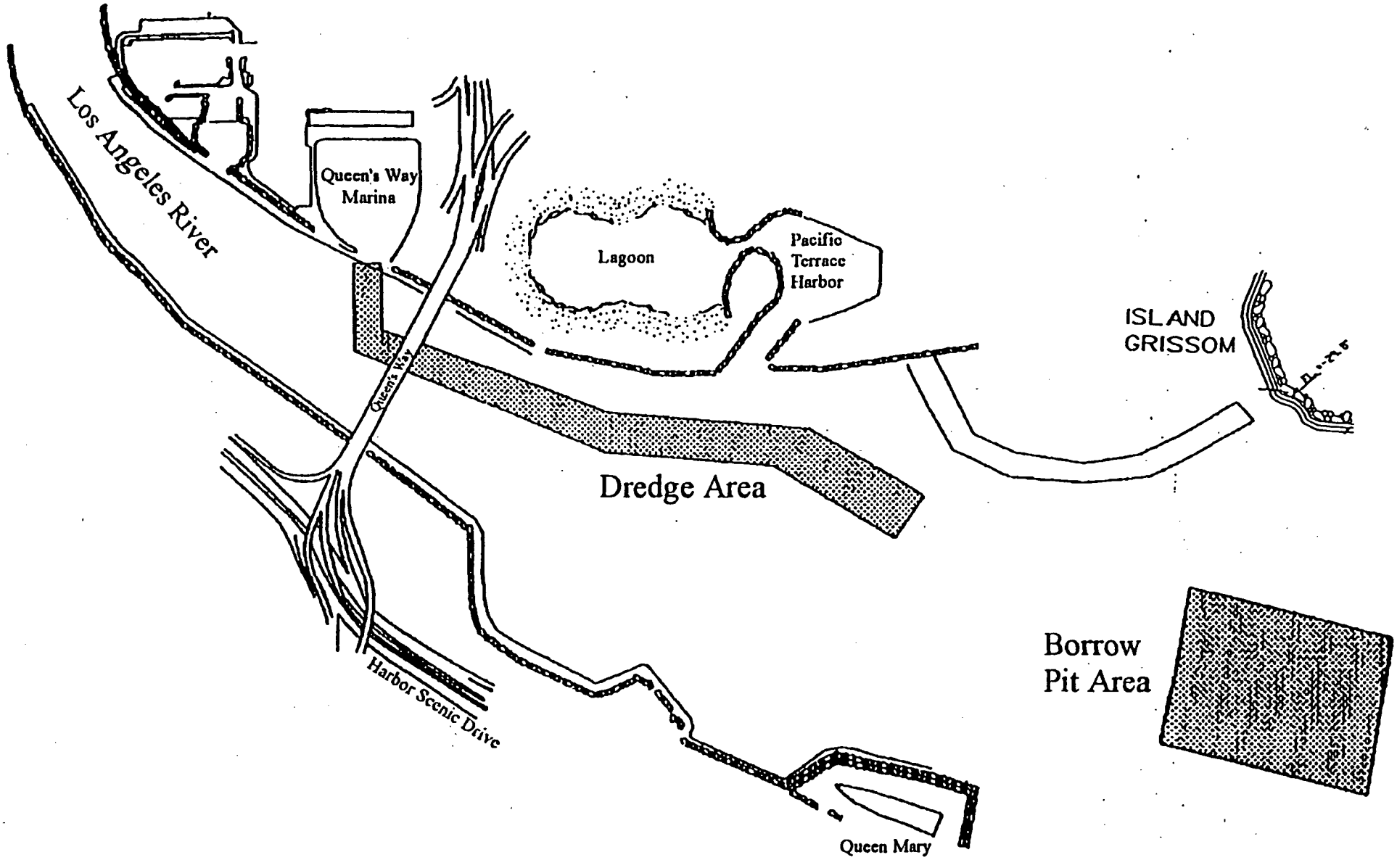

FIGURE 2: PROJECT LOCATION MAP

FIGURE 2: PROJECT LOCATION MAP

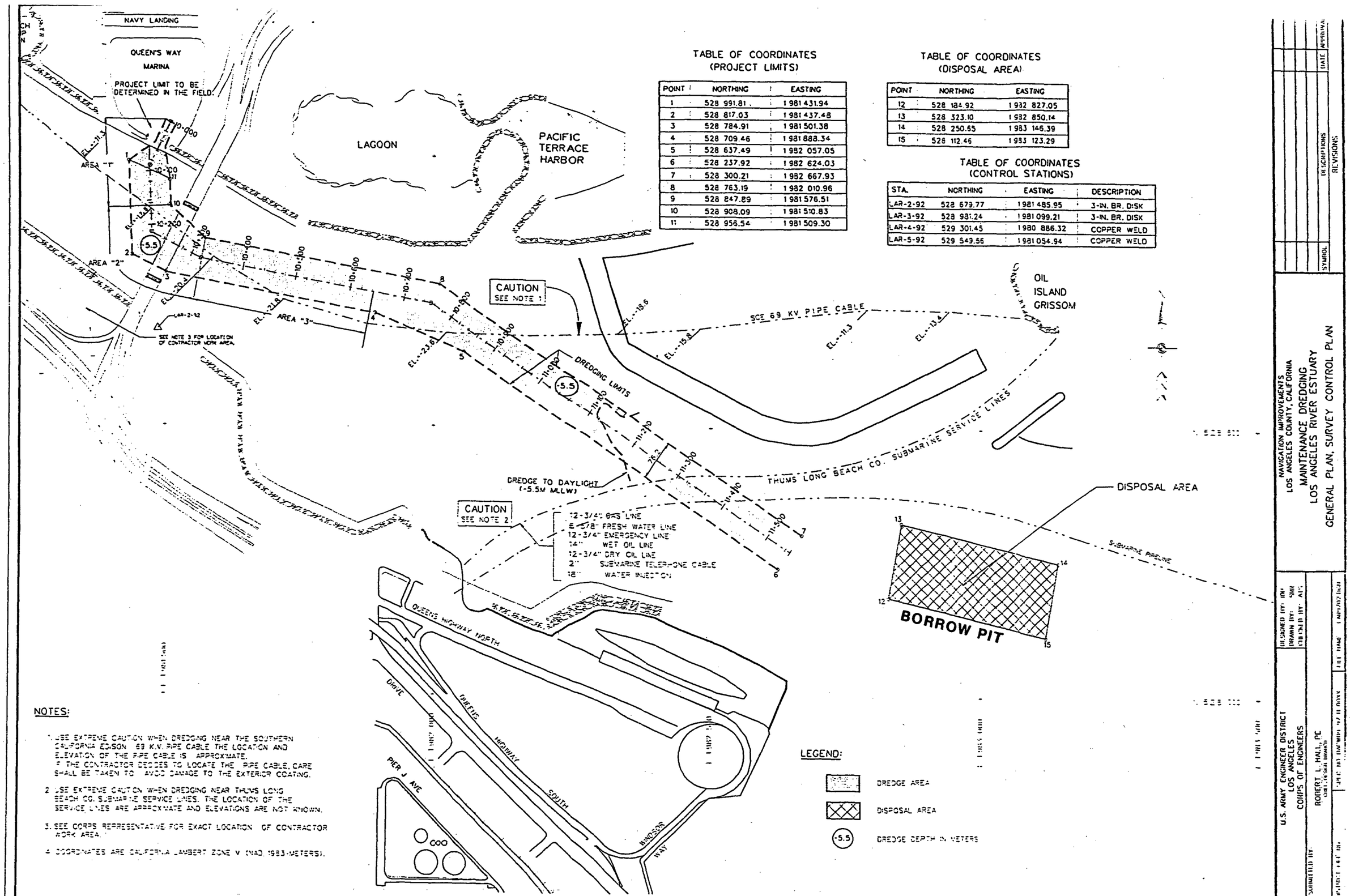

TABLE OF COORDINATES
(PROJECT LIMITS)

POINT	NORTHING	EASTING
1	528 991.81	1 981 431.94
2	528 817.03	1 981 437.48
3	528 784.91	1 981 501.38
4	528 709.46	1 981 888.34
5	528 637.49	1 982 057.05
6	528 237.92	1 982 624.03
7	528 300.21	1 982 667.93
8	528 763.19	1 982 010.96
9	528 847.89	1 981 576.51
10	528 908.09	1 981 510.83
11	528 956.54	1 981 509.30

TABLE OF COORDINATES
(DISPOSAL AREA)

POINT	NORTHING	EASTING
12	528 184.92	1 932 827.05
13	528 323.10	1 932 850.14
14	528 250.65	1 983 146.39
15	528 112.46	1 983 123.29

TABLE OF COORDINATES
(CONTROL STATIONS)

STA.	NORTHING	EASTING	DESCRIPTION
LAR-2-92	528 679.77	1 981 485.95	3-IN. BR. DISK
LAR-3-92	528 981.24	1 981 099.21	3-IN. BR. DISK
LAR-4-92	529 301.45	1 980 886.32	COPPER WELD
LAR-5-92	529 549.56	1 981 054.94	COPPER WELD

NOTES:

1. USE EXTREME CAUTION WHEN DREDGING NEAR THE SOUTHERN CALIFORNIA EDISON 69 K.V. PIPE CABLE. THE LOCATION AND ELEVATION OF THE PIPE CABLE IS APPROXIMATE. IF THE CONTRACTOR DECIDES TO LOCATE THE PIPE CABLE, CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE EXTERIOR COATING.
2. USE EXTREME CAUTION WHEN DREDGING NEAR THUMS LONG BEACH CO. SUBMARINE SERVICE LINES. THE LOCATION OF THE SERVICE LINES ARE APPROXIMATE AND ELEVATIONS ARE NOT KNOWN.
3. SEE CORPS REPRESENTATIVE FOR EXACT LOCATION OF CONTRACTOR WORK AREA.
4. COORDINATES ARE CALIFORNIA LAMBERT ZONE V (NAD 1983-METERS).

LEGEND:

- DREDGE AREA
- DISPOSAL AREA
- (-5.5) DREDGE DEPTH IN METERS

FIGURE 2a: PROPOSED DREDGE SITE AND DISPOSAL AREA

NAVIGATION IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA
MAINTENANCE DREDGING
LOS ANGELES RIVER ESTUARY
GENERAL PLAN, SURVEY CONTROL PLAN

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

ROBERT L. HALL, PE
CHIEF, ENGINEERING BRANCH

SUBMITTED BY:

SYMBOL | DESCRIPTIONS | DATE | APPROVED
REVISIONS

SAFETY DAYS

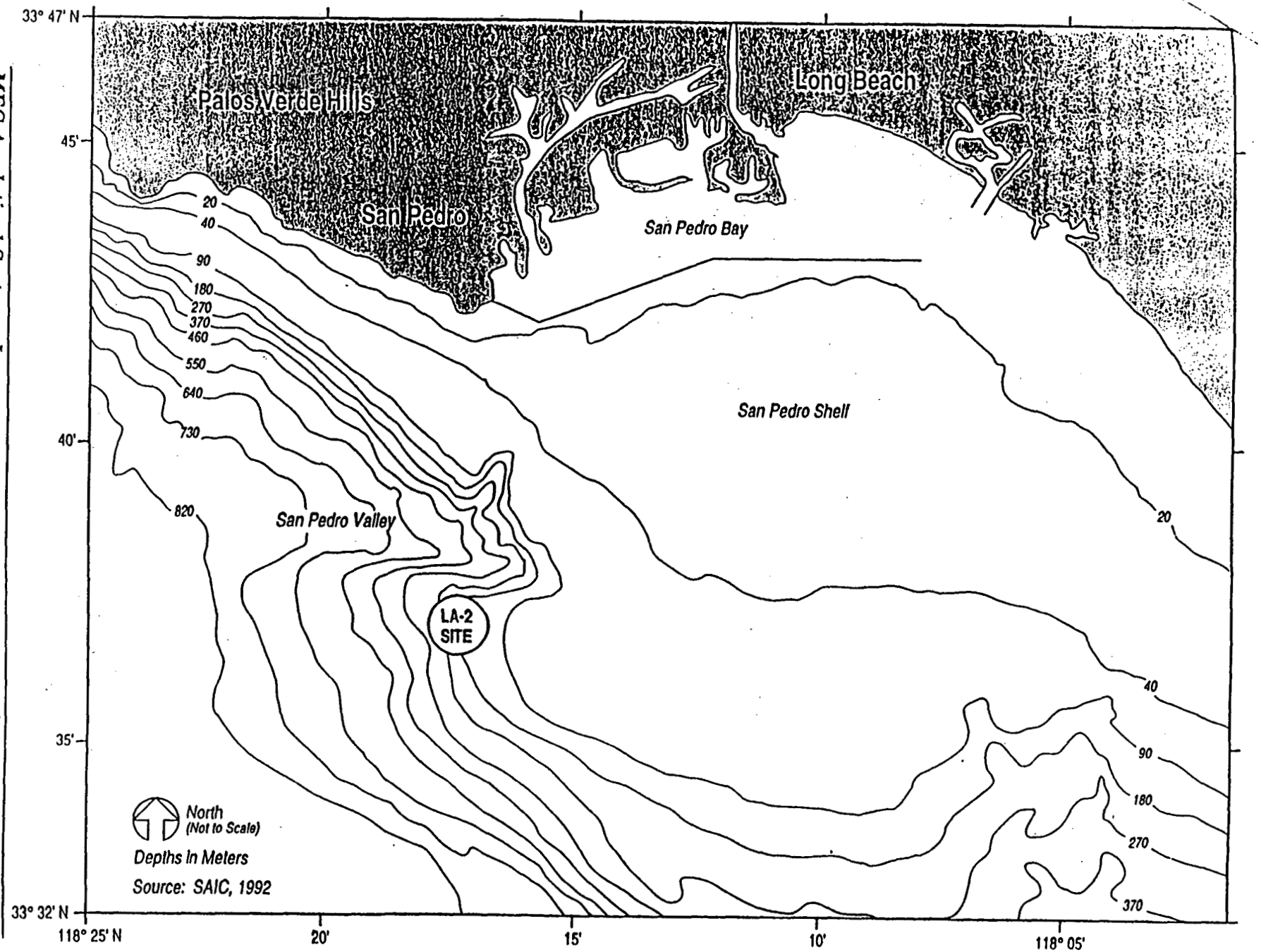

FIGURE 3: LA-2 ALTERNATIVE DISPOSAL SITE

MEC Analytical Systems, Inc.

Draft August 16, 1994

FIGURE 3: LA-2 ALTERNATIVE DISPOSAL SITE

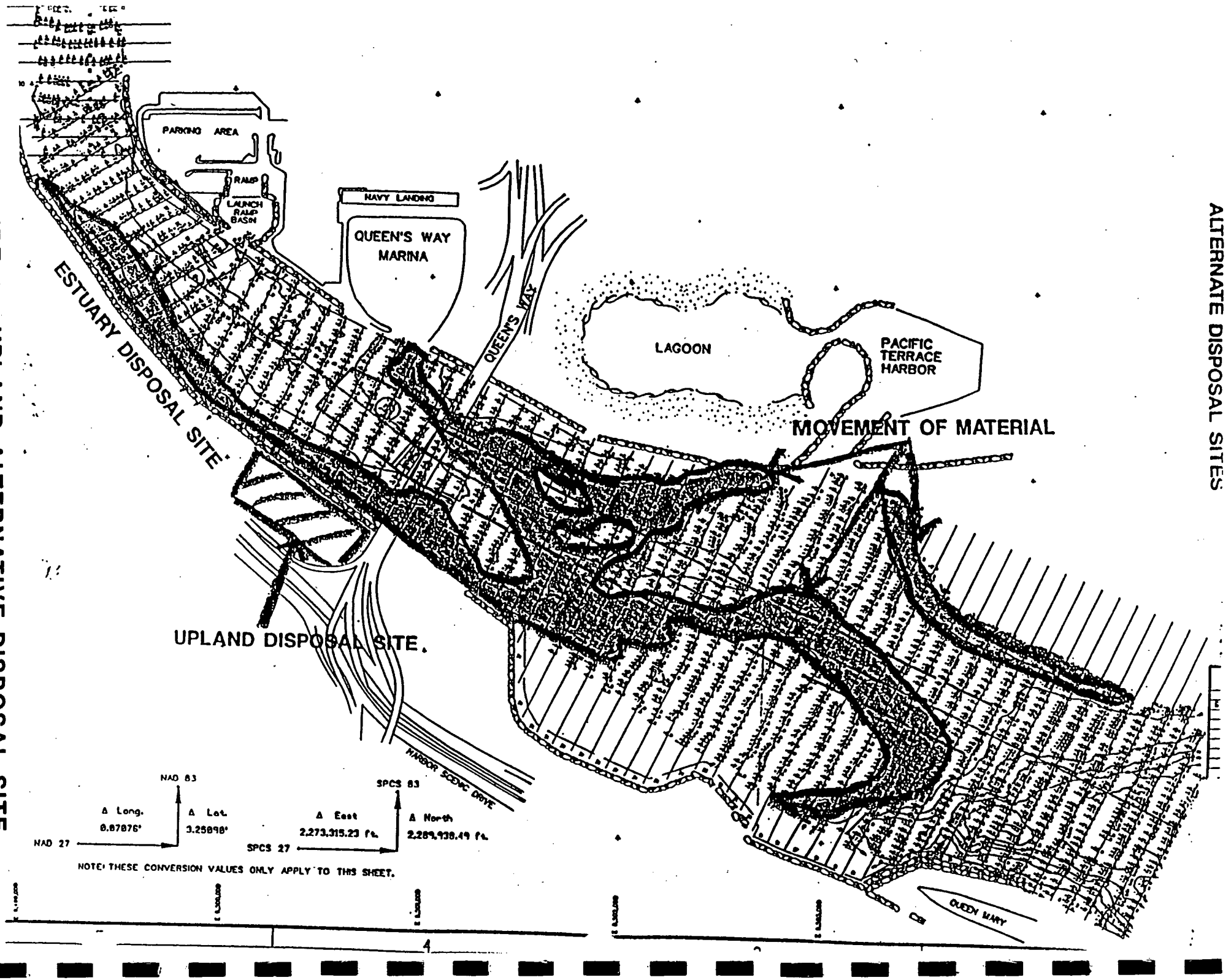

FIGURE 4: UPLAND ALTERNATIVE DISPOSAL SITE

ALTERNATE DISPOSAL SITES

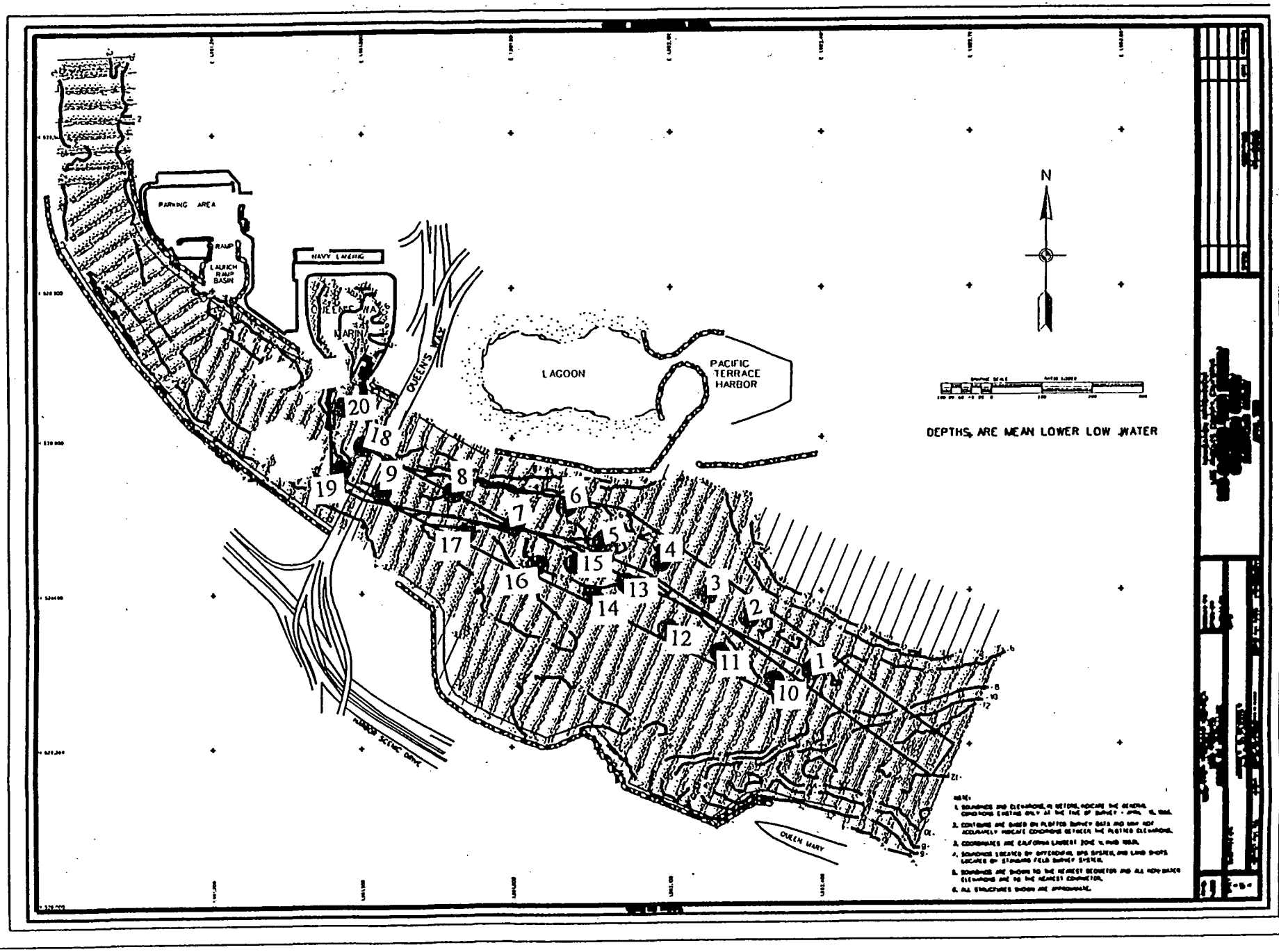

FIGURE 5: SEDIMENT TESTING SITES (1996/97)

FIGURE 5: SEDIMENT TESTING SITES (1996/97)

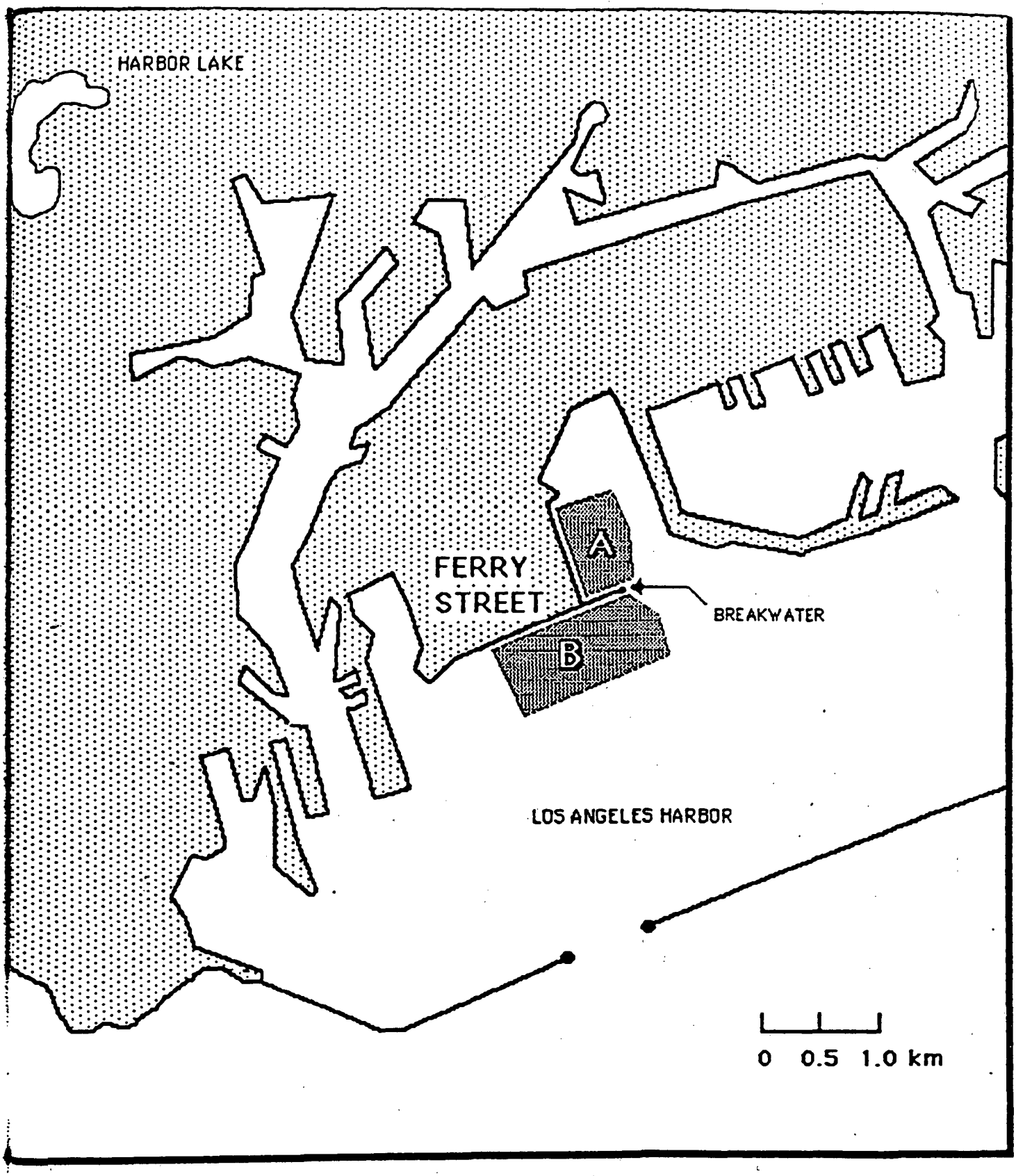

FIGURE 6: . LOCATION OF FORAGING STUDY AREAS IN VICINITY OF TERMINAL ISLAND, 1985

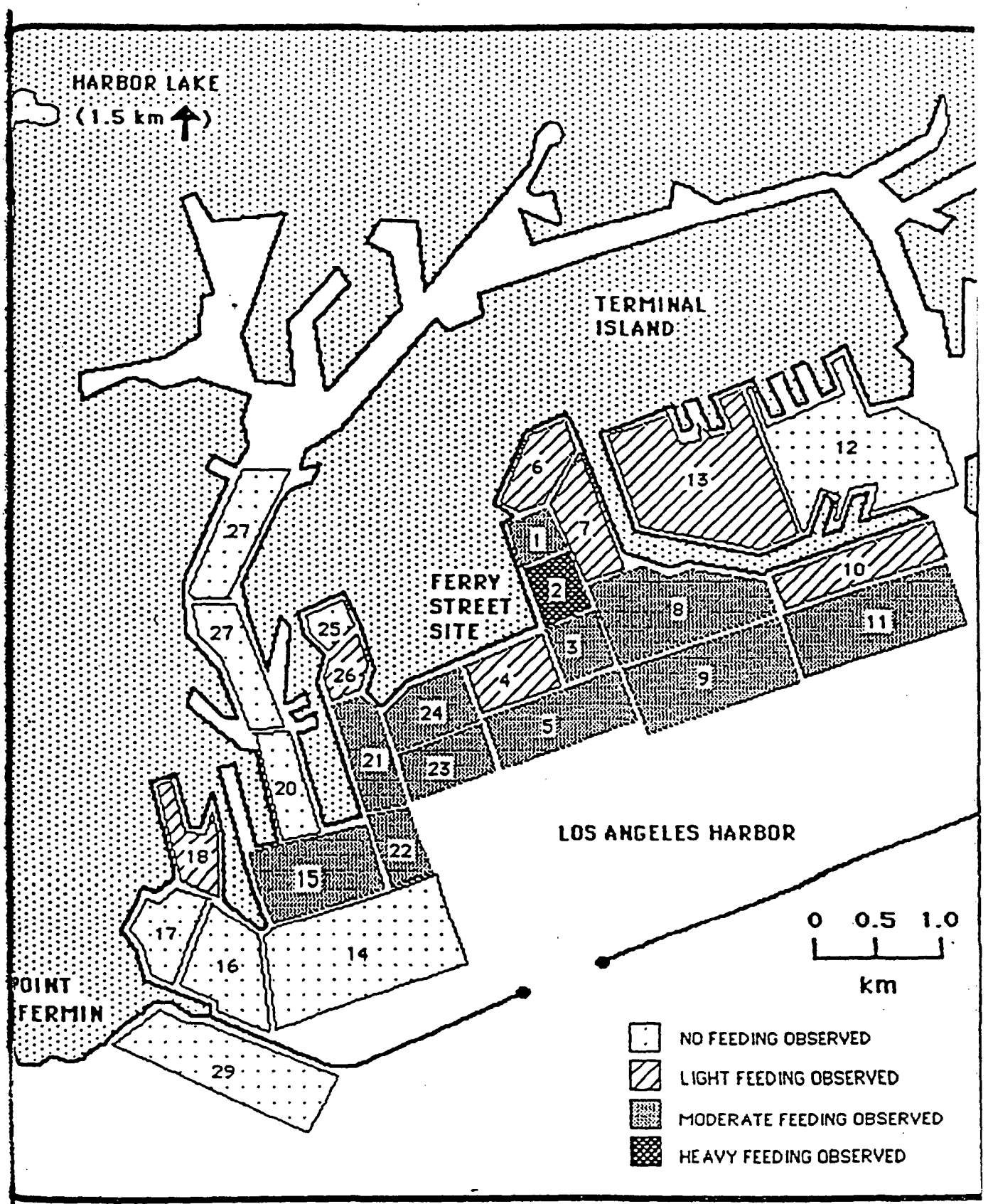

FIGURE 7: LEAST TERN FORAGING SURVEY RESULTS, 1984

TABLES

TABLE 1
List of Major Benthic Species in Los Angeles Harbor
Unconsolidated Bottom Organisms

Mollusca:
- Chione californiensis
- Cryptomya californica
- Macoma acolasta
- Macoma nasuta
- Macoma yoldiformis
- Pelecypoda, unidentified
- Plothothaca staminea
- Tellina modesta
- Theora lubrica

Arthropoda, Crustacea:
- Copepoda, cyclopoid and harpacticoid
- Euphilomedes carcharodonta
- Gammarid amphipods
- Listriella goleta
- Upogebia sp.

Annelida, polychaeta:
- Armandia bioculata
- Capitella capitata
- Chaetozone corona
- Cirriformia spirabrancha
- Cistena californiensis
- Cossura candida
- Euchone incolor
- Euchone limnicola
- Glycera americana
- Haploscoloplos elongatus
- Laonice cirrata
- Lumbrineris spp.
- Marphysa disjuncta
- Mediomastis californiensis
- Nephtys cornuta franciscana
- Neris procera
- Notomastus tenuis
- Ophidromus pugettensis
- Paranois gracilis oculata
- Pista fasciata
- Polydora ligni
- Prionospio cirrifera
- Prionospio pinnata
- Prionospio pygmaeus
- Pseudopolydora californica
- Pseudopolydora paucibrancchiata
- Schistomeringos longicornis
- Sigambra tentuculata
- Spiophanes berkeleyorum
- Spiophanes missionensis
- Stauroneris rudophi
- Streblosoma crassibranchiata
- Tharyx sp.

TABLE 2. (continued)

COMMON NAME	SCIENTIFIC NAME
White seaperch	Phanerodon furcatus
Rubberlip seaperch	Rhacochilus toxotes
Pile perch	Rhacochilus vacca
Blacksmith	Chromis punctipinnis
Garibaldi	Hypsypops rubicundus
Rock wrasse	Halichoeres semicinctus
Senorita	Oxyjulis californica
California sheephead	Semicossyphus pulcher
Pacific barracuda	Sphyraena argentea
Giant kelpfish	Heterostichus rostratus
Sarcastic fringehead	Neoclinus blanchardi
Yellowfin fringehead	Neoclinus stephensae
Onespot fringehead	Neoclinus uninotatus
Rockpool blenny	Hypsoblennius gilberti
Yellowfin goby	Acanthogobius flavimanus
Arrow goby	Clevelandia ios
Blackeye goby	Coryphopterus nicholsi
Cheekspot goby	Ilypnus gilberti
Bay goby	Lepidogobius lepidus
Chameleon goby	Tridentiger trigonocephalus
Pacific bonito	Sarda chiliensis
Chub mackerel	Scomber japonicus
Pacific pompano	Peprilus simillimus
California scorpionfish	Scorpaena guttata
Kelp rockfish	Sebastes atrovirens
Brown rockfish	Sebastes auriculatus
Calico rockfish	Sebastes dalli
Chilipepper	Sebastes goodei
Black rockfish	Sebastes melanops
Vermilion rockfish	Sebastes miniatus
Blue rockfish	Sebastes mystinus
Bocaccio	Sebastes paucispinis
Grass rockfish	Sebastes rastrelliger
Stripetail rockfish	Sebastes saxicola
Halfbanded rockfish	Sebastes semicinctus
Olive rockfish	Sebastes serranoides
Treefish	Sebastes serriceps
Kelp greenling	Hexagrammos decagrammus
Painted greenling	Oxylebius pictus
Shortspine combfish	Zaniolepis frenata
Smoothhead sculpin	Artedius lateralis
Woolly sculpin	Clinocottus analis
Pacific staghorn sculpin	Leptocottus armatus
Snubnose sculpin	Orthonopias triacis
Cabezon	Scorpaenichthys marmoratus
Pygmy poacher	Odontopyxis trispinosa
Blacktip poacher	Xeneretmus latifrons

TABLE 3. Bird species observed in the project area between March 1983 and March 1984 (MBC 1984)

COMMON NAME	SCIENTIFIC NAME
Red-throated loon	Gavia stellata
Arctic loon	Gavia arctica
Common loon	Gavia immer
Pied-billed grebe	Podilymbus podiceps
Horned grebe	Podiceps auritus
Eared grebe	Podiceps nigricollis
Western grebe	Aechmophorus occidentalis
California brown pelican	Pelecanus occidentalis californicus
Double-crested cormorant	Phalacrocorax auritus
Brandt's cormorant	Phalacrocorax penicillatus
Pelagic cormorant	Phalacrocorax pelagicus
Great blue heron	Ardea herodias
Green-backed heron	Butorides striatus
Black-crowned night-heron	Nycticorax nycticorax
Mallard	Anas platyrhynchos
Cinnamon teal	Anas cyanoptera
Lesser scaup	Aythya affinis
King eider	Somateria spectabilis
Surf scoter	Melanitta perspicillata
Red-breasted merganser	Mergus serrator
Peregrine falcon	Falco peregrinus
American coot	Fulica americana
Black-bellied plover	Pluvialis squatarola
Semipalmated plover	Charadrius semipalmatus
Killdeer	Charadrius vociferus
Black-necked stilt	Himantopus mexicanus
Willet	Catoptrophorus semipalmatus
Wandering tattler	Heteroscelus incanus
Spotted sandpiper	Actitis macularia
Marbled godwit	Limosa fedoa
Ruddy turnstone	Arenaria interpres
Black turnstone	Arenaria melanocephala
Surfbird	Aphriza virgata
Sanderling	Calidris alba
Western sandpiper	Calidris mauri
Least sandpiper	Calidris minutilla
Bonaparte's gull	Larus philadelphia
Heermann's gull	Larus heermanni
Mew gull	Larus canus
Ring-billed gull	Larus delawarensis
California gull	Larus californicus
Herring gull	Larus argentatus
Thayer's gull	Larus thayeri
Western gull	Larus occidentalis
Glaucous-winged gull	Larus glaucescens
Black-legged kittiwake	Rissa tridactyla

TABLE 4. Most abundant species of benthic invertebrates captured in 1983 (MBC 1984) - LOS ANGELES RIVER

Capitella capitata

Cossura candida

Grandidierella japonica

Mediomastus ambiseta

Mediomastus californiensis

Nephtys cornuta franciscana

Paraprionospio pinnata

Polydora ligni

Polydora nuchalis

Prionospio cirrifera

Pseudopolydora paucibranchiata

Sigambra tentaculata

Theora lubrica

TABLE 5

NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	*Averaging Time*	*California Standards*[a,c]	National Standards[b] *Primary*[c,d]	National Standards[b] *Secondary*[c,e]
Ozone (O_3)	1-Hour	0.09 ppm (180 $\mu g/m^3$)	0.12 ppm (235 $\mu g/m^3$)	Same as Primary Standard
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	-
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	-
Nitrogen Dioxide (NO_2)	Annual	-	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard
	1-Hour	0.25 ppm (470 $\mu g/m^3$)	-	-
Sulfur Dioxide (SO_2)	Annual		80 $\mu g/m^3$ (0.03 ppm)	-
	24-Hour	0.04 ppm (105 $\mu g/m^3$)	365 $\mu g/m^3$ (0.14 ppm)	-
	3-Hour	-	-	1,3000 $\mu g/m^3$ (0.5 ppm)
	1-Hour	0.25 ppm (655 $\mu g/m^3$)	-	-
Suspended Particulate Matter (PM_{10})	Annual	30 $\mu g/m^3$[f]	50 $\mu g/m^3$[g]	Same as Primary Standard
	24-Hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standard
Sulfates	24-Hour	25 $\mu g/m^3$	-	-
Lead	30-Day	1.5 $\mu g/m^3$	-	-
	Quarterly	-	1.5 $\mu g/m^3$	Same as Primary Standard
Hydrogen Sulfide	1-Hour	0.03 ppm (42 $\mu g/m^3$)	-	-
Vinyl Chloride	24-Hour	0.010 ppm (26 $\mu g/m^3$)	-	-
Visibility Reducing Particles[h]	8-Hour (10 a.m. to 6 p.m.)	In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent. ARB Method V.	-	-

TABLE 5

NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Notes:

a. California standards for ozone, carbon monoxide, sulfur dioxide (1-Hour and 24-Hour), nitrogen dioxide, PM_{10}, and visibilty reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

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

c. Concentration expressed first in units in which it was promulgated. Equivalent units given in parathensis are based upon a reference temperature of 25 °C and a reference pressure of 760 mm of mercury. All measurements of air quality are corrected to a reference temperature of 25 °C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

e. National Secondary Standards: The levels of air quality necessary protect the public welfare from any known or anticipated adverse effects from a pollutant.

f. Calculated as geometric mean

g. Calculated as arthmetic mean

h. This standrd is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visiual range when relative humidity is less than 70 percent.

ppm = parts per million
km = kilometer
ARB = Air Resources Board
$\mu g/m^3$ = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

APPENDIX A

Documentation of Sediment Testing and Coastal Commission Coordination

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

April 14, 1997

Office of the Chief
Environmental Resources Branch

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

This letter modifies the U.S. Army Corps of Engineers Consistency Determination (CD) for the Los Angeles River Maintenance Dredging and Disposal Demonstration Site Project (CD-005-97), by providing additional information. The Draft Environmental Assessment (DEA) and CD were sent to your office for review on January 9, 1997. Your staff report and recommendation to the Commission stated that "the CD does not contain enough information to find the project consistent with the California Coastal Management Program." Specifically, additional information was required on sediment analysis, upland disposal alternative analysis, and engineering and environmental analysis of the Contained Aquatic Disposal (CAD) site. Also, you suggested the Corps incorporate additional measures to ensure protection of water quality and stability of the disposal mound, including monitoring and timely placement of the cap.

The requested information was informally sent to Mr. James Raives of your staff. Fact sheets sent to Mr. Raives summarized: the Corps' vision for this site as a pilot demonstration project for disposal of contaminated sediment; the sediment chemistry analysis report; analysis of upland and other disposal alternatives; biological surveys of the disposal site; monitoring of the 1995 disposal mound and cap; hydrodynamic characteristics of the site; need for dredging; future monitoring plans; and water quality monitoring commitments. These fact sheets, and additional figures identifying specific dredging boundaries and bathymetry, are included in Enclosure 1. Enclosure 2 is a copy of a handout provided by the Corps at the March 26, 1997 Contaminated Sediment Task Force Technical Advisory Committee meeting. This handout includes a figure showing proposed disposal limits within the borrow pit.

Mr. Raives also received several reports prepared for this and similar projects, including the Analysis of Marine Sediment Samples Report (Coastal Frontiers, 1997), Marina del Rey and Ballona Creek Final Reconnaissance Report (Corps of Engineers, 1995), Los Angeles River Estuary Navigation Channel Alternatives (Moffatt and Nichol, November 1996), and Hydrographic and Sediment Profile Imaging (SPI) Investigation Report (Coastal Frontiers, July 1996).

In addition to the environmental commitments outlined in the DEA, this project will incorporate the following environmental protection measures:

- GPS or similar technology will be used to verify that disposal of dredged and cap material occurs within authorized limits. This monitoring data will be forwarded to the Coastal Commission staff at the completion of this project.

- Approximately 200,000 cubic yards (cy) of clean, silty material (suitable for open ocean disposal) will be placed over the disposal mound within six months of completion of the dredging project. This time allows for modeling of the cap, as discussed in Enclosure 1, and consolidation of dredged material. The cap will be approximately 1 meter thick. Cap material average grain size will be similar to or larger than that of the dredged material. Clean sand will not be used, but will be reserved for beach or nearshore placement.

- Unless an emergency situation develops, dredging of contaminated sediments from the Los Angeles River navigation channel will not occur until availability of an appropriate capping source is confirmed.

- Dredging operations will not extend to the most contaminated areas within the navigation channel. Revised dredging limits (including "Chem 3 and Chem 11," as defined in the sediment chemistry report) are included in Enclosure 1.

- Post-disposal and post-cap SPI and bathymetric surveys will be conducted. Annual bathymetric surveys will be conducted indefinitely. Bathymetric resolution is sufficient to detect minor movement of the disposal mound and cap in relation to the surrounding area (1/2 foot of vertical movement may be detected). SPI has even finer resolution, and can detect very minute vertical changes.

- If surveys detect significant erosion of the cap (>1 foot), the Corps will immediately coordinate with the Contaminated Sediment Task Force Technical Advisory Committee to determine the need to replace cap material to original dimensions.

Please consider this information when making your final recommendation to the Commission. The Final EA will include the environmental commitments outlined in this letter, as well as a copy of this correspondence. If you have any questions or concerns regarding this modification, you may contact Ms. Hayley Lovan, Environmental Coordinator, Environmental Resources Branch, at the above address, or at (213) 452-3863. Representatives from the Corps of Engineers will attend the May 1997 Coastal Commission meeting, and will be available to answer staff or Commissioners' questions at that time.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosures

DETERMINATION OF CONSISTENCY
with the
California Coastal Act of 1976
Los Angeles Harbor Maintenance Dredging
Los Angeles County, California

January 1997

Project Description

The Los Angeles District, Corps of Engineers (Corps), as a part of its continuing program of regular maintenance dredging, proposes to remove approximately 100,000 cubic yards (cy) of sediment from the mouth the Los Angeles River estuary, dispose of this material in an existing borrow pit offshore of Island Grissom, also at the mouth of the Los Angeles River (LAR), and cap the material with clean sediment. Dredging and disposal operations are expected to occur between March and April, 1997. Capping may occur as late as Fall 1997, if dredging of cap material is restricted by the least tern's nesting season.

The LAR Estuary is located in the City of Long Beach, California, approximately 20 miles south of downtown Los Angeles. Also known as the Queensway Bay, the estuary connects the Los Angeles River channel with San Pedro Bay in the limits of Long Beach Harbor. The area of the estuary which receives periodic dredging extends from Queensway Marina into Long Beach Harbor.

The borrow pit is located at the mouth of the estuary, about 1,600 feet offshore of Island Grissom. It currently has a capacity of approximately 900,000 cubic yards. Dimensions of the borrow pit are approximately 600'-by-600', with a maximum depth of -35' to -40' Mean Lower Low Water (MLLW). Material is expected to remain confined in this site because of its depth, and because no strong currents are expected to occur over this area. This borrow pit was created to supply fill material for offshore oil rig islands, including Island Grissom.

The proximity of the disposal site to the dredge site indicates that sediment from both areas would likely be similar in quality and grain size. The environmental impacts of relocating this material to the borrow pit, therefore, are not expected to be significant. Material to be dredged from the LAR estuary, however, is potentially contaminated. Therefore, to isolate this material from the surrounding environment, and to prevent movement within the borrow pit, the Corps will cap this material with at least one foot of clean sediment.

For this purpose, the Corps proposes to use approximately 200,000 cubic yards of material from the Port of Long Beach-proposed Pier "T" dredging project, in Long Beach

Harbor. No specific area within the Pier T dredge limits has been designated for cap material, however, any dredged material deemed suitable (i.e. material that is suitable for disposal in LA-2) may be used for the cap.

This project includes monitoring (both SPI and Bathymetric) to ensure that the cap continues to remain in place. Absence of strong currents and waves indicates the material is not likely to migrate, but biannual monitoring will be conducted over the next two (2) years to verify this assumption. Bathymetric monitoring would detect the noticeable changes in the bottom profile, which will lead to detecting movement of the cap or the original disposal mound. Sediment Profile Imaging (SPI) will give an electronic image of the disposal mound enabling a comparison of SPI surveys over a period of time to determine any movement of the mound, once it is placed.

Project Need

Winter storms cause shoaling in the Queen's Way Marina area. The water in this area is extremely shallow and can cause significant disruption to boat traffic. Heavy shoaling caused by continuous storm events necessitates dredging at this site. In the likelihood that even heavier shoaling will occur as it did in 1995, the result could be a temporary closure of the Marina. This would affect businesses in the Marina such as Catalina Cruise Lines, and Catalina Island, which depend on tourist trade.

To prevent closure of the marina, the Corps proposes to dredge a channel within the LAR estuary (through shoaled material), allowing for unobstructed passage of vessels in and out of Queen's Way Marina. Approximately 100,000 cubic yards of sediment will need to be dredged to provide a minimum depth of approximately -27' MLLW at the upstream end of the channel and a depth of -18' to -20' MLLW at the downstream end of the channel Dredging and disposal will likely be accomplished via a hopper dredge, cutterhead/pipeline, and/or a clamshell/barge. A hopper bin will most likely be used to dispose of dredged and cap material in the borrow pit.

Conformance with Plans for a Regional Solution

The Corps is presently conducting baseline studies to assess potential multi-user, contaminated sediment disposal areas. The North Energy Island (NEI) borrow pit is a potential site for designation. A detailed plan is expected to be ready for approval in 1999. In the mean time, possibly contaminated sediment from the LAR Estuary must be dredged and disposed as expeditiously as possible. The use of the LAR borrow pit for contaminated sediment disposal will provide a small scale opportunity for testing capping procedures, as well as monitoring the stability of mounds placed in an existing borrow pit. Disposal at this site will also provide real field data to confirm computer model data.

New physical and chemical testing of the shoaled material is currently being conducted, the results of which will be available in mid-January, 1997. Sampling and testing conducted in 1995 indicated that material from this area is not suitable for beach or nearshore disposal in the littoral zone, due to physical or chemical incompatibility with sediment in those areas. Beach suitable material, if present, would probably be mixed with contaminated material rather than occurring in isolated pockets. It would be cost prohibitive to isolate any clean sediment from contaminants, or to proceed with bioassays to determine suitability with deep ocean disposal sites. Furthermore, the Corps plans to use this project to evaluate and refine the following techniques and practices: (1) the placement of sediment mounds and capping, refining this technology before any large scale, regional operations are proposed in the area, (2) continue monitoring mound and cap stability of the 1995 disposal project (discussed below), the currently proposed project, and any future project that may be authorized for this area, and (3) managing multiple disposal and capping projects within this borrow pit.

Previous Capping Projects at Island Grissom Borrow Pit

The City of Long Beach previously used the LAR borrow pit as a disposal site for material dredged from the river estuary. Approximately 5,000 cubic yards was disposed on that site per year, from 1989 to 1994. The permit for such use expired February 1994.

During February and March 1995, the Corps conducted emergency dredging operations at the Los Angeles River Estuary to re-open the navigation channel leading to Queensway Marina (City of Long Beach). The project entailed the removal of 300,000 cy of sediments, and disposal of these sediments in the borrow pit offshore of Island Grissom.

Sediment sample test results of the area dredged in 1995 indicated that a portion of the dredged sediments contained elevated levels of PAH's. However, because of the emergency nature of the project, Tier III (or biological) testing of the sampled sediments was not accomplished, therefore it was never ascertained whether or not these sediments were suitable or unsuitable for unconfined open water disposal. Because of this uncertainty, it was decided to treat the dredged sediments deposited within the Los Angeles River Estuary Borrow Pit as material not suitable for unconfined open water disposal. Through coordination with the California Coastal Commission and USEPA, Region IX, it was agreed that the sediments deposited within Estuary would require capping to isolate and confine the contaminants.

The Port of Long Beach deposited Pier J Access Channel sediments within the Los Angeles River Estuary Borrow Pit as capping material for the Los Angeles River Estuary dredged sediments. The capping method and sequencing was designed by the Corps of Engineers (Los Angeles District) using computer modeling techniques, and provided to the Port of Long Beach for implementation. The objective of the design was to uniformly cover the disposal mound with a 0.9 m (3 ft) cap thickness, without displacing

the contaminated sediments. The Port of Long Beach accomplished the capping project over a two week time span in September 1995. Monitoring results, concluding that no migration of the cap has occurred, are discussed in the January 1997 Draft EA.

Potential 1998 Dredging and Disposal Requirements

Dredging 100,000 cy is considered a "stopgap" measure to prevent closure of the marina this year. Ideally, more material would need to be dredged to fully restore the entire navigation channel to authorized depths and provide an advanced maintenance area. Funding is not presently available, however, to accomplish dredging a project of this scale. Therefore, a similar dredging project will probably be required in 1998, prior to completion of any long-term, regional solution for disposal of contaminated material. As discussed above, should such projects be authorized, permitted and constructed this year and next, valuable information would be obtained for use in a larger scale, regional disposal strategy. The Corps is not currently submitting a Consistency Determination for a 1998 dredging project; this information is included to inform the Commission of future requirements. The Corps will coordinate with CCC staff at a later date to determine whether a new CD, or possibly a Negative Determination, would be required for a 1998 dredging and disposal project.

Need for a Consistency Determination for 1997 Dredging

A Consistency Determination is required for maintenance dredging, and disposal of dredged material, since the proposed operation could have an effect upon the coastal zone. The following Determination of Consistency is prepared in compliance with the Federal Coastal Zone Management Act of 1972, Section 307 (Title 16, U.S.C. Section 1456(c)), which states that Federal actions must be consistent with approved state coastal management programs to the maximum extent practicable. Sections of the California Coastal Act of 1976 applicable to this project, as determined by the Los Angeles District, include: Article 2 - Public Access (Sections 30210-30219); Article 3 - Recreation (Section 30220-30224); Article 4 - Marine Environment (Section 30230-30235); and Article 5 - Land Resources (Section 30240). This Consistency Determination summarizes the 1997 Maintenance Dredging EA. The EA provides greater detail on the proposed project, the existing environment, and the project's potential environmental effects.

It is the opinion of the Los Angeles District Corps of Engineers, based on a review of the applicable sections of the Act, and on the data presented in the EA prepared for the proposed maintenance dredging activities, that the Los Angeles River Estuary Maintenance Dredging Project is consistent with the California Coastal Act of 1976, to the maximum extent practicable. This Determination of Consistency has been prepared with the following applicable sections of the California Coastal Act of 1976:

a. Article 2 - Public Access (Sections 30210-30219):

The proposed maintenance dredging of the Los Angeles River Estuary and subsequent disposal at the Island Grissom borrow pit would not cause a significant adverse impact upon public access to Long Beach harbor, local beaches, or associated recreational facilities. Public access would need to be limited within the immediate area of the dredging and disposal operations for safety reasons.

The dredging and disposal operation would be conducted such that obstruction to navigating vessels is minimized. The operation would be bounded by buoys and other markers to ensure that navigators are aware of the operation and can safely avoid the area. The dredge operator shall move the dredge for law enforcement and rescue vessels whenever necessary. This project will have an overall positive effect of enhancing public access through the Los Angeles River Estuary navigation channels and Queensway Marina by enhancing navigation.

b. Article 3 - Recreation (Sections 30220-30224):

Shoreline Village, public campgrounds, fishing areas, hotels, and restaurants are located along Queensway Bay (the mouth of the LAR). Recreational opportunities involve passive activities such as sightseeing, sunbathing, beachcombing, and picnicking. Harbor activities also include sportfishing, commercial cruises, tour boats, boating, and sailing. Within the LA/LB Harbor complex, several major charter boat companies provide and charter service to Avalon and Isthmus Cove on Santa Catalina Island, including Catalina Cruises in Queensway Marina. These recreational charters also serve specialized activities, including sportfishing, scuba diving, whale watching, and harbor touring.

Dredging activities at the Los Angeles River are intended to provide a safe, navigable channel. The project will result in an immediate benefit to navigation, and to businesses based in Queensway Marina. Public access to nearby recreational facilities will remain available during the construction period. This project may have a temporary, insignificant impact on recreational fishing at the disposal site.

c. Article 4 - Marine Environment (Sections 30230-30235);
d. Article 5 - Land Resources (Section 30240):

Potential changes in water quality in the form of pollutants, toxic materials, trace metals, and turbidity may result due to resuspension of bottom sediments during dredging activities. A turbidity monitoring program will be implemented to reduce this impact to a level of non-significance by ensuring that high levels of suspended solids are restricted to the immediate dredge and disposal areas.

Physical and chemical testing of the material to be dredged is currently underway, however, the results will not be available until mid-January. At that time, the data will

be sent to the CCC staff, as an amendment to this CD. The results will probably be similar to previous sampling that occurred in the area, as discussed below.

Testing of material taken from the LAR in October 1994 indicated that a portion of sediment at that site, at that time, was unsuitable for disposal at LA-2 (sample area 10; see Appendix B). Almost half of the material was silt. Liquid/Suspended Phase tests, Solid Phase tests, and 28-day exposure period for bioaccumulation testing were completed, as well as bulk sediment chemical analysis. Sediment in one sample area exceeded LPC requirements based on the results of the solid-phase study with the amphipod Grandidierella japonica, and therefore was not considered suitable for ocean disposal (MEC 1995). This area also exhibited toxicity in the Liquid/Suspended Phase tests, but this may have been due to high levels of ammonia.

The City of Long Beach conducted physical and chemical tests of two new samples in January, 1995, after shoaling occurred. The new material was composed primarily of sand, and contained fewer contaminants than the fines that were tested in October, 1994. The top layer of contaminated fines that were present in October were probably washed out of the area by the storms, and replaced by a layer of coarse-grained, clean material.

The proximity of the borrow pit disposal site to the river mouth dredge site indicates that sediment from both areas would likely be similar in quality and grain size. Physical and chemical testing was done concurrent with the 1995 emergency dredging to document compatibility of dredge material with the disposal site, and to determine mitigation requirements (MEC 1995). This testing confirmed that sediments from the dredge site and disposal site were similar, and moreover, that sediments from both sites were not exceedingly contaminated.

EPA review of the 1995 chemistry data, however, indicated particular concern with elevated levels of Polyaromatic Hydrocarbons (PAHs). The EPA would not have permitted this material for open-water disposal in a non-emergency situation, and had recommended that the Corps design and place a cap to cover the potentially contaminated sediments. The Corps complied with this recommendation to the extent that clean sediments from dredging projects undertaken at the Port of Long Beach and/or the Port of Los Angeles were approved for use as capping sediments. The site will continue to be monitored to assess the value of this capping operation as a permanent solution to isolate potentially contaminated sediments in the borrow pit.

This project may also contribute to a decrease in dissolved oxygen levels and light penetration, which may result in a temporary decrease in aquatic primary productivity. Turbidity, if significant, has the potential to cause clogging of respiratory and feeding apparatuses of sedentary bottom fish and filter feeders. Motile organisms, however, will probably evacuate and avoid the dredging and disposal areas and temporarily relocated to adjacent undisturbed areas. Most of the impacts would be confined to the immediate vicinity of the dredging and disposal activities, with turbidity levels dissipating rapidly

through resettlement. See Section 5.3 of the EA for additional discussion of water quality impacts.

The benthic fauna and flora within the immediate dredge and disposal areas may be eliminated by the dredging activities. The creation of the newly denuded dredged areas will form the basis for rapid recolonization of biological habitats within the construction limits. Therefore, benthic habitat loss will be short-term as rapid recolonization is expected to occur.

Birds, fish, and other motile species will likely avoid the immediate dredging area, and thus avoid direct impacts. Some species may be attracted to the disposal site, to feed on the benthic organisms dredged from the river. Dredging activities will not cause significant adverse impacts to fish, wildlife, or their associated habitats.

Federally-listed threatened or endangered animal species that may occur in the project area include: California brown pelican (Pelecanus occidentalis californicus); California least tern (Sterna antillarum browni); light-footed clapper rail (Rallus longirostris levipes); peregrine falcon (Falco peregrinus); marbled murrelet (Brachyramphus marmoratus); and the western snowy plover (Charadrius alexandrinus nivosus). Threatened and endangered species are discussed in Sections 4.5 and 5.5 of the EA. With the implementation of environmental commitments as outlined in the EA (and summarized below), these species would not be affected by this project.

Dredging and disposal operations are expected to be completed prior to the least tern's nesting season. Unavoidable delays due to storms or mechanical breakdowns, however, could result in activities continuing beyond April 1. Interference with least tern foraging could be a concern if turbidity from dredging impacted surface water clarity over a substantial portion of preferred foraging areas during the breeding season. The USFWS has confirmed that terns do forage within the LAR, although the relative importance of this site compared to other areas has not been documented.

This project (including the proposed capping project) is not expected to affect food availability or nesting success. Least terns would continue to forage in the unaffected portions of Los Angeles and Long Beach harbors, the LAR, and nearshore, and would **probably** not be affected by the temporary disturbance caused by dredging the mouth of the LAR. The deeper water in the area of the borrow pit is also not an important or frequently used foraging site. For this reason, capping operations are not expected to affect tern foraging behavior or reproductive success, even if the cap is placed during the tern's nesting season.

The lack of field data regarding the frequency of least tern foraging within the LAR requires the Corps to assume that this site is an important feeding area for least terns. Therefore, although the Corps does not expect this project to adversely affect least terns, the Corps will commit to implementing a turbidity monitoring program in the event that

dredging and disposal occurs during the tern's nesting season (April 1-September 15). The intent of this monitoring program is to ensure that any turbidity plume that may be formed is minimized, and that significant turbidity does not extend beyond 100 feet of the dredge. The specific procedure, including possible corrective actions, has been coordinated with the U.S. Fish and Wildlife Service, and is outlined in the Draft EA.

Several species of marine mammals may be transient visitors to the LA/LB area, but these species are also not expected to be affected by this project. Because dredging and disposal activities will not affect any threatened or endangered species, or its designated critical habitat, formal consultation pursuant to the Endangered Species Act is not required.

1. Pilot Demonstration Disposal Site

As stated in the Draft EA, the Corps plans to use this project as an opportunity to evaluate and refine the following techniques and practices before any large scale, regional operations are proposed for the area: (1) placement of sediment mounds and capping; (2) monitoring of mound and cap stability; and (3) management of multiple, sequential, disposal and capping projects within one borrow pit.

The use of the LAR borrow pit for contaminated sediment disposal will provide a small scale opportunity for testing capping procedures, as well as for monitoring the stability of mounds placed in an existing borrow pit. Disposal at this site will also provide real field data to confirm computer generated model data.

Prior to approval of a large-scale, multiple user, confined aquatic disposal site, Resource Agencies would require field testing of this procedure on a smaller scale. The Corps believes that the Los Angeles River Maintenance Dredging Project provides this opportunity. The Island Grissom Borrow Pit is in the same general area as the North Energy Island Borrow Pit (a potential regional disposal site), and is within a higher energy environment. To expand on the EA's discussion, this project will provide field experience with the following:

Cap Modeling: The numerical capping model was recently developed, and there is limited field verification of results. This project will provide an opportunity to validate and, or adjust the model to improve results. For instance, some adjustments of the numerical model were made based on lessons learned from the 1995 capping operation. Experience using and verifying the cap modeling program is, perhaps, the most important aspect of this demonstration project.

To most accurately design a cap and placement sequence, the disposal mound needs to be in place. An initial design based on predicted mound configurations may be modeled; however, to reduce error, a second model would still need to be run, based on actual field dimensions.

Placement Techniques: This project will provide LA District direct field experience in design and placement of dredged disposal and cap material. Other Corps Districts and research facilities (including Waterways Experiment Station) currently have such experience (which we will draw upon); however, with the exception of the 1995 emergency dredging project, Los Angeles District does not have extensive field experience in capping contaminated sediment.

The limited capacity of the disposal site will only allow for a total of three separate capped disposal operations, including the 1995 project and the proposed project. Therefore, the ability to test various disposal methods (i.e., layering or dividing material into multiple mounds vs. placement of a single capped mound) will also be limited. In

any case, continuous, natural deposition of contaminated sediment on the cap would make it difficult to ascertain which disposal method is better at isolating material.

However, this project will provide a better indication of the minimum grain size suitable for capping. We are proposing to use a silty material that is coarser than the lean clay material used to cap the emergency dredge disposal mound. The lean clay had a "soupy" consistency, and tended to flow toward the bottom of the mound. This uneven distribution resulted in a thinner cap at the top of the mound, and a thicker cap at the bottom. We expect that the silty material from Pier T would allow more even distribution, but field application is required to test this assumption. (The Corps is not proposing to use sandy material as a cap, in order to reserve this material for beach nourishment.)

Monitoring:

SPI Surveys: A pre-disposal survey has already been completed; post-disposal and post-capping surveys are also planned. If a similar project is authorized next year, the database will be further expanded. SPI surveys are used to indicate deposition rates, extent of the mound/cap footprint, and (to a limited extent) density of benthic organisms. These data will be useful in developing a long-term, regional strategy by enabling the Corps to gain experience in (1) establishing suitable sampling grid sizes for the survey area, (2) interpreting the data, and (3) assessing the effectiveness of using these surveys to indicate general habitat quality changes and recovery rates associated with capping operations.

Bathymetric Surveys: (Including pre- and post-disposal, pre- and post-capping, and annual monitoring that will be continued indefinitely.) These surveys will provide indications of cap stability. Proof of cap integrity at the relatively higher energy Island Grissom Borrow Pit will provide additional confidence in using the larger, lower energy North Energy Island Borrow Pit. (Current meters were recently deployed to verify currents in both pits.)

Management: This demonstration project will help the Corps develop or improve siting techniques for placement of disposal mounds, including optimal placement of multiple disposal mounds within a confined area (i.e., distance required between mounds, and whether placement of a second mound affects the stability of the first mound). Three capping projects could potentially occur within the Island Grissom site, including the existing capped mound, the currently proposed project, and a similar project next year. This would provide a small-scale example of similar capping projects that may be proposed at the North Energy Island site.

The Corps intends to use a GIS database to manage placement activities, and to evaluate inter-relationships of all spatial data (SPI surveys, bathymetry, chemistry, cap thickness, etc.) The Corps also intends to integrate numerical models into the GIS

database to assist in predicting disposal mound configurations and managing placement and orientation of multiple mounds.

Finally, the Corps would provide a "lessons learned" report to the Contaminated Sediment Strategy Task Force. This report will discuss proven monitoring and placement methodologies, and will also discuss mistakes to be avoided in a long-term solution.

2. Sediment Analysis Report

The most recent sediment sampling analysis of the Los Angeles River Estuary (LAR) occurred on January 6-10, 1997 by Coastal Frontiers, Inc. under contract from the Corps of Engineers. Sampling was accomplished using a hydraulic vibratory corer owned and operated by the Southern California Marine Institute (SCMI). The vibratory corer consisted of a hydraulically actuated vibrating head mounted on a core barrel whose length was either 10 or 20 ft (depending on the desired core length). 2 ½ inch Lexan liners were utilized in the metal core barrel to facilitate the recovery of an uncontaminated sample.

A minimum of 2 cores was collected at each sampling location. If material was not recovered to the target depth of either -7.9 m or -9.6 m, MLLW (depending on station), a third core was collected. The longest of the recovered cores at a given station was split, visually logged, and chemical and grain size classification samples were taken. The second longest core at a given station was cut into 1 meter long lengths, and archived for potential future analysis. The third longest core (if taken) was used on an as-needed basis to augment the chemical and/or size classification samples, or archived samples.

The liner of the longest core recovered at each station was cut lengthwise down either side using a power saw. The liner was opened to expose the recovered sediment. The material characteristics were logged, including grain size, color, maximum particle size, estimated density (sand) or consistency (silts and clays), odor, and quantity and types of organics and trash encountered.

The sediment was then sampled for chemical analysis using a compositing scheme.[1] The composite samples were placed in an ice-filled cooler and delivered to Columbia Analytical Services, Inc. (CAS) for chemical analysis. Grain size classification samples were obtained from the same cores as those from which chemical samples were taken. The classification samples were stored in labeled, self-sealing, plastic bags and delivered to the Corps' Soils Laboratory.

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[1] Compositing scheme can be found on Table xx of the Sampling and Analysis Report.

The total number of composite samples and number of boring locations is listed below:

Area	Number of Locations	Number of Chemical Samples
Channel	12	7
Alt. Channel[2]	8[3]	6
Pier J	2	1
Pit	3	6

All samples were tested for a variety of compounds, such as ammonia, sulfides, heavy metals, petroleum hydrocarbons, organic pesticides, polychlorinated biphenyls (PCB), phthalate esters and polyaromatic hydrocarbons. Sampling was performed in accordance with the "Green Book" and in conjunction with EPA Region IX consultation and approval.

Table 3 in the Sampling and Analysis Plan summarizes the results of the chemical analysis and compares the results with ER-L and ER-M (Long et. al.) values, as well as SL and ML (PSSDA) values. Although samples were taken throughout the length and width of the sample, for this particular project, the Corps proposes to dredge only in the areas represented by samples CHEM #3 and CHEM #11 (see Figure 1). A characterization of the proposed disposal site is represented by sample CHEM #20. By comparing samples CHEM #3, #11, and #20, it can be seen that the proposed dredge sediments and the existing disposal pit sediments contain similar levels of chemical compounds.

As analyzed by the Corps and the EPA, results indicate that the proposed dredged material is not suitable for either ocean or beach disposal. However, the material is not considered to be "hazardous," meaning that upland disposal in a designated "hazardous materials disposal site" is not required by the EPA. Placing dredged materials within the borrow pit would not significantly change that site's environmental character. As discussed below, the Borrow Pit is a low-energy, depositional area; contaminants, therefore, would not spread to adjacent areas. Placement of 200,000 cy of clean material over the disposal mound would temporarily improve conditions at the site, until continued deposition from the Los Angeles River covers the cap with additional contaminated sediment.

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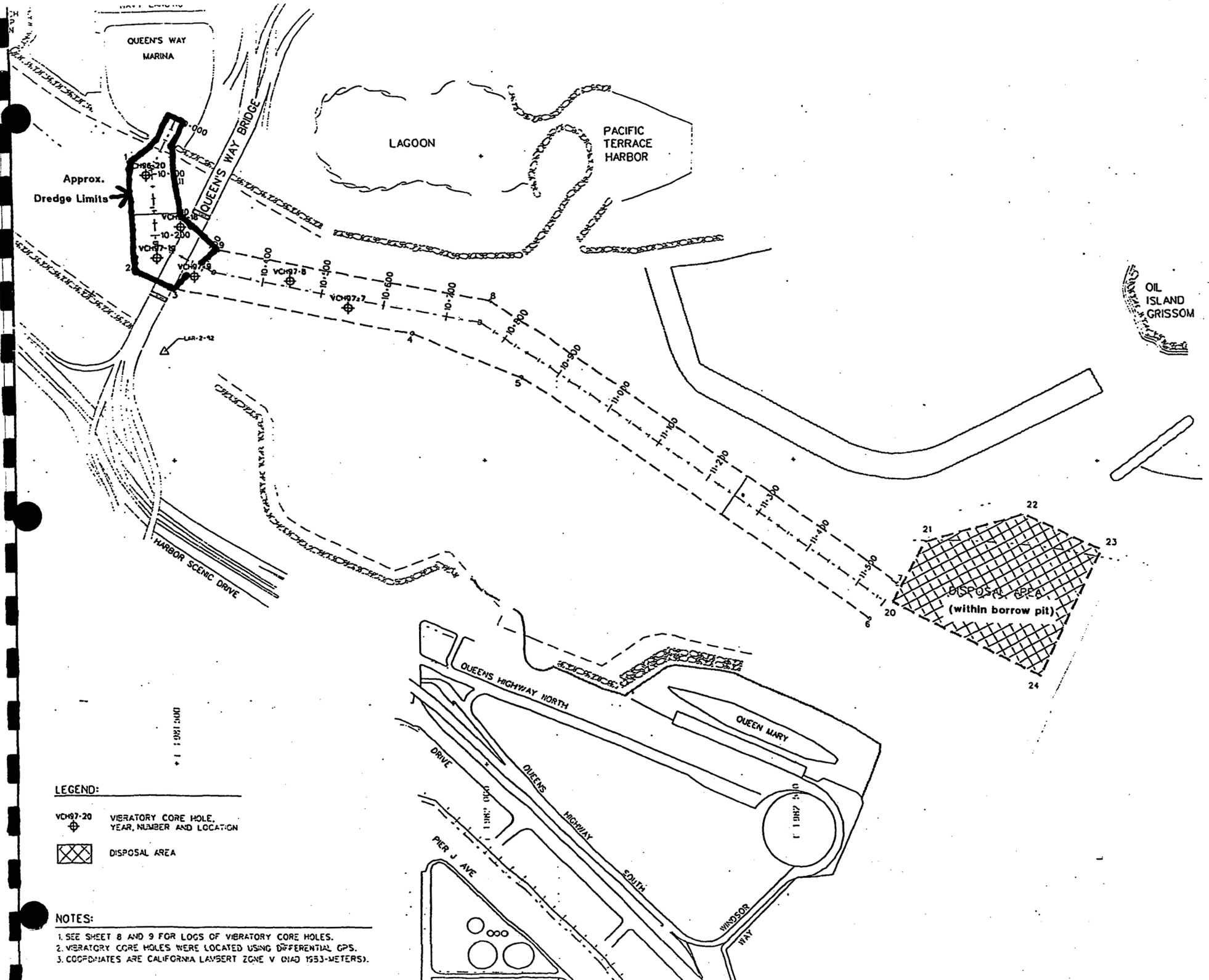
[2] Alt. Channel refers to the channel alternative that has a straight alignment to daylight after passing under the Queensway Bridge.

[3] An additional site was sampled for a total of 9, although this second location was offset from an existing location in hopes of achieving better recovery. The location did not provide better recovery, so no chemical samples were taken, although physical samples were.

FIGURE 1



LEGEND:

VCH97-20 ⊕ VIBRATORY CORE HOLE, YEAR, NUMBER AND LOCATION

DISPOSAL AREA

NOTES:

1. SEE SHEET 8 AND 9 FOR LOGS OF VIBRATORY CORE HOLES.
2. VIBRATORY CORE HOLES WERE LOCATED USING DIFFERENTIAL GPS.
3. COORDINATES ARE CALIFORNIA LAMBERT ZONE V (NAD 1983-METERS).

SYMBOL	DESCRIPTIONS REVISIONS	DATE	APPROVED

NAVIGATION IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA
MAINTENANCE DREDGING
LOS ANGELES RIVER ESTUARY
PLAN OF EXPLORATION

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: GD
DRAWN BY: eh
CHECKED BY: GD

SUBMITTED BY: ABBAS I. ROOSSARI, CHIEF, GEOTECHNICAL BRANCH

SPEC. NO. DACW09-97-R-0004

FILE NAME: G07PLNVW.DGN

DIST. FILE NO.

A-17

3. Disposal Alternative Analysis

The Upland Disposal Alternative site identified in Section 3.3 (E), page 8, is a vacant lot owned by the City of Long Beach. Several factors make this alternative disposal site unfeasible, and does not require a detailed analysis. First, this site has a maximum capacity of 50,000 cubic yards (after placement of berms that would be required to hold material), which would be an insufficient amount of volume for this project. The current project plans to dredge approximately 100,000 cubic yards. Also, the mechanical properties of the sediments from the LAR do not have the mechanical strength to provide for a stable foundation for future development. The City has plans to develop a boat launch area at the site. (Mr. Raives informed the Corps that this project is currently in the design stage, and will be built within a year.) Either filling this lot to the 50,000 cubic yard capacity or stockpiling 100,000 cubic yards would render this lot unusable for any future use.

The Pier S project in the Port of Long Beach was also evaluated as a possible disposal alternative. Pier S is a pier expansion project currently under construction by the Port of Long Beach. The dredged sediments from LAR would be contained within Pier S, surrounded and capped with clean fill. Again, the physical analysis of the sediment determined that the material does not have the mechanical strength properties required for Pier S disposal.

Additional disposal alternatives can be found in the Marina Del Rey and Ballona Creek, California Final Reconnaissance Report, September 1995, U.S. Army Corps of Engineers. Although the disposal alternative analysis in the report does not specifically address the Los Angeles River Estuary (LAR), the conclusions and data derived from the Marina Del Rey (MDR) Reconnaissance (Recon) Report directly relate and are fully applicable to the LAR. Both MDR and LAR contain sediments whose source is primarily from storm water discharge of the Los Angeles Basin, Ballona Creek and the Los Angeles River, respectively. These sediments are deemed unsuitable for unconfined open water disposal. A comparison of chemical analysis shows that sediment quality of both project sites is comparable. Also, physical analysis of the sediments indicates that sediment types are similar as well. MDR and LAR close proximity (~ 20 miles) to each other should render differences in transportation costs of sediments in the alternative analysis insignificant. Thus, the Corps is quite confident that the MDR Disposal Alternative Analysis is directly applicable and accurate for the LAR as well.

The MDR Disposal Alternative Analysis identified an initial Base Plan and eight (8) alternative plans, for a total of nine (9) disposal plans. Of the nine (9), seven (7) alternatives would be applicable to LAR. Two (2) alternatives, Sediment Trap Plan and

the Jettied Diversion Plan, are not applicable to the LAR, due to their very site specific nature. The seven (7) applicable alternatives[4] are listed as follows:

- Base Plan (Utah landfill disposal via rail);
- Aquatic Capping;
- Upland Landfilling;
- Geocontained Capping;
- Treatment;
- Nearshore Containment; and
- Watershed Sediment Management.

The alternative plans were evaluated based on examining the economic costs and benefits and environmental impacts, if any, associated with each plan for maintaining the navigation channel and disposal of dredged sediments. Specific plan descriptions and cost estimates are detailed in the MDR Recon Report. The estimated annual costs for each plan are as follows:

Disposal Alternative Plan	Annual Cost (millions)
Base Plan (Utah landfill disposal via rail)	5.1
Aquatic Capping	0.9
Upland Landfilling	4.5
Geocontained Capping	3
Treatment	8.7
Nearshore Containment	4.6
Watershed Sediment Management	n/a

Table 4.7[5] neatly summarizes the methods of each plan, annualized costs and environmental impacts. From the data provided on Table 4-7, the Corps believes that aquatic capping is the most economically and environmentally feasible alternative plan identified at this time.

4. Engineering and Environmental Analysis of the Contained Aquatic Disposal (CAD) Site

Emergency Dredge Project - 1995

In March 1995, the U.S. Army Corps of Engineers, Los Angeles District issued an emergency dredging contract at the Los Angeles River Estuary to excavate approximately 230,000 cubic meters of material from the federally authorized navigation channel

[4] A description of each plan is detailed in the Marina Del Rey and Ballona Creek, CA, Final Reconnaissance Report, September 1995, attached.

[5] Marina Del Rey Reconnaissance Report, pages 4-79 and 4-80.

servicing the Queensway Marina. The dredged sediments were placed in an aquatic borrow pit (termed the "*Los Angeles River Estuary Borrow Pit*") located immediately downstream of the Estuary. Following completion of the project, EPA, Region IX, concluded that the dredged sediments contained elevated levels of PAHs, at concentrations that may have been unsuitable for unconfined open water disposal. To confine and isolate the contaminants from the surrounding marine environment, the Corps of Engineers agreed to cap the Estuary's dredged material with "clean" sediments from dredging projects of opportunity. In September 1995, the Port of Long Beach implemented a project to dredge approximately 135,000 cubic meters (in-situ) from their Pier J access channel. Bore logs of the Pier J access channel project site indicated that the dredged material would consist primarily of fine grain sediments, ranging from fine sand to clay. In an effort to maximize the areal coverage of the disposal mound with "clean" cap material, the Los Angeles District simulated the disposal (or capping) operations utilizing a numerical model developed by the U.S. Army Corps of Engineers, Waterways Experiment Station. The model, titled "*CAPPING*", permits the user to simulate a variety of cap material placement scenarios to design the optimum multiple disposal sequence that will obtain the desired cap configuration. The Los Angeles District's capping objective, was to completely cover the area of concern with a maximum of 0.9 m of cap material, without displacing the bottom sediments. After numerous executions of the model, a disposal sequence was simulated that met the District's cap configuration criteria. The design (which included equipment, operating parameters, site description, and disposal sequence) was provided to the Port of Long Beach for implementation. After two weeks of operations, the Port of Long Beach completed the capping of the disposal mound (contained within the Los Angeles River Estuary Borrow Pit) on September 21, 1995, with 200,000 cubic meters (bulk) of "clean" dredged material from the Pier J access channel.

The equipment employed and the disposal sequencing during the construction phase of the capping project was consistent with the simulated model runs. However, it was discovered during field operations, that the actual sediments mined (dredged) for capping material were a finer quality (lean clay) than what was originally shown on the boring logs. Sediment samples taken during dredging activities revealed the material to be a *lean clay*, which emulated a soupy texture upon entrainment of water. As a result, the cap sediments completely released from the disposal barge fifteen (15) times faster than the model simulations and remained suspended in the water column much longer than expected. This in turn resulted in a much broader cap footprint at the disposal site, than what was predicted by the model.

As part of the Corps' monitoring program for the Los Angeles River Estuary Borrow Pit, a delivery order was awarded to Coastal Frontiers, Inc. in March 1996 to conduct sediment profile imaging (SPI) survey of the capped disposal mound. The contract entailed distinguishing the thickness and areal extent of the cap with a bathymetric survey, and refining the extent of the cap footprint with the SPI survey. The SPI Survey Report (*Los Angeles District, 1996a*) concluded that, 1) the cap material

mirrors the topography of the Borrow Pit; 2) the Borrow Pit acts as a sediment trap for the LA River sediments; 3) the average annual natural deposition of sediments within the Borrow Pit ranges from 20 to 50 cm; 4) since the Borrow Pit is depositional, the cap will most likely remain stable; 5) at the current rate of natural deposition, the Borrow Pit shall be completely filled in 10 years (at the earliest); and, 6) recolonization potential within the Borrow Pit by the infaunal community is negatively impacted by the large scale seasonal deposition of sediments from the Los Angeles River.

Partial verification the SPI Survey Report's conclusions was obtained from the sediment samples (vibratory core) taken within the Borrow Pit in January 1997. From the results and analysis obtained, it appears the quality of sediments naturally depositing within the Borrow Pit is similar to the sediments residing within the Los Angeles River navigation channel.

Monitoring of the Los Angeles River Estuary Borrow Pit site will continue for the foreseeable future in the manner of annual bathymetric surveys. Should additional dredged material be placed within the Borrow Pit, it is envisioned that SPI surveys will accompany such projects.

Current Proposed Project

The current project proposes to dispose of dredged sediments from the LAR into the LAR Borrow Pit and utilize aquatic capping techniques to isolate the sediments. Several studies of the channel and borrow pit lead us to believe that the Borrow Pit is currently the best site for an aquatic capping project. Also, by performing a second aquatic capping project within the same site as the 1995 project, we will be able to refine our placement techniques and develop better management strategies for a multi-user disposal site, which supports one of the possible long term goals of the Contaminated Sediment Task Force.

In November 1996, a navigation channel design alternative analysis for the Los Angeles River Estuary was performed by Moffatt & Nichol Engineers under contract with the Los Angeles District. In developing the optimal navigation channel design, several conclusions about the dynamics of the channel and Borrow Pit were obtained. Factors such as physical and chemical conditions of the estuary, watershed sediment input to the estuary, and historical records of surveying and dredging were all analyzed. By utilizing the RMA-2 hydrodynamic model in conjunction with the SED2D sediment transport model, Moffatt & Nichol (Los Angeles District, 1996b) concluded that the Borrow Pit area is a low energy area that is depositional and would remain depositional even after the Borrow Pit reaches ambient elevation (is filled to capacity). Filling the

Borrow Pit to capacity is expected to have negligible effects on current flow and sedimentation conditions[6].

Without this project, continued deposition will eventually fill in the pit, probably within 15-20 years. The pit was originally dredged to provide fill material for one or more construction projects in the area, and was not designed as a sediment "trap" for contaminated material. Therefore, filling the pit within the next few years will not significantly affect the long-term dispersion of sediments from the Los Angeles River; in fact, deposition in the area will still continue to occur after the pit is filled, as discussed above.

Need for Dredging

Current conditions within the channel warrant the need for a dredging project this year. The navigation channel depth is very near closure depths (see Figures 2 and 3, bathymetry of dredge and disposal sites). The Catalina Cruises' vessels have a maximum draft of 3.8 m, while the navigation channel ranges from a -1.0 m to -4.8 m MLLW in the area upstream of Queensway Bridge. The minimum design depth of the channel is -5.4 MLLW, for one-way traffic with poor maneuverability conditions[7]. Sediment flows into the estuary average 351,000 cubic meters per year[8]. With a minimum 1.0 - 2.1 m/year shoaling rate[9], the channel has the potential to close at any time. The proposed project will allow us to create in the navigation channel an advanced maintenance prism, which will help offset future sediment flows, in hopes of avoiding future emergency dredging situations.

Long-Term Plans

The limited capacity of the disposal site will only allow for a total of three separate capped disposal operations, including the 1995 project and the proposed project. The Corps plans to propose a similar project next year. The final result would be three distinct, capped mounds, filling most of the pit. It is anticipated that the Corps would then place clean fill in the interstices between the mounds, and a final layer over the entire site, bringing the site to ambient elevation (approximately even with the surrounding area).

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[6] Moffat & Nichol, pgs. 52-53.

[7] Moffatt & Nichol, pg. 52.

[8] Moffat & Nichol, pg. 52.

[9] Moffatt & Nichol, pg. 13.

FIGURE 2

PARKING AREA

RAMP

LAUNCH RAMP BASIN

NAVY LANDING

QUEEN'S WAY MARINA

LAGOON

PACIFIC TERRACE HARBOR

OIL ISLAND GRISSOM

QUEENS HIGHWAY NORTH

QUEEN MARY

DRIVE

DISPOSAL AREA

A-23

:22 52 2 :22 222 322

SCALE 1:3 222

DEPTHS ARE MEAN LOWER LOW WATER

NOTES:

1. SOUNDINGS AND ELEVATIONS, IN METERS, INDICATE THE GENERAL CONDITIONS EXISTING ONLY AT THE TIME OF SURVEY - DECEMBER 1996.
2. CONTOURS ARE BASED ON PLOTTED SURVEY DATA AND MAY NOT ACCURATELY INDICATE CONDITIONS BETWEEN THE PLOTTED ELEVATIONS.
3. COORDINATES ARE CALIFORNIA LAMBERT ZONE V, (NAD 1983).
4. SOUNDINGS LOCATED BY DIFFERENTIAL GPS SYSTEM.
5. SOUNDINGS ARE SHOWN TO THE NEAREST TENTH OF A METER.
6. ALL STRUCTURES SHOWN ARE APPROXIMATE.

SYMBOL	DESCRIPTIONS
	REVISIONS

NAVIGATION IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA
MAINTENANCE DREDGING
LOS ANGELES RIVER ESTUARY

CONDITION SURVEY

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY: SRR
CHECKED BY: ATS

SUBMITTED BY:

ROBERT L. HALL, PE
CHIEF, DESIGN BRANCH

SPEC. NO. DACW09-97-R-00XX

FILE NAME: LA89703.DGN

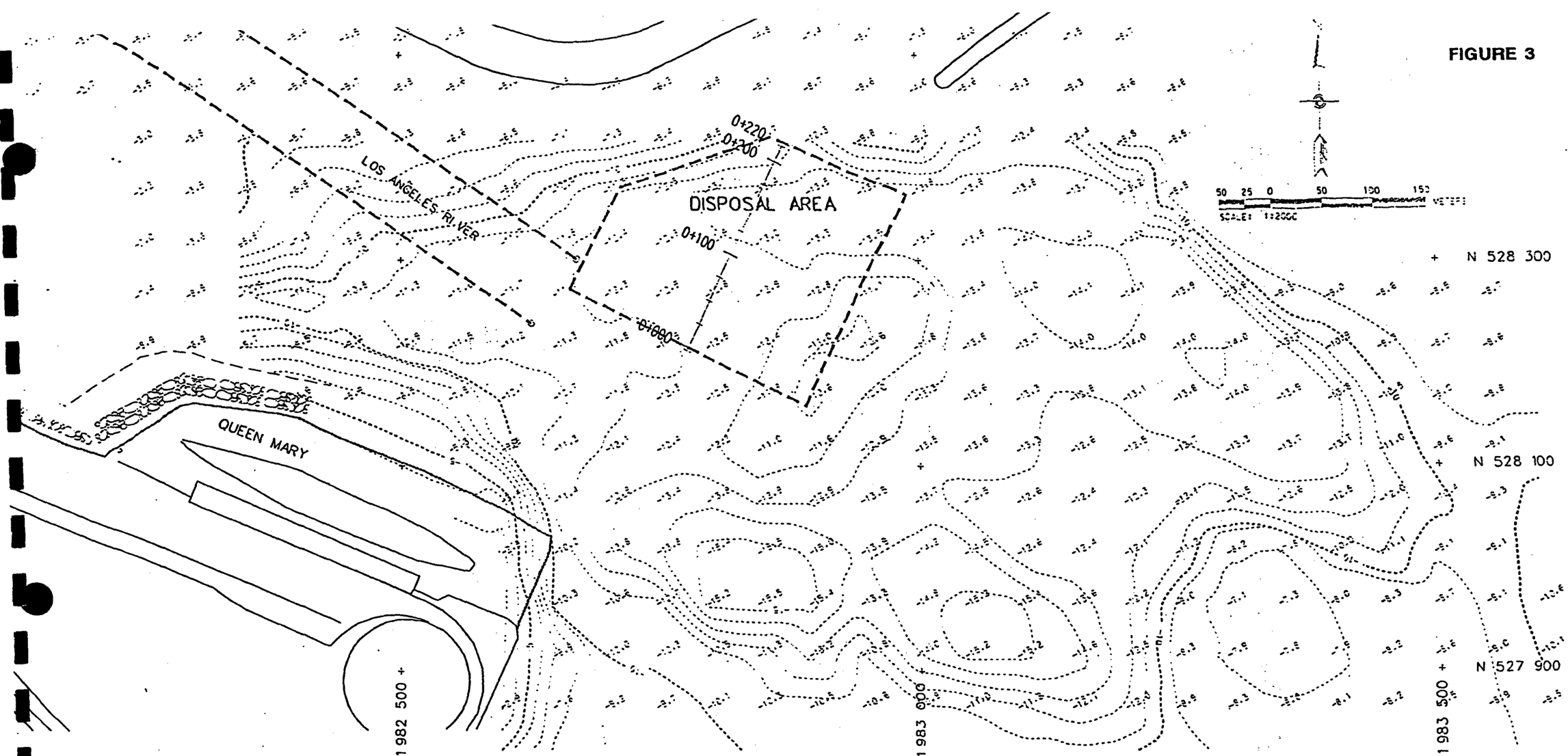
DISTRICT FILE NO.

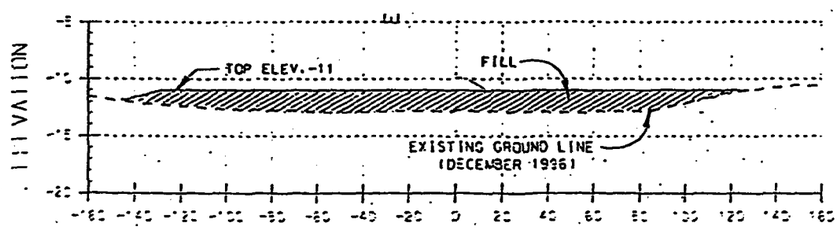
SCALE: 1:3 000

SHEET 3 OF 9 SHEETS

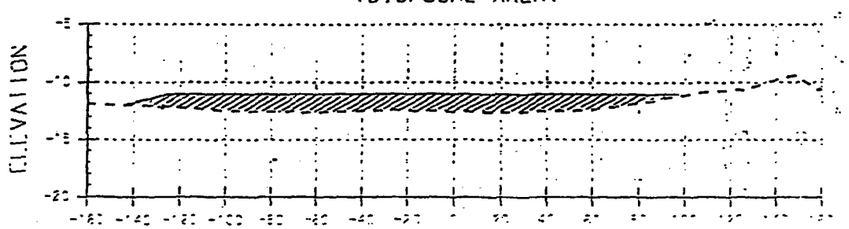
SAFETY PAYS

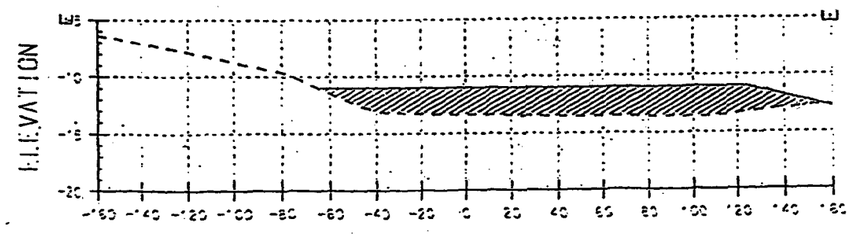
FIGURE 3





STA 0+075
(DISPOSAL AREA)





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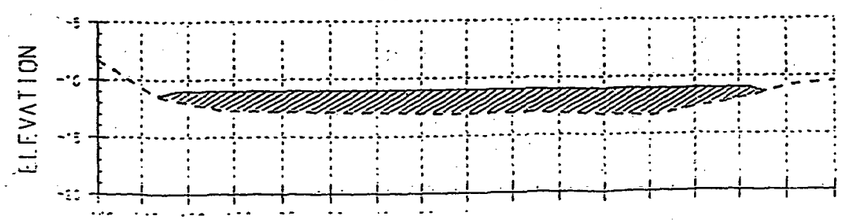

A-24

NAVIGATION IMPROVEMENTS
LOS ANGELES COUNTY, CALIFORNIA
MAINTENANCE DREDGING
LOS ANGELES RIVER ESTUARY
DISPOSAL AREA AND CROSS-SECTIONS

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY: JR
DRAWN BY: SRR
CHECKED BY: AJS

ROBERT L. HALL, PE
CHIEF, DESIGN BRANCH

SYMBOL | DESCRIPTION | DATE | APPROVAL
REVISIONS

Additional Biological Data

The Draft EA included a general discussion of nearshore and harbor benthic and fish communities, and summarized a recent biological survey of the North Energy Island borrow pit. The EA also briefly summarized the main conclusions of the SPI survey. Finally, the EA stated that surveys of similar borrow pits in Long Island Sound revealed that the biological communities in such areas are extremely limited due to anoxic conditions.

The following additional, site-specific information was obtained from the SPI Survey Report (Coastal Frontiers Corporation, July 1996).

Page 11-14:

Native sediments fringing the borrow area to the north and east are predominately sorted, slightly silty sands with a well-developed oxidized layer and a mature, deep dwelling infaunal community. SPI images from this area show numerous feeding voids, indicative of "Stage 3" infauna, along with burrow structures. Similarly, images from stations located south and southeast of the borrow area also show numerous feeding voids and a dense assemblage of surface tube-dwelling infauna. (The report does not specifically define Stage 3 infauna, except to say that those assemblages are indicative of relatively unstressed benthic environments. Stage 3 appears to refer to mature, high-density communities, while Stage 1 fauna are defined as "characteristic of chronically or recently disturbed areas.")

The distribution of infaunal succession stages across the survey area is shown in Figure 5-6 of the report (Figure 4 of this submittal). The areas exhibiting solely Stage 1 fauna encompass the borrow area except for the central capped disposal mound, the far eastern reaches of the borrow area, and the upriver region west of the pit. Outside the borrow area to the north, east, and south, Stage 3 or Stage 1/Stage 3 assemblages are widespread.

Figure 5-7 (Figure 5 of this submittal) shows the distribution of Organism-Sediment Index (OSI) values. OSI values <7 suggest "disturbed" benthic environments. Outside the borrow area to the north, east, and south, high OSI values (up to +11) are evident. These areas do not appear to be adversely affected by recent sedimentation, disposal/capping operations, or regional benthic stresses. In contrast, most of the borrow pit has OSI values <7. Areas with low OSI values (<3) occur in the deep eastern and western portions of the borrow area. These areas are overlain by disposed dredged and cap materials. Two stations near the top of the disposal mound show relatively high OSI values of 7. This pattern strongly suggests that while recent deposition of cap and natural sediments eliminated Stage 3 infauna, re-establishment is occurring on the mound and at the eastern margin of the borrow area. In the deeper portions of the pit, continuing natural deposition of native sediments and/or water column oxygen stress are

Figure 5-6. Distribution of infaunal successional stages at and adjacent to the Long Beach Borrow Area

April 1996 SPI Survey
California State Plane Zone 5 (NAD83)
1 inch = 300 feet

Striplin Environmental Associates, Inc.

LEGEND

Stage 1 Community Only

Stage 2 or Stage 3 Communities

N

Figure 5-7. Distribution of OSI values at and adjacent to the Long Beach Borrow Area

April 1996 SPI Survey
California State Plane Zone 5 (NAD83)
1 inch = 300 feet

Striplin Environmental Associates, Inc.

LEGEND

OSI Values
0 - 3
3.1 - 6.9
> 6.9
Ind Indeterminate

N

slowing (or preventing) the re-colonization process. Many of the lowest OSI values (0, +1) are west (upriver) of the borrow area. The low habitat quality in this area appears to be a regional feature and may be a function of high rates of organic loading, possibly magnified by periodic water column oxygen depletion.

Page 16:

The long-term infaunal recolonization will be heavily influenced by large scale seasonal deposition events. If 20 cm (0.7 ft) or more of sediment is annually deposited over the borrow area, the resident fauna will be eliminated yearly. The infaunal community will be in a constant state of disturbance due to annual burial of the recolonizing fauna, subsequent early stage recolonization during the quiescent period, followed again by the cycle of burial and recolonization.

Page 17:

The development within the borrow area of a benthic community that could burrow through both the recently deposited native material and the cap is highly unlikely given the cumulative thickness of the deposits and the annual burial of the community. At the time of the survey, the resident infauna were not actively bioturbating (vertically mixing) the sediment within the borrow area to great depths. This is corroborated by the pioneering, shallow-dwelling Stage 1 communities observed over much of the cap area. Therefore, it appears that the cap and overlying layer of recently deposited native material are effective in physically isolating the February 1995 dredged material deposit.

Post-disposal and post-cap SPI surveys, combined with surveys associated with 1998 disposal operations (if approved and budgeted), will provide additional data to more accurately estimate biological conditions within the borrow pit, and to evaluate impacts from capped disposal operations. A final survey (possibly involving grab samples of surface sediments) may be conducted 6-12 months after the borrow pit is filled to capacity, to determine any significant changes to the benthic community (i.e., Stage 3 to Stage 1, or recolonization after capping).

5. Water Quality Monitoring

Environmental commitments in the Draft EA included the following turbidity monitoring requirement from the Regional Water Quality Control Board:

- The contractor shall implement a water quality monitoring plan at the dredge and disposal site. Monitoring shall be conducted at 3 points (100 feet up-current of the dredge, 100 feet and 300 feet down-current of the dredge) for dissolved oxygen, light transmittance, pH and suspended solids. Background readings shall be obtained a minimum of 500 feet from the dredge. Water quality shall be monitored daily for the first seven days and then once weekly throughout the

project. Turbidity monitoring shall not be required if the contractor opts to place a silt curtain around the dredge and disposal site, no more than 250 feet from the dredge.

- If turbidity exceeds 20% of baseline readings (indicating a spread of material), operations shall be modified to reduce turbidity to ambient levels. Modifications may include: use of a silt curtain; using an enclosed clamshell bucket; lowering the bucket into the water (rather than dropping material into the water); and slowing or temporarily stopping operations. If excess turbidity is due to a problem in a limited area, such as shallow water or fine sediments, the restrictions may be lifted after dredging of that problem area had been completed, and if monitoring shows that surface turbidity is no longer significant.

The Plans and Specifications to the contractor will require Secchi disk monitoring data to be forwarded to the Corps of Engineers daily, and laboratory results will be forwarded as soon as possible.

It is my understanding that silt curtains would not be feasible to use with a hopper dredge, which frequently moves between dredge and disposal sites. Also, the total area of potential impact is less for this project than most nearshore disposal projects, as the disposal site is located only 1,500 feet from the dredge site. If a cutterhead (pipeline) dredge is used, previous research (LaSalle, 1991) indicates that levels of suspended sediments are usually restricted to the immediate vicinity of the cutterhead, with little suspension occurring in surface waters. Indeed, upper water column levels are usually quite low or even undetectable, depending on water depth. If a clamshell dredge is used, water quality monitoring will determine the need for silt curtains or other project modifications.

Dredges will be equipped with GPS or a similar system, to ensure that disposal occurs within specified boundaries. GPS or other system monitoring data will be forwarded to the Coastal Commission at the completion of this project.

REFERENCES

Los Angeles District. (1996a). Hydrographic and Sediment Profile Imaging Investigation Report, Long Beach Harbor, California, March and April 1996, Prepared for the United States Department of the Army, Corps of Engineers, Los Angeles District, Los Angeles, California, and Prepared by Coastal Frontiers Corporation, Chatworth, California and Striplin Environmental Associates, Olympia, Washington, July 1996.

Los Angeles District. (1996b). Los Angeles River Estuary Navigation Channel Alternatives, Draft Report, Prepared for the Department of the Army, Corps of Engineers, Los Angeles District, Los Angeles, California, and Prepared by Moffatt and Nichol Engineers, Long Beach, California, November 1996.

Los Angeles River Estuary

March 26, 1997

Background

Overview of the Project

Sediment Quantity and Quality
- Results from latest sampling performed
- Comparison between Dredge Site and Disposal Site

Disposal Alternatives
- Upland Pier H site
- Beach/Nearshore
- Port of Long Beach Pier S

Capping Project
- Location within the Pit
- Cap Material Source/Quantity
- Thickness
- Pilot Project Benefits

Discussion/Feedback

Background

- Corps maintains a navigation channel in the Los Angeles River Estuary;
  Channel shoals with sediments from the Los Angeles River Watershed;
  Channel originally served Golden Shore Boat Ramp and Queen's Way Bay Marina;
  Golden Shore Boat Ramp closed in 1991 due to extensive shoaling.
- Maintenance dredging:
  1991 (145,000 cy)
  1995 (emergency of 300,000 cy)

Overview of the Project

- Aquatic Capping Project;
- Maintenance dredge approximately 80,000 cubic meters of sediments from upstream portion of the channel;
- Dispose sediments to the Los Angeles River Borrow Pit, off Island Grissom;
- Cap dredged materials with clean fill for the Port of Long Beach's Pier T project.

Sediment Quantity and Quality

- Dredge approximately 80,000 cubic meters of material;
- Historically, sediments appear to be unsuitable for unconfined open ocean disposal unless further Tier III testing is performed;
- Latest sampling and analysis performed in January 1997, 20 composite samples were taken in the channel (13) , borrow pit (6), and Pier J (1);
- 1997 project will dredge in Chem #3 and #11 areas only; Pit represented by Chem #20;
- Results show elevated levels of metals, PAHs, phthalates, and chlordane, some metals exceeded ERL/SL criteria, however, they were below ERM/ML criteria;
- Pit samples also exceed ERL/SL criteria in metals, and chlordane;
- 1997 sampling results show a strong similarity in chemical makeup of sediments in channel and borrow pit, not surprising since the borrow pit is directly downstream of the river;

Disposal Alternatives

- Upland "Quiet Cannon" site
  - Area approximately 175,000 square feet useable for confined disposal;
  - Assumptions: trapezoidal shaped storage area, 1000' sides, 100' & 250' ends;
    2:1 berm slope (height vs. base), 5' minimum crest width;
  - Results: 20-25 foot berm heights for 80,000 cubic meters of storage;
  - City has plans for a public boat launch in near future.
- Beach/Nearshore
  - Generally, not suitable for beach nourishment;
  - Average 56% fine grained sediment, no distinct sand layers present;
- Port of Long Beach Pier S Project
  - Sediment data evaluated for compatibility as fill material;
  - Concluded that sediments do not have mechanical strength for pier fill.

Capping Project

- Location within the Pit
  - Disposal mound to be located in Northwestern corner of pit;
  - Lower energy area of pit;
  - Utilizes 1995 mound as downstream barrier to prevent migration;
  - Fill to approximately -10 m MLLW elevation, inclusive of cap material.
- Cap Material Source/Quantity
  - Cap material source currently identified from Port of Long Beach Pier T project;
  - Preliminary estimates suggest 200,000-300,000 cubic yards of cap material;
  - Cap will be clean material, any material identified for disposal to LA-2 or main channel pit (after consultation with EPA and Regulatory);
- Thickness - Currently estimating cap thickness to be in the 1.0 meter range. Exact cap thickness and geometry will be designed once the exact disposal mound geometry is determined after disposal;
- Pilot Project Benefits
  - Refine sediment and cap placement methods and procedures;
  - Refine monitoring of mound and cap stability;
  - Management of multi-use, sequential disposal and capping projects in a borrow pit.

Discussion/Feedback

TABLE 3

BULK CHEMICAL TESTING RESULTS
United States Army Corps of Engineers
Los Angeles River Estuary (January 1997)
Long Beach, California

Test	Method	Method Reporting Limit	Units	Screening Criteria				CHEM #1	CHEM #2	CHEM #3	CHEM #4	CHEM #5	CHEM #6	CHEM #7	CHEM #8	CHEM #9	CHEM #10	CHEM #11	CHEM #12	CHEM #13	CHEM #14	CHEM #15	CHEM #16	CHEM #17	CHEM #18	CHEM #19	CHEM #20
				ERL (Long et al.)	ERM (Long et al.)	SL (PSDDA)	ML (PSDDA)	Cores 1 2 3	Cores 4 5 6	Core 9	Cores 7 8 9	Cores 10 11 12 13	Cores 10 11 12 13	Cores 11 13	Cores 14 16 17	Cores 14 15 16 17	Cores 14 15	Cores 13 19 20	Cores 18 20	Core 18	Cores 24 25	Core 22	Core 22	Cores 21 23	Cores 21 23	Cores 21 23	Core 21
								ESTUARY													PIER J	BORROW PIT					
								CHANNEL DOWNSTRM	CHAN CENTER	CHANNEL UPSTREAM		ALT CHANNEL DOWNSTREAM			ALT CHANNEL UPSTREAM			CHANNEL UPSTREAM OF QUEENS WAY BRIDGE				CENTER		FLANKS			
																						FILL/CAP	FILL	CAP	FILL	FILL	UNDER
PHYSICAL or CONVENTIONAL																											
Total Solids/Dry Weight	EPA 160.3 mod	0.1	%					62.3	61.5	48.5	62.9	61.4	72.6	66.3	71.1	68.9	62.5	61.4	65.2	65.3	77.4	64.1	77.7	58.7	55	54.8	54.2
Total Volatile Solids	EPA 160.4 mod	0.01	%					5.25	5.93	9.30	6.05	5.24	3.23	4.81	2.66	4.16	6.43	5.56	7.34	6.68	1.32	4.13	13.16	4.79	7.98	6.63	5.78
ph	Plumb 1981	0.01	pH units					8.13	7.57	7.74	7.43	7.83	8.05	8.03	7.90	7.57	8.21	7.54	8.12	8.00	7.39	7.94	7.24	7.67	7.85	7.91	8.40
Ammonia as Nitrogen	Plumb 1981	0.1	mg/kg					72	88	153	280	84	45	67	41	120	210	160	380	240	1.8	20	15	31	100	92	46
Total Organic Carbon	ASTM D4129-82M	0.01	%					1.88	1.83	3.83	2.62	2.02	1.21	1.36	0.87	1.75	2.54	3.00	3.01	2.50	0.25	1.33	0.75	1.13	3.40	2.43	1.71
Total Sulfides	EPA 9030M	0.1	mg/kg					1,700	1,900	3,100	2,300	1,900	830	1,000	570	1,200	970	1,800	1,000	2,400	29	1,300	640	500	2,800	3,400	2,200
Oil and Grease	EPA 413.2	25	mg/kg (wet)					2,140	1,900	3,800	3,800	2,490	1,140	1,530	1,290	2,500	3,060	4,000	4,200	5,200	34	1,410	1,040	116	4,800	2,440	1,920
METALS and NONMETALS																											
Arsenic (As)	EPA 200.8	0.1	mg/kg	8.2	70	70	700	5.5	7.1	6.1	6.7	4.3	3.0	5.5	2.2	3.5	5.3	4.4	5.6	5.3	2.9	*5.4*	3.6	8.5	6.3	6.3	7.7
Cadmium (Cd)	EPA 200.8	0.02	mg/kg	1.2	9.6	0.56	9.6	*1.8*	*1.95*	*2.24*	*2.41*	*1.54*	*1.05*	*1.49*	0.70	1.33	2.12	2.29	3.26	2.69	0.10	0.95	*1.13*	0.71	*2.53*	*1.88*	*2.03*
Chromium (Cr)	EPA 200.8	0.1	mg/kg	81	370			23.6	32.5	30.3	31.8	23.1	18.3	27.0	12.1	19.7	25.7	25.4	35.1	36.5	12.9	23.9	24.0	33.7	33.0	30.3	33.8
Copper (Cu)	EPA 200.8	0.1	mg/kg	34	270	81	810	*45.8*	*53.0*	*71.2*	*61.1*	*40.5*	*27.2*	*38.4*	19.8	*34.6*	*49.1*	*57.5*	*73.7*	*64.0*	10.5	33.1	*36.4*	*38.4*	*61.4*	*50.4*	*52.8*
Lead (Pb)	EPA 200.8	0.02	mg/kg	46.7	218	65	660	*147*	*187*	*102*	*213*	*87.6*	*97.5*	*139*	34.9	*73.1*	*119*	*193*	*130*	*209*	7.63	64.9	79.8	65.3	*143*	*108*	*142*
Mercury (Hg)	EPA 7471	0.02	mg/kg	0.15	0.71	0.21	2.1	*0.24*	0.2	0.1	0.2	0.18	0.13	0.13	0.10	0.14	*0.19*	*0.2*	*0.7*	*0.2*	0.04	0.13	0.07	*0.18*	*0.24*	*0.19*	*0.23*
Nickel (Ni)	EPA 200.8	0.1	mg/kg	20.9	51.6	23	120	*22.7*	*25.5*	*26.1*	*25.3*	*21.0*	14.5	*22.4*	11.2	17.0	*22.4*	*21.7*	*27.9*	*29.9*	8.8	*17.7*	*21.7*	*24.4*	*25.9*	*24.7*	*25.2*
Selenium (Se)	EPA 200.8	0.1	mg/kg					0.7	0.9	2.5	1.3	0.7	ND (0.5)	0.2	ND (0.5)	0.8	1.0	1.6	1.5	1.4	ND (0.5)	0.6	0.9	0.6	1.2	1.3	1.1
Silver (Ag)	EPA 200.8	0.02	mg/kg	1	3.7	1.2	5.2	0.37	0.44	0.97	0.87	0.36	0.11	0.23	0.15	0.29	0.49	0.57	0.64	0.40	0.04	0.35	0.15	0.35	0.82	0.61	0.36
Zinc (Zn)	EPA 200.8	0.1	mg/kg	150	410	160	1600	*248*	*219*	*351*	*296*	*199*	120	142	123	*204*	*300*	*272*	*338*	*294*	37.8	*151*	99.9	131	*331*	*270*	*221*
Pesticides																											
Total Chlorinated Pesticides	EPA 8080A	0.020	mg/kg					ND (0.640)	ND (1.000)	ND (0.700)	ND (1.030)	ND (0.570)	ND (0.490)	ND (0.470)	ND (0.460)	ND (0.890)	ND (0.510)	ND (0.800)	ND (1.250)	ND (1.010)	ND (0.450)	ND (0.450)	ND (0.450)	ND (0.470)	ND (0.610)	ND (0.740)	ND (0.700)
Aldrin	EPA 8080A	0.020	mg/kg			0.005		ND (0.020)	ND (0.030)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Chlordane and Derivatives	EPA 8080A	0.020	mg/kg			0.005		*0.120*	ND (0.150)	ND (0.090)	ND (0.270)	*0.094*	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	*0.120*	ND (0.140)	ND (0.200)	ND (0.170)	ND (0.060)	ND (0.060)	*0.087*	ND (0.060)	*0.290*	*0.270*	*0.200*
Dieldrin	EPA 8080A	0.020	mg/kg			0.005		ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	*ND (0.020)*	*ND (0.020)*	*ND (0.020)*	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
DDT and Derivatives	EPA 8080A	0.020	mg/kg	0.00153	0.0461	0.0069	0.069	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)
Endosulfan and Derivatives	EPA 8080A	0.020	mg/kg					ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)
Endrin and Derivatives	EPA 8080A	0.020	mg/kg					ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)
Heptachlor and Derivatives	EPA 8080A	0.020	mg/kg			0.005		ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)
Hexachlorocyclohexane and Derivatives	EPA 8080A	0.020	mg/kg			0.005		ND (0.060)	ND (0.030)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)	ND (0.060)
Methoxychlor	EPA 8080A	0.020	mg/kg					ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
Toxaphene	EPA 8080A	0.020	mg/kg					ND (0.220)	ND (0.440)	ND (0.250)	ND (0.400)	ND (0.150)	ND (0.070)	ND (0.030)	ND (0.040)	ND (0.030)	ND (0.030)	ND (0.300)	ND (0.700)	ND (0.480)	ND (0.030)	ND (0.030)	ND (0.030)	ND (0.050)	ND (0.190)	ND (0.320)	ND (0.250)
ORGANIC COMPOUNDS																											
ORGANOTINS																											
Monobutyltin	Krone 1988	0.001	mg/kg					ND (0.001)	0.005	0.018	0.018	ND (0.001)	0.002	ND (0.001)	ND (0.001)	0.001	0.002	0.025	0.022	0.006	ND (0.001)	0.005	0.020	ND (0.001)	0.011	0.006	0.005
Dibutyltin	Krone 1988	0.001	mg/kg					0.007	0.025	0.019	0.048	0.005	0.008	0.003	0.004	0.007	0.009	0.063	0.088	0.061	0.002	0.010	0.019	0.004	0.028	0.014	0.020
Tributyltin	Krone 1988	0.001	mg/kg					0.017	0.017	0.038	0.29	0.011	0.010	0.003	0.005	0.011	0.013	0.033	0.048	0.033	0.002	0.016	0.020	0.007	0.043	0.025	0.043
PETROLEUM HYDROCARBONS																											
Total Recoverable Petroleum Hydrocarbons	EPA 418.1	5	mg/kg					1,670	1,400	3,400	2,700	1,560	823	1,150	979	1,950	2,760	2,400	3,000	2,400	30	1,020	706	72	4,000	1,880	1,510
PHTHALATES																											
Total phthalates	GC/MS SIM	0.010	mg/kg					4.025	5.660	10.350	11.710	2.659	2.321	4.294	5.255	9.026	21.770	9.840	35.930	9.400	0.102 (a)	2.720	1.869	0.553 (a)	7.182	4.559	2.864
Dimethyl phthalate	GC/MS SIM	0.010	mg/kg			0.16		ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	0.018	0.019	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	0.020	0.013	0.013
Diethyl phthalate	GC/MS SIM	0.010	mg/kg			0.057		ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	0.034	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	0.010	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Di-n-butyl phthalate	GC/MS SIM	0.010	mg/kg			1.4		0.035	ND (0.100)	0.130	ND (0.100)	0.035	0.020	0.051	0.027	0.045	0.079	ND (0.100)	0.120	ND (0.100)	*ND (0.010)*	0.028	0.018	0.015	0.071	0.071	0.028
Butyl benzyl phthalate	GC/MS SIM	0.010	mg/kg			0.47		*0.890*	0.250	*0.750*	0.360	0.168	0.141	0.143	0.116	0.393	0.460	*0.510*	*0.530*	*0.560*	ND (0.010)	*0.472*	0.105	0.051	*0.485*	0.358	0.243
Bis (2-ethylhexyl) phthalate	GC/MS SIM	0.010	mg/kg			3.1		2.900	*5.400*	*8.700*	*11.000*	2.300	2.000	*4.200*	*5.000*	*8.400*	*21.000*	*8.800*	*36.000*	*8.600*	0.102 (a)	2.600	1.600	0.437 (a)	6.000	3.600	2.500
Di-n-octyl phthalate	GC/MS SIM	0.010	mg/kg			58		0.200	ND (0.100)	0.510	0.330	0.336	0.126	ND (0.010)	0.112	0.170	0.212	0.530	0.280	0.240	ND (0.010)	0.210	0.145	ND (0.010)	0.606	0.517	0.080
POLYCHLORINATED BIPHENYLS (PCB)																											
Total PCB Congeners	EPA 680	0.0098	mg/kg			0.130	2.500	0.0257	*0.2732*	0.050	0.045758	0.001072	0.0605	*0.142*	0.0211	ND (0.0069)	0.0683	*0.1383*	0.124	*0.3971*	ND (0.0065)	0.02809	0.0618	0.0525	*0.2063*	0.11147	0.06304
Aroclor 1254	EPA 8082A	0.020	mg/kg					0.190	ND (0.310)	ND (0.100)	ND (0.400)	ND (0.060)	ND (0.040)	ND (0.110)	0.065	0.370	ND (0.050)	ND (0.100)	ND (0.050)	ND (0.200)	ND (0.020)	ND (0.060)	ND (0.050)	ND (0.080)	ND (0.270)	ND (0.220)	ND (0.360)
Aroclor 1260	EPA 8082A	0.020	mg/kg					0.060	0.028	0.053	0.118	0.052	0.025	0.043	0.023	0.160	0.057	0.055	*0.114*	0.073	ND (0.020)	0.023	0.030	0.033	0.100	0.085	0.110
POLYNUCLEAR AROMATICS HYDROCARBONS (PAH)																											
Total PAHs	GC/MS SIM	0.010	mg/kg	4.022	44.792			1.369	ND (1.600)	2.520	2.250	1.135	0.869	3.870	1.020	*17.473*	2.224	ND (1.600)	2.570	2.150	ND (0.160)	2.274	1.221	0.347	2.059	1.880	1.100
Subtotal - Low molecular weight PAH	GC/MS SIM	0.010	mg/kg	0.552	31.6	0.61	6.1	0.121	0.120	0.430	0.270	0.123	0.056	*1.525*	0.111	*2.143*	0.258	0.140	0.300	0.200	0.060	*0.685*	0.114	0.015	0.256	0.134	0.055
Acenaphthene	GC/MS SIM	0.010	mg/kg	0.016	0.5	0.063	0.63	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	*0.149*	ND (0.010)	*0.042*	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Naphthalene	GC/MS SIM	0.16	2.1	0.21	2.1	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	0.343	ND (0.010)	0.012	0.011	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	*ND (0.010)*	0.013	*ND (0.010)*	ND (0.010)
Acenaphthylene	GC/MS SIM	*0.010*	mg/kg	0.044	0.64	0.064	0.64	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	0.014	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
Anthracene	GC/MS SIM	0.010	mg/kg	0.0853	1.1	0.13	1.3	0.019	ND (0.100)	ND (0.100)	ND (0.100)	0.015	ND (0.010)	0.197	0.018	*0.228*	0.034	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	0.018	0.016	ND (0.010)	0.031	0.025	ND (0.010)
Phenanthrene	GC/MS SIM	0.010	mg/kg	0.24	1.5	0.32	3.2	0.091	0.120	*0.400*	*0.270*	0.092	0.056	*0.673*	0.082	1.600	0.215	0.140	*0.300*	0.200	ND (0.010)	*0.633*	0.098	0.015	0.186	0.143	0.055
Fluorene	GC/MS SIM	0.010	mg/kg	0.019	0.54	0.054	0.64	0.011	ND (0.100)	ND (0.100)	ND (0.100)	0.016	ND (0.010)	*0.153*	0.011	*0.061*	*0.028*	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	0.020	ND (0.010)	ND (0.010)	0.026	0.013	ND (0.010)
Subtotal - High molecular weight PAH	GC/MS SIM	0.010	mg/kg	1.7	9.6	1.8	51	1.248	0.860	2.120	*1.980*	1.012	0.804	*2.345*	0.909	15.330	*1.936*	1.070	*2.270*	*1.950*	0.000	1.589	1.107	0.331	*1.803*	1.656	1.045
Fluoranthene	GC/MS SIM	0.6	5.1	0.63	6.3	0.245	0.290	0.650	0.460	0.228	0.162	*0.671*	0.205	*4.800*	*0.456*	0.340	0.540	0.440	ND (0.010)	0.452	0.276	0.050	0.402	0.368	0.159		
Benzo(a)anthracene	GC/MS SIM	0.261	1.6	0.45	4.5	0.086	ND (0.100)	0.130	0.140	0.071	0.055	0.292	0.073	1.700	0.133	0.100	0.160	0.140	ND (0.010)	0.063	0.092	0.025	0.108	0.123	0.064		
Benzo(a)pyrene	GC/MS SIM	0.43	1.6	0.68	6.8	0.105	ND (0.100)	0.130	0.140	0.072	0.062	0.178	0.070	*0.763*	0.147	ND (0.100)	0.150	0.150	ND (0.010)	0.064	0.088	0.034	0.141	0.135	0.093		
Benzo(b)fluoranthene	GC/MS SIM	0.010	mg/kg			0.8 (b)	8 (b)	0.102	ND (0.100)	0.140	0.140	0.076	0.065	0.135	0.064	0.771	0.151	0.100	0.160	0.140	ND (0.010)	0.074	0.087	0.023	0.166	0.131	0.095
Benzo(k)fluoranthene	GC/MS SIM	0.010	mg/kg					0.089	ND (0.100)	0.120	0.130	0.061	0.053	0.127	0.059	0.659	0.121	ND (0.100)	0.130	0.130	ND (0.010)	0.071	0.078	0.025	0.113	0.111	0.085
Chrysene	GC/MS SIM	0.010	mg/kg	0.384	2.8	0.67	6.7	0.135	0.160	0.250	0.250	0.119	0.087	0.214	0.110	*1.800*	0.238	0.190	0.290	0.240	ND (0.010)	0.157	0.125	0.035	0.217	0.188	0.093
Benzo(g,h,i)perylene	GC/MS SIM	0.010	mg/kg			0.54	5.4	0.109	0.110	0.130	0.120	0.085	0.071	0.118	0.065	0.423	0.136	ND (0.100)	0.140	0.140	ND (0.010)	0.067	0.081	0.037	0.140	0.128	0.103
Dibenzo(a,h)anthracene	GC/MS SIM	0.0634	0.26	0.12	1.2	0.016	ND (0.100)	ND (0.100)	ND (0.100)	0.012	0.011	0.023	0.012	0.035	0.021	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.010)	ND (0.010)	0.016	ND (0.010)	0.020	0.022	0.019	
Indeno(1,2,3-cd)pyrene	GC/MS SIM	0.010	mg/kg			0.069	5.25	*0.089*	ND (0.100)	*0.110*	0.120	0.052	0.057	0.123	0.055	0.479	0.108	ND (0.100)	0.160	0.130	ND (0.010)	0.054	0.079	0.031	*0.107*	*0.108*	*0.089*
Pyrene	GC/MS SIM	0.010	mg/kg	0.665	2.6	0.43	7.3	0.272	0.300	*0.510*	0.470	0.226	0.131	*0.544*	0.196	3.500	0.435	0.340	*0.540*	*0.440*	*ND (0.010)*	*0.577*	0.185	*0.064*	0.389	0.382	0.245

Notes

MRL for parameter without matrix interference
mg/kg = milligrams per kilogram (dry weight unless noted)
EPA = United States Environmental Protection Agency
ND = not detectated at or above MRL (w/wo interfer.) indicated in parentheses
Total Chlorinated Pesticides = sum of named compounds and their derivatives
Total Phthalates = sum of six named compounds
Total PCB Congeners = sum of mono- through decachlorobiphenyl compounds
Total PAHs = sum of sixteen named compounds

Chlordane and Derivatives = sum of gamma-Chlordane, alpha-Chlordane, and Chlordane
DDT and Derivatives = sum of 4,4'-DDE, 4,4'-DDD, and 4,4'-DDT
Endosulfan and Derivatives = sum of Endosulfan I, Endosulfan II, and Endosulfan Sulfate
Endrin and Derivatives = sum of Endrin, Endrin Aldehyde, and Endrin Ketone
Heptachlor and Derivatives = sum of Heptachlor and Heptachlor Epoxide
Hexachlorocyclohexane and Derivatives = sum of alpha-BHC, beta-BHC, gamma-BHC (Lindane), and delta-BHC
(a) = Estimated
(b) = combined benzofluoranthenes

Screening Criteria Notes:
ERL = Effects Range-Low; ERM = Effects Range-Median (Long. et. al., 1995)
SL = Screening Level; ML = Maximum Level (PSSDA, 1988)
Bold Italic Value = Value Exceeds ERL or SL
Box without bold = Value Exceeds ERM

A-35

tab3.xls
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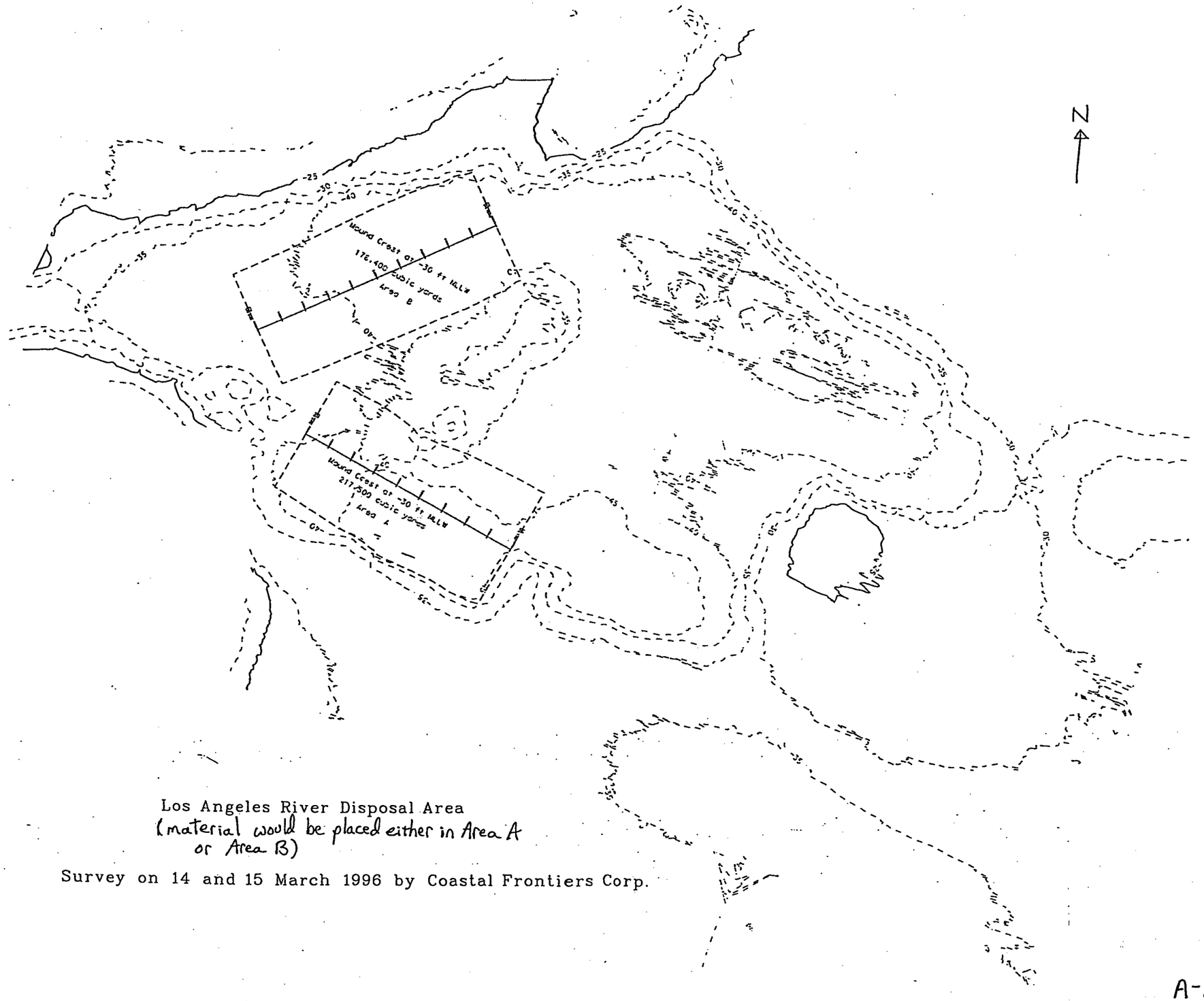
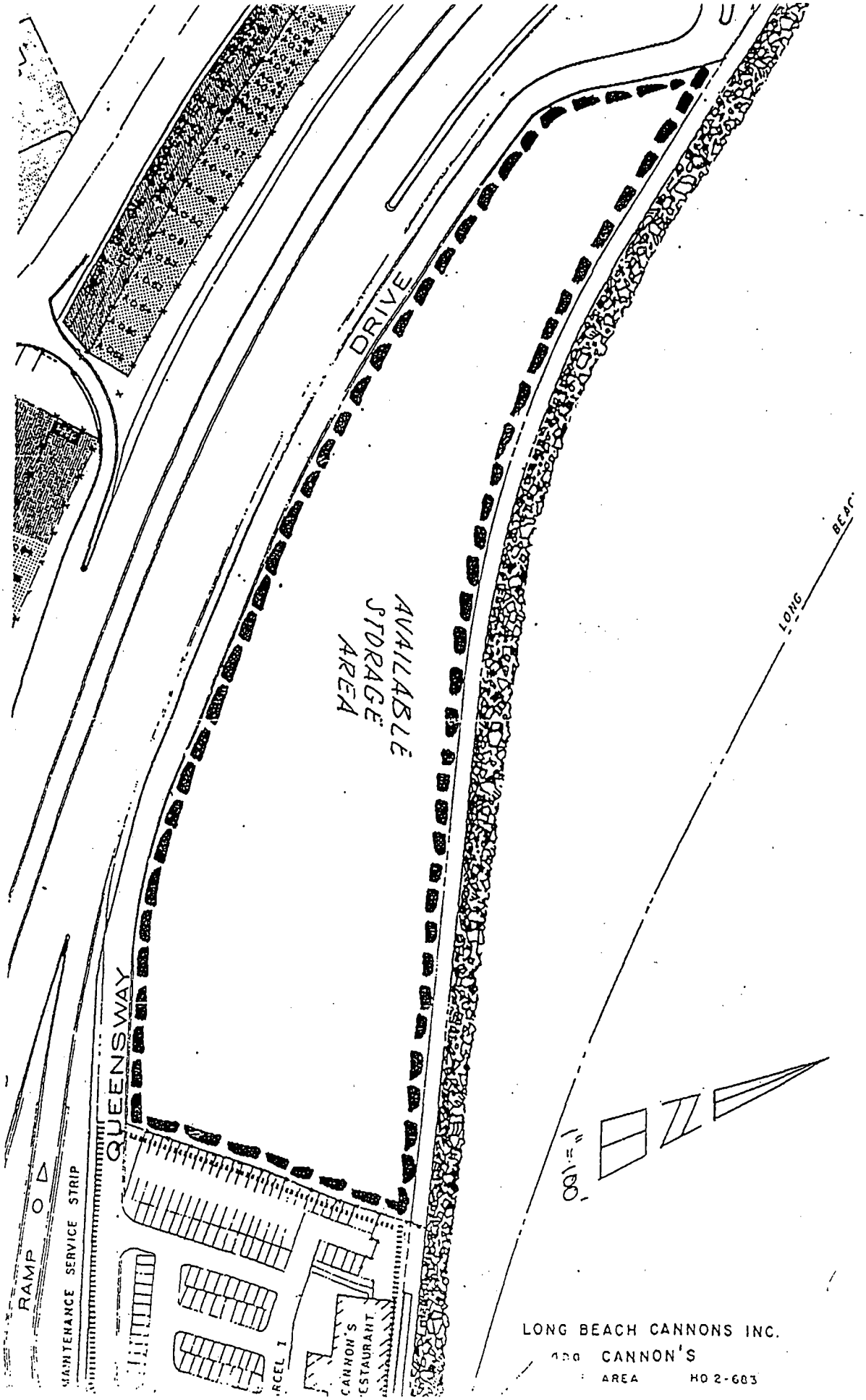


Los Angeles River Disposal Area
(material would be placed either in Area A or Area B)

Survey on 14 and 15 March 1996 by Coastal Frontiers Corp.

1" = 400'

98 NOV 16.



APPENDIX B

Section 404(b)(1) Water Quality Evaluation
Los Angeles River Estuary Maintenance Dredging
Los Angeles County, California

January 1997

THE EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO THE WATERS OF THE UNITED STATES IN THE VICINITY OF LONG BEACH HARBOR (LOS ANGELES RIVER MOUTH) LOS ANGELES COUNTY, CALIFORNIA

I INTRODUCTION. The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), as amended by the Clean Water Act of 1977 (Public Law 95-217).

II PROJECT DESCRIPTION.

a. Location: Long Beach harbor is an independent commercial port within San Pedro Bay, Los Angeles County, about 20 miles south of downtown Los Angeles. The mouth or "estuary" of the Los Angeles River (LAR) is located within the City of Long Beach, and empties into Long Beach Harbor. The area to be dredged extends from Queen's Way Marina to the harbor.

b. General Description: Dredging of the Estuary is proposed to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. Approximately 100,000 cubic yards of material is to be dredged. Dredging will be accomplished by a combination of hopper, clamshell, or cutterhead hydraulic dredge. Disposal is proposed to occur in a previously excavated "borrow pit" offshore of Island Grissom.

c. Authority and Purpose: This evaluation has been prepared pursuant to Section 404(b)(1) of the Clean Water Act of 1977 (33 USC 1344) which applies to the discharge of dredged or fill material into navigable waters of the United States of America.

d. General Description of Dredged or Fill Material: The upper layer of sediment in the Los Angeles River was predominantly sand, especially areas upstream of Queen's Way Marina. Downstream areas and the upstream bottom layer contained a higher percentage of silty material. Chemical testing from January 1997 show that sediments from the dredge proposed dredge site and disposal site are similar, and moreover, that sediments from both sites were not exceedingly contaminated (see summary of results in Appendix A).

e. Description of the Proposed Discharge Sites: The previously excavated borrow-pit is located at the mouth of the LAR, about 1,600 feet offshore of Island Grissom (see Figure 2 of the attached EA). It currently has a capacity of about 900,000 cys. Dimensions of the borrow pit are approximately 600'-by-600', with a maximum depth of approximately -50 ft. Mean Lower Low Water (MLLW).

f. Description of Dredging and Disposal Methods: Dredging an disposal is expected to be performed using one or more of the following dredge types: a hopper dredge, a cutterhead hydraulic dredge, or a mechanical dredge.

III FACTUAL DETERMINATIONS.

a. Physical Substrate Determinations: See Paragraph II(d), above, and Appendix A.

b. Water Circulation, Fluctuation, and Salinity Determinations:

1) Water. The proposed project will not adversely affect the salinity of the receiving waters, as waters used in slurring the dredge material was of approximately the same salinity as the receiving waters. Receiving waters immediately adjacent to the discharge site may experience changes in pH, if dredging of anaerobic sediments occur. Water clarity may be adversely affected. Dissolved oxygen may be somewhat depleted from waters immediately adjacent to the discharge site if anaerobic sediments are encountered. Localized nutrient enrichment of seawater may occur. These impacts are not considered significant due to their temporary nature.

2) Current Patterns and Circulation. Currents and wave action are relatively weak in the area of the borrow pit disposal site, due to the depth of the site and the configuration of Long Beach Harbor. The project will not have a significant effect upon current patterns or circulation.

3) Normal Water Level Fluctuations. The project will not have a significant effect upon normal water level fluctuations.

c. Suspended Particulate/Turbidity Determinations:

1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites: Increases in local turbidity will likely occur at the receiving site during discharge operations. Construction-related increases in turbidity were of short duration and were not considered significant. Temporary increases in local turbidity also may occur in the local vicinity of the dredge.

2) Effects on Chemical and Physical Properties of the Water Column: The effects of construction-related turbidity may include a reduction in light penetration and a reduction in dissolved oxygen (the latter due to the discharge of reduced sediments). Minimal impacts will be ensured through

implementation of a turbidity monitoring program, as required by the CRWQCB.

3) Effects of Turbidity on Biota: It is likely that no significant reduction in phytoplankton production will occur due to project generated turbidity. There are no kelp or eelgrass beds in near enough proximity to the discharge site to be significantly affected by any turbidity. The effect of project-related turbidity on local suspension and filter-feeding invertebrate and fish populations is unknown, but is considered insignificant due to the degraded nature of the borrow pit, and the probable anoxic conditions in that area. Turbidity, if significant, has the potential to cause clogging of respiratory and feeding apparatuses of sedentary bottom fish and filter feeders. Motile organisms, however, will likely evacuate and avoid the dredging and disposal areas, and temporarily relocate to adjacent undisturbed areas. Most of the impacts will likely be confined to the immediate vicinity of dredging and disposal activities. Sight-dependent bird species may be adversely affected due to reduced surface-water visibility in the immediate area of dredging activities, but these impacts will be temporary and insignificant.

d. Contaminant Determination: Chemical and grain size analyses indicate that sediment from the proposed dredge site is similar to the receiving site at the borrow pit. 1997 analysis of both the Los Angeles River Estuary dredge site and the borrow pit is summarized in Appendix A of the attached EA.

The Environmental Protection Agency (EPA) reviewed the 1997 sediment chemistry data from the LAR as well as the borrow-pit. Results indicate that levels of a particular group of contaminants, polycyclic aromatic hydrocarbons (PAH's) were high and not acceptable for open water disposal.

e. Aquatic Ecosystem and Organism Determinations: Adverse effects of the proposed project on local benthic organisms may include the elimination of organisms inhabiting the dredge material to be excavated, and direct burial of all organisms inhabiting the benthic habitat at the receiving site, as well as decreased feeding efficiency due to the increase in turbidity in nearby areas not physically dredged or buried.

Federally-listed threatened or endangered animal species that may occur in the project area include: California brown pelican (Pelecanus occidentalis californicus); California least tern (Sterna antillarum browni); peregrine falcon (Falco peregrinus); marbled murrelet (Brachyramphus marmoratus); and the western snowy plover (Charadrius alexandrinus nivosus). None of these species are expected to be affected by this project. Several species of marine mammals may be transient visitors to the harbor and the disposal site, but also are not expected to be affected by this project.

f. Disposal Site Determinations: Grain size and chemical analyses of the dredge site indicates compatibility with the preferred disposal site (see Appendix A).

g. Determination of Cumulative Effects on the Aquatic Ecosystem: No significant cumulative adverse effects on the aquatic ecosystem occurred.

IV FINDING OF COMPLIANCE.

a. Adaptation of the Section 404 (b)(1) Guidelines to this Evaluation: No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem: There are no alternative disposal sites available for this project which 1) are more consistent with the project authorization, or 2) will have a less environmentally damaging result.

c. Compliance with Applicable State Water Quality Standards: The project will comply with State water quality standards promulgated by the California Regional Water Quality Control Board, Los Angeles Region.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act: No toxic materials are known or likely to occur in the project area.

e. Compliance with the Endangered Species Act of 1973: As discussed in the EA, and following informal consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers (herein the action agency) has determined that this project will not have an effect upon the continued existence of any species listed as threatened or endangered by the Service, and therefore formal consultation pursuant to Section 7(c) of this act is not required.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972: No sanctuaries as designated by the Marine Protection, Research and Sanctuaries Act of 1972 will not be affected by this project.

g. Evaluation of Extent of Degradation of the Waters of the United States: No significant degradation of municipal or private water supplies, special aquatic sites, or plankton resources are expected to occur. The project may have a short-term effect upon fish and invertebrates due to project-related turbidity and the burial of organisms.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem: Specific environmental commitments are outlined in the EA. These include monitoring turbidity and other water quality parameters during all dredging and disposal operations, as required by the California Regional Water Quality Control Board.

i. On the Basis of the Guidelines, the Disposal Site for the Discharge of Dredged or Fill Material is: **in compliance** with Section 404(b)(1) guidelines, with the inclusion of appropriate conditions to minimize pollution or adverse effects on the aquatic ecosystem.

APPENDIX C

DETERMINATION OF CONSISTENCY
with the
California Coastal Act of 1976

Los Angeles River Estuary

January 1997

DETERMINATION OF CONSISTENCY
with the
California Coastal Act of 1976
Los Angeles River Estuary Maintenance Dredging
Los Angeles County, California

January 1997

Project Description

The Los Angeles District, Corps of Engineers (Corps), as a part of its continuing program of regular maintenance dredging, proposes to remove approximately 100,000 cubic yards (cy) of sediment from the mouth the Los Angeles River estuary, dispose of this material in an existing borrow pit offshore of Island Grissom, also at the mouth of the Los Angeles River (LAR), and cap the material with clean sediment. Dredging and disposal operations are expected to occur between March and April, 1997. Capping may occur as late as Fall 1997, if dredging of cap material is restricted by the least tern's nesting season.

The LAR estuary is located in the City of Long Beach, California, approximately 20 miles south of downtown Los Angeles. Also known as the Queen's Way Bay, the estuary connects the Los Angeles River channel with San Pedro Bay in the limits of Long Beach Harbor. The area of the estuary which receives periodic dredging extends from Queen's Way Marina into Long Beach Harbor.

The borrow pit is located at the mouth of the estuary, about 1,600 feet offshore of Island Grissom. It currently has a capacity of approximately 900,000 cubic yards. Dimensions of the borrow pit are approximately 600'-by-600', with a maximum depth of -35' to -40' Mean Lower Low Water (MLLW). Material is expected to remain confined in this site because of its depth, and because no strong currents are expected to occur over this area. This borrow pit was created to supply fill material for offshore oil rig islands, including Island Grissom.

The proximity of the disposal site to the dredge site indicates that sediment from both areas would likely be similar in quality and grain size. The environmental impacts of relocating this material to the borrow pit, therefore, are not expected to be significant. Material to be dredged from the LAR estuary, however, is potentially contaminated. Therefore, to isolate this material from the surrounding environment, and to prevent movement within the borrow pit, the Corps will cap this material with at least one foot of clean sediment.

For this purpose, the Corps proposes to use approximately 200,000 cubic yards of material from the Port of Long Beach-proposed Pier "T" dredging project, in Long Beach

Harbor. No specific area within the Pier T dredge limits has been designated for cap material, however, any dredged material deemed suitable (i.e. material that is suitable for disposal in LA-2) may be used for the cap.

This project includes monitoring (both SPI and Bathymetric) to ensure that the cap continues to remain in place. Absence of strong currents and waves indicates the material is not likely to migrate, but biannual monitoring will be conducted over the next two (2) years to verify this assumption. Bathymetric monitoring would detect the noticeable changes in the bottom profile, which will lead to detecting movement of the cap or the original disposal mound. Sediment Profile Imaging (SPI) will give an electronic image of the disposal mound enabling a comparison of SPI surveys over a period of time to determine any movement of the mound, once it is placed.

Project Need

Winter storms cause shoaling in the Queen's Way Marina area. The water in this area is extremely shallow and can cause significant disruption to boat traffic. Heavy shoaling caused by continuous storm events necessitates dredging at this site. In the likelihood that even heavier shoaling will occur as it did in 1995, the result could be a temporary closure of the Marina. This would affect businesses in the Marina such as Catalina Cruise Lines, and Catalina Island, which depend on tourist trade.

To prevent closure of the marina, the Corps proposes to dredge a channel within the LAR estuary (through shoaled material), allowing for unobstructed passage of vessels in and out of Queen's Way Marina. Approximately 100,000 cubic yards of sediment will need to be dredged to provide a minimum depth of approximately -27' MLLW at the upstream end of the channel and a depth of -18' to -20' MLLW at the downstream end of the channel Dredging and disposal will likely be accomplished via a hopper dredge, cutterhead/pipeline, and/or a clamshell/barge. A hopper bin will most likely be used to dispose of dredged and cap material in the borrow pit.

Conformance with Plans for a Regional Solution

The Corps is presently conducting baseline studies to assess potential multi-user, contaminated sediment disposal areas. The North Energy Island (NEI) borrow pit is a potential site for designation. A detailed plan is expected to be ready for approval in 1999. In the mean time, possibly contaminated sediment from the LAR estuary must be dredged and disposed as expeditiously as possible. The use of the LAR borrow pit for contaminated sediment disposal will provide a small scale opportunity for testing capping procedures, as well as monitoring the stability of mounds placed in an existing borrow pit. Disposal at this site will also provide real field data to confirm computer model data.

New physical and chemical testing of the shoaled material is currently being conducted, the results of which will be available in mid-January, 1997. Sampling and testing

conducted in 1995 indicated that material from this area is not suitable for beach or nearshore disposal in the littoral zone, due to physical or chemical incompatibility with sediment in those areas. Beach suitable material, if present, would probably be mixed with contaminated material rather than occurring in isolated pockets. It would be cost prohibitive to isolate any clean sediment from contaminants, or to proceed with bioassays to determine suitability with deep ocean disposal sites. Furthermore, the Corps plans to use this project to evaluate and refine the following techniques and practices: (1) the placement of sediment mounds and capping, refining this technology before any large scale, regional operations are proposed in the area, (2) continue monitoring mound and cap stability of the 1995 disposal project (discussed below), the currently proposed project, and any future project that may be authorized for this area, and (3) managing multiple disposal and capping projects within this borrow pit.

Previous Capping Projects at Island Grissom Borrow Pit

The City of Long Beach previously used the LAR borrow pit as a disposal site for material dredged from the river estuary. Approximately 5,000 cubic yards was disposed on that site per year, from 1989 to 1994. The permit for such use expired February 1994.

During February and March 1995, the Corps conducted emergency dredging operations at the Los Angeles River Estuary to re-open the navigation channel leading to Queen's Way Marina (City of Long Beach). The project entailed the removal of 300,000 cy of sediments, and disposal of these sediments in the borrow pit offshore of Island Grissom.

Sediment sample test results of the area dredged in 1995 indicated that a portion of the dredged sediments contained elevated levels of PAH's. However, because of the emergency nature of the project, Tier III (or biological) testing of the sampled sediments was not accomplished, therefore it was never ascertained whether or not these sediments were suitable or unsuitable for unconfined open water disposal. Because of this uncertainty, it was decided to treat the dredged sediments deposited within the Los Angeles River Estuary Borrow Pit as material not suitable for unconfined open water disposal. Through coordination with the California Coastal Commission and USEPA, Region IX, it was agreed that the sediments deposited within Estuary would require capping to isolate and confine the contaminants.

The Port of Long Beach deposited Pier J Access Channel sediments within the Los Angeles River Estuary Borrow Pit as capping material for the Los Angeles River Estuary dredged sediments. The capping method and sequencing was designed by the Corps of Engineers (Los Angeles District) using computer modeling techniques, and provided to the Port of Long Beach for implementation. The objective of the design was to uniformly cover the disposal mound with a 0.9 m (3 ft) cap thickness, without displacing the contaminated sediments. The Port of Long Beach accomplished the capping project over a two week time span in September 1995. Monitoring results, concluding that no migration of the cap has occurred, are discussed in the January 1997 Draft EA.

Potential 1998 Dredging and Disposal Requirements

Dredging 100,000 cy is considered a "stopgap" measure to prevent closure of the marina this year. Ideally, more material would need to be dredged to fully restore the entire navigation channel to authorized depths and provide an advanced maintenance area. Funding is not presently available, however, to accomplish dredging a project of this scale. Therefore, a similar dredging project will probably be required in 1998, prior to completion of any long-term, regional solution for disposal of contaminated material. As discussed above, should such projects be authorized, permitted and constructed this year and next, valuable information would be obtained for use in a larger scale, regional disposal strategy. The Corps is not currently submitting a Consistency Determination for a 1998 dredging project; this information is included to inform the Commission of future requirements. The Corps will coordinate with CCC staff at a later date to determine whether a new CD, or possibly a Negative Determination, would be required for a 1998 dredging and disposal project.

Need for a Consistency Determination for 1997 Dredging

A Consistency Determination is required for maintenance dredging, and disposal of dredged material, since the proposed operation could have an effect upon the coastal zone. The following Determination of Consistency is prepared in compliance with the Federal Coastal Zone Management Act of 1972, Section 307 (Title 16, U.S.C. Section 1456(c)), which states that Federal actions must be consistent with approved state coastal management programs to the maximum extent practicable. Sections of the California Coastal Act of 1976 applicable to this project, as determined by the Los Angeles District, include: Article 2 - Public Access (Sections 30210-30219); Article 3 - Recreation (Section 30220-30224); Article 4 - Marine Environment (Section 30230-30235); and Article 5 - Land Resources (Section 30240). This Consistency Determination summarizes the 1997 Maintenance Dredging EA. The EA provides greater detail on the proposed project, the existing environment, and the project's potential environmental effects.

It is the opinion of the Los Angeles District Corps of Engineers, based on a review of the applicable sections of the Act, and on the data presented in the EA prepared for the proposed maintenance dredging activities, that the Los Angeles River Estuary Maintenance Dredging Project is consistent with the California Coastal Act of 1976, to the maximum extent practicable. This Determination of Consistency has been prepared with the following applicable sections of the California Coastal Act of 1976:

a. Article 2 - Public Access (Sections 30210-30219):

The proposed maintenance dredging of the Los Angeles River Estuary and subsequent disposal at the Island Grissom borrow pit would not cause a significant adverse impact upon public access to Long Beach harbor, local beaches, or associated recreation facilities. Public

access would need to be limited within the immediate area of the dredging and disposal operations for safety reasons.

The dredging and disposal operation would be conducted such that obstruction to navigating vessels is minimized. The operation would be bounded by buoys and other markers to ensure that navigators are aware of the operation and can safely avoid the area. The dredge operator shall move the dredge for law enforcement and rescue vessels whenever necessary. This project will have an overall positive effect of enhancing public access through the Los Angeles River Estuary navigation channels and Queen's Way Marina by enhancing navigation.

b. Article 3 - Recreation (Sections 30220-30224):

Shoreline Village, public campgrounds, fishing areas, hotels, and restaurants are located along Queen's Way Bay (the mouth of the LAR). Recreation opportunities involve passive activities such as sightseeing, sunbathing, beachcombing, and picnicking. Harbor activities also include sportfishing, commercial cruises, tour boats, boating, and sailing. Within the LA/LB Harbor complex, several major charter boat companies provide and charter service to Avalon and Isthmus Cove on Santa Catalina Island, including Catalina Cruises in Queen's Way Marina. These recreation charters also serve specialized activities, including sportfishing, scuba diving, whale watching, and harbor touring.

Dredging activities at the Los Angeles River are intended to provide a safe, navigable channel. The project will result in an immediate benefit to navigation, and to businesses based in Queen's Way Marina. Public access to nearby recreation facilities will remain available during the construction period. This project may have a temporary, insignificant impact on recreation fishing at the disposal site.

c. Article 4 - Marine Environment (Sections 30230-30235);
d. Article 5 - Land Resources (Section 30240):

Potential changes in water quality in the form of pollutants, toxic materials, trace metals, and turbidity may result due to resuspension of bottom sediments during dredging activities. A turbidity monitoring program will be implemented to reduce this impact to a level of non-significance by ensuring that high levels of suspended solids are restricted to the immediate dredge and disposal areas.

Physical and chemical testing of the material to be dredged is currently underway, however, the results will not be available until mid-January. At that time, the data will be sent to the CCC staff, as an amendment to this CD. The results will probably be similar to previous sampling that occurred in the area, as discussed below.

Testing of material taken from the LAR in October 1994 indicated that a portion of sediment at that site, at that time, was unsuitable for disposal at LA-2 (sample area 10; see

Appendix B). Almost half of the material was silt. Liquid/Suspended Phase tests, Solid Phase tests, and 28-day exposure period for bioaccumulation testing were completed, as well as bulk sediment chemical analysis. Sediment in one sample area exceeded LPC requirements based on the results of the solid-phase study with the amphipod Grandidierella japonica, and therefore was not considered suitable for ocean disposal (MEC 1995). This area also exhibited toxicity in the Liquid/Suspended Phase tests, but this may have been due to high levels of ammonia.

The City of Long Beach conducted physical and chemical tests of two new samples in January, 1995, after shoaling occurred. The new material was composed primarily of sand, and contained fewer contaminants than the fines that were tested in October, 1994. The top layer of contaminated fines that were present in October were probably washed out of the area by the storms, and replaced by a layer of coarse-grained, clean material.

The proximity of the borrow pit disposal site to the river mouth dredge site indicates that sediment from both areas would likely be similar in quality and grain size. Physical and chemical testing was done concurrent with the 1995 emergency dredging to document compatibility of dredge material with the disposal site, and to determine mitigation requirements (MEC 1995). This testing confirmed that sediments from the dredge site and disposal site were similar, and moreover, that sediments from both sites were not exceedingly contaminated.

EPA review of the 1995 chemistry data, however, indicated particular concern with elevated levels of Polyaromatic Hydrocarbons (PAHs). The EPA would not have permitted this material for open-water disposal in a non-emergency situation, and had recommended that the Corps design and place a cap to cover the potentially contaminated sediments. The Corps complied with this recommendation to the extent that clean sediments from dredging projects undertaken at the Port of Long Beach and/or the Port of Los Angeles were approved for use as capping sediments. The site will continue to be monitored to assess the value of this capping operation as a permanent solution to isolate potentially contaminated sediments in the borrow pit.

This project may also contribute to a decrease in dissolved oxygen levels and light penetration, which may result in a temporary decrease in aquatic primary productivity. Turbidity, if significant, has the potential to cause clogging of respiratory and feeding apparatuses of sedentary bottom fish and filter feeders. Motile organisms, however, will probably evacuate and avoid the dredging and disposal areas and temporarily relocated to adjacent undisturbed areas. Most of the impacts would be confined to the immediate vicinity of the dredging and disposal activities, with turbidity levels dissipating rapidly through resettlement. See Section 5.3 of the EA for additional discussion of water quality impacts.

The benthic fauna and flora within the immediate dredge and disposal areas may be eliminated by the dredging activities. The creation of the newly denuded dredged areas will form the basis for rapid recolonization of biological habitats within the construction limits.

Therefore, benthic habitat loss will be short-term as rapid recolonization is expected to occur.

Birds, fish, and other motile species will likely avoid the immediate dredging area, and thus avoid direct impacts. Some species may be attracted to the disposal site, to feed on the benthic organisms dredged from the river. Dredging activities will not cause significant adverse impacts to fish, wildlife, or their associated habitats.

Federally-listed threatened or endangered animal species that may occur in the project area include: California brown pelican (Pelecanus occidentalis californicus); California least tern (Sterna antillarum browni); light-footed clapper rail (Rallus longirostris levipes); peregrine falcon (Falco peregrinus); marbled murrelet (Brachyramphus marmoratus); and the western snowy plover (Charadrius alexandrinus nivosus). Threatened and endangered species are discussed in Sections 4.5 and 5.5 of the EA. With the implementation of environmental commitments as outlined in the EA (and summarized below), these species would not be affected by this project.

Dredging and disposal operations are expected to be completed prior to the least tern's nesting season. Unavoidable delays due to storms or mechanical breakdowns, however, could result in activities continuing beyond April 1. Interference with least tern foraging could be a concern if turbidity from dredging impacted surface water clarity over a substantial portion of preferred foraging areas during the breeding season. The USFWS has confirmed that terns do forage within the LAR, although the relative importance of this site compared to other areas has not been documented.

This project (including the proposed capping project) is not expected to affect food availability or nesting success. Least terns would continue to forage in the unaffected portions of Los Angeles and Long Beach harbors, the LAR, and nearshore, and would **probably** not be affected by the temporary disturbance caused by dredging the mouth of the LAR. The deeper water in the area of the borrow pit is also not an important or frequently used foraging site. For this reason, capping operations are not expected to affect tern foraging behavior or reproductive success, even if the cap is placed during the tern's nesting season.

The lack of field data regarding the frequency of least tern foraging within the LAR requires the Corps to assume that this site is an important feeding area for least terns. Therefore, although the Corps does not expect this project to adversely affect least terns, the Corps will commit to implementing a turbidity monitoring program in the event that dredging and disposal occurs during the tern's nesting season (April 1-September 15). The intent of this monitoring program is to ensure that any turbidity plume that may be formed is minimized, and that significant turbidity does not extend beyond 100 feet of the dredge. The specific procedure, including possible corrective actions, has been coordinated with the U.S. Fish and Wildlife Service, and is outlined in the Draft EA.

Several species of marine mammals may be transient visitors to the LA/LB area, but these species are also not expected to be affected by this project. Because dredging and disposal activities will not affect any threatened or endangered species, or its designated critical habitat, formal consultation pursuant to the Endangered Species Act is not required.

APPENDIX D

WATER QUALITY MONITORING PLAN

Post-April 1 Dredging Contingency Plan for Protection of Least Terns

SURFACE WATER TURBIDITY MONITORING PROGRAM

I. PURPOSE

The U.S. Fish and Wildlife Service (USFWS) has expressed concern that summer dredging at Los Angeles Harbor would cause turbidity and affect the ability of the endangered California least tern to forage in these waters. (Summer dredging is not proposed, but equipment failure and late-winter storms have, in the past, extended various dredging projects into the least tern's nesting season.) This surface water turbidity monitoring program has been developed to determine if a significant turbidity plume emanates from the dredge and is visible at or near the surface of the water. Hydraulic pipeline dredges generally produce little surface water turbidity. Hopper and mechanical dredges are more likely to produce a turbidity plume that extends some distance from the dredge. If a significant turbidity plume is identified, as discussed below, measures will be taken to modify dredging to avoid impacts to least terns feeding in the vicinity.

II. INITIATION

If and when it appears that operations may continue beyond **March 20**, the Corps of Engineers will inform the USFWS. If it is determined that the extended dredging may impact least terns, the procedures outlined below would be implemented.

III. BASELINE DATA

A. The Corps or a qualified contractor shall collect baseline surface water turbidity information in the area to be dredged, and in the nearshore disposal site.

B. Baseline data shall be collected daily for a period of seven (7) days, **within the river estuary and near the disposal site**, in areas that are outside of any visible turbidity plume **(at least 500 ft. from the dredge)**.

1. Samples shall be collected three (3) times daily during the baseline data collection period.

2. Samples shall be collected during daylight hours.

3. Samples may be collected at random times during the day, but the interval between sampling on any given day shall be no less than four (4) hours and no more than eight (8) hours.

4. Samples shall be collected from five (5) representative sites **(three (3) within the river estuary and two (2) near the disposal site)** each time samples are collected.

C. Surface water clarity/turbidity shall be measured in feet, using a standard Secchi disk.

1. Readings shall be taken from a boat small enough to obtain accurate Secchi disk readings.

2. The same or similar type of boat shall be used for all readings to assure consistency.

D. The investigator shall prepare a list of values and compute the mean and standard deviation.

1. The baseline data shall be made available to the Environmental Resources Branch (ERB), Los Angeles District, U.S. Army Corps of Engineers, and the USFWS, Carlsbad, California.

2. The baseline data shall be used as a basis to determine if significant surface water turbidity is associated with the dredging activity.

IV. DREDGE-RELATED TURBIDITY MONITORING

A. At the same time baseline data is being collected, surface water turbidity adjacent to the dredge shall be monitored daily for a period of seven (7) days, following the schedule prescribed in II. B. 1-3 above.

B. Surface water turbidity shall be monitored weekly during the remainder of the dredging episode, also following the schedule prescribed in II. B. 1-3 above.

C. Dredge-related measurements shall be taken no more than 100 feet from the dredge.

D. A control measurement shall also be taken within the project area, at least 500 feet from the dredge, each time a dredge-related measurement is taken.

E. The investigator shall compare each dredge-related measurement with the baseline data.

1. If a dredge-related measurement falls within the standard deviation of the baseline data, at the 95% confidence level, dredging-related turbidity is assumed not to be significant.

2. If a dredge-related measurement falls outside the standard deviation of the baseline data, at the 95% confidence level, turbidity will be assumed to be

dredging-related, and corrective action will be taken (see IV RECOMMENDATIONS, below).

F. The investigator shall report to ERB and USFWS any dredge-related measurement of turbidity that falls outside the standard deviation at the 95% confidence level. ERB will notify the contracting officer immediately to notify the contractor to immediately modify operations as recommended below.

V. RECOMMENDATIONS

A. If turbidity at the dredge site is significantly higher than baseline and control site values, as determined in III. E. 2-3 above, the contractor will be required to immediately modify dredging to eliminate the effect of turbidity on least terns feeding in the project area. Modifications could include one or more of the following:

1. Limiting dredging to ebb tides
2. Limiting dredging to hours when least terns do not feed (night).
3. Use of a turbidity curtain.
4. **Slowing operations (dredging at a slower rate).**

B. If modifications do not successfully limit the effect of surface water turbidity by April 1, dredging may be terminated or further restricted.

C. If excess turbidity is due to a problem in a limited area, such as shallow water or fine sediments, the restrictions may be lifted after dredging of that problem area has been completed if monitoring shows that surface turbidity is no longer significant.

D. The investigator shall compile the results of monitoring into a report. The report shall be submitted to ERB within 30 days of completion of dredging. ERB shall provide the USFWS a copy of this monitoring report.

VI. COORDINATION

A. Appropriate resource agencies (i.e. USFWS, California Department of Fish and Game, California Coastal Commission) will be given an opportunity to review this plan.

B. Resource agencies may assist in the monitoring program.

C. Any party observing visible surface-water turbidity in the vicinity of the dredge after the initial 7-day dredge-related monitoring program should contact ERB and USFWS and appropriate measures will be taken.

APPENDIX E

Correspondence and Response to Comments

RESPONSE TO COMMENTS

City of Long Beach, Department of Public Works

COMMENT: The City is requesting the Corps to extend the dredge limits to include the entrance to Shoreline Lagoon (minimum depth of -20 feet).

RESPONSE: We regret that the Corps has neither the funding nor the authorization to dredge the entrance to Shoreline Lagoon.

Worldport LA

COMMENT NO. 1

RESPONSE: The Corps mission includes Navigation, Flood Control, and Environmental Protection and Restoration. While it may seem sufficient to state navigation as the sole purpose of this project, it would not be accurate from an environmental standpoint. By disposing marginally contaminated materials (see Appendix A) in the existing (contaminated sediment) borrow pit, the Corps will not significantly impact the surrounding resources or environment, thus preserving both. Likewise, dredging now to alleviate the need for emergency dredging in this area, falls well within the Corps mission of Navigation safety. These two purposes will therefore remain in the EA as described in Section 2.2.

COMMENT NO. 2

RESPONSE: Per Appendix A, a cap will no longer be required for this project. Supplemental test data for both the estuary and borrow pit were submitted to the Coastal Commission, EPA, and other members of the Contaminated Sediment Task Force (CSTF) after the distribution of the Draft EA. The data shows that sediment quality (level of contamination) is similar in both the dredge and disposal area and that material placed in the borrow pit is not likely to migrate. The agencies concurred with the Corps' determination that capping would not be required. This information had not been fully available prior to the completion of the DEA.

COMMENT NO. 3

RESPONSE: The document has been modified to reflect a closure of the channel situation due to siltation, but still includes a discussion of "anticipated" emergency dredging. Closure of the channel would have severe economic consequences and would most likely result in a request for emergency action.

COMMENT NO. 4

RESPONSE: All reasonable Alternatives must be evaluated in the EA before they are ruled unfeasible. Sediment chemistry testing must be done to define current conditions. It cannot be assumed that since historically, material from this area has not been suitable for ocean disposal and therefore, will never be suitable for ocean disposal. In fact, testing shows that some material (outside of the current dredge limits) may be suitable for ocean disposal. As stated in response to comment no. 2, supplemental data regarding new sediment testing analysis is contained in Appendix A, which was unavailable at the time of the draft submittal of the EA.

COMMENT NO. 5

RESPONSE: See Appendix A.

COMMENT NO. 6

RESPONSE: The Corps concurs. The document has been revised to reflect this change.

COMMENT NO. 7

RESPONSE: The Corps concurs. The document has been revised to reflect this change.

COMMENT NO. 8

RESPONSE: In this case, "Significant" would be termed as a 20% increase in turbidity over baseline turbidity meter readings.

Heal the Bay

COMMENT NO. 1

RESPONSE: The Corps concurs that capping would be of "no significant environmental benefit to the estuary". Sediment test results included in Appendix A show that the material to be disposed in the borrow pit is marginally contaminated. The borrow pit itself is depositional, therefore, any cap material placed after operations would be overlain by contaminated estuary material in a relatively short period of time.

The Corps also concurs that certain mitigation requirements should be included in the proposed project due to sediment contaminant concentrations being, in some cases, consistently above ER-Ls. The Corps additional environmental commitments are contained in Appendix A, and are summarized as follows:

- The Corps has committed to using silt curtains and closed-bucket attachment if a clamshell dredge is used, to minimize turbidity to the maximum extent practicable during operations.

- The Corps will provide documentation specifying the type of dredging equipment to be used. Documentation will include attendant mitigation measures for the type of equipment used. This documentation will be submitted to the Coastal Commission Executive Director.

COMMENT NO. 2

RESPONSE: The Corps has also committed to continue to participate in Contaminated Sediment Task Force (CSTF) and Technical Advisory Committee (TAC) coordination meetings. The Corps will work with CSTF/TAC to develop a plan of study for the Los Angeles River Estuary and the estuary Borrow Pit. The details of the study are as follows:

- The purpose of the study will be to investigate and evaluate the effectiveness of the Borrow Pit as a sediment trap.

- The scope of this study will be defined jointly by the CSTF/TAC and the Corps, and will be subject to the Corps' budgetary constraints and Congressional appropriation.

The Corps hopes that the results of the proposed study will provide essential information to the Task Force, the joint goal being the continued commitment to protect the environment.

Friends of the Los Angeles River (FOLAR)

COMMENT NO. 1 (Maintenance Dredging & Disposal Overview)

RESPONSE: The Corps will take FOLAR's recommendations under advisement, as many of these recommendations are already included in the proposed study of the Los Angeles River Estuary (see RESPONSE to COMMENT NO. 2, Heal the Bay, and APPENDIX A). The Corps, in conjunction with the Contaminated Sediment Task Force and the Technical Advisory Committee (CSTF/TAC) are committed to finding solutions to upstream management of the Los Angeles River. A regional solution is in the best interest of both the public and the environment, both of which it is the Corps' mission to serve. The study findings as well as all relevant information gathered for the study by the Corps and the CSTF/TAC will be made available to the public.

COMMENT NO. 2 (Proposed Action)

RESPONSE: The Corps is no longer proposing to cap the disposal site. The existing cap is considered stable, based on the November 1996 study that determined the site is depositional.

This study used at least 20 years of historic flow rate data to predict currents over periods of 1, 5, 10, 20 and 50 years. Bathymetry surveys will be conducted at least once a year, indefinitely (depending on availability of funds).

COMMENT NO. 3 (Affected Environment)

RESPONSE: The Corps concurs. Reference to the beneficial uses in the project area as designated by the Regional Water Quality Control Board (RWQCB) has been incorporated into the EA.

COMMENT NO. 4a (Environmental Effects)

RESPONSE: Samples collected from the Los Angeles River Estuary were found to be predominantly fine-grained sediments classified as clay, fine-grained sand, and silt. Fine-grained sediments would be suspended for a few hours after operations in the area cease, whereas coarse-grained material would settle almost immediately after dredging or disposal. The extent and duration of the turbidity plume also depends on frequently changing factors such as winds, currents, and tides. The estimates given in the EA may be considered a "worst-case" scenario. We expect the dredging and disposal project to be completed within approximately 30 days, barring equipment failure or storm delays.

COMMENT NO. 4b

RESPONSE: Few fish or birds are expected to occur within the immediate dredge area. Temporary relocation of these individuals would have no impact on population dynamics within the estuary. Considering the constantly motile nature of these species, it is not possible to quantitatively estimate the number of individuals that will occur within or adjacent to work areas.

COMMENT NO. 4c

RESPONSE: Although fish occurring within the immediate dredge area may dive deeper or scatter to adjacent areas, pelican foraging is not restricted to the Queensway Bridge. Pelicans and least terns will continue to forage on the edge of the turbidity plume, unaffected portions of the estuary, Los Angeles and Long Beach Harbors, and nearshore waters. Few, if any, least terns are expected to be in the area when operations begin. In the unlikely event that dredging continues into least tern breeding season, turbidity monitoring will be conducted as outlined in Appendix D (which allows increased turbidity immediately adjacent to the dredge, but requires readings to approach background levels within 100 feet of the dredge).

COMMENT NO. 4d

RESPONSE: According to the USFWS, the clapper rail does not occur in the project area, therefore, no impact to this species will occur.

COMMENT NO. 4e

RESPONSE: SPI surveys conducted in and near the borrow pit, and at the North Energy Island borrow pit, indicate that the benthic community consists of fairly common species, and is therefore expected to recover far more quickly than indicated by this "worst-case" scenario. The vast majority of the estuary will be unaffected, and fish, mammals, and birds will continue to forage in adjacent areas.

COMMENT NO. 4f

RESPONSE: Fish are not confined to the project site, and therefore will be able to avoid lethal concentrations of suspended sediments (although a few fish may become entrained in the dredge). Natural "mixing and flushing" occurs during tidal exchanges, and as winds and currents move the water.

COMMENT NO. 5 (Commitments and Mitigation)

RESPONSE: The Corps has committed to additional environmental protection measures in conjunction with this project (see RESPONSE to COMMENTS 1 and 2, Heal the Bay). Various agencies, specifically the California Coastal Commission and U.S. Fish and Wildlife Service concur on the sufficiency of these measures.

The Corps has various environmental restoration projects underway that include portions of the Los Angeles River. Dominguez Gap Spreading Grounds is one such project. As stated, the Corps is committed to environmental restoration and protection, however, funds for any undertaking must be obtained through Congressional appropriation. Congressional appropriation is a lengthy process, however, local sponsors have been successful in petitioning Congress for projects such as these.

A water quality improvement program is a recommendation that would probably be incorporated in the study plan as referenced in RESPONSE to COMMENT NO. 2, Heal the Bay. The Corps and the CSTF/TAC welcome recommendations that will be helpful in formulating the proposed study plan.

U.S. Fish and Wildlife Service

COMMENT NO. 1

RESPONSE: The decision to initiate dredging after September 1, and the agreement with the USFWS concerning turbidity monitoring, were reached after the draft EA was distributed. The Final EA has been modified.

COMMENT NO. 2

RESPONSE: Proposed channel alignments and depths were developed through numerical modeling, based on a shoaling analysis, watershed sediment yield, historical dredging, and historical bathymetry. An economic analysis will be completed within a few months. At that time, the Los Angeles District Corps of Engineers will forward this information through the appropriate channels for Congressional approval, which we hope will be obtained before the next dredging cycle. In any case, future maintenance work will most likely occur within the currently proposed channel dimensions.

COMMENT NO. 3

RESPONSE: The subject "baseline studies" were conducted specifically to provide information to the Contaminated Sediment Task Force (CSTF).

COMMENT NO. 4

RESPONSE: Based on updated sediment chemistry results, and with the approval of the CSTF, the Corps is no longer proposing to cap the disposal mound. However, post-disposal bathymetric surveys will be conducted annually.

COMMENT NO. 5

RESPONSE: This paragraph has been revised. Cap thickness ranges from 2 to 2.3 feet.

COMMENT NO. 6

RESPONSE: See response to Comment 4, above.

COMMENT NO. 7

RESPONSE: Borrow pit depths range from -10.6 meters to -15.5 meters MLLW (see bathymetry maps in Appendix A). The disposal mound will be placed in areas 12-14 meters deep, and the top of the mound is expected to occur at a depth of -11 meters.

COMMENT NO. 8

RESPONSE: Dredging occurs only where necessary to protect navigation. Although previous projects used emergency funds, the current project has been specifically funded for maintenance dredging. However, funds are not sufficient to remove all shoaled material within the newly defined channel limits; therefore, this project will affect only a small portion of the estuary (near Queensway Bridge).

COMMENT NO. 9

RESPONSE: As with all Corps-maintained harbors and navigation channels, it is in the Federal interest to remove obstructions before the channel becomes completely blocked and an emergency situation develops. If shoaling was allowed to continue to such an extent, more dredging would be necessary over a wider area to reopen the channel. Also, the expedited planning and implementation process inherent in an emergency project may not allow for certain environmental protection measures that would otherwise be included, such as turbidity monitoring and avoidance of the least tern's breeding season. This project includes such protection measures, limits dredging to a small portion of the estuary, and restricts disposal to a confined site.

COMMENT NO. 10

RESPONSE: See response to Comment 2, above.

COMMENT NO. 11

RESPONSE: The proposed dredge area is directly within the navigation channel leading to Queen's Way Marina. The Corps will be dredging only those areas that are necessary to maintain navigation, by removing direct obstructions as well as mounds of sediment that would otherwise move into, and block, the central channel. WRDA 1988 authorized the Corps to propose channel limits and depths to ensure safe navigability. This authorization does not limit the project depth at -20 feet MLLW.

COMMENT NO. 12

RESPONSE: Borrow pit depths range from -10.6 meters to -15.5 meters MLLW, and the surrounding area is approximately -9 meters MLLW (see bathymetry maps in Appendix A).

COMMENT NO. 13

RESPONSE: The Corps is no longer proposing to cap the disposal mound.

COMMENT NO. 14

RESPONSE: The document has been revised.

COMMENT NO. 15

RESPONSE: The document has been revised.

COMMENT NO. 16

RESPONSE: Comment noted.

COMMENT NO. 17

RESPONSE: See response to Comment 1.

COMMENT NO. 18

RESPONSE: Updated bathymetric maps are included in the Final EA (Appendix A). Figures 6 and 7 represent historic least tern foraging areas. Changes in the harbor configuration do not appear to have significantly changed available foraging area.

Environmental Protection Agency, Region IX

(Informal Comments. Responses included in APPENDIX A)

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

January 9, 1997

Office of the Chief
Environmental Resources Branch

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

Enclosed for your review and comment is a copy of the Draft Environmental Assessment (DEA) for the proposed 1997 Los Angeles River Estuary Maintenance Dredging Project. The U.S. Army Corps of Engineers (Corps) proposes to remove approximately 100,000 cubic yards (cy) of sediment from the Los Angeles River estuary navigation channels, to restore safe navigability within the reach between Queensway Marina and Long Beach Harbor. Material will be dredged with a hopper, hydraulic pipeline, and/or clamshell dredge. The proposed disposal site is a previously excavated "borrow pit" offshore of Island Grissom. This site was also used for last year's emergency dredging operation at the Los Angeles River. Material from this year's operation would be placed adjacent to the capped mound that was created in 1995. Dredging and disposal operations are expected to occur between March and April, 1997.

Attached to the DEA, as per informal coordination with Mr. James Raives of your staff, is a Determination of Consistency with the California Coastal Act. Please respond with comments on the Environmental Assessment, staff recommendations and Commission findings on the Consistency Determination by February 7, 1997. Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325
Attn: Ms. Hayley Lovan

If you have any questions regarding the project, please contact Ms. Hayley Lovan, Project Ecologist, Environmental Support Section, at (213) 452-3863, or Ms. Stephanie Hall, Project Coordinator, Environmental Support Section, at (213) 452-3862.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

March 6, 1997

Office of the Chief
Environmental Resources Branch

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

The U.S. Army Corps of Engineers (Corps) hereby requests that the Los Angeles River Estuary Maintenance Dredging and Disposal Demonstration Site Project (Long Beach, California) be postponed from the Coastal Commission's March hearing. Upon further analysis, the Corps wishes to include supplemental data that was not available when the original Coastal Consistency Determination (CCD) was submitted. This supplemental data will be provided under separate cover letter by March 14, 1997. This extension will also allow the Corps adequate time to respond to concerns outlined in the Commission's Staff Recommendations (CD-005-97).

The Corps also agrees to extend the regulatory time restriction to April 25, 1997. It is also requested that the above stated project CCD be placed on the April Commission Meeting Agenda. Correspondence may be sent to the above address, Attn: Ms. Stephanie Hall. If you have any questions regarding the project, please contact Ms. Hayley Lovan, Project Ecologist, Environmental Support Section, at (213) 452-3863, or Ms. Stephanie Hall, Project Coordinator, Environmental Support Section, at (213) 452-3862.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

E-11

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
911 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA 90017-3401

REPLY TO
ATTENTION OF:
Navigation Section
Construction-Operations Division

April 7, 1997

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

The U.S. Army Corps of Engineers (Corps) hereby requests that the Los Angeles River Estuary Maintenance Dredging and Disposal Demonstration Site Project (Long Beach, California) be postponed from the Coastal Commission's April hearing. An additional month will be required to address Staff concerns. This information will be provided under separate cover letter by April 11, 1997. Previous supplemental information has been provided to respond to several concerns outlined in the Commissions's Staff Recommendations (CD-005-97).

The Corps also agrees to extend the regulatory time restriction to May 23, 1997. It is requested that the above stated project CCD be placed on the May Commission Meeting Agenda. If you have any other questions, or require further assisstance, please contact Mr. Doland Cheung at (213) 452-3400.

Thank you for your attention.

Charles S. Davis
for George L. Beams, P.E.
Chief, Construction-
Operations Division

E-12

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

April 22, 1997

Office of the Chief
Environmental Resources Branch

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

This letter modifies the U.S. Army Corps of Engineers Consistency Determination (CD) for the Los Angeles River Maintenance Dredging and Disposal Demonstration Site Project (CD-005-97), by withdrawing the original proposal to cap sediments deposited in the Los Angeles River borrow pit. The Corps still proposes to dredge approximately 100,000 cubic yards of material. This material will be dredged from the Los Angeles River estuary, near Queen's Way Marina, and disposed within the borrow pit "uncapped". This decision is based on chemical test results which were not finalized at the time of the original proposal to cap. Based on these results (previously provided to your staff), it has been determined that the level of contamination present in the proposed dredge material is similar to that in the borrow pit. Therefore, it is the Corps determination that confinement of this material within the borrow pit without a "clean" cap would not have an adverse impact on the surrounding environment (borrow pit or estuary).

As suggested by Mr. James Raives of your staff, the Corps will commit to studying the effectiveness of the borrow pit as a sediment trap. It is the Corps' intention to develop a detailed plan of study. The study will be developed in consultation with the Contaminated Sediment Task Force, Technical Advisory Committee (CSTF/TAC) by mid-August, 1997. The scope of the proposed study will be subject to the Corps' budgetary constraints, and the study would not be initiated prior to Fiscal Year 1998 (after September 30, 1997).

Although an alternative to the proposed study plan would be to "cap" as previously proposed, capping will preclude the proposed study plan. The borrow pit's

sand trapping capability would be significantly diminished, moreover, once disposal and capping activities are completed.

If you have any questions or concerns regarding this modification, you may contact Ms. Stephanie Hall, Environmental Coordinator, Environmental Resources Branch, at the above address, at (213) 452-3862. Representatives from the Corps of Engineers will attend the May 1997 Coastal Commission meeting, and will be available to answer staff or Commissioners' questions at that time.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

May 28, 1997

Office of the Chief
Environmental Resources Branch

Mr. Peter Douglas
Executive Director
California Coastal Commission
ATTN: Mr. James Raives
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Douglas:

This letter formalizes the Corps environmental commitments with regards to the Los Angeles River Estuary Maintenance Dredging project (CD-005-97). On May 16, 1997, the Coastal Commission Board concurred with the Corps findings that this project will not have a significant adverse impact upon the existing environment. The Board did however, recommend that the Corps commit to additional environmental safeguards.

Therefore, in the continued spirit of cooperation, and in accordance with the Coastal Commission board recommendations, the Corps commits to the following environmental protection measures (in addition to those specified in the Environmental Assessment):

Dredging Operations

- If a clamshell dredge is used, silt curtains and a closed clamshell bucket attachment will be used to minimized turbidity during operations.

- The Corps will provide documentation specifying the type of dredging equipment to be used. Documentation will include attendant mitigation measures for the type of equipment used. This documentation will be submitted to the Coastal Commission Executive Director.

Plan of Study

- The Corps will continue to participate in Contaminated Sediment Task Force (CSTF) and Technical Advisory Committee (TAC) coordination meetings. The Corps will work with CSTF/TAC to develop a plan of study for the Los Angeles River Estuary and the estuary Borrow Pit.

- The purpose of the study will be to investigate and evaluate the effectiveness of the Borrow Pit as a sediment trap.

- The scope of this study will be defined jointly by the CSTF/TAC and the Corps, and will be subject to the Corps' budgetary constraints and Congressional appropriation.

In closing, it has been determined by the Corps, based on the additional environmental measures outlined in this letter and outlined in Section 8.0 of the EA, that sufficient measures have been taken to ensure that any potentially adverse impacts from this project have been avoided or minimized to negligible levels.

Thank you for your continued participation in the coordination of this project.

Sincerely,

Robert S. Joe
Chief, Planning Division

STATE OF CALIFORNIA – THE RESOURCES AGENCY PETE WILSON, Governo

CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

May 21, 1997

Mr. Robert S. Joe
Los Angeles District, Corps of Engineers
Planning Division
P.O. Box 2711
Los Angeles, CA 90053-2325

Attention: Hayle Lovan

RE: CD-005-97, Consistency Determination for dredging navigation channel with disposal of contaminated material in borrow pit in Los Angeles River estuary

Dear Mr. Joe:

On 5/16/1997, by a vote of 10 in favor, 0 opposed, and 0 abstentions, the California Coastal Commission **concurred** with the above-referenced consistency determination. The Corps modified the project at the hearing and the the Commission found the modified project to be consistent to the maximum extent practicable with the California Coastal Management Program.

Sincerely,

James R. Raives
Coastal Program Analyst

cc: South Coast Area Office
NOAA Assistant Administrator
OCRM
Department of Water Resources
Governor's Washington D.C. Office

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

January 24, 1997

Office of the Chief
Environmental Resources Branch

Mr. Gail Kobetich
Field Supervisor
U.S. Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, California 92008

Dear Mr. Kobetich:

Please provide a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be affected by the proposed 1996 Los Angeles River Maintenance Dredging Project. Enclosed for your review and comment is a copy of the draft Environmental Assessment (EA) for this project. The list of endangered species included in this document was obtained from your agency in November 1994, during coordination for the proposed Port of Long Beach (Queen's Gate) Channel Deepening project.

The U.S. Army Corps of Engineers (Corps) proposes to remove approximately 100,000 cubic yards (cy) of sediment from the Los Angeles River estuary navigation channels, to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. Material will be dredged with a hopper, hydraulic pipeline, and/or clamshell dredge. The proposed disposed site is a previously excavated "borrow pit" offshore of Island Grissom. This site was also used for last year's emergency dredging operation at the Los Angeles River. Material from this year's operation would be placed adjacent to the capped mound that was created in 1995. Dredging and disposal operations are expected to occur between March and April, 1997.

Please respond with comments on the Draft Environmental Assessment, and a species list, within 30 days of receipt of this letter. Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325
Attn: Ms. Hayley Lovan

If you have any questions regarding the project, please contact Ms. Hayley Lovan, Project Ecologist, Environmental Support Section, at (213) 452-3863.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

February 6, 1997

Lieutenant Colonel Robert L. Davis
District Engineer, Los Angeles District
U.S. Army Corps of Engineers
P.O. Box 2711
Los Angeles, California 90053-2325

Attn: Ms. Hayley Lovan, Environmental Support Section

Re: Draft Environmental Assessment for the Los Angeles River Estuary Maintenance Dredging and Disposal Demonstration Site, Long Beach, Los Angeles County, California (Project No. **FP/COE-049**)

Dear Lieutenant Colonel Davis:

The Fish and Wildlife Service (Service) has reviewed the referenced document dated January 1997 and received by us on February 4, 1997. The following comments and questions are provided for clarification and incorporation in the final environmental assessment.

General Comments

In general, the referenced document addresses the project, existing resources, and the potential project impacts fairly accurately. However, the project description raises several questions that need clarification, Figures 4 and 5 have limited utility, and Figures 6 and 7 need updating to represent the current conditions. Without legible bathymetric maps, it is difficult to determine the extent of necessary maintenance dredging. In addition, no sediment quality data are included in the draft document for review. The Service recommends that the Corps of Engineers expeditiously define the boundaries and project depth of a Federal channel in the Los Angeles River Estuary to prevent further unnecessary deepening of the estuary. As you know, estuaries are highly diverse and productive, partly due to relatively shallow water depths.

Specific Comments

Page 1, paragraph 1: Coordination between the Corps and the Service indicated that the dredging would not occur until September 1, 1997, not between March and April. The agreement was that turbidity monitoring would not be required, provided that dredging began after September 1. The draft document conflicts with this Corps-Service agreement.

Page 2, paragraph 2: What is the current status of defining a Federal channel in the Los Angeles River Estuary? We recommend that the Corps expeditiously pursue this effort. A defined Federal channel would reduce many concerns of the Service by knowing the fixed channel boundaries and area of direct maintenance dredging impacts.

Page 2, paragraph 3: How do the baseline studies fit into the efforts of the Contaminant Sediment Task Force? Do we have duplication of efforts?

Page 3, paragraph 2: Since the Sediment Profile Imaging (SPI) is only useful to 1.0 foot, we suggest that a post-disposal bathymetric survey be conducted before the placement of cap material, followed by a post-capping bathymetric survey. Many benthic organisms will burrow 2-3 feet into the sediments, potentially bringing contaminants to the surface and reintroducing them into the food chain.

Page 3/4, last paragraph: We would be more concerned about the minimum thicknesses of the cap.

Page 4, paragraph 1: When will the dredged material disposed in the LAR borrow pit be capped and what is the source of capping material?

Page 5, paragraph 2: It is indicated that the maximum depth of the LAR borrow pit is -35 to -40 feet MLLW. This appears to conflict with the statement on page 6, paragraph 3. Needs clarification in the final document.

Page 5, paragraph 3: We are concerned about the unnecessary deepening of the Los Angeles River Estuary. It appears that dredging occurs where shoaling occurs, regardless of whether or not the shoaled area interferes with commercial navigation. It is indicated that the only funds available for dredging the Los Angeles River mouth are funds for emergency work. If this is the case, more than minimal dredging occurs during each dredging episode than is necessary. An emergency dredging action should be the minimum necessary to alleviate the emergency and not consist of a major project. With the improvement in water quality through the efforts of various agencies, the biological importance of the estuary increases. Productive estuaries are relatively shallow, therefore, we urge the Corps define a Federal channel so that the remainder of the estuary will be undredged.

Page 5, paragraph 5: Item 1) indicates that the dredging is not an emergency, but a preventive measure, which means the dredging is not currently necessary. It is not clear how item 3) preserves natural resources and the environment when dredging can occur anywhere in the estuary impacting biological resources in the process.

Page 6, paragraph 1: The Water Resources Development Act of 1988 directed the Corps to

perform maintenance dredging of the "existing Federal project" to the authorized depth of "20 feet". What is the description of the Federal project? This should be clarified in the final document. Also, what is the status of the Federal channel delineation if it is not part of the Federal project description?

Page 6, paragraph 2: The proposed area to be dredged appears to have no relationship to Queen's Way Marina for the most part. The proposed channel goes directly through the largest shoaled area as opposed to minimizing the dredging impacts to the estuary by dredging only the shoals that may impede safe navigation (i.e.,emergency). It is clear from Figure 4 that considerably less dredging would be required by connecting Queen's Way Marina with the safe navigation depths by dredging only the entrance to the marina and the two short stretches along the south side of the estuary. This would appear to be sufficient to remove the "emergency" situation. Again, just randomly dredging throughout the estuary has significant adverse impacts to the biological resources of the estuary. Shoals are highly productive areas and need to be preserved to the greatest degree possible. This paragraph also indicates that the upstream end of the estuary will be excessively overdredged to -27 feet MLLW, 7 feet deeper than the authorized Federal project depth (WRDA 1988). How can this be considered "emergency"? It also states that the dredging is expected to be completed by April 1997, which conflicts with what the Corps has been telling the Service.

Page 6, paragraph 3: What is the ambient water depths of the LAR borrow pit and the surrounding area?

Page 7, paragraph 2: How will the quality of the capping material, i.e., clay clumps, be monitored and enforced?

Page 14, paragraph 4: It should be stated that the ecological values of the estuary have been reduced by all of the stated reasons since 1870. The ecological importance of the estuary has significantly increased since 1870 due to scarcity of estuarine resources in the Southern California Bight.

Page 18, paragraph 5: The light-footed clapper rail does not exist in the project area, therefore, it should be removed from the final document.

Page 20, paragraph 1: The species listed as candidates are no longer considered candidates, however, they are considered sensitive species. They were former Category 2 candidate species.

Page 29, paragraph 3: It is the Service's understanding from the Corps that the dredging will begin on September 1, 1997, not during March. This needs to be clarified in the final document.

Figures: Figures 4 and 5 have very little utility because they cannot be read. A quality

bathymetric map should be included in the final document. Also, Figures 6 and 7 should be updated to represent current conditions in the Los Angeles Harbor.

Thank you for the opportunity to review and comment on the referenced document. I hope that our comments are constructive and helpful in the preparation of the final document. If you have any questions, please feel free to contact John Hanlon, Chief, Branch of Federal Projects, at (619) 431-9440.

Sincerely,

for
Gail C. Kobetich
Field Supervisor

cc: CDFG, Region 5, Long Beach, CA (Attn: R. Nitsos)
NMFS, Long Beach, CA (Attn: R. Hoffman)
CCC, San Francisco, CA (Attn: J. Raives)
RWQCB, Monterey Park, CA (Attn: R. Ghirelli)

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

January 24, 1997

Office of the Chief
Environmental Resources Branch

Mr. Robert Hoffman
National Marine Fisheries Service
501 West Ocean Blvd. Suite 4200
Long Beach, California 90802-4221

Dear Mr. Hoffman:

Please provide a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be affected by the proposed 1996 Los Angeles River Maintenance Dredging Project. Enclosed for your review and comment is a copy of the draft Environmental Assessment (EA) for this project.

The U.S. Army Corps of Engineers (Corps) proposes to remove approximately 100,000 cubic yards (cy) of sediment from the Los Angeles River estuary navigation channels, to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. Material will be dredged with a hopper, hydraulic pipeline, and/or clamshell dredge. The proposed disposed site is a previously excavated "borrow pit" offshore of Island Grissom. This site was also used for last year's emergency dredging operation at the Los Angeles River. Material from this year's operation would be placed adjacent to the capped mound that was created in 1995. Dredging and disposal operations are expected to occur between March and April, 1997.

Please respond with comments on the Draft Environmental Assessment, and a species list, within 30 days of receipt of this letter. Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325
Attn: Ms. Hayley Lovan

If you have any questions regarding the project, please contact Ms. Hayley Lovan, Project Ecologist, Environmental Support Section, at (213) 452-3863.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

January 24, 1997

Office of the Chief
Environmental Resources Branch

Mr. Michael Lyons
California Regional Water Quality Control Board
Los Angeles Region
101 Centre Plaza Drive
Monterey Park, California 91754

Dear Mr. Lyons:

Enclosed for your review and comment is a copy of the Draft Environmental Assessment (DEA) for the proposed 1997 Los Angeles River Estuary Maintenance Dredging Project. The U.S. Army Corps of Engineers (Corps) proposes to remove approximately 100,000 cubic yards (cy) of sediment from the Los Angeles River estuary navigation channels, to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. Material will be dredged with a hopper, hydraulic pipeline, and/or clamshell dredge. The proposed disposal site is a previously excavated "borrow pit" offshore of Island Grissom. This site was also used for last year's emergency dredging operation at the Los Angeles River. Material from this year's operation would be placed adjacent to the capped mound that was created in 1995. Dredging and disposal operations are expected to occur between March and April, 1997.

Attached to the DEA, as per informal coordination with Mr. Lyons is a Section 404(b)(1) Evaluation (Appendix B) and a Water Quality Monitoring Plan (Appendix D). Please respond with comments and recommendations within 30 days of receipt of this letter. Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325
Attn: Ms. Stephanie Hall

If you have any questions regarding the project, please contact Ms. Stephanie Hall, Project Coordinator, Environmental Support Section, at (213) 452-3862.

Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

July 23, 1997

Office of the Chief
Environmental Resources Branch

Ms. Cherilyn Widell
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 942896
Sacramento, California 94296-0001

Dear Ms. Widell:

We are writing in regard to completing Section 106 compliance for the Los Angeles River Estuary Maintenance Dredging (LAREMD) Environmental Assessment being prepared by our office. The proposed project will occur at the estuary of the Los Angeles River where it flows into the Pacific Ocean near the Port of Long Beach (Enclosure 1, attachments 1 and 2). The project entails dredging 100,00 yards of sediments and disposing it offshore in an existing borrow pit near energy Island Grissom.

The LAREMD project has been completed twice: first in 1989 and again in 1995 under emergency conditions. Compliance for the first project was completed with a letter from your office dated February 1, 1989. The emergency situation was coordinated with a letter of compliance from your office on June 14, 1995 (COE95051A). Your letter concurred with our determination that the project as planned would not involve historic properties. Compliance for the emergency dredging project was combined with consultation for maintenance dredging in Los Angeles Harbor.

There has been no change in the area of potential effects since the LAREMD was initiated in 1989. Therefore, we have determined that the proposed LAREMD project as planned will not involve National Register eligible or listed properties.

Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
Attn: Mr. Richard Perry (CESPL-PD-RN)
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

We request that you review the enclosed information. If you agree with this determination, we would appreciate your concurrence. We understand that you have 30 days in which to respond to this request, otherwise we will proceed according to the provisions stated in 36 CFR 800.4(d) and consider that we have discharged our obligations under Section 106. If you have any questions concerning this project or the determination, please contact project archeologist, Mr. Richard Perry, at (213) 452-3855.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

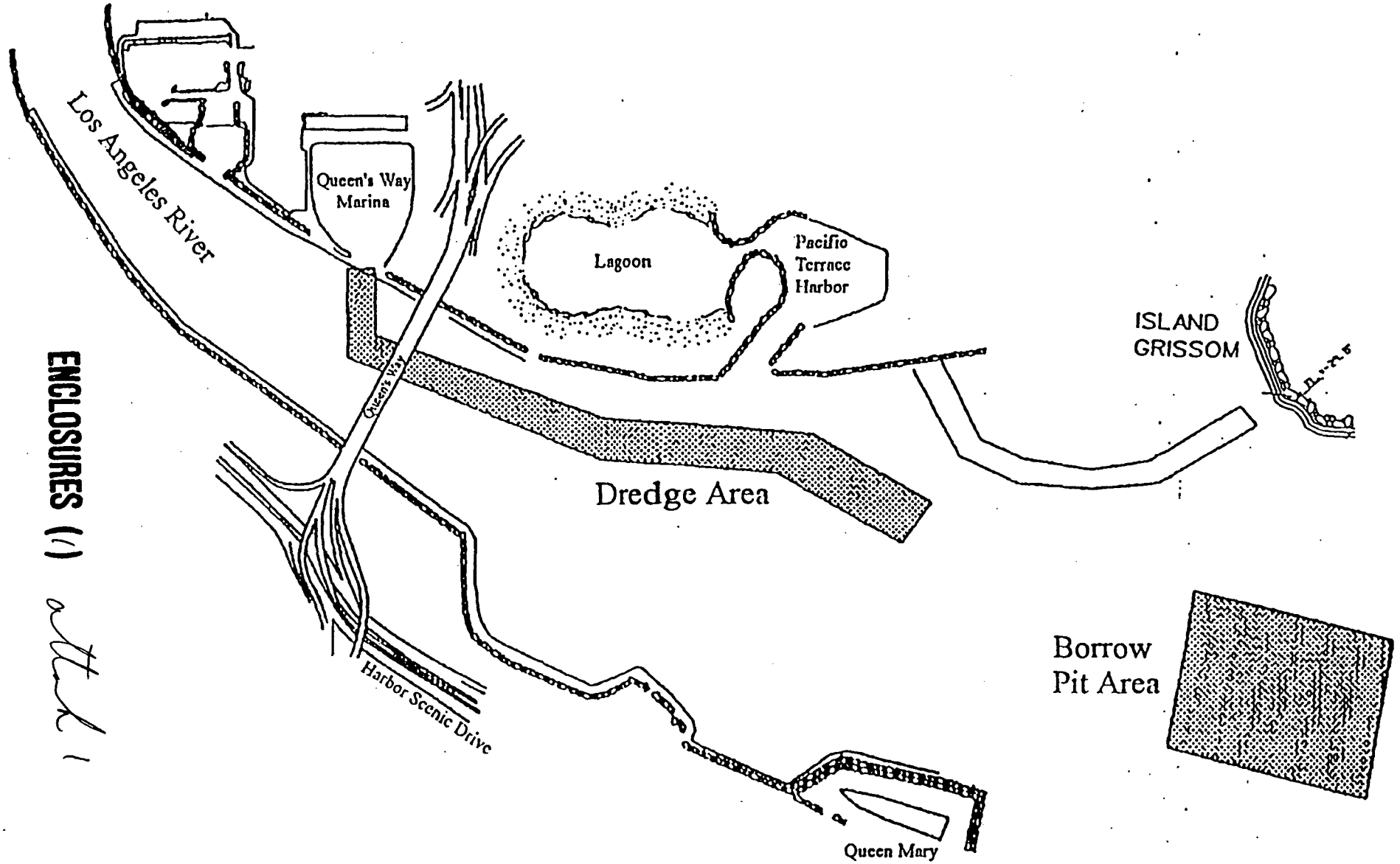


FIGURE 2: PROJECT LOCATION MAP

E-29

ENCLOSURES (1) attach 1

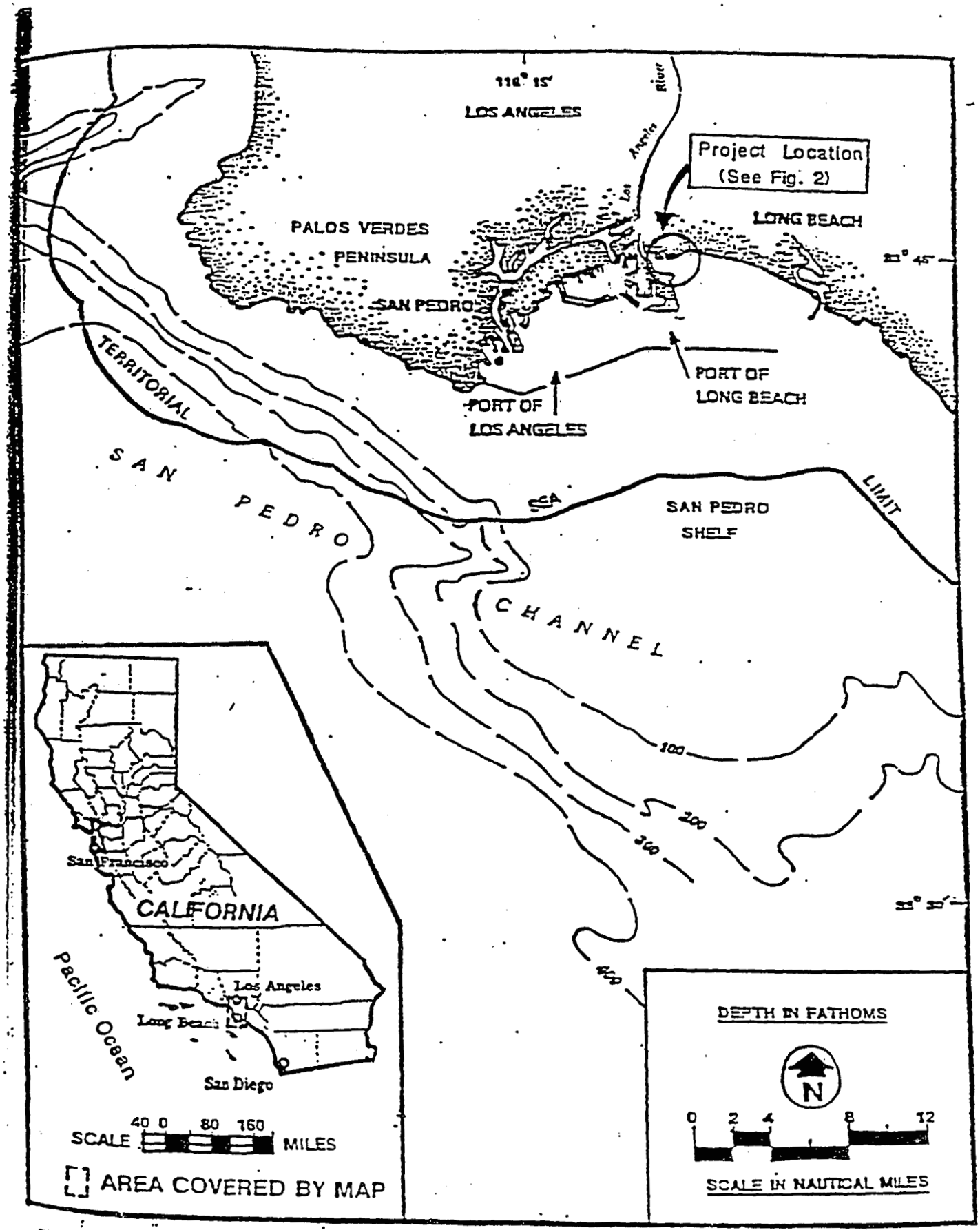


FIGURE 1 PROJECT VICINITY

ENCLOSURES ( ) attach 2

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2711
LOS ANGELES, CALIFORNIA 90053-2325

January 24, 1997

Office of the Chief
Environmental Resources Branch

TO INTERESTED PARTIES:

Enclosed for your review and comment is a copy of the Draft Environmental Assessment (DEA) for the proposed 1997 Los Angeles River Estuary Maintenance Dredging Project. The U.S. Army Corps of Engineers (Corps) proposes to remove approximately 100,000 cubic yards (cy) of sediment from the Los Angeles River estuary navigation channels, to restore safe navigability within the reach between Queen's Way Marina and Long Beach Harbor. Material will be dredged with a hopper, hydraulic pipeline, and/or clamshell dredge. The proposed disposal site is a previously excavated "borrow pit" offshore of Island Grissom. This site was also used for last year's emergency dredging operation at the Los Angeles River. Material from this year's operation would be placed adjacent to the capped mound that was created in 1995. Dredging and disposal operations are expected to occur between March and April, 1997.

Please respond with comments on the DEA within 30 days of receipt of this letter. Correspondence may be sent to:

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325
Attn: Stephanie Hall

If you have any questions regarding the project, please contact Ms. Stephanie Hall, Project Coordinator, Environmental Support Section, at (213) 452-3862. Thank you for your attention to this document.

Sincerely,

Robert S. Joe
Chief, Planning Division

Enclosure

March 6, 1997

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, CA 90053-2325
Attn: Stephanie Hall

Dear Mr. Joe:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE PROPOSED 1997 LOS ANGELES RIVER ESTUARY MAINTENANCE DREDGING PROJECT

Thank you for allowing us the opportunity to comment on this very important project. We received the subject document for review on February 4, 1997; our comments are attached.

We support your findings and feel that this type of operation is beneficial to both the need to perform maintenance dredging in our harbors and the desire to do so in a manner that is protective to the environment.

If you have any questions, please contact Mr. Larry Smith at (310) 732-3914.

Sincerely,

DONALD W. RICE
Director of Environmental Management

DWR:RA:LS
Attachment

ADP No.: 970219-500

Los Angeles Harbor Department
Comments
DRAFT ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED 1997 LOS ANGELES RIVER ESTUARY MAINTENANCE DREDGING PROJECT

- The given purposes for this project (p. 5 of the DEA) are overly general and do not deal with the specifics of this project. This is particularly true of the first and third purposes. The second purpose, by itself, is sufficient for this project. We recommend deleting the first and third purposes.
- What is the proposed depth of the cap to be placed above the contaminated materials? The project description (p. 6 of the DEA) does not contain this vital information. The discussion in "Environmental Effects" (p. 28 of the DEA) states that ""potentially contaminated sediment would be covered by at least one foot of clean material." The project description should include the exact depth of the proposed cap and the reasoning behind its selection or a range of thicknesses along with the criteria to be used to make the final determination.
- The discussion of the no action alternative (p. 7) states that a consequence of no action is "an emergency dredging episode during the coming winter season". Anticipated emergency dredging is not an emergency. This language should be modified to a requirement for dredging before winter to preclude closure of the channel due to siltation.
- The DEA discusses in great detail and evaluates the impacts of disposal at LA-2. We feel that there is sufficient information available to rule out this alternative. Sediments historically from this area have not been suitable for ocean disposal and there is no reason to believe that this has changed. We recommend that the discussion of this alternative (p. 8 of the DEA) be modified to rule out this alternative from further analysis and that all additional analyses in the DEA regarding this alternative be deleted.
- The discussion of the borrow pit disposal alternative (p. 8 of the DEA) includes the determination that sediments from the dredge and disposal sites are similar in both quality and grain size because of the "proximity" of the two sites. Data from past samples (p. A-23 of the DEA) do not support this conclusion. Sediments from the upper reaches are almost pure sand (92.8-87.7% sand). The disposal site is more of a silty sand averaging 50% sand and 50% silt and clay. The dredge site does grade down as you go downriver so that downstream samples are very close to the disposal site. We recommend that the section in the alternatives analysis (p. 8 of the DEA) be revised to more accurately discuss the differences and similarities as reflected by the previous samples. We do not believe that similarity in the quality/grain size of the sites is a critical factor in whether or not to dispose in the borrow pit area, but might affect the design or dredging/placement sequence of the project.
- The discussion on impacts to marine habitat (p. 13 of the DEA) states that "Because the navigation channels within the harbors and the LAR consist of unconsolidated sediment which is dredged periodically, they do not support vegetation." This statement is incorrect. These channels are not dredged often enough to preclude establishment of vegetation. Lack of vegetation is due more to physical conditions found in these channels including turbidity, channel depth, a lack of suitable substrate. We recommend revising this discussion to reflect these other factors.

E-32a

- The discussion of the impact of dredging activities on water and sediment quality (p. 25 of the DEA) includes the statement that "This impact would be minimized by limiting the turbidity plume created by dredging and open-water disposal operations, and by disposing contaminated material in an upland site." The upland disposal alternative was not considered feasible (p. 8 of the DEA); and the closely related beach or nearshore disposal alternatives were not considered feasible (p. 7 of the DEA). This option was not evaluated in this DEA. Stating that upland disposal will minimize water quality impacts is an incorrect statement. We recommend that this wording be deleted.
- The discussion on biological impacts of the borrow pit alternative (p. 30 of the DEA) state that corrective actions would be undertaken "If significant increases in turbidity as a result of dredging are determined to occur". Please define your use of the term "significant". How much of a reduction in Secchi disk readings would constitute a "significant increase in turbidity"?

CITY OF LONG BEACH

DEPARTMENT OF PUBLIC WORKS

333 WEST OCEAN BOULEVARD • LONG BEACH, CALIFORNIA 90802 • (562) 570-6383

March 17, 1997

Mr. Robert S. Joe, Chief Planning Division
U. S. Army Corps of Engineers
P. O. Box 532711
Los Angeles, CA 90053-2325

Subject: Draft Environmental Assessment - Comments

Dear Mr. Joe:

This is in response to your letter dated January 24, 1997, regarding the subject Environmental Assessment. The City has no comments on the environmental review.

The City, however, has one comment on the dredging project. The City is requesting the Corps to extend the dredging limits to include the entrance to Shoreline Lagoon (minimum depth of minus 20 feet) as highlighted in red on the attached "Project Location Map." Your cooperation with this request would be greatly appreciated.

Should you have any questions, please contact Richard Schacht, Division Engineer, at (562) 570-6386.

Sincerely,

Edward T. Putz

EDWARD T. PUTZ
CITY ENGINEER

RS:RM:ptr
60-106.ltr

Attachment

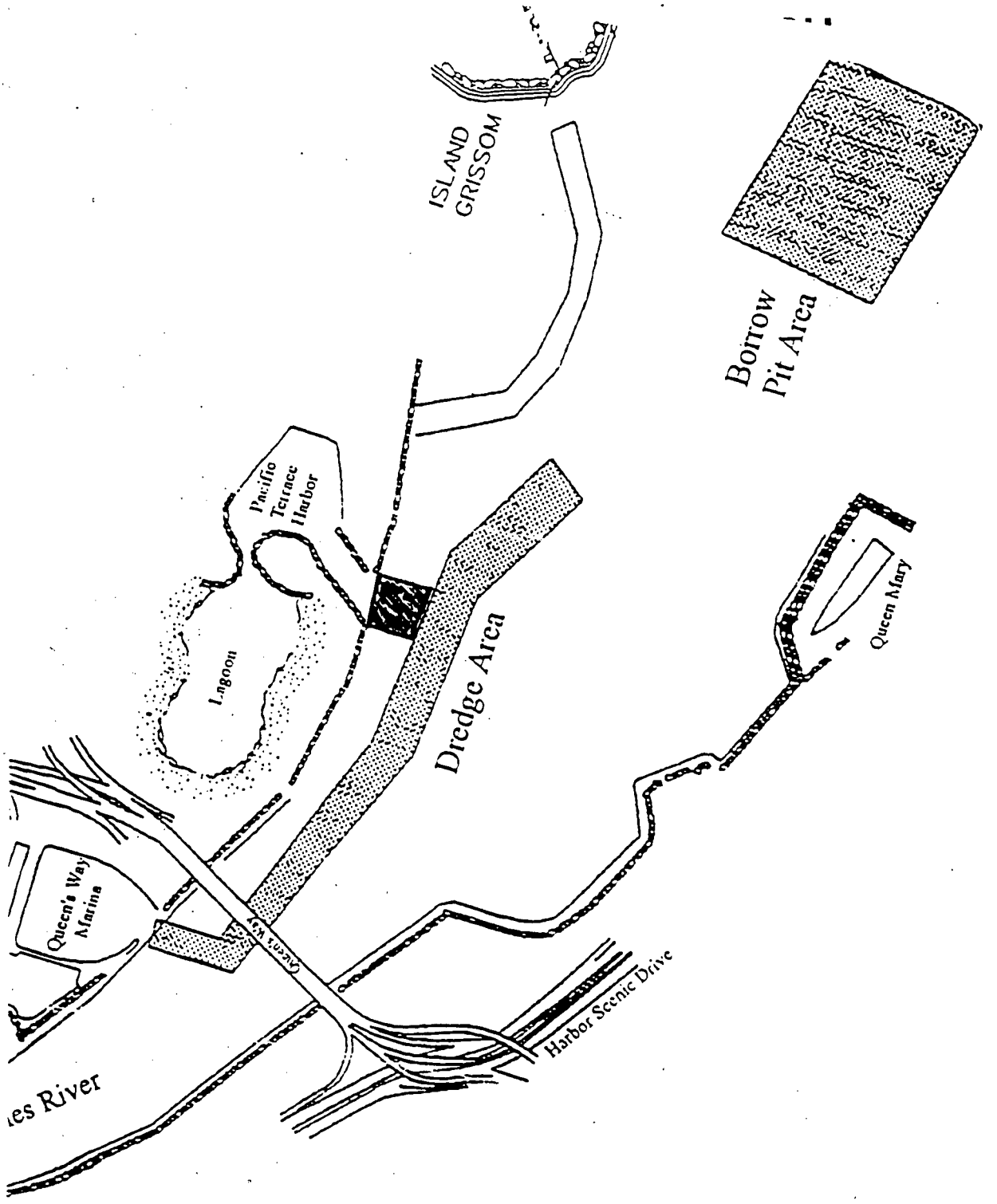
AIRPORT BUREAU
4100 DONALD DOUGLAS DR.
90808 (562) 570-2600
FAX(562) 570-2601

ENERGY RECOVERY BUREAU
120 HENRY FORD AVE.
90802 (562) 570-1196
FAX (562) 570-1230

ENGINEERING BUREAU
333 W. OCEAN BLVD., 9th FLOOR
90802 (562) 570-6383
FAX (562) 570-6012

INTEGRATED RESOURCES BUREAU
2929 EAST WILLOW ST.
90806 (562) 570-2850
FAX (562) 570-2861
TDD (562) 570-2863

PUBLIC SERVICE BUREAU
1601 SAN FRANCISCO AVE.
90813 (562) 570-2700
FAX (562) 570-2792
TDD (562) 570-2779



PROJECT LOCATION MAP

E-35

JBLIC SERVICE BUREAU
)1 SAN FRANCISCO AVE
90813 (562) 570-2700
FAX (562) 570-2793
TDD (562) 570-2779

Heal the Bay.

2701 Ocean Park Blvd.
Suite 150
Santa Monica CA 90405
310.581.4188 fax 310.581.4195
htb@pacificnet.net

May 7, 1997

California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105-2219

Re: Comments on consistency determination no. CD-005-97

Dear Commissioners:

On behalf of Heal the Bay, an environmental group dedicated to making Santa Monica Bay and Los Angeles County coastal waters safe and healthy again for people and marine life, I am registering the following concerns about the L.A. River Estuary maintenance dredging and disposal project. As you know, this project has been problematic for a number of reasons. The timing of the project, on the heels of the controversial Pier T project, could not have been worse. Also, the Commission has made it clear that it doesn't want to see any new capping and CAD site projects until after the Regional Contaminated Sediment Task Force has made recommendations for disposal of contaminated dredge spoils. In addition, the Corps' original proposal for the project, a borrow pit disposal-capping project, was described as a "pilot project" without any known scientific rationale for the need for the pilot.

After numerous meetings with the Task Force, we came to the conclusion that the capping idea was a waste of Corps funds and provided no significant environmental benefit to the estuary. However, the sediments were indeed contaminated and may pose significant ecological risk to the estuary. For that reason, we strongly disagree with staff mitigation findings for the dredging activity. Any time that sediment contaminant concentrations are consistently above ER-Ls (effects range-low for toxicity to marine organisms as determined by NOAA), the project proponent should be required to mitigate potential environmental harm through the use of silt curtains, environmentally sealed clamshell buckets or other appropriate technologies. We strongly encourage the Commission to add these requirements as an amendment to the Consistency Determination.

The other major concern we had was the lack of detail on the requirement for the study of the sediment removal efficiency of the borrow pit. At the last Task Force Technical Advisory Meeting, I suggested that the Corps should be allowed to proceed with the project providing that they complete a study that will greatly assist the efforts of the Task Force. Currently, we don't know what the sediment loads are to the estuary from the L.A. River. Also, we don't know where the sediments are transported to within the estuary. In addition, we have no estimate of the sediment removal efficiency of the borrow pit. And finally, we have no information on the

fraction of the L.A. River sediment load that is captured by the borrow pit. All of this information is essential for completing our goal of a Regional Contaminated Sediment Management Plan. Heal the Bay can not emphasize how important it is for the Commission to require the Corps to answer the aforementioned questions on the loads, fate and transport of sediments from the L.A. River. Also, the Commission must get a firm commitment from the Corps on the amount of funds they will spend to answer these research questions. Otherwise, there's a significant possibility that the Corps' fund allocation for the research will not be adequate to answer these questions.

Heal the Bay strongly believes that the Corps should be required to provide significant funding on sediment load, fate and transport because this project may have significant impacts on the ecology and water quality in the estuary. Also, the fact that the Commission is even allowing this project to take place after the Corps' previous poor applications, the Commission's responses to prior capping and CAD site issues, and the Corps' emergency dredging activities of 1995 and the problems caused by that activity, is exceedingly generous. Our organization is willing to withhold our opposition to the project, only if the previously mentioned mitigation concerns are adequately addressed by the Commission. Please seize this opportunity to protect the environment and provide essential information to the Task Force while still demonstrating the flexibility to allow the L.A. River estuary dredging project to occur.

If you have any questions on our comments, please call me at (310) 581-4188 x119.

Sincerely,

Mark Gold, D.Env.
Executive Director

Friends of the Los Angeles River

February 24, 1997

Mr. Robert S. Joe
Chief, Planning Division
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, CA 90053-2325
Attn: Stephanie Hall

Dear Mr. Joe:

Friends of the Los Angeles River (FoLAR) submits the following comments regarding *the Draft Environmental Assessment (EA) for Los Angeles River Estuary Maintenance Dredging and Disposal Demonstration Site, Long Beach, California, January 1997.*

MAINTENANCE DREDGING AND DISPOSAL OVERVIEW

The EA indicates that the Corps already identifies the activities described as inevitable since they are characterized "as part of its continuing program of regular maintenance dredging [in which the Corps] proposes to remove approximately 100,000 cubic yards (cy) of sediment from the mouth of the Los Angeles River estuary and to dispose of this material in an existing borrow pit off shore of Island Grissom, also at the mouth of the Los Angeles River".

Although the dredging and disposal activities result in impacts to the environment as described in the EA, the Corps plans to perform similar activities many, many times in future years and is now preparing a study for long term dredging spoils disposal at the North Energy Island (NEI) borrow pit.

Our suggestion is that the Corps think in terms of eliminating, to a large extent, the deposition of silt at the River mouth. Means to accomplish this are incorporated under river watershed management elements including, but not limited to: upstream detention, increased groundwater recharge, and wetlands restoration. These elements provide silt reduction measures while simultaneously improving water quality, water supply, and biological habitat. Obviously, any technique which solves more than one problem is going to save money. Watershed management is the best long term alternative to a "continuing program of regular maintenance dredging", and will save the Corps millions of dollars in dredging and associated costs, not the least of which are the environmental compliance requirements such as the preparation, review and approval of an EA.

Incidentally, the study for dredging spoils disposal at the NEI borrow pit is of interest to FoLAR and we wish to be advised of its progress as well as be placed on a mailing list to receive preliminary and draft copies.

PROPOSED ACTION

The EA states repeatedly that the disposed "material is expected to remain confined because no strong currents are expected to transgress the area". The EA goes on to use information from a six-month period as proof that migration of disposed sediments will not occur in the future. The information in the EA involves the sediment recently disposed in September 1995 and surveyed in March 1996.

It is our opinion that a record obtained over less than one year is far too little for concluding sediment

FoLAR P.O. Box 292134 Los Angeles, CA 90029 213.223.0585

migration will not occur. In fact, the currents occurring during the September 1995 to March 1996 time period are certainly not representative of currents to which the cap will be exposed. Presuming the cap is designed to last forever, a database of currents representative of long term conditions, and their computed effects on the disposal site, is necessary. Please provide the proper current information and analysis and base the EA statements on these facts.

The EA states that biannual monitoring, conducted over the next two years, will be performed on the newly placed material to verify the assumption that sediment migration will not occur. Since biannual is defined as once every two years, this means the Corps is offering to do one monitoring round. For the same reasons as given in the previous paragraph, we feel this is far too little monitoring and long term monitoring, on the order of once a year for 25 years or more, and more often during high frequency storms (10-year or greater), is necessary.

AFFECTED ENVIRONMENT

The EA states that "although the waters in the vicinity have been degraded, water quality is improving, and many species of fish and wildlife utilize the area" and that "continued improvement is anticipated". The EA should reference the beneficial uses in the project area as designated by the Regional Water Quality Control Board (RWQCB). The RWQCB has defined the project area as an Estuary and the identified beneficial uses range from fisheries habitat to recreation.

ENVIRONMENTAL EFFECTS

In section 5.3 Water and Sediment Quality, the EA states that dredging and disposal impacts would include "temporary" increases in turbidity and suspended solids, decreases in dissolved oxygen, and decreased light penetration confined to the immediate vicinity of the dredging operation. In addition, it is stated that the high percentage of silts at the site would result in suspension for "a period of time". The EA goes on to suggest the visible plume will dissipate in one or two hours, but the reference (LaSalle) indicates that dissipation time depends on the type of material dredged. Please determine if the material proposed to be dredged is consistent with that in the bibliographical reference. If so, please remove the vagueness in Section 5.3 and include a more definite period of time solids will be suspended. If not, please provide the estimated period, within 5%, of increased turbidity, suspended solids, decreased oxygen and decreased light penetration. Include in the total estimated period the times for dredging, disposal, and capping operations.

The time expected for increased suspended solids determined above is important in the analysis of biological resources described in section 5.4. The EA provides only general details about the direct and indirect impacts of the dredging and disposal activities on benthic organisms, fish species and bird populations. For example, the EA states that birds, marine mammals, and fish populations will tend away from the area during the time of disturbance. However, knowing the estimated time of disturbance, the EA needs to describe what effect will these relocations have on the existing bird, marine mammal and fish populations already settled in the adjacent areas. Quantification of the existing populations in the immediate and adjacent areas, as well as the impacts on the immediate and adjacent populations due to the project should be included.

Similar questions regarding biological resource are even more important in section 5.5 Threatened and Endangered Species. The impacts of relocated populations on ecosystems already present are crucial with respect to the brown pelican, least tern, etc. For example, what is the background supporting the statement in the EA that due to the project "fish may become unavailable to foraging pelicans and least terns, which depend on concentrated forage fish" but pelicans would not be affected by the dredging?
The EA also states that the USFWS has confirmed that terns do forage within the LA River, "although the

relative importance of this site compared to other areas has not been documented". However, the EA goes on to say that the importance of the area has not been determined because no-one has made organized observations of least tern foraging at the LA River yet! Therefore, until complete observations are provided, it should not be concluded in the EA that "it appears that most foraging occurs closer to Terminal Island", especially since the referenced material in the EA suggest that terns move to nearby areas such as in: "the estuary may attract greater numbers of terns than would otherwise forage so far from Terminal Island". What is the effect of the project on the reduction of food to the least tern at the estuary? Although the Corps offers to assume the estuary is an important least tern feeding area and to perform turbidity monitoring what is the recommended maximum allowable turbidity for tern foraging and how will that threshold be incorporated into the specific program for this project?

What is the effect of the project on the light-footed clapper rail?

The EA states that field studies of dredged areas have shown that [benthic] recolonization occurs within 2 weeks to 3 years after dredging stops. Under the 3 year repopulation scenario, what will be the effect on the marine ecosystem, including that on the predatory fish, and their predatory mammals and birds?

Why does the EA state that fish are known to be killed due to suspended silts yet lethal effects on fish from suspended sediment due to the project are not anticipated? What mixing and flushing are proposed as part of the project to eliminate fish kills?

COMMITMENTS AND MITIGATION

The project site is directly linked with the LA River. And it couldn't be written better that the River is a resource; the EA lists 14 different kinds of recreation dependent on the local water quality and 6 different kinds of seafood gathered commercially in the immediate project vicinity. The EA explains the connection of the LA River with the endangered brown pelican, least tern, peregrine falcon and others. The EA describes that the outer harbor serves as a nursery for a variety of nearshore marine fishes and that the inner harbor is a major resting area for water birds. It describes that marine mammals and sea turtles visit the project site routinely. These beneficial uses are not replaceable and must be protected.

We request that mitigation be provided as compensation because the area, and the associated beneficial uses, will be disturbed. The mitigation should be provided regardless whether the disturbance is "temporary" for a period of 3 weeks or as long as 3 years.

Mitigation should involve the two key factors as follows:

- **Partial restoration of the river estuary.** Restoration of the River estuary should be provided in locations between the river mouth to the Willow Street Bridge. Restoration should include native vegetation plantings, invasive plant removal, and wetlands construction. The restoration goals must be toward wildlife habitat expansion and enhancement as well as toward human educational and open-space purposes. In addition, native vegetation plantings (especially plants indigenous to the locale) should be provided in the linear park adjacent to the project area.

- **Water quality improvement program.** A water quality improvement program should be provided for the river that has a measurable benefit to the aquatic habitat. The program can include such techniques as run-off control measures for parking areas and buildings to

prevent trash and parking lot oils from entering water and the restriction of motor boaters and jet skis on the river from Ocean Blvd. to Pacific Coast Hwy.

Please let me know if you have any questions or wish to discuss these comments. I look forward to your reply.

Very truly yours,

Nina Danza

Nina Danza
Technical Advisory Board

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

May 21, 1997

Mr. Robert S. Joe
Chief, Planning Division
U S Army Corps of Engineers
P.O. Box 532711
Los Angeles, CA 90053-2325

Dear Mr. Joe:

This letter is in response to your letter dated January 24, 1997 requesting our interpretation of the Applicable or Relevant and Appropriate Requirements (ARARs) for the proposed dredging project of the Los Angeles River Estuary.

The South Coast AQMD recommends that the following District Rules and Regulations should be considered in the ARARs for the project:

Regulation II - Permits

Rule 201: Permit to Construct

This rule prohibits installation, alteration or replacement of any equipment without first obtaining written authorization for such construction from the Executive Officer of the AQMD if the use of the equipment may cause, eliminate, reduce or control the issuance of air contaminants (i.e., internal combustion engines that powers generators.)

Regulation IV - Prohibitions

Rule 401: Visible Emissions

This rule prohibits discharge of any air contaminant from any single source (i.e., internal combustion engines) for more than three minutes in any one hour which is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to a degree equal to or greater than 20 percent opacity.

Rule 402: Nuisance

This rule prohibits discharge of any material (including odorous compounds) that causes injury or annoyance to the public, property or business, or endangers human health, repose or safety. When transporting dredged materials to the disposal site,

every reasonable steps shall be taken to prevent discharge of odorous compounds into the atmosphere.

Rule 403: Fugitive Dust

This rule limits on site activities so that the concentration of fugitive dust at the property line shall not be visible. This rule only applies to an activity capable of generating fugitive dust. If the dredging activity is confined to wet sediments in the river and transportation of the dredged materials does not cause fugitive dust, there is no likelihood that the proposed project will violate the requirements of this rule.

Regulation X - National Emissions Standards for Hazardous Air Pollutants

This regulation implements the provisions of Part 61, Chapter I, Title 40 of the Code of Federal Regulations (CFR) under the supervision of the Executive Officer of the AQMD. It specifies emissions testing, monitoring, and procedures for handling of hazardous pollutants such as benzene, vinyl chloride, mercury and chloroform.

Regulation XI - Source Specific Standards

Rule 1166: Volatile Organic Compound Emissions from Decontamination of Soil

This rule applies to decontamination of soil with Volatile Organic Compound (VOC) emission of 50 ppm or greater. Prior to an excavation of such contaminated soil, a mitigation plan should be submitted and approved by the AQMD. The plan shall include the description of excavation methods and mitigation measures of VOC-contaminated soil.

Regulation XIII - New Source Review

This rule applies to any new or modified equipment which may cause the issuance of any non-attainment air contaminant, halogenated hydrocarbon or ammonia (i.e., operation of internal combustion engines that are not permitted to operate in the South Coast Air Basin). It requires all emission increases to be offset and all equipment to be constructed with BACT (Best Available Control Technology). It also requires substantiation with computer modeling that the equipment will not cause a significant increase in concentrations of specific contaminants.

Regulation XIV - Toxics

Rule 1401: New Source Review of Carcinogenic Air Contaminants

This rule specifies limits for maximum individual cancer risk and estimated excess cancer cases from new stationary sources and modifications to existing stationary

sources that emit carcinogenic air contaminants. Best Available Control Technology for Toxics (T-BACT) will be required for any source where a lifetime (70 years) maximum individual cancer risk is estimated to be one in a million or greater. The maximum individual cancer risk is calculated according to the procedures published by the AQMD.

If you have any questions regarding this matter, please call me at (909) 396-2317 or Mr. Brian Choe at (909) 396-2617.

Sincerely,

David Jones
A.Q.A.C. Supervisor
Public Facilities Team
Stationary Source Compliance

DJ:BJC:ARARLTR

APPENDIX F

Mailing List

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

U.S. Department of the Interior
Fish and Wildlife Service
2730 Loker Avenue West
Carlsbad, CA 92008
ATTN: JOHN HANLON

Environmental Protection Agency, Region IX
911 Wilshire Blvd. Suite 1430
Los Angeles, CA 90017
ATTN: STEVEN JOHN

Environmental Protection Agency, Region IX
75 Hawthorne St.
San Franciso, CA 94105
ATTN; BRIAN ROSS

Commander
11th Coast Guard District
400 Ocean Gate Blvd.
Long Beach, CA 90822-2399

U.S. Coast Guard - Marine Safety Office
165 N. Pico Ave.
Long Beach, CA 90802-1096
ATTN: CAPT. JAMES MORRIS

U.S. Naval Shipyard
Building 300
Long Beach, CA 90822-5099
ATTN: CAPT. PICKERING

U.S. Dept. of Transportation
400 Oceangate, #708
Long Beach, CA 90822
ATTN: KINGDON DIETZ

California Department of Fish and Game
Marine Resources
330 Goldenshore Suite 50
Long Beach, CA 90802
ATTN: DICK NITSOS

California Regional Water Quality Control Board
Los Angeles Region
101 Centre Plaza Drive
Monterey Park, CA 91754
ATTN: MICHAEL LYONS

Mr. Peter Douglas
Executive Director
California Coastal Commission
45 Fremont St. Suite 2000
San Francisco, CA 94105
ATTN: MARK DELAPLAINE

State of California
Department of Transportation
District 7
Transportation Planning and Analysis Branch
120 S. Spring St.
Los Angeles, CA 90012
ATTN: GARY MCSWEENEY
SENIOR TRANSPORTATION PLANNER

State Lands Commission
100 Howe Ave., #100S
Sacramento, CA 95852-8202
ATTN: JANE SMITH

State Lands Commission
245 West Broadway, Suite 425
Long Beach, CA 90802
ATTN: EXECUTIVE OFFICER

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

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

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

California Department of Boating & Waterways
1629 S Street
Sacramento, CA 95814

State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
ATTN: CHERYLIN WIDELL, AIA

Marine Bureau
205 Marina Drive
Long Beach, CA 90802
ATTN: RICHARD L. MILLER

South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182
ATTN: DAVID JONES

Port of Los Angeles
P.O. Box 151
San Pedro, CA 90733-0151
ATTN: EXECUTIVE DIRECTOR

Board of Harbor Commissioners
P.O. Box 151
San Pedro, CA 90733-0151

Port of Long Beach
P.O. Box 570
Long Beach, CA 90801
ATTN: EXECUTIVE DIRECTOR

Port of Long Beach
P.O. Box 570
Long Beach, CA 90801
ATTN: PLANNING DIRECTOR

City of Los Angeles
Public Works
Room 800 City Hall, Mail Stop 490
Los Angeles, CA 90012
ATTN: ROBERT S. HORII

City of Los Angeles
Dept. of Transportation
Room 1200 City Hall, Mail Stop 725
Los Angeles, CA 90012
ATTN: S.E. ROWE

City of Los Angeles
Environmental Affairs
200 N. Spring St.
Room 2403 City Hall
Los Angeles, CA 90012
ATTN: LILLIAN KAWASAKI

City of Los Angeles
Planning Department
Room 561c City Hall, Mail Stop 395
Los Angeles, CA 90012
ATTN: CON HOWE

Los Angeles County
Department of Planning
320 W. Temple
Los Angeles, CA 90012
ATTN: JAMES E. HARTL, DIRECTOR

City of Los Angeles
Department of Recreation and Parks
200 N. Main Street, City Hall E #1330
Los Angeles, CA 90012
ATTN: JACKIE TATUM

City of Los Angeles
City Clerk
Room 395 City Hall, Mail Stop 160
Los Angeles, CA 90012

Coastal and Harbor Hazards Council
1717 Crescent Avenue
San Pedro, CA 90731
ATTN: BEA ATWOOD HUNT

City of Long Beach
Planning & Building Dept.
333 W. Ocean Blvd.
Long Beach, CA 90802
ATTN: GENE ZELLER

City of Long Beach
City Clerk
333 W. Ocean Blvd.
Long Beach, CA 90802
ATTN: SHELBA POWELL

San Pedro Chamber of Commerce
390 West 7th Street
San Pedro, CA 90731

Wilmington Chamber of Commerce
1324-1/2 Avalon Blvd.
Wilmington, CA 90744

Head Librarian
Los Angeles Public Library
921 South Gaffey Street
San Pedro, CA 90731

Head Librarian
Wilmington Library
1300 N. Avalon
Wilmington, CA 90744

City of Long Beach - Main Library
101 Pacific Avenue
Long Beach, CA 90802

Executive Director
The Surfrider Foundation
122 S. El Camino Real, #67
San Clemente, CA 92672

Friends of San Pedro Bay
1955 Palacios Drive
San Pedro, CA 90732
ATTN: ROBERT GOLDBERG

Friends of the Harbor
211 W. 22nd Street
San Pedro, CA 90731

Friends of the Harbor
P.O. Box 15235
Long Beach, CA 90815
ATTN: BOB SEABOURN

Friends of the Los Angeles River
P.O. Box 292134
Los Angeles, CA 90029
ATTN: JIM DANZA

Greg Bombard
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San Pedro, CA 90733