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STAFF RECOMMENDATION

ON CONSISTENCY DETERMINATION

Consistency Determination No.	CD-035-07
Staff:	LJS-SF
File Date:	6/12/2007
60th Day:	8/11/2007
75th Day:	8/26/2007
Commission Meeting:	8/10/2007

FEDERAL AGENCY: **U.S. Army Corps of Engineers**

PROJECT LOCATION: Los Angeles River Estuary, City of Long Beach (Exhibits 1-3)

PROJECT DESCRIPTION: Maintenance dredging of the federal navigation channel in the Los Angeles River Estuary, and dredged material disposal at Port of Long Beach Pier G Slip, LA-2 ocean disposal site, and the nearshore zone off Bixby Park Beach in the City of Long Beach, Los Angeles County.

SUBSTANTIVE FILE DOCUMENTS: See Pages 20-21

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers has submitted a consistency determination for maintenance dredging of the federal navigation channel in the Los Angeles River Estuary (LARE) in the City of Long Beach. Conditions in the channel are unsafe for vessel operations due to shoaling of sediments transported into the estuary by the Los Angeles River during previous winter storm events. The channel width is significantly reduced and water depths now range between -0.7 feet to -18 feet mean lower low water (MLLW). Due to these restrictions and to return the channel to previously-established depths, the Corps proposes to dredge approximately 575,000 cubic yards (cu.yds.) of accumulated sediments to restore the channel depth to -18 to -20 feet MLLW.

Sediment testing established that 85,000 cu.yds. of sediments, located near the entrance to Queen's Way Marina, are unsuitable for unconfined ocean disposal. These materials will be mechanically dredged and placed in the Port of Long Beach Pier G slip. Approximately 16,250 cu.yds. of clean sediment from will be dredged from the navigation channel, transported to the slip, and deposited as a one-foot-thick cap over all the Area 1 sediments. Approximately 130,000 cu.yds. of clean sandy materials located in the sand trap will be dredged and disposed in the nearshore zone off Bixby Park Beach in the City of Long Beach, and 343,750 cu.yds. of clean sediments which are not suitable for beach replenishment or other beneficial reuses will be transported to and disposed at the LA-2 ocean disposal site. Dredging and disposal operations will occur between November 2007 and May 2008.

The proposed project would generate temporary impacts on recreational boating due to dredging activities in the LARE. These minor effects are outweighed by the significant improvements to recreational boating safety that will occur from the removal of shoaled sediments that currently obstruct the navigation channel in the LARE. The Commission has previously concurred with consistency and negative determinations for maintenance dredging in the LARE. The proposed maintenance dredging project is consistent with the public access and recreational boating policies of the CCMP (Coastal Act Sections 30210-12, 30220, and 30224).

Under Section 30233 of the Coastal Act, dredging and filling of open coastal waters is limited to those cases where the proposed project is an allowable use, is the least damaging feasible alternative, and where mitigation measures are provided to minimize environmental impacts. The proposed dredging of the navigation channel in the LARE and the disposal of those dredged sediments at LA-2, the nearshore zone for beach replenishment, and in the Pier G slip in the Port of Long Beach is an allowable use and is the least damaging feasible alternative. Mitigation measures are incorporated into the project where necessary to protect water quality and marine resources from dredging and disposal activities. The proposed maintenance dredging project is consistent with the allowable use, alternatives, and mitigation tests contained in the dredge and fill policy of the CCMP (Coastal Act Section 30233).

The consistency determination addresses the potential water quality and marine resource impacts from dredging operations, and in particular from the dredging of sediments that hold the potential (due to their location at the mouth of the Los Angeles River) to contain contaminants

harmful to marine organisms. The Corps reports that physical, chemical, and biological testing of project sediments in the LARE was conducted in 2005 and 2006, including water column and benthic bioassay and bioaccumulation tests. Based on the combined 2005 and 2006 sediment test results, the Corps developed a dredged material disposal plan that called for placing 130,000 cu.yds. of clean sand in the nearshore zone of Bixby Park Beach, placing 85,000 cu.yds. of unsuitable sediments into the Port of Long Beach Pier G slip, and disposing the remaining 360,000 cu.yds. of dredged materials at the LA-2 ocean disposal site. After the plan was reviewed by the Advisory Committee of the Los Angeles Contaminated Sediments Task Force, including members of the Commission staff, the Corps modified the project to include a one-foot-thick cap of clean sandy materials over the unsuitable sediments in the Pier G slip.

The unsuitable sediments in the LARE are currently exposed to the water column and are affecting water quality, marine habitat, and marine resources to some, albeit unquantifiable, degree. Dredging these sediments and placing them in the more isolated Pier G slip (where upon completion of disposal they will be capped with clean sandy materials and ultimately sequestered behind a rock dike and buried beneath a port landfill) permanently removes these materials from the marine environment. The potential temporary impacts to water quality and marine resources associated with the LARE dredging and the disposal of unsuitable sediments in the Pier G slip are out-weighed by the benefits of the permanent removal of these sediments from the marine environment. Turbidity effects at the nearshore disposal site will be localized and temporary due to the high sand content of the dredged sediments. While nearshore disposal off Bixby Park Beach will result in minor, short-term impacts to existing nearshore habitat, fish, plankton, and benthic organisms, affected species in the disposal area will recolonize the area soon after completion of the project.

The proposed dredging of sediments from the Los Angeles River estuary, the disposal of sediments suitable for unconfined aquatic disposal in the nearshore zone off Bixby Park Beach and at the LA-2 ocean disposal site, and the disposal of unsuitable sediments within the Port of Long Beach Pier G slip will not create significant adverse effects on coastal water quality or marine resources. Impacts will be temporary and localized due to the project's design, timing, and mitigation measures. The proposed project is consistent with the water quality and marine resource protection policies of the CCMP (Coastal Act Sections 30230 and 30231).

The proposed dredging and disposal project will not significantly affect environmentally sensitive habitat or endangered species found at these locations. The noise and activity of dredging is not anticipated to adversely affect brown pelicans that may rest on piers and other structures in the project area, as the pelican is generally tolerant of these types of human activities. While turbidity from dredging and disposal could prevent pelicans from foraging in the immediate vicinity of the dredge, pelicans would find other areas in the adjacent waters of San Pedro Bay and in offshore waters to forage that would not be affected by the proposed dredging activities.

Foraging in the LARE by the least tern could be affected due to turbidity and resultant changes in feeder fish distribution should dredging extend into May 2008. However, the LARE is not the primary foraging area for the Port of Los Angeles tern colony and the short-term nature of the

potential dredging incursion into the nesting season is not expected to create significant adverse effects on the species. Should it appear to the Corps that project dredging within the LARE will extend past May 1, 2008, the Corps has committed to contact the Commission staff no later than April 1, 2008, to determine if further federal consistency review is necessary in order to ensure adequate protection of least tern foraging activity in the LARE. With this commitment, the proposed project is consistent with the environmentally sensitive habitat and endangered species protection policies of the CCMP (Coastal Act Section 30240).

The project would dispose approximately 130,000 cu.yds. of clean sandy dredged material from the LARE sand trap in the nearshore off Bixby Park Beach in the City of Long Beach. The proposed dredged materials are physically compatible and chemically suitable for beach nourishment at this location. By placing the dredged materials at this location, they will remain in the longshore littoral system off the coast of Long Beach. The proposed project is consistent with the sand supply policy of the CCMP (Coastal Act Section 30233(b)).

STAFF SUMMARY AND RECOMMENDATION

I. STAFF SUMMARY.

A. Project Description. The Corps of Engineers (Corps) proposes to conduct maintenance dredging in the Los Angeles River Estuary (LARE) in order to facilitate vessel access to the Queen's Way Marina at the mouth of the Los Angeles River in the City of Long Beach (**Exhibits 1-3**). Heavy rains in southern California in the winter and spring of 2005 deposited large amounts of sediment at the mouth of the Los Angeles River, resulting in shoaling that prevented the Catalina Express Ferry and other commercial operating vessels from accessing their piers in the marina basin. As a result, the Commission's Executive Director concurred with a Corps of Engineers negative determination in March 2005 for emergency sidecast dredging of approximately 26,000 cu.yds. of sediment to re-open the navigation channel into the marina. However, current conditions in the navigation channel remain restrictive due to the narrow width and reduced depth of the existing channel; depths currently range from -0.7 feet to -18 feet mean lower low water (MLLW).

Due to these restrictions and to return the channel to previously-established depths, the Corps proposes to dredge approximately 575,000 cubic yards (cu.yds.) of accumulated sediments to restore the channel depth to -18 to -20 feet MLLW. The project area is divided into Areas 1-4 and the sand trap (**Exhibit 3**). Sediment testing established that the 85,000 cu.yds. of sediments in Area 1 are unsuitable for unconfined ocean disposal. These materials will be mechanically dredged and transported via tugboat and bottom dump scow and placed in the Port of Long Beach Pier G slip (**Exhibits 2 and 4**). The sediments will initially be used to create an underwater berm within the slip and the balance of the sediments will be placed in the area behind the berm and the back wall of the slip. Once all the unsuitable sediments from Area 1 have been placed within the slip, approximately 16,250 cu.yds. of clean sediment from Area 2 will be dredged and transported to the slip and deposited as a one-foot-thick cap over all the Area 1 sediments, including those used to create the underwater berm. This construction work is scheduled to occur between November 2007 and May 2008. (Beginning in August of 2008, the

Port of Long Beach will construct a rock dike adjacent to the south side of the berm and will completely fill the northern half of the slip to expand the upland area on Pier G, thereby permanently sequestering the Area 1 dredged materials beneath approximately two million cu.yds. of dredged material and an asphalt/concrete cap.)

Approximately 130,000 cu.yds. of clean sandy materials located in the sand trap will be dredged and disposed in the nearshore zone off Bixby Park Beach in the City of Long Beach (**Exhibit 5**). Dredged material will be placed in the nearshore environment as a submerged bar parallel to the beach in water depths of -20 to -30 feet MLLW and approximately 300 feet from the shoreline. The disposal area footprint is expected to be 330 feet wide by 1,970 feet long in the area bounded by Hermosa and Lindero Avenues. Material would be placed such that the final surface elevation would not exceed -15 feet MLLW to reduce potential navigation hazards to recreational boaters. The sediments will gradually move onshore by wave and current action and eventually increase the beach width. The sand trap sediments are compatible, both in grain size and color, with the receiver beach sands.

Approximately 343,750 cu.yds. of clean sediments from Areas 2, 3, and 4 which are not suitable for beach replenishment or other beneficial reuses will be transported to and disposed at the LA-2 ocean disposal site.

The proposed project includes monitoring of dredging operations as follows:

- The contractor will implement a water quality-monitoring plan at the dredge sites. Monitoring shall be conducted at 3 points (100 feet up current, 100 feet and 330 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 southwest from the dredge outside any visible plume. Water quality shall be monitored weekly throughout the project and will include turbidity, temperature, salinity, and pH; TSS samples will be collected on a monthly basis as a check on the turbidity measurements.

- Modifications to reduce turbidity may include but are not limited to using a silt curtain, using an enclosed clamshell bucket, 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 has been completed, and if monitoring shows that surface turbidity is no longer significant.

B. <u>Background</u>. Corps of Engineers maintenance dredging in the Los Angeles River estuary has generally involved contaminated sediments, and the issues surrounding the limited disposal options for these sediments over the past decade have included formulation of the Contaminated Sediment Task Force (CSTF) for the Los Angeles County Region,[1] pilot studies, use of the

1 Formed in 1998 to address the problem of managing contaminated dredged sediments.

area's offshore borrow pits and capping contaminated sediments, and, where feasible and when the material is structurally usable, disposal in port landfills.

Past Commission authorizations for Los Angeles River estuary dredging include:

ND-032-05. On March 18, 2005, the Commission staff concurred with the Corps' negative determination for the temporary sidecasting of 26,000 cu.yds. of maintenance-dredged material from the Los Angeles River navigation channel. The dredging was the minimum amount needed to enable the Catalina ferry to operate, pending the larger, subject, consistency determination. The grain size testing showed high (93%) sand content, but sediment chemistry results indicated minor contamination from several chemical constituents attached to fine sediments, and the bioassay test results indicate an unidentified source of contamination. Given the test results and the need for further analysis of the bioassay results, the material was sidecast and not proposed for beach replenishment. The 10-day dredging project included restrictions such as limiting work to low current regimes, dredging equipment operating in a controlled manner to minimize resuspension and spillage of sediments, and turbidity monitoring.

CD-028-01. On May 9, 2001, the Commission concurred with the Corps' consistency determination for several pilot studies using 170,000 cu.yds. of contaminated dredged sediment from the Los Angeles River estuary. The project involved both aquatic capping and chemical treatment with subsequent upland disposal. The aquatic capping component of the project consisted of placing contaminated sediment in the North Energy Island Borrow Pit (NEIBP) east of Island White offshore of Long Beach. The material would then be capped with up to approximately 170,000 cu.yds. of clean material dredged from the South Energy Island Borrow Pit (SEIBP). The chemical treatment (cement stabilization) component of the project consisted first of a "bench-scale" (laboratory study) mixing of the contaminated sediments with a cement-based product to produce structurally stable soil material. This would be followed by a larger project transporting up to 19,000 cu.yds. of contaminated sediments to a staging area, mixing the sediments with a cement-based product, with the ultimate goal of using the material for beneficial reuse as a source of structural fill.

ND-021-99. On March 15, 1999, the Commission staff concurred with the Corps' negative determination for Los Angeles River estuary maintenance dredging, with disposal at LA-2 (for clean material) and at the Pier E/Slip 2 landfill in the Port of Long Beach (for contaminated material).

CD-94-98. On December 9, 1998, the Commission concurred with the Corps' consistency determination for 585,000 cu.yds. of Los Angeles River maintenance dredging. Approximately 390,000 cu.yds. of clean material was disposed at LA-2, and 195,000 cu.yds. of contaminated material was disposed at the Pier E/Slip 2 landfill in the Port of Long Beach.

CD-005-97. On May 16, 1997, the Commission concurred with the Corps' consistency determination for 100,000 cu.yds. of Los Angeles River maintenance dredging, with disposal at a previously excavated offshore "borrow pit" within estuary. Originally proposed for capping, the material was not capped after the Commission agreed with the Corps that capping was not

necessary because the disposal site was in the same vicinity (Los Angeles River estuary) as the dredge site, the sediment in the disposal site was physically and chemically similar to the material proposed for dredging, and the borrow pit was essentially functioning as trap for contaminated material discharged from the Los Angeles River. Part of the rationale was the desire for evaluating the borrow pit as a sediment trap, to assist studies and alternatives analyses for the Contaminated Sediment Task Force.

CD-43-95. On July 14, 1995, the Commission concurred with the Corps' "after the fact" consistency determination for emergency dredging of the L. A. River channel in February/March 1995. The emergency dredging was necessary because winter storms resulted in significant shoaling within navigation channels and interfered with use of those channels. The Corps dredged approximately 300,000 cu. yds. of material, with disposal at the Island Grissom Borrow Pit. Because of potential sediment contamination (the material had not been fully tested), the Corps modified its consistency determination to include temporary placement of a sediment cap. The Commission was concerned that the cap thickness, 1.75 to 5 feet, might not be thick enough to fully isolate the contaminated material, and that the grain size of the cap material may be too small to assure its permanence. Also, the Corps had not conducted any of the studies necessary to assure that it designed the cap to isolate the sediments from disturbance associated with ocean currents, wave energy, Los Angeles River flood flows, or benthic infauna (burrowing organisms). Because of these concerns, the Corps, EPA, and the Commission staff negotiated modifications to that project. Those modifications included placement of a temporary cap, monitoring it, and designing a permanent contained aquatic disposal site at this location. The Corps agreed to submit a new consistency determination for the permanent contained aquatic disposal site within three years. The Corps also agreed to monitor the temporary cap to ensure that it was containing the contaminated sediment. The Commission also noted that removal of the contaminated sediment from the "borrow pit" might be more environmentally damaging then capping it in place. After-the-fact testing analysis showed the material to be contaminated, as had been suspected. The Corps capped this material with 175,000 cu.yds. of clean material (Pier J access dredging)[2]. The three- foot-thick cap was placed without displacing the contaminated sediments. The Port of Long Beach accomplished the capping project over a two-week period in September 1995. Subsequent monitoring results concluded that no migration of the cap had occurred.

CD-011-91. On April 9, 1991, the Commission concurred with the Corps' consistency determination for maintenance dredging of the L.A. River estuary. The issue was not over disposal (which was proposed for Pier J), but rather the type and timing of dredging. The Commission staff had previously concurred with two negative determinations: (a) ND-010-90, 142,000 cu.yds. of maintenance dredging between May and September; and (b) ND-039-90, a project revision to include an option for use of a clamshell dredge if needed during emergencies, and to be conducted between September 1 through November 23. Under this second concurrence, 42,000 cu.yds. of material was dredged (by hydraulic dredge); however the project was terminated due to contractor problems. The project was then revised to consist of a volume

2 The Corps accomplished this through its permitting of the Port of Long Beach's dredging, which the Commission reviewed as (CC-41-95 and 5-95-111).

of 103,000 cu.yds., use of a clamshell dredge, and dredging during the least tern nesting season (i.e., after April 15). Because clamshell dredging causes greater turbidity levels, and turbidity adversely affects least tern foraging, the staff requested, and the Corps agreed to submit, a consistency determination, rather than a negative determination. The Corps' subsequent submittal included commitments for use of a silt curtain to reduce turbidity, and for turbidity monitoring.

ND-10-90. On April 4, 1990, the Commission staff concurred with a negative determination by the Corps of Engineers for maintenance dredging of the L.A. River estuary, with disposal at the Pier J expansion landfill, at the Port of Long Beach.

The Corps also examines in its consistency determination the problems associated with developing regional disposal solutions for dredged materials in the Los Angeles region:

> *Maintenance dredging activities in the Los Angeles Region (the Region), including at the LARE, have been hampered over the last decade because much of the sediments accumulating in local harbors do not meet state and federal criteria for unconfined open ocean disposal, and disposal areas for contaminated materials are unreliable and difficult to permit. Regional solutions for this problem have been the focus of on-going efforts by the Los Angeles Contaminated Sediments Task Force (CSTF) member agencies and the USACE. The Los Angeles CSTF has worked for the past 7 years to develop suitable disposal and reuse alternatives for contaminated sediments in the Region, primarily through the USACE's ongoing development of the Los Angeles Regional dredge material management plan (DMMP) and the CSTF's Long-Term Management Strategy (LTMS). The Los Angeles Regional DMMP will serve as a regional management framework, covering multiple ports and harbors, including the LARE.*

C. Federal Agency's Consistency Determination. The Corps of Engineers has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

II. STAFF RECOMMENDATION.

The staff recommends that the Commission adopt the following motion:

MOTION: I move that the Commission **concur** with consistency determination CD-035-07 that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).

Staff Recommendation:

The staff recommends a **YES** vote on the motion. Passage of this motion will result in an agreement with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution to Concur with Consistency Determination:

The Commission hereby **concurs** with the consistency determination by the Corps of Engineers, on the grounds that the project described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the CCMP.

III. Findings and Declarations:

The Commission finds and declares as follows:

A. Recreational Boating. Section 30220 of the Coastal Act provides that:

Coastal areas suitable for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30224 of the Coastal Act provides in part that:

Increased recreational boating use of coastal waters shall be encouraged . . . .

In addition, Sections 30210-30212 of the Coastal Act require maximization of public access and recreational opportunities.

The Commission has historically recognized that shoaling of Los Angeles River estuary interferes with recreational boating at the Queen's Way Marina. The Corps states in its consistency determination that:

The Los Angeles River Flood Control Channel, designed as a sediment diversion channel, was constructed between 1919 and 1923. Soon after the construction of the flood control channel, the City of Long Beach constructed recreational small-craft facilities and recreational ferry landings along the banks of the estuary. 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 using facilities along the estuary such as the Queensway Marina.

The consistency determination examines the public access and recreational resources of the Los Angeles River estuary (LARE):

The LARE hosts several major charter boat operators that provide passenger and charter service to Santa Catalina Island from bases within the estuary including Queensway Marina. The passenger and charter services support recreational activities such as sport fishing, scuba diving, whale watching, and harbor sightseeing. The Queen Mary, permanently docked on the southern shoreline of the estuary, attracts over a million visitors

a year, and contains hotel accommodation and restaurants. Most recently, Carnival Cruise Lines has begun operating a dock facility for its cruise ships on property adjacent to the Queen Mary.

Recreational boating in the area is primarily supported by the Long Beach Shoreline Marina and Rainbow Lagoon/Marina located in downtown Long Beach. Rainbow Lagoon/Marina is located next to the Long Beach Aquarium and is composed of 103 commercial and recreational boat slips and a 61-m day mooring dock. Opened in 1982, Shoreline (Downtown) Marina has 1,844 recreational boat slips located adjacent to Shoreline Village with retail shops and restaurants. Along the downtown side of the estuary shoreline, the Aquarium of the Pacific, recreational vehicle parking, and retail and entertainment venues are found. Sailboat regattas, day sailing events, power-boat cruising, offshore power-boat racing, and other water-based recreational events take place throughout the year. In addition, a public boat ramp is located directly across from the Queensway Bay docks.

Primary vessel types using the navigable waters in the estuary include passenger and charter ships, recreational boats, and dinner and harbor cruise ships.

The beaches of Bixby Park and the adjacent Bluff Park are used primarily as passive recreational facilities. Walking paths provide views of the Pacific Ocean, the City of Long Beach landmarks (the Queen Mary and the Long Beach Marina, etc.), shipping traffic and recreational vessels, and wildlife.

Winter storms generate shoaling in the estuary and the resultant shallow water depth causes significant disruption to boat traffic in the estuary and at the entrance to the Queensway Bay Marina. In turn, this navigation hazard adversely affects southern California recreational boating activities based in the marina. To prevent severe shoaling and possible closure of the marina, the Corps proposes to maintenance dredge the existing navigation channel within the LARE to allow unobstructed passage of vessels in and out of Queensway Bay Marina. The proposed project would generate temporary impacts on recreational boating due to dredging activities in the LARE. These minor effects are outweighed by the significant improvements to recreational boating safety that will occur from the removal of shoaled sediments that currently obstruct the navigation channel in the LARE. The Commission has previously concurred with consistency and negative determinations for maintenance dredging in the LARE. The Commission finds that the proposed maintenance dredging project is consistent with the public access and recreational boating policies of the CCMP (Coastal Act Sections 30210-12, 30220, and 30224).

B. <u>Dredging and Filling</u>. Section 30233 of the Coastal Act provides the following in relevant part:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no les feasible environmentally damaging alternative, and where feasible mitigation

measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

. . .

(2) Maintaining existing, or restoring previously dredged, depths in existing navigation channels, turning basins, vessel berthing and mooring areas, and boat launching ramps

. . .

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

The proposed maintenance dredging and disposal project needs to be examined for consistency with Section 30233 of the Coastal Act. Under this section, dredging and filling of open coastal waters, including disposal of dredged materials, is limited to those cases where the proposed project is an allowable use, is the least damaging feasible alternative, and where mitigation measures are provided to minimize environmental impacts. The proposed dredging of the navigation channel in the Los Angeles River estuary and the disposal of those dredged sediments is an allowable use under Section 30233(a)(2).

In evaluating the proposed project, the Corps considered several alternatives: no project, temporary storage (aquatic and upland), dredged material treatment (sand separation, immobilization, chemical removal), and disposal alternatives (ocean, beach, nearshore, confined nearshore or submerged facilities, upland landfills, shallow water habitat). The Corps rejected the no-project alternative because it would not benefit existing recreational boating facilities and activities in the project area. The Corps rejected the other project alternatives due to infeasibility, the lack of suitable locations for implementation, and/or technical obstacles. The proposed disposal locations are the nearshore zone off Bixby Park Beach (where sandy dredged materials will nourish the beach), the Pier G slip in the Port of Long Beach (where dredged materials unsuitable for unconfined ocean disposal will be capped by sandy materials and subsequently buried within a port landfill), and the LA-2 ocean disposal site (for dredged materials that cannot be beneficially re-used within the project time frame). The proposed dredging project and the proposed disposal locations together comprise the least damaging feasible alternative for maintenance of the existing navigation channel in the Los Angeles River estuary. As discussed in Section C of this report, mitigation measures are incorporated into the project where necessary to protect water quality and marine resources from dredging and disposal activities. Therefore, the Commission finds that the proposed maintenance dredging project is consistent with the allowable use, alternatives, and mitigation tests contained in the dredge and fill policy of the California Coastal Management Program (CCMP) (Coastal Act Section 30233).

C. <u>Water Quality and Marine Resources</u>. Section 30230 of the Coastal Act provides that:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act provides that:

> *The biological productivity of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Los Angeles River estuary sediments have historically contained elevated levels of contaminants due to the discharge of industrial effluents, untreated runoff from storm drains within the watershed, and vessel spills within harbor waters. However, the Corps reports that water quality in the estuary is improving due to ongoing programs to increase the level of municipal sewage treatment, pre-treatment of industrial effluents, and control of untreated stormwater runoff. Marine habitat in the project area includes open water, sandy bottom benthic habitat, and harbor structures. The Corps reports that seven fish species tend to dominate in abundance in the region: white croaker, queenfish, white seaperch, northern anchovy, shiner perch, tonguefish, and speckled sanddab. Other less abundant but ecologically important species present are California halibut, barred sandbass, kelp bass, California corbina, pacific bonito, pacific barracuda, white seabass, jacksmelt, and several species of rockfish, sharks, and rays.

Previous Corps consistency determinations and negative determinations for maintenance dredging of the existing navigation channel in the LARE focused primarily on managing the handling of contaminated sediments to protect water quality and marine resources. The subject consistency determination addresses the potential water quality and marine resource impacts from dredging operations, and in particular from the dredging of sediments that hold the potential (due to their location at the mouth of the Los Angeles River) to contain contaminants harmful to marine organisms. The Corps reports that physical, chemical, and biological testing of project sediments in the LARE was conducted in 2005 and 2006, and that the sampling and analysis of proposed dredged sediments was conducted in accordance with the *Ocean Testing Manual* (OTM; USEPA/USACE 1991), the *Inland Testing Manual* (ITM; USEAP/USACE 1998), and the *Regional Implementation Agreement* (RIA; USEPA/USACE).

The technical guidance for determining the suitability of dredged material involves a tiered-testing procedure, which includes four levels of testing. Tier I and II apply to existing or easily

obtained information and require limited chemical testing to predict effects. If these predictions indicate that the dredged material has any potential for significant adverse effects, EPA will elevate the sediment analysis to a higher tier. Tier III and IV use water column and benthic bioassay and bioaccumulation tests to determine effects on representative marine organisms. Specifically, EPA requires bioassay tests on suspended particulate and solid phases of the material before allowing the disposal. These tests allow EPA to evaluate the acute and chronic toxicity of the contaminated material on biological resources. EPA also measures bioaccumulation potential of contaminates. The intent of that test is to determine if organisms are concentrating chemicals in their tissues to levels that might prove harmful to either themselves or their predators. Both the bioassay and the bioaccumulation tests measure the biological effect of contaminated dredge spoils. Although these tests are not precise predictors of environmental effects, they provide quantitative estimators of impacts. The Commission also uses results from the EPA process to evaluate ocean disposal activities for consistency with the CCMP. These tests allow the Commission to determine if the ocean disposal activity will adversely affect water quality or biological resources of the coastal zone.

A Tier III sediment sampling and analysis program occurred in February 2005 for the LARE sediments. The proposed dredge footprint was divided into four sampling areas (Area 1/2, Area 3, Area 4, and the sand trap) with each area containing four to six separate core locations. Physical, chemical, and biological analyses were performed on the sampled materials (**Exhibit 6**). Based on this evaluation of the sediments, materials from Area 3 and the sand trap met the requirements for unconfined ocean disposal. The remaining areas (Area 1/2 Top, Area 1/2 Bottom, and Area 4) did not meet the limiting permissible concentration requirements for ocean disposal based on poor survival in solid phase toxicity tests with one amphipod test species.

However, the Corps reported that a general lack of elevated chemistry in the sediments, the predominately sandy nature of the sediments, and the high survival in subsequent tests with another amphipod test species suggested that factors other than sediment-associated contaminants may have affected survival of the first species and therefore artificially affected the suitability determination of the sediments in Areas 1/2 and 4. Consequently, the Corps undertook supplemental Tier IV testing of material from these areas in August 2006 to provide for a more definitive determination of sediment suitability for ocean disposal (**Exhibit 7**).

The Corps reports the following conclusions from the Tier IV testing (*Final Report: Supplemental Sampling and Tier III and IV Analysis for the Los Angeles River Estuary (LARE), Los Angeles County, February 2007*):

- *Chemical analyses were performed on project sediments from four areas (1/2A, 1/2B, 4A, and 4B). Chemical concentrations in sediment from Area 1/2A, Area 1/2B, Area 4A, and Area 4B were relatively low with only a few ER-L exceedances (metals and DDTs) and estimated ER-M exceedances (total chlordanes); all other chemicals were below ER-L values.* [The ER-L is the level of concentration of a contaminant in the sediment that has possible biological effects, and the ER-M is the level of contaminant concentration that has probable biological effects.]

- *SP toxicity tests with the amphipods E. estuarius and R. abronius were conducted on project sediments from all areas (1/2A, 1/2B, 4A, and 4B). These SP test results indicate that sediment from Areas 1/2B, 4A, and 4B meets the LPC requirements for ocean disposal.*

- *Results of SP tests with E. estuarius on sediment from Area 1/2A demonstrate that this material does not meet LPC requirements for ocean disposal.*

- *BP tests were conducted on project sediments from Area 1/2A, Area 1/2B, Area 4A, and Area 4B. Based on ERED and CBR guidelines, all contaminant concentrations in tissues of organisms exposed to LARE sediments were below published relevant effect levels. In addition, none of the chemicals in project areas that were measured above reference tissue concentrations have a proclivity to biomagnify in marine food webs. These bioaccumulation test results indicate that sediment from Area 1/2A, Area 1/2B, Area 4A, and Area 4B meets the LPC requirements for ocean disposal.*

- *Based on the results of all testing and analyses described in this report, sediment from Areas 1/2B, 4A, and 4B meets the LPC requirements for ocean disposal. Sediment from Area 1/2A does not meet the LPC requirements for ocean disposal; however, this is based solely on the results of one SP test with the amphipod E. estuarius. It should be noted that SP tests with the amphipod R. abronius, BP tests, previous SP tests using N. arenaceodentata, and all three previous SPP tests (M. edulis, M. beryllina, and M. bahia) conducted by Weston (2005a) on Area 1/2 (A and B) sediments met the LPC requirements for ocean disposal.*

- *Based primarily on the low percentage of fines in Area 1/2B, sediment from Area 1/2B may be suitable for beach nourishment projects. Sediment from Area 1/2A, Area 4A, and Area 4B may not be suitable for beach nourishment projects based primarily on the high percentage of fines in these areas which were much higher than 20%.*

Based on the combined 2005 and 2006 sediment test results (**Exhibit 8**), the Corps developed a dredged material disposal plan that called for placing 130,000 cu.yds. of clean sand from the sand trap in the nearshore zone of Bixby Park Beach, placing 85,000 cu.yds. of unsuitable materials from Area 1 (also referred to as Area 1/2 A) into the Port of Long Beach Pier G slip, and disposing the remaining 360,000 cu.yds. of dredged materials at the LA-2 ocean disposal site. The Corps' original plan for disposal of the unsuitable dredged materials from Area 1 called for: (1) using a portion of the unsuitable materials to construct an underwater berm (approximately 8 to 10 feet above existing grade) across the Pier G slip (at a location approximately half-way up the 2,200-foot-long slip) that would rise to an elevation of -50 feet MLLW with a gradual slope on both sides of the berm of approximately 20:1; (2) have the City of Long Beach place unsuitable, fine-grained dredged sediments from Queen's Way Bay behind this berm; and (3) place the remaining Area 1 dredged materials on top of the Queen's Way Bay sediments and behind the berm. The Port of Long Beach would continue to use the Pier G slip for cargo vessel berthing during and after the placement of the dredged materials through May 2008 (approximately one vessel per week at this time of year), when it would cease vessel

operations at the slip in order to commence construction of its previously-approved slip landfill project.

Members of the Advisory Committee of the Los Angeles Contaminated Sediment Task Force, including Coastal Commission staff, met in person and via conference call on July 10 and July 17, 2007, to review the Corps' disposal plan. Previous to and again during these meetings, concerns were expressed by members of the Task Force about the placement of unsuitable dredged materials within the Pier G slip without a cap of clean sediments to isolate the unsuitable materials from the marine environment. This was a particular concern given that large cargo vessel operations would continue to occur in the slip during and after sediment disposal, possibly leading to the re-suspension of sediments due to propeller wash and potential water quality degradation. As a result of the comments and discussions that took place during the July 17, 2007, meeting, the Corps modified the project on July 19, 2007, as follows:

- Reduce the volume of dredged materials to be placed in the Pier G slip from 112,000 cu.yds. to 101,500 cu.yds. due to a re-calculation of available space in the slip allocated to the Corps project based on the location of the underwater berm.

- Place the 85,000 cu.yds. of unsuitable Area 1 sediments in the Pier G slip, in the form of a berm and backfilled sediments.

- Place a one-foot-thick cap of 16,250 cu.yds. of clean sediments dredged from Area 2 above all the unsuitable Area 1 sediments, including the berm.

- Do not place the City of Long Beach Queen's Way Bay dredged materials into the slip during the Corps dredging project (these materials will be dredged and disposed in the slip in conjunction with the Port's subsequent slip fill project).

- Conduct monthly bathymetric surveys of the Pier G slip fill (starting at completion of sediment disposal by the Corps to the start of the landfill dike construction by the Port) to determine if scouring or sloughing of the berm and fill is occurring, and if sediments are resuspending and moving beyond the berm.

- Conduct water quality monitoring within the Pier G slip (pre-project, monthly during disposal, and monthly post-project (until start of the landfill dike construction by the Port)) to determine if the clean sediment cap was effective in isolating the unsuitable sediments and maintaining existing water quality levels. The details of the water quality monitoring program shall be submitted to the Executive Director for his review and approval no later than thirty days prior to the start of project dredging operations.

The CSTF Advisory Committee did not formally re-convene to discuss these July 19, 2007, project modifications. However, based on comments made by Advisory Committee representatives during the July 17, 2007, meeting, the Corps' project modifications to cap the unsuitable sediments to be placed in the Pier G slip, monitor the stability of the berm and fill, and monitor water quality within the slip adequately addresses the primary concerns of the Advisory Committee members (including staff from

U.S. EPA, Los Angeles Regional Water Quality Control Board, California Department of Fish and Game, National Marine Fisheries Service, and the Coastal Commission) regarding the proposed handling of unsuitable project sediments. However, a representative of Advisory Committee member Heal the Bay stated in an e-mail communication to Commission staff on July 24, 2007, regarding the project modifications that:

> *The change was significant and a definite step in the right direction. Most important to you and the CCC is that this project can go forward AND protect the marine environment. The clean cap helps for this.*
>
> *However, there are numerous other issues (lack of BMPs, full dismissal of earlier toxicity data, logical rationale for what volume gets dredged and placed in the slip fill, etc.) that are concerns about this project and for the region's failure to make meaningful progress on implementation of the contaminated sediment management plan. We will speak to this at the hearing and try to get you comments next week.*

Notwithstanding these concerns, the Commission finds that the unsuitable sediments in the Los Angeles River estuary are currently exposed to the water column and are affecting water quality, marine habitat, and marine resources to some, albeit unquantifiable, degree. Dredging these sediments and placing them in the more isolated Pier G slip (where upon completion of disposal they will be capped with clean sandy materials and ultimately sequestered behind a rock dike and buried beneath a port landfill) permanently removes these materials from the marine environment. The potential temporary impacts to water quality and marine resources associated with the LARE dredging and the disposal of unsuitable sediments in the Pier G slip are out-weighed by the benefits of the permanent removal of these sediments from the marine environment.

The Corps' consistency determination examines the potential water quality impacts associated with the project:

> *Potential water column impacts at the dredge site include increased turbidity, increased oxygen demand, and slightly elevated levels of contaminates and nutrients. Because the dredge material is relatively clean sediments, oxygen depletion, eutrophication, and resuspension of contaminants are not likely to occur. Water column effects will be largely limited to turbidity in the immediate vicinity of the dredge . . . Standard monitoring at the dredge and disposal site (excluding LA-2) will occur to monitor turbidity to ensure that significant impacts do not occur and to enforce corrective measures should an exceedance occur.*
>
> *Dredging in the LARE entrance channel would impact water quality by temporarily resuspending sediments, causing an increase in turbidity and nutrients, and possibly a decrease in dissolved oxygen. Resuspension of sediments by the clamshell dredge would occur from the disturbance of bottom sediments during excavation and by leakage from the bucket as the sediments are lifted from the bottom and into the disposal scow. Most research on turbidity plumes has been conducted in areas with predominantly silty material, which generates greater levels of suspended solids than would be expected for this project (CSTF*

2003). Previous investigations conducted at the LARE (USACE 2003) showed that minimal sediment resuspension and transport occurred during clamshell dredging. Sediments that did become entrained in the water column quickly settled out a short distance from the dredge area. As such, dredging of the LARE is not expected to result in significant impacts due to turbidity.

The proposed location and configuration of the placed material [in the Pier G slip] *will allow continued use of the slip without disturbance of the consolidated dredged sediments. Additionally, should ship operations disturb the placed material, the propeller wash generated while thrust is applied to stop or start the vessels should inherently push the suspended material closer to the back of the slip against the terminal, and not into the main channel. Side-to-side thrust generated by bow-thrusters or tug-boat assisted docking should similarly not be anticipated to suspend material in a manner that it would be transported to the main channel. Water quality impacts during beach nourishment are similarly expected to be temporary and insignificant with the sand quickly settling as new beach material. All alternatives have similar, insignificant impacts to water quality.*

The Commission does not expect impacts to water quality and the benthic habitat to be significant. The project will disturb benthic resources at both the dredge and disposal sites. However, within a short time, these organisms will re-colonize the areas. The Corps proposes to mitigate impacts to water quality by requiring its contractor to monitor turbidity and employ mitigation measures if turbidity at the dredging site increases to 20 percent over background. This type of mitigation is not normally adequate for dredging contaminated material, because it allows for a degradation of water quality. Contaminates bind to small-grained particles and those particles are easily re-suspended during the dredging operation. This fine-grained material also remains in suspension longer than heavier grained material and may drift far off site. In past projects, the Commission has required the use of silt curtains, environmentally sealed clamshell buckets, or other appropriate technologies when projects involve dredging of contaminated material. For example, the Commission required (and the Corps agreed to) similar modifications to the Marina del Rey dredging project (CD-088-94). The Commission also imposed similar requirements on the Port of Long Beach's “Pier T” dredging project (5-96-231).

With respect to the subject project, however, dredge sediment contamination is not at a high level. As described previously in this report, the concentration of several contaminates are above the ER-L level, which indicates that the sediment may have a biological effect. However, the vast majority of contaminates are tested below the ER-M level, which is the level that the contaminates are likely to have a biological effect. Because of the low level contamination of this material, the Commission finds that the water quality mitigation proposed by the Corps will adequately address the potential impacts to water quality and marine resources from re-suspension of contaminates.

Turbidity effects at the nearshore disposal site will be localized and temporary due to the high sand content of the dredged sediments. While nearshore disposal off Bixby Park Beach will result in minor, short-term impacts to existing nearshore habitat, fish, plankton, and benthic organisms, affected species in the disposal area will recolonize the area soon after completion of the project. The Commission has previously found that these types of impacts are not significant

and do not require additional mitigation measures when it concurred with other dredge material disposal operations at southern California nearshore disposal sites.

In conclusion, the proposed dredging of sediments from the Los Angeles River estuary, the disposal of sediments suitable for unconfined aquatic disposal in the nearshore zone off Bixby Park Beach and at the LA-2 ocean disposal site, and the disposal of unsuitable sediments within the Port of Long Beach Pier G slip will not create significant adverse effects on coastal water quality or marine resources. Impacts will be temporary and localized due to the project's design, timing, and mitigation measures. Therefore, the Commission finds that the proposed project is consistent with the water quality and marine resource protection policies of the CCMP (Coastal Act Sections 30230 and 30231).

D. Endangered Species. Section 30240 of the Coastal Act provides that:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.
(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The proposed project could potentially affect habitat for three federally listed species: the California brown pelican, California least tern, and western snowy plover. (Several species of marine mammals and sea turtles may be transient visitors to the LARE and the LA-2 ocean disposal site, but the project will not affect those species.) In its environmental assessment, the Corps describes the three aforementioned species and their presence in the project area:

California Brown Pelican. The California brown pelican was federally listed as endangered in 1970 and was state listed as endangered in 1971. The California brown pelican is a year-round resident of the southern California coastline. The brown pelican feeds primarily on surface feeding fish in the nearshore waters. The species is very tolerant of human activity and utilizes various shoreline structures such as piers, breakwaters, groins, and buoys for roosting. The brown pelican is relatively common in nearshore waters. Activities of the brown pelican are restricted to feeding, overflying, and temporary resting. California brown pelicans frequent San Pedro Bay and have been observed resting and feeding within Long Beach Harbor. Pelicans occur year-round in the project area, although their numbers fluctuate seasonally due to an influx from Mexico 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. Breeding areas are found on Islas Coronados (Coronado Islands), Anacapa Island, Santa Barbara Island, and Scorpion Rock off Santa Cruz Island.

California Least Tern. The California least tern was federally listed as endangered in 1970 and state listed as endangered in 1971. The California least tern is present in small numbers

from mid-April to mid-September. The birds breed in open, unvegetated sandy areas, and forage on small fish such as top smelt and anchovy in shallow waters (less than 20 feet deep) 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 birds, cats, foxes, and other predators. The California least tern is present in the project area in small numbers from April to August. The least tern feeds primarily on surface fishes at dawn and dusk, such as topsmelt and anchovies, in nearshore waters and estuaries near the breeding colonies. Least terns have a medium to high probability of occurring within the project area between April and August. The closest nesting colony is located in the Port of Los Angeles on Pier 400, approximately 5 km (3 nautical miles) from the dredging area. The tern is known to forage along the banks of the LARE, but no suitable habitat is located in this area for nesting.

<u>Western Snowy Plover.</u> The western snowy plover is federally listed as threatened and is a state "species of special concern." Nest sites typically occur in flat, open areas with sandy or saline substrates. Nest site selection and pairing occurs 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 high tide, on salt pans, and along the edges of salt marshes and salt ponds. A few migratory snowy plovers have been reported in Los Angeles Harbor in 1998 and 2000, but no nesting has been documented in the project area (Chambers Group 1996).

The Western snowy plover nests and forages on sandy beaches along the California coast but no nesting and foraging sites are in or near the project area and this species will not be affected by the project.

The noise and activity of dredging is not anticipated to adversely affect brown pelicans that may rest on piers and other structures in the project area, as the pelican is generally tolerant of these types of human activities. Turbidity from dredging and disposal could prevent pelicans from foraging in the immediate vicinity of the dredge, although the species may find suitable foraging habitat near the fringe of any turbidity plume that may form. Since turbidity may also alter fish distribution and behavior, the fish may dive deep or scatter and become unavailable to foraging pelicans. Pelicans would find other areas in the adjacent waters of San Pedro Bay and in offshore waters to forage that would not be affected by the proposed dredging activities.

The majority of the project dredging operations will occur outside the April through September least tern nesting season. However, depending on project scheduling and weather interruptions the possibility exists that dredging will extend into May. Should that occur, foraging in the LARE by the least tern could be affected due to turbidity and resultant changes in feeder fish distribution. However, the LARE is not the primary foraging area for the Port of Los Angeles tern colony and the short-term nature of the potential dredging incursion into the nesting season is not expected to create significant adverse effects on the species. In addition, the removal of Area 1 unsuitable sediments from the LARE will improve water quality and soft bottom habitat,

both of which will lead to an increase in the quality of marine habitat that supports the foraging activities of the least tern. However, should it appear to the Corps that project dredging within the LARE will extend past May 1, 2008, the Corps has committed to contact the Commission staff no later than April 1, 2008, to determine if further federal consistency review is necessary in order to ensure adequate protection of least tern foraging activity in the LARE.

In conclusion, the proposed dredging of the navigation channel in the LARE will not significantly affect environmentally sensitive habitat or endangered species found at these locations. With the aforementioned California least tern commitment, the Commission finds that the proposed project is consistent with the environmentally sensitive habitat and endangered species protection policies of the CCMP (Coastal Act Section 30240).

E. Sand Supply. Section 30233(b) of the Coastal Act provides that:

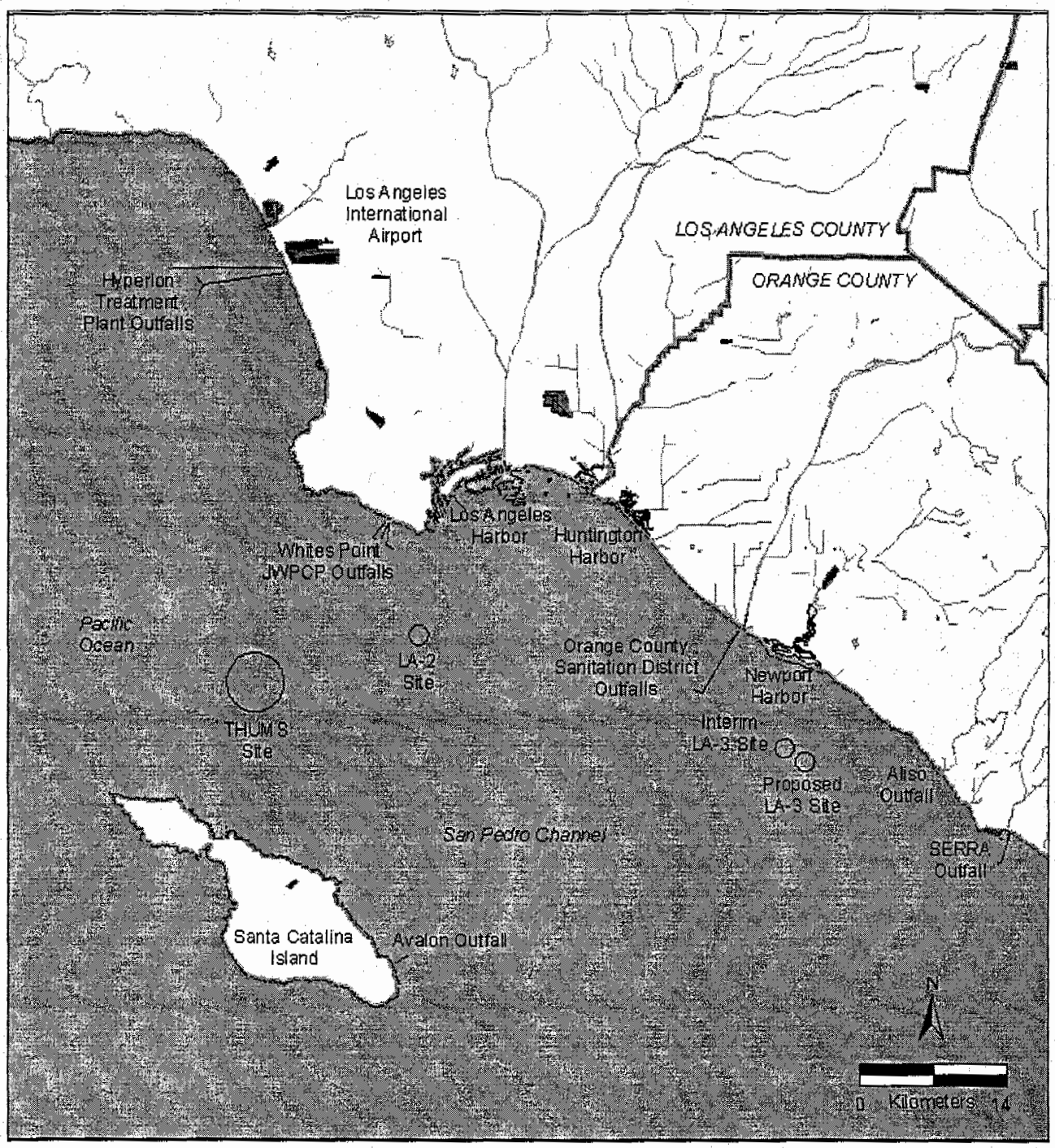
> *Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*

The Corps proposes to dispose approximately 130,000 cu.yds. of clean sandy dredged material from the Los Angeles River Estuary sand trap in the nearshore off Bixby Park Beach. The proposed dredged materials are physically compatible for beach nourishment at this location. The sand content of the LARE sand trap material is 87 percent and the sand content of the receiver beach adjacent to the nearshore disposal site is 98 percent. The Commission has typically held that material with a sand content of at least 80 percent and that has no more than a 20 percent difference in sand content from the receiver beach is compatible for that receiver site. As discussed previously in this report, the sand trap materials passed chemical testing and are suitable for unconfined aquatic disposal in the nearshore zone. By placing the dredged materials at this location, they will remain in the longshore littoral system off the coast of Long Beach. The City of Long Beach submitted a letter to the Corps on June 20 agreeing to accept the LARE sand trap materials for beach nourishment in the nearshore zone off Bixby Park Beach (**Exhibit 5**). In conclusion, the Commission finds that the proposed maintenance dredging project is consistent with the sand supply policy of the CCMP (Coastal Act Section 30233(b)).

Substantive File Documents:

1. Corps of Engineers, Draft Environmental Assessment, Maintenance Dredging at Los Angeles River Estuary, June 2007.
2. Corps of Engineers and Weston Solutions, Inc., Final Report: Supplemental Sampling and Tier III and IV Analysis for Los Angeles River Estuary, February 2007.

3. Corps of Engineers consistency and negative determinations for maintenance dredging of the Los Angeles River Estuary: ND-032-05, CD-028-01, ND-021-00, CD-094-98, CD-005-97, CD-043-95, CD-011-91, ND-010-90.
4. CC-041-95 (Port of Long Beach, dredge material disposal at LA-2 ocean disposal site)
5. 5-95-111 (Port of Long Beach, Pier J breakwater construction and turning basin expansion)



Regional Location

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EXHIBIT NO. 1
APPLICATION NO.
CD-035-07

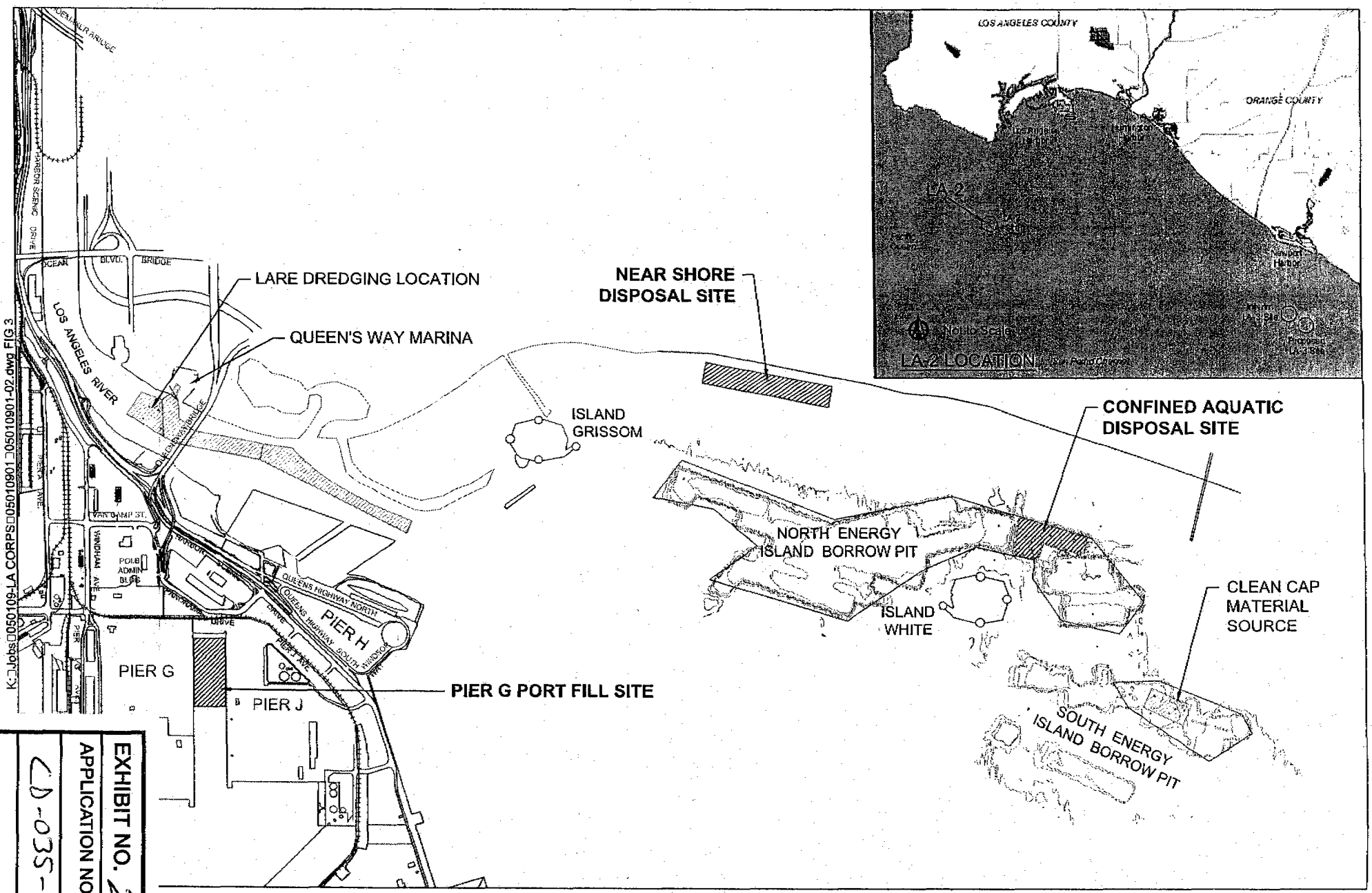

EXHIBIT NO. 2
APPLICATION NO.
CD-035-07

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Scale in Meters

Figure 4
Disposal Locations
Los Angeles River Maintenance Dredging

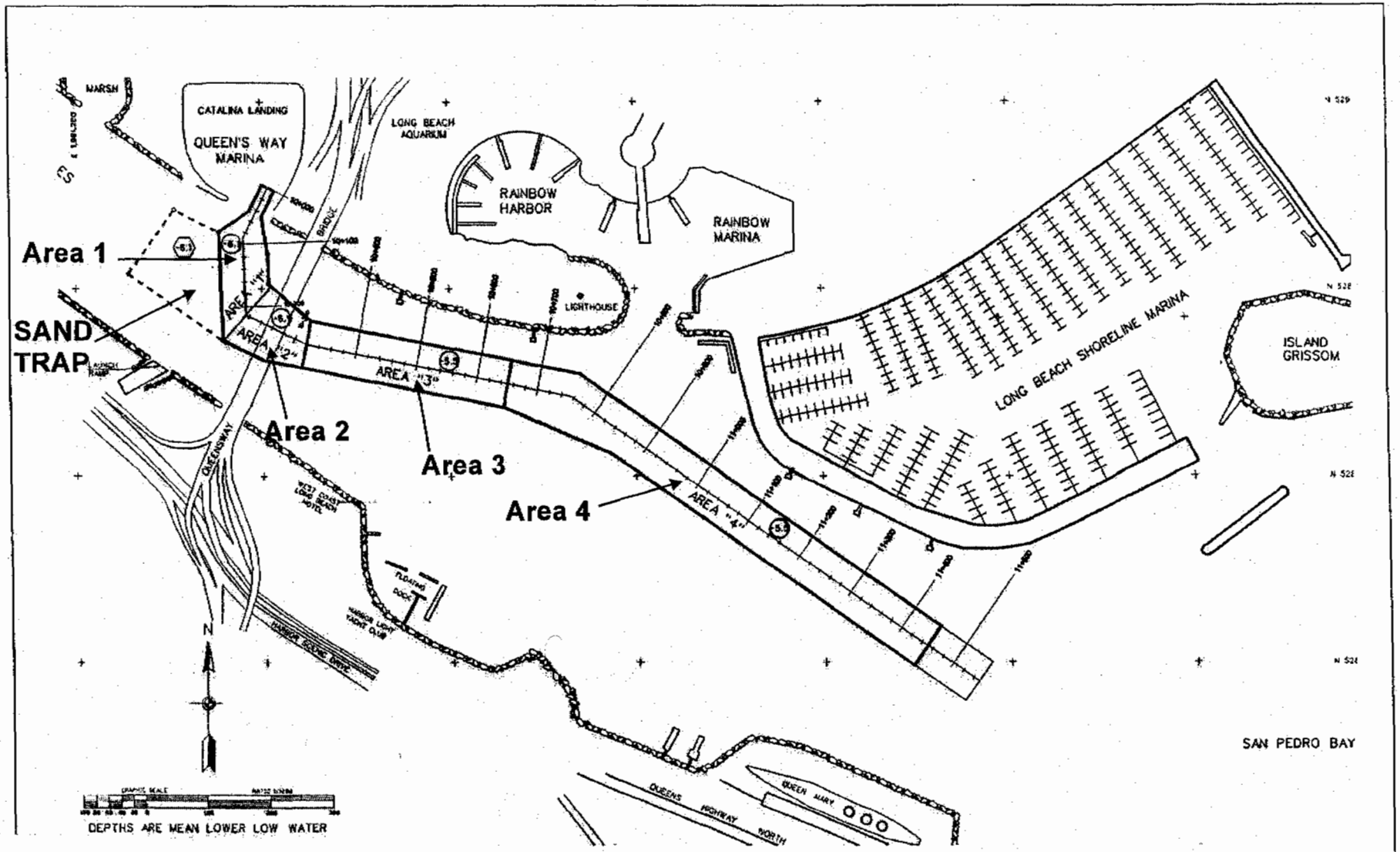

EXHIBIT NO. 3
APPLICATION NO.
CD-035-07

Figure 2
Dredging Locations
Los Angeles River Maintenance Dredging

The Port of Long Beach

P.O. BOX 570 · LONG BEACH, CA 90801-0570 · TELEPHONE (562) 437-0041 · FAX (562) 901-1725

June 20, 2007

California Coastal Commission
Attention: Larry Simon
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Simon:

Subject: **SEDIMENT PLACEMENT INTO LONG BEACH SLIP G**

This is a letter of support for the US Army Corps of Engineers and City of Long Beach Parks Department to gain approval and place Catalina Basin and Los Angeles River Estuary sediments into the Port's Slip G with an upcoming proposed dredging project.

The Port, City of Long Beach, and Corps of Engineers have been meeting regularly to plan a project to allow sediments unsuitable for ocean disposal or near shore beach nourishment to be placed into an upcoming Port landfill project. The placement of the material is subject to approval of an MOU by the Board of Harbor Commissioners and Long Beach City Council (tentatively planned for July 16 & 17). Once approved, and permitted by all regulatory agencies, the placement of the material in the Slip will provide a final repository for these materials. Following placement and within approximately 4-6 months, upcoming critical Port dredging projects will cover and contain these sediments.

Placement of the LA River and Catalina Basin dredge material will allow restoration of the federal navigation channel that serves the landing that provides vital ferry service to Catalina Island. Furthermore, it will help reduce City and Federal dredging costs and benefit the environment. The Port has long been a proponent of environmental sound, sustainable, beneficial dredge material reuse projects. This project is consistent with the Los Angeles Regional Contaminate Sediments Management Plan.

We respectfully urge your concurrence with the Corps of Engineers Consistency Determination (CD-035-07) to place the material into Pier G.

Sincerely Yours,

Doug Thiessen
Managing Director, Engineering

cc: Jim Fields and Larry Smith, US Army
Reginald Harrison and Phil Hester, City of Long Beach

PRESIDENT'S "I
AWARDS FOR EXC

EXHIBIT NO. 4
APPLICATION NO.
CD-035-07

CITY OF LONG BEACH

DEPARTMENT OF PARKS, RECREATION & MARINE

2760 N. Studebaker Road, Long Beach, CA 90815-1697

(562) 570-3100 • FAX (562) 570-3109

www.lbparks.org

June 20, 2007

Larry Smith, Jr.
Environmental Policy Group
CESPL-PD-RN
P. O. Box 532711
Los Angeles, CA 90053-2325

Subject: Near Shore Disposal of Clean Sand from Los Angeles Estuary Dredging

Dear Mr. Smith:

The City of Long Beach has a generally stable shoreline, with the exception of a few erosion hot spots. One of those hot spots is the east beach; also known as Peninsula Beach, where the U. S. Army Corps of Engineer is conducting a feasibility study of means of mitigating a chronic beach erosion problem. A smaller hot spot is located in the west beach area, approximately in alignment with Cherry Avenue. The Cherry Avenue area is impacted by swells that enter through the Queen's Gate opening in the federal breakwater. Through a complicated set of rebounds and refractions, erosion forces seem to focus in this area, with the sand from this location moving westerly and becoming entrapped in the lee of the Long Beach Shoreline Marina jetty adjacent to dock GG.

Erosion off of Cherry Avenue is chronically threatening our lifeguard headquarters building, as well as a beach access parking lot. Damage to those structures is prevented by our maintenance staff, continually filling the lost sand from the receiving area nearby. However, both structures are in danger of damage in a substantial storm event.

The disposal of good quality sand in the near shore area would be a substantial benefit in protecting the vulnerable structures on the beach off of Cherry Avenue. Given the wave pattern, it is expected that sand placed in the near shore zone would generally move towards the beach, helping to replenish the sand that is eroding form the beach.

The City of Long Beach welcomes the opportunity to receive sand from the Los Angeles River Maintenance Dredging Project for beach nourishment in the near shore zone off of Cherry Avenue.

Sincerely,

Phil T. Hester
Director of Parks, Recreation and Marine

EXHIBIT NO. 5
APPLICATION NO.
CD-035-07

Table 1. Summary of physical/chemical analysis of LARE project sediment collected in February of 2005 including a comparison to published ER-L and ER-M Sediment Quality Values

ANALYTE	ER-L	ER-M	LA-2 Reference	LA Borrow Pit	Sand Trap	Area 1/2 Top	Area 1/2 Bottom	Area 3 Top	Area 3 Bottom	Area 4 Top	Area 4 Bottom
Physical Characteristics											
Median grain size (microns)			69.5	46.4	516	423	200	438	71.3	300	40.6
Gravel (%)			0.00	0.004	7.865	0.539	0.594	2.750	0.813	0.00	0.076
Sand (%)			63.5	41.8	87.6	92.7	71.4	94.5	51.5	92.8	41.4
Silt (%)			29.8	42.4	2.93	3.97	17.3	1.05	31.8	4.63	43.4
Clay (%)			6.70	15.8	1.58	2.86	10.7	1.69	15.9	2.58	15.2
General Chemistry											
Percent Solids (%)			66.4	58.5	84	81.3	59.4	80.9	61.3	81.8	57.2
TRPH (%)			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1E	<0.5	<0.5
Dissolved Sulfides (mg/L			<0.05	<0.05	NPW	NPW	NPW	NPW	NPW	NPW	<0.05
Total Sulfides (mg/L)			0.28	0.1	NPW	NPW	0.13	NPW	NPW	NPW	<0.1
Total Organic Carbon (%)			0.730	1.47	0.505	0.447	2.90	0.234	2.76	0.298	3.36
Metals (mg/kg)											
Arsenic (As)	8.2	70	5.01	3.41	0.834	0.957	4.85	1.23	5.77	1.49	3.42
Cadmium (Cd)	1.2	9.6	**1.67**	0.287	0.31	0.326	**1.54**	0.262	0.573	0.288	1.44
Chromium (Cr)	81	370	36	35	5.97	9.11	34.8	13.6	27.6	11.2	31
Copper (Cu)	34	270	**70**	12.4	6.21	7.53	**51.9**	7.08	31.8	10.4	48.3
Lead (Pb)	46.7	218	**61.1**	7.05	23.1	24.7	**71.1**	12.7	27.9	13.3	50.2
Mercury (Hg)	0.15	0.71	**0.157**	**0.178**	0.012	0.017	**0.171**	<0.005	0.081	<0.005	0.12
Nickel (Ni)	20.9	51.6	**22.3**	15.4	5.1	5.27	**22**	5.63	18.7	8.77	20.3
Selenium (Se)			1.25	0.585	<0.025	0.051	0.9	0.175	0.554	0.125	0.83
Silver (Ag)			1.3	0.249	<0.025	<0.025	0.711	<0.025	0.209	<0.025	0.76
Zinc (Zn)	150	410	**323**	55.4	37	41	**239**	40.7	105	47.4	**257**
Pesticides (µg/kg)											
2,4'-DDD	2	20	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4'-DDE	2.2	27	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4'-DDT	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1
4,4'-DDD	2	20	<1	<1	<1	<1	<1	<1	<1	<1	<1
4,4'-DDE	2.2	27	<1	1.2J	<1	<1	1.9J	<1	<1	<1	2.1J
4,4'-DDT	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Detectable DDTs	1.58	46.1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Aldrin			<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-alpha			<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-beta			<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-delta			<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-gamma			<1	1.3J	<1	2.6J	2.8J	<1	5.1	<1	4.9J
Chlordane-alpha			<1	1.6J	<1	1.7J	3.8J	<1	5.9	<1	5.5
Chlordane-gamma			<1	<1	<1	<1	<1	<1	<1	<1	<1
Dieldrin	0.02	8	<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan Sulfate			<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan-I			<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan-II			<1	<1	<1	<1	<1	<1	<1	<1	<1
Endrin			<1	<1	<1	<1	<1	<1	<1	<1	<1

ANALYTE	ER-L	ER-M	LA-2 Reference	LA Borrow Pit	Sand Trap	Area 1/2 Top	Area 1/2 Bottom	Area 3 Top	Area 3 Bottom	Area 4 Top	Area 4 Bottom
Endrin Aldehyde			<1	<1	<1	<1	<1	<1	<1	<1	<1
Endrin Ketone			<1	<1	<1	<1	<1	<1	<1	<1	<1
Heptachlor			<1	<1	<1	<1	<1	<1	<1	<1	<1
Heptachlor Epoxide			<1	<1	<1	<1	<1	<1	<1	<1	<1
Methoxychlor			<1	<1	<1	<1	<1	<1	<1	<1	<1
Mirex			<1	<1	<1	<1	<1	<1	<1	<1	<1
Oxychlordane			0	1.2	0	0	1.9	0	0	0	2.1
Toxaphene			<10	<10	<10	<10	<10	<10	<10	<10	<10
trans-Nonachlor			2.3J	1.3J	<1	1.5J	2.4J	<1	3.6J	<1	3.4J
Polychlorinated biphenyls (µg/kg)											
Aroclor 1016			<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1221			<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1232			<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1242			<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1248			<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1254			<10	15.2J	<10	28	<10	17.2J	28.4	<10	14.2J
Aroclor 1260			<10	<10	<10	<10	<10	<10	<10	<10	<10
PCB018			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB028			<1	<1	<1	1.7J	<1	<1	<1	<1	<1
PCB031			<1	<1	<1	2.5J	<1	<1	<1	<1	<1
PCB033			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB037			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB044			<1	<1	<1	5	<1	<1	<1	<1	<1
PCB049			<1	<1	<1	7.3	<1	<1	<1	<1	<1
PCB052			<1	<1	<1	7.3	<1	<1	<1	<1	<1
PCB066			<1	<1	<1	9.1	<1	<1	<1	<1	<1
PCB070			<1	<1	<1	8.4	<1	<1	<1	<1	<1
PCB074			<1	<1	<1	4.3J	<1	<1	<1	<1	<1
PCB077			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB081			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB087			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB095			<1	<1	<1	3.1J	<1	<1	3J	<1	2.5J
PCB097			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB099			<1	<1	<1	4.5J	<1	<1	<1	<1	<1
PCB101			<1	<1	<1	6	<1	1.1J	<1	<1	<1
PCB105			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB110			<1	1.9J	<1	3.4J	<1	2.1J	3.5J	<1	1.7J
PCB114			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB118			<1	<1	<1	4.2J	<1	2.4J	<1	<1	<1
PCB119			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB123			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB126			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB128+167			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB138			<1	<1	<1	<1	<1	2.8J	<1	<1	3J
PCB141			<1	<1	<1	<1	<1	<1	<1	<1	<1

ANALYTE	ER-L	ER-M	LA-2 Reference	LA Borrow Pit	Sand Trap	Area 1/2 Top	Area 1/2 Bottom	Area 3 Top	Area 3 Bottom	Area 4 Top	Area 4 Bottom
PCB149			<1	1.6J	<1	1.1J	<1	<1	1.6J	<1	<1
PCB151			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB153			<1	<1	<1	1.7J	<1	1.8J	2.8J	<1	<1
PCB156			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB157			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB158			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB168+132			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB169			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB170			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB177			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB180			<1	<1	<1	<1	<1	1.1J	<1	<1	<1
PCB183			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB187			<1	<1	<1	<1	<1	<1	<1	<1	2.5J
PCB189			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB194			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB200			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB201			<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB206			<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Detectable PCBs	22.7	180	0	3.5	0	**69.6**	0	12.9	10.9	0	9.7
Phenols (µg/kg)											
2,4,6-Trichlorophenol			<50	<50	<50	<50	<50	<50	<50	<50	<50
2,4-Dichlorophenol			<50	<50	<50	<50	<50	<50	<50	<50	<50
2,4-Dimethylphenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4-Dinitrophenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Chlorophenol			<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Methyl-4,6-dinitrophenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Nitrophenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Nitrophenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
Pentachlorophenol			<50	<50	<50	<50	<50	<50	<50	<50	<50
Phenol			<100	<100	<100	<100	<100	<100	<100	<100	<100
Phthalates (µg/kg)											
Butylbenzyl Phthalate			<10	33.6	26.2	12.6	146	111	266	<10	214
Di-n-butyl Phthalate			<10	113	164	185	119	162	146	183	107
Di-n-octyl Phthalate			<10	36.7	18.7	17.5	606	1080	85.7	<10	328
Diethyl Phthalate			<10	<10	<10	<10	<10	<10	48	<10	<10
Dimethyl Phthalate			<10	<10	<10	<10	<10	<10	<10	<10	<10
bis(2-Ethylhexyl) Phthalate			<10	998	256	383	3870	320	4880	161	4310
Organotins (µg/kg)											
Dibutyltin			<1	<1	<1	<1	<1	<1	<1	<1	<1
Monobutyltin			<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrabutyltin			<1	<1	<1	<1	<1	<1	<1	<1	<1
Tributyltin			<1	<1	<1	<1	<1	<1	<1	<1	7.4
Polynuclear Aromatic Hydrocarbons (µg/kg)											
1-Methylnaphthalene			<1	1.6J	<1	1.6J	6.1	1.1J	6.2	<1	4.6J

ANALYTE	ER-L	ER-M	LA-2 Reference	LA Borrow Pit	Sand Trap	Area 1/2 Top	Area 1/2 Bottom	Area 3 Top	Area 3 Bottom	Area 4 Top	Area 4 Bottom
1-Methylphenanthrene			<1	4.6J	6.9	32.3	19.5	50.4	21.3	2J	7.5
2,3,5-Trimethylnaphthalene			<1	2.3J	1.1J	1.9J	7.9	<1	9.3	<1	6.2
2,6-Dimethylnaphthalene			<1	4.4J	6.3	6.4	70	<1	80.5	1.3J	45.6
2-Methylnaphthalene			<1	2.6J	1.5J	3.4J	10.7	1.6J	11.4	<1	9.6
Acenaphthene	16	500	<1	1.6J	1.7J	2.3J	5.4	<1	6.8	1.9J	5.2
Acenaphthylene	44	640	<1	1J	1.6J	1.9J	2.4J	<1	3J	<1	3.5J
Anthracene	85.3	1100	<1	3.9J	9.3	67.5	17.8	2.6J	21.9	2.3J	21
Benz[a]anthracene	261	1600	<1	25.7	74.2	**601**	76	18.4	86.3	17.5	107
Benzo[a]pyrene	430	1600	1.1J	31.9	88.2	**530**	30.7	12.9	97.6	22.4	130
Benzo[b]fluoranthene			<1	28.7	60.9	359	88.2	9.9	105	19.2	124
Benzo[e]pyrene			1J	24.4	55.1	247	82.9	12.2	82.8	15.6	99.3
Benzo[g,h,i]perylene			<1	25.6	58.7	218	86	7.1	86	13.9	105
Benzo[k]fluoranthene			<1	28.8	67.7	465	77.6	9.4	97.8	22.3	121
Biphenyl			<1	1.9J	1J	1.4J	6	<1	7.8	<1	7.6
Chrysene	384	2800	1.4J	40.1	76.2	**560**	127	133	156	26	168
Dibenz[a,h]anthracene	63.4	260	<1	6.1	13.7	**85.2**	**64.8**	<1	17.1	3.6J	24.2
Fluoranthene	600	5100	1.4J	63.2	130	**1090**	239	62	262	53.6	271
Fluorene	19	540	<1	2J	1.7J	3.6J	13.2	1.2J	18.6	1J	10.5
Indeno[1,2,3-c,d]pyrene			<1	22.3	51.7	307	13.3	4.9J	61.9	15.9	92.1
Naphthalene	160	2100	<1	3.2J	1.9J	4J	13.8	1J	11.5	1J	9.2
Perylene			1.5J	14.6	28.8	125	48.8	8	51.6	9.5	50.1
Phenanthrene	240	1500	<1	25.1	28.7	**246**	114	17.5	121	26.9	103
Pyrene	665	2600	1.9J	65.4	138	**1030**	215	485	254	52.1	284
Total Detectable PAHs	4022	44792	9.2	433	907	**5997**	1443	839	1686	311	1817

<	denotes value below the method detection limit (MDL)
J	denotes estimated concentration above MDL but below method reporting limit (MRL)
NPW	denotes insufficient pore water obtained from sample to conduct analysis
Bold	≥ ER-L (effects range–low value reported by Long et al. 1995)
Bold & Underline	≥ ER-M (effects range–median value reported by Long et al. 1995)

All values presented as dry weight unless noted.

EX-6

Table 13. Concentrations of chemicals in LARE sediments and reference sediments collected in August of 2006 and corresponding ER-L and ER-M for each chemical separately

Analyte	ER-L	ER-M	1/2A COMP.	1/2B COMP.	4A COMP.	4B COMP.	Cherry St. Beach Reference	LA-2 Reference	LA Borrow Pit Reference
Physical Characteristics									
Grain Size									
Gravel (%)	.	.	0.25	1.06	0.50	0.63	0.02	0.00	0.03
Sand (%)	.	.	63.9	86.0	57.5	54.3	98.5	59.4	39.3
Silt (%)	.	.	24.3	8.14	29.4	32.2	0.51	32.2	46.8
Clay (%)	.	.	11.6	4.75	12.6	12.9	1.01	8.33	13.8
Atterberg Limits									
Liquid Limit (LL)	.	.	n/p.	n/p.	5	n/p.	n/p.	n/p.	6
Plasticity Index (PI)	.	.	n/p	n/p	41	n/p	n/p	n/p	50
Specific Gravity	.	.	2.58	2.59	2.61	2.56	2.68	2.71	2.37
Soil Classification	.	.	SM	SM	SM	SM	SP	ML	ML
General Chemistry									
Total Organic Carbon (%)	.	.	1.69	1.44	1.83	2.04	0.02J	0.59	2.57
Percent Total Solids (%)	.	.	67.1	72.3	62.5	62.0	77.4	74.4	52.4
TRPH (%)	.	.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Sulfides (mg/kg)	.	.	4.00	15.3	3.30	16.0	<0.01	1.35	68.7
Total Sulfides (mg/kg)	.	.	168	159	397	253	0.04	5.34	325
Metals (mg/kg)									
Arsenic (As)	8.2	70	2.60	2.30	4.20	4.40	0.70	2.5	6.20
Cadmium (Cd)	1.2	9.6	0.90	0.60	**1.30**	**1.20**	<0.025	0.20	1.10
Chromium (Cr)	81.0	370	16.4	13.4	26.1	27.1	0.20	24.4	32.1
Copper (Cu)	34.0	270	30.7	26.9	**50.2**	**44.8**	1.20	10.5	**47.1**
Lead (Pb)	46.7	218	28.3	24.2	**47.2**	42.8	1.27	4.35	35.9
Mercury (Hg)	0.15	0.71	0.044	0.07	0.147	0.06	<0.01	0.019J	0.07
Nickel (Ni)	20.9	51.6	13.1	11.9	19.8	20.7	1.5	12.1	**24.7**
Selenium (Se)	.	.	0.60	0.40	0.70	0.70	<0.025	0.5	0.80
Silver (Ag)	1.0	3.7	**2.10**	**2.20**	**3.60**	**3.20**	0.30	0.70	**2.30**
Zinc (Zn)	150	410	143	135	**202**	**201**	8.40	43.3	**172**
Chlorinated Pesticides (µg/kg)									
2,4'-DDD	.	.	<1	<1	<1	<1	<1	<1	<1
2,4'-DDE	.	.	<1	<1	<1	<1	<1	1J	<1
2,4'-DDT	.	.	<1	<1	<1	<1	<1	<1	<1
4,4'-DDD	2.0	20.0	<1	3.40J	3.90J	3.90J	<1	<1	<1
4,4'-DDE	2.2	27.0	**5.60**	3.90J	4.50J	**5.80**	<1	**5.90**	3.60J
4,4'-DDT	1.0	7.0	<1	<1	<1	<1	<1	<1	<1
Total Detectable DDTs	1.58	46.1	**5.60***	**7.30J***	**8.40J***	**9.70J***	0	**6.90J***	**3.60J***
Aldrin	.	.	<1	<1	<1	<1	<1	<1	<1
BHC-alpha	.	.	<1	<1	<1	<1	<1	<1	<1
BHC-beta	.	.	<1	<1	<1	<1	<1	<1	<1
BHC-delta	.	.	<1	<1	<1	<1	<1	<1	<1
BHC-gamma	.	.	<1	<1	<1	<1	<1	<1	<1

Analyte	ER-L	ER-M	1/2A COMP.	1/2B COMP.	4A COMP.	4B COMP.	Cherry St. Beach Reference	LA-2 Reference	LA Borrow Pit Reference
cis-Nonachlor			<1	<1	1.30J	<1	<1	<1	<1
trans-Nonachlor			2.20J	2.10J	2.70J	2.20J	<1	<1	1.30J
Oxychlordane			<1	<1	<1	<1	<1	<1	<1
Chlordane-alpha			2.60J	2.90J	2.70J	3.30J	<1	<1	2J
Chlordane-gamma			2.80J	3.10J	3.10J	3.60J	<1	<1	2.20J
Total Detectable Chlordanes	0.5	6.0	**7.60J***	**8.10J***	**9.80J***	**9.10J***	0	0	**5.5J**
Dieldrin	0.02	8.0	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**
Endosulfan Sulfate			<1	<1	<1	<1	<1	<1	<1
Endosulfan-I			<1	<1	<1	<1	<1	<1	<1
Endosulfan-II			<1	<1	<1	<1	<1	<1	<1
Endrin			<1	<1	<1	<1	<1	<1	<1
Endrin Aldehyde			<1	<1	<1	<1	<1	<1	<1
Endrin Ketone			<1	<1	<1	<1	<1	<1	<1
Heptachlor			<1	<1	<1	<1	<1	<1	<1
Heptachlor Epoxide			<1	<1	<1	<1	<1	<1	<1
Methoxychlor			<1	<1	<1	<1	<1	<1	<1
Mirex			<1	<1	<1	<1	<1	<1	<1
Perthane			<5	<5	<5	<5	<5	<5	<5
Toxaphene			<10	<10	<10	<10	<10	<10	<10
Aroclor PCBs (µg/kg)									
Aroclor 1016			<10	<10	<10	<10	<10	<10	<10
Aroclor 1221			<10	<10	<10	<10	<10	<10	<10
Aroclor 1232			<10	<10	<10	<10	<10	<10	<10
Aroclor 1242			<10	<10	<10	<10	<10	<10	<10
Aroclor 1248			<10	<10	<10	<10	<10	<10	<10
Aroclor 1254			13.1J	15J	<10	22.4	<10	<10	14.7J
Aroclor 1260			<10	<10	<10	<10	<10	<10	<10
PCB Congeners (µg/kg)									
PCB018			<1	<1	<1	<1	<1	<1	<1
PCB028			<1	<1	<1	<1	<1	<1	<1
PCB031			<1	<1	<1	<1	<1	<1	<1
PCB033			<1	<1	<1	<1	<1	<1	<1
PCB037			<1	<1	<1	<1	<1	<1	<1
PCB044			<1	<1	<1	<1	<1	<1	<1
PCB049			<1	<1	<1	<1	<1	<1	<1
PCB052			<1	<1	<1	<1	<1	<1	<1
PCB066			<1	<1	<1	<1	<1	<1	<1
PCB070			<1	<1	<1	<1	<1	<1	<1
PCB074			<1	<1	<1	<1	<1	<1	<1
PCB077			<1	<1	<1	<1	<1	<1	<1
PCB081			<1	<1	<1	<1	<1	<1	<1
PCB087			<1	<1	<1	<1	<1	<1	<1
PCB095			1.10J	1J	1.30J	1.30J	<1	<1	<1

EX.7

Analyte	ER-L	ER-M	1/2A COMP.	1/2B COMP.	4A COMP.	4B COMP.	Cherry St. Beach Reference	LA-2 Reference	LA Borrow Pit Reference
PCB097	.	.	<1	<1	<1	<1	<1	<1	<1
PCB099	.	.	<1	<1	<1	<1	<1	<1	<1
PCB101	.	.	<1	<1	2.30J	<1	<1	<1	<1
PCB105	.	.	<1	<1	<1	<1	<1	<1	<1
PCB110	.	.	1.60J	1.80J	<1	2.70J	<1	<1	1.80J
PCB114	.	.	<1	<1	<1	<1	<1	<1	<1
PCB118	.	.	<1	1.90J	1.5J	1.90J	<1	<1	<1
PCB119	.	.	<1	<1	<1	<1	<1	<1	<1
PCB123	.	.	<1	<1	<1	<1	<1	<1	<1
PCB126	.	.	<1	<1	<1	<1	<1	<1	<1
PCB128+167	.	.	<1	<1	<1	<1	<1	<1	<1
PCB138	.	.	<1	<1	<1	<1	<1	<1	<1
PCB141	.	.	<1	<1	<1	<1	<1	<1	<1
PCB149	.	.	1.80J	1.60J	1.5J	2.20J	<1	<1	<1
PCB151	.	.	<1	<1	<1	<1	<1	<1	<1
PCB153	.	.	1.60J	<1	1.70J	2.10J	<1	<1	1.5J
PCB156	.	.	<1	<1	<1	<1	<1	<1	<1
PCB157	.	.	<1	<1	<1	<1	<1	<1	<1
PCB158	.	.	<1	<1	<1	<1	<1	<1	<1
PCB168+132	.	.	<1	<1	<1	<1	<1	<1	<1
PCB169	.	.	<1	<1	<1	<1	<1	<1	<1
PCB170	.	.	<1	<1	<1	<1	<1	<1	<1
PCB177	.	.	<1	<1	<1	<1	<1	<1	<1
PCB180	.	.	1.70J	1.70J	1.70J	3.5J	<1	<1	1.20J
PCB183	.	.	<1	<1	<1	<1	<1	<1	<1
PCB187	.	.	<1	<1	<1	<1	<1	<1	<1
PCB189	.	.	<1	<1	<1	<1	<1	<1	<1
PCB194	.	.	<1	<1	<1	<1	<1	<1	<1
PCB200	.	.	<1	<1	<1	<1	<1	<1	<1
PCB201	.	.	<1	<1	<1	<1	<1	<1	<1
PCB206	.	.	<1	<1	<1	<1	<1	<1	<1
Total Detectable PCBs	22.7	180	7.80	8	10	13.70	0	0	4.5
Polycyclic aromatic hydrocarbons (µg/kg)									
1-Methylnaphthalene	.	.	4.20J	3.70J	3.10J	3.10J	<1	<1	1.90J
1-Methylphenanthrene	.	.	18.2	18.8	12.7	10.3	<1	<1	5.60
2,3,5-Trimethylnaphthalene	.	.	6.40	8.20	4.90J	4.30J	<1	<1	6.40
2,6-Dimethylnaphthalene	.	.	25	20.6	12.6	9.70	<1	1.20J	6.30
2-Methylnaphthalene	70	670	6.5	6.80	6.80	7.5	<1	<1	3.80J
Acenaphthene	16	500	7.40	5.30	3.60J	3.40J	<1	<1	2.90J
Acenaphthylene	44	640	1.5J	1.90J	2.5J	1.40J	<1	<1	1.10J
Anthracene	85.3	1100	25.2	13.4	12.0	8.30	<1	<1	7.70
Benz[a]anthracene	261	1600	152	53.1	56.3	39.4	<1	2J	37.2
Benzo[a]pyrene	430	1600	192	75.1	74.8	57.7	<1	2.20J	54

EX. 7

Analyte	ER-L	ER-M	1/2A COMP.	1/2B COMP.	4A COMP.	4B COMP.	Cherry St. Beach Reference	LA-2 Reference	LA Borrow Pit Reference
Benzo[b]fluoranthene	.	.	148	83	81	60	<1	2.20J	43.9
Benzo[e]pyrene	.	.	130	71.8	72.9	59.1	<1	2J	46.5
Benzo[g,h,i]perylene	.	.	141	88.2	80.1	61.4	<1	2.80J	47
Benzo[k]fluoranthene	.	.	142	69.8	61.8	51.6	<1	1.90J	43.5
Biphenyl	.	.	3.20J	2.30J	1.60J	2.20J	<1	<1	2.70J
Chrysene	384	2800	171	95.8	77.5	63.4	<1	1.90J	53.6
Dibenz[a,h]anthracene	63.4	260	34.7	18	19.2	10.4	<1	<1	<1
Dibenzothiophene	.	.	9.70	9.10	5.60	4.90J	<1	<1	<1
Fluoranthene	600	5100	320	169	135	108	<1	3.10J	84.3
Fluorene	19	540	12.1	11.8	6.5	5.60	<1	<1	3.5J
Indeno[1,2,3-c,d]pyrene	.	.	158	76.20	75.80	54.70	<1	2.60J	43.6
Naphthalene	160	2100	5.00	3.40J	2J	2.90J	<1	<1	<1
Perylene	.	.	47.6	32.3	29.4	27.9	<1	3.80J	21.4
Phenanthrene	240	1500	142	86.1	51.9	39.3	<1	1.60J	28
Pyrene	665	2600	313	169	146	118	<1	3.40J	85.4
Total Detectable PAHs	4022	44792	2215.7	1192.7	1035.6	814.5	0	30.70	630.3
Organotins (µg/kg)									
Dibutyltin	.	.	<1	<1	<1	<1	<1	<1	<1
Monobutyltin	.	.	<1	<1	<1	<1	<1	<1	<1
Tetrabutyltin	.	.	<1	<1	<1	<1	<1	<1	<1
Tributyltin	.	.	3.4	12.7	8.3	7.2	<1	<1	26.2
Phenols (µg/kg)									
2,4,6-Trichlorophenol	.	.	<50	<50	<50	<50	<50	<50	<50
2,4-Dichlorophenol	.	.	<50	<50	<50	<50	<50	<50	<50
2,4-Dimethylphenol	.	.	<100	<100	<100	<100	<100	<100	<100
2,4-Dinitrophenol	.	.	<100	<100	<100	<100	<100	<100	<100
2-Chlorophenol	.	.	<50	<50	<50	<50	<50	<50	<50
2-Methyl-4,6-dinitrophenol	.	.	<100	<100	<100	<100	<100	<100	<100
2-Nitrophenol	.	.	<100	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	.	.	<100	<100	<100	<100	<100	<100	<100
4-Nitrophenol	.	.	<100	<100	<100	<100	<100	<100	<100
Pentachlorophenol	.	.	<50	<50	<50	<50	<50	<50	<50
Phenol	.	.	<100	<100	<100	<100	<100	<100	<100
Phthalates (ug/kg)									
Butylbenzyl Phthalate	.	.	877	123	108	113	<5	18	60.7
Di-n-butyl Phthalate	.	.	789	209	221	686	233	1100	362
Di-n-octyl Phthalate	.	.	266	387	152	220	<5	<5	<5
Diethyl Phthalate	.	.	11.30	7.80J	6.90J	16.20	5.30J	17.10	7.30J
Dimethyl Phthalate	.	.	<5	<5	5J	6J	<5	<5	27.80
bis(2-Ethylhexyl) Phthalate	.	.	3420	4790	3290	3130	50	82.1	1640

* Concentrations of these chemicals exceed ER-L/ER-M values because they are the sum of several chemicals (i.e., DDT derivatives or chlordanes: alpha, gamma, oxychlordane, nonachlors); however, their individual counterparts are found at concentrations below reporting limits and thus total chlordanes and total DDTs are estimated values.

J denotes estimated concentration above detectiom limit but below reporting limit; **Bold** indicates values ≥ ER-L (effects range–low value reported by Long et al. 1995); **Bold & Underline** indicates values ≥ ER-M (effects range–median value reported by Long et al. 1995); n/p indicates sediment that is not plastic

EX. 7

4. DISCUSSION

4.1 AREA 1/2A

4.1.1 Chemical and Physical Characteristics

The composite sediment sample from Area 1/2A demonstrated similar grain size characteristics to the LA-2 reference sediment, with 35.9% fine-grained materials (24.3% silt and 11.6% clay), and 64.2% coarse-grained materials (0.25% gravel and 63.9% sand; Figure 4). The sediment was classified as silty sands with no plasticity and 1.69% TOC.

The concentrations of chemicals detected (i.e., metals, DDTs, chlordanes, PCBs, PAHs, and phthalates) in Area 1/2A sediment were relatively low when compared to sediment quality objectives or reporting limits and were only slightly elevated above LA-2 reference sediment. All of the metals detected were below ER-L values except silver, which was below the ER-M value (3.7 mg/kg). The DDT derivative 4,4'-DDE and total DDTs also exceeded their respective ER-L values, but were well below their ER-M values. Total chlordane was estimated at a concentration of 7.6 µg/kg, which exceeds the ER-M value; however, this result is based on the sum of estimated concentrations of chlordane isomers, all of which were measured below reporting limits. All other chemicals were below their ER-L values.

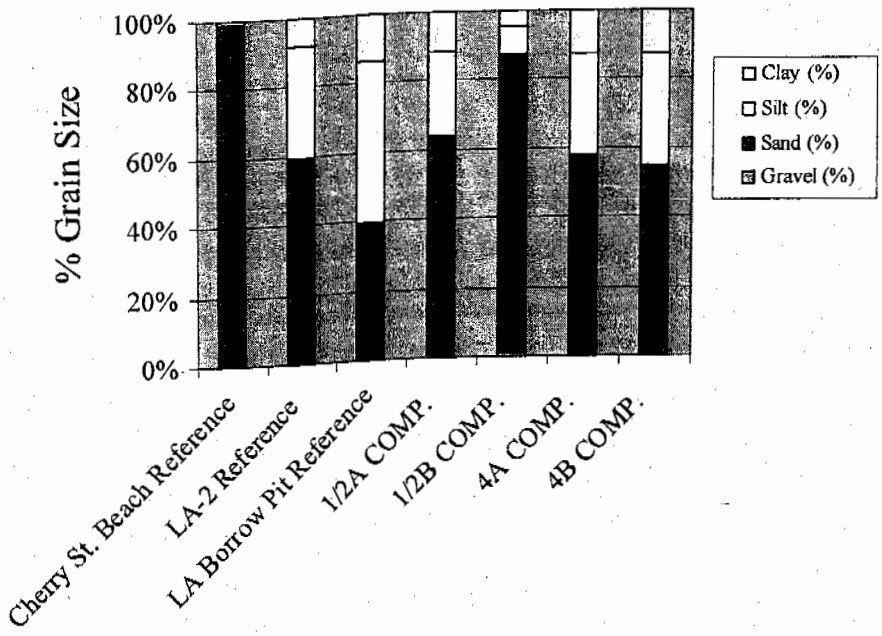

Figure 4. Grain size fractions of reference sediments and LARE project sediments

4.1.2 Biological Test Results

In the initial solid phase test with *E. estuarius*, the survivorship in Area 1/2A sediment (55%) was determined to be both significantly different and greater than 20% different from the survival in LA-2 Reference sediment (84%), thus failing to meet the LPC requirements for ocean disposal. In contrast, in the solid phase test with *R. abronius*, the survivorship in Area 1/2A sediment was 98% and thus met the LPC requirements for ocean disposal. Because of the lack of toxicity to *R. abronius* in Area 1/2A

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sediment, these results indicate that *E. estuarius* may be sensitive to a physical feature of the sediment (i.e. grain size or angularity). Similarly, previous investigations by Weston (formerly MEC Analytical) have provided evidence that survival of *E. estuarius* is affected by grain size extremes (i.e., >75% sand or >75% clay) while survival of *R. abronius*, an amphipod typically found in high energy, sandy environments (*R. abronius*), is not affected by grain size and typically demonstrates high survival in a wide range of grain sizes.

Based on these results and the phased approach described in section 2.3, Weston proceeded with Phase II to further examine whether the physical or chemical characteristics of materials were responsible for the observed toxicity to *E. estuarius*. Side by side testing of *E. estuarius* demonstrated survival of 52% and 60% for *E. estuarius* in SP and pore water tests of Area 1/2A sediments, respectively, both of which were significantly different from control survival for each test separately. Due to the similar level of toxicity in pore water vs. SP tests with Area 1/2A material, it remains unclear whether the physical or chemical characteristics of Area 1/2A material are responsible for the observed toxicity to the amphipod *E. estuarius*, and therefore the material does not meet the LPC requirements for ocean disposal.

Because of limited holding times for sediment samples, bioaccumulation potential tests were initiated following completion of initial solid phase tests to determine if there were bioaccumulative chemicals in Area 1/2A sediment. Results of BP tests demonstrated that while several metals (i.e., cadmium, chromium, nickel, lead, selenium) were statistically elevated in tissues *M. nasuta* exposed to Area 1/2A sediments relative to reference tissue concentrations, concentrations of these metals were well below any published relevant effect levels for lead, cadmium, chromium, nickel and selenium in marine invertebrate species. In *N. virens*, only phenanthrene was statistically elevated in tissues of *N. virens* exposed to LARE sediments relative to reference tissues. Similar to *M. nasuta*, a comparison to residue-effects information obtained through ERED indicated that the observed mean phenanthrene concentrations in tissues of *N. virens* exposed to LARE sediments were significantly below any published relevant effect levels for these analytes in marine invertebrate species. Based on these bioaccumulation test results alone, sediment from Area 1/2A meets the LPC requirements for ocean disposal.

Sediment from Area 1/2A does not meet the LPC requirements for ocean disposal based solely on the results of the SP test with the amphipod *E. estuarius*.

4.2 AREA 1/2B

4.2.1 Chemical and Physical Characteristics

The composite sediment sample from Area 1/2B demonstrated similar grain size characteristics to those of the Cherry Street Beach Reference sediment, with 12.9% fine-grained materials (8.14% silt, and 4.75% clay), and 87.1% coarse-grained materials (1.06% gravel and 86.0% sand; Figure 4). The sediment was classified as silty sands with no plasticity, and 1.44% TOC.

The concentrations of chemicals detected (i.e., metals, DDTs, chlordanes, PCBs, PAHs, and phthalates) in Area 1/2B sediment were relatively low when compared to sediment quality objectives or reporting limits and were only slightly elevated above LA-2 reference sediment. Silver (2.20 mg/kg) was the only heavy metal of concern detected above the ER-L sediment quality value, but was below the ER-M value. The DDT derivative 4,4'-DDE and total DDTs also exceeded their respective ER-L values, but were well below their ER-M values. Total chlordane was estimated at a concentration of 8.1 µg/kg, which exceeds the ER-M value; however, this result is based on the sum of estimated concentrations of chlordane isomers, all of which were measured below reporting limits. All other chemicals were below their ER-L values.

4.2.2 Biological Test Results

In the initial solid phase test with *E. estuarius*, the survivorship in Area 1/2B sediment (65%) was determined to be significantly different, but not greater than 20% different from the survival in LA-2 Reference sediment (84%). These results demonstrate that the material meets the LPC requirements for ocean disposal. The solid phase test with *R. abronius* demonstrated survival of 98% in Area 1/2B sediment and thus also met the LPC requirements for ocean disposal.

Because both amphipod tests indicated that the material was suitable for ocean disposal, bioaccumulation potential tests were performed to determine if there were bioaccumulative chemicals in Area 1/2B sediment. Results of BP tests demonstrated that while two metals (i.e., cadmium, lead) and two PAHs (i.e., fluoranthene and pyrene) were statistically elevated in tissues *M. nasuta* exposed to Area 1/2B sediments relative to reference tissue concentrations, concentrations of these chemicals were well below any published relevant effect levels for marine invertebrate species. In *N. virens* exposed to Area 1/2B sediment, only nickel was statistically elevated relative to reference tissue concentrations. Similar to *M. nasuta*, a comparison to residue-effects information obtained through ERED indicated that the observed mean nickel concentrations in tissues of *N. virens* exposed to Area 1/2B sediments were significantly below any published relevant effect levels for marine invertebrate species. Based on these BP test results alone, sediment from Area 1/2B meets the LPC requirements for ocean disposal.

Based on the results of SP and BP tests, sediment from Area 1/2B meets the LPC requirements for ocean disposal.

4.3 AREA 4A

4.3.1 Chemical and Physical Characteristics

The composite sediment sample from Area 4A demonstrated similar grain size characteristics to those of the LA-2 Reference sediment, with 42.0% fine-grained materials (29.4% silt and 12.6% clay), and 58.0% coarse-grained materials (0.50% gravel and 57.5% sand; Figure 4). The sediment was classified as silty sands with a plasticity index of 41, and 1.83% TOC.

The concentrations of chemicals detected (i.e., metals, DDTs, chlordanes, PCBs, PAHs, and phthalates) in Area 4A sediment were relatively low when compared to sediment quality objectives or reporting limits and were only slightly elevated above LA-2 reference sediment. Cadmium, copper, lead, silver, and zinc were detected above the ER-L sediment quality values; however, none of these metals exceeded ER-M values. The DDT derivative 4,4'-DDE and total DDTs also exceeded their respective ER-L values, but were well below their ER-M values. Total chlordane was estimated at a concentration of 9.8 µg/kg, which exceeds the ER-M value; however, this result is based on the sum of estimated concentrations of chlordane isomers, all of which were measured below reporting limits. All other chemicals were below their ER-L values.

4.3.2 Biological Test Results

In the initial solid phase test with *E. estuarius*, the survival in Area 4A sediment (80%) was determined not significantly different and not greater than 20% different from the survival in LA-2 Reference sediment (84%). These results demonstrate that the material meets the LPC requirements for ocean disposal. Similarly, the solid phase test with *R. abronius* demonstrated survival of 93% in Area 4A sediment and thus also met the LPC requirements for ocean disposal.

Because both amphipod tests indicated that the material was suitable for ocean disposal, BP tests were performed to determine if there were bioaccumulative chemicals in Area 4A sediment. Results of BP tests

demonstrated that while several metals (i.e., cadmium, chromium, lead) were statistically elevated in tissues *M. nasuta* exposed to Area 4A sediments relative to reference tissue concentrations, concentrations of these chemicals were well below any published relevant effect levels for marine invertebrate species. In *N. virens* exposed to Area 4A sediment, no chemicals were statistically elevated relative to reference tissue concentrations. Based on these BP test results alone, sediment from Area 4A meets the LPC requirements for ocean disposal.

Based on the results of SP and BP tests, sediment from Area 4A meets the LPC requirements for ocean disposal.

4.4 AREA 4B

4.4.1 Chemical and Physical Characteristics

The composite sediment sample from Area 4B demonstrated similar grain size characteristics to those of the LA-2 Reference sediment, with 45.1% fine-grained materials (32.2% silt, and 12.9% clay), and 54.9% coarse-grained materials (0.63% gravel and 54.6% sand; Figure 4). The sediment was classified as silty sands with no plasticity, and 2.04% TOC.

The concentrations of chemicals detected (i.e., metals, DDTs, chlordanes, PCBs, PAHs, and phthalates) in Area 4B sediment were relatively low when compared to sediment quality objectives or reporting limits and were only slightly elevated above LA-2 reference sediment. Cadmium, copper, silver, and zinc were the only metals detected above the ER-L sediment quality values; however, none of these metals exceeded ER-M values. The DDT derivative 4,4'-DDE and total DDTs also exceeded their respective ER-L values, but were well below their ER-M values. Total chlordane was estimated at a concentration of 9.1 µg/kg, which exceeds the ER-M value; however, this result is based on the sum of estimated concentrations of chlordane isomers, all of which were measured below reporting limits. All other chemicals were below their ER-L values.

4.4.2 Biological Test Results

In the initial solid phase test with *E. estuarius*, the survival in Area 4B sediment (86%) was determined not significantly different and not greater than 20% different from the survival in LA-2 Reference sediment (84%). These results demonstrate that the material meets the LPC requirements for ocean disposal. Similarly, the solid phase test with *R. abronius* demonstrated survival of 96% in Area 4B sediment and thus also met the LPC requirements for ocean disposal.

Because both amphipod tests indicated that the material was suitable for ocean disposal, bioaccumulation potential tests were performed to determine if there were bioaccumulative chemicals in Area 4B sediment. Results of BP tests demonstrated that while several metals (i.e., cadmium, chromium, lead) and were statistically elevated in tissues *M. nasuta* exposed to Area 4B sediments relative to reference tissue concentrations, concentrations of these chemicals were well below any published relevant effect levels for marine invertebrate species. In *N. virens* exposed to Area 4B sediment, only phenanthrene was statistically elevated relative to reference tissue concentrations. Similar to *M. nasuta*, a comparison to residue-effects information obtained through ERED indicated that the observed mean phenanthrene concentrations in tissues of *N. virens* exposed to Area 4B sediments were significantly below any published relevant effect levels for marine invertebrate species. Based on these BP test results alone, sediment from Area 4B meets the LPC requirements for ocean disposal.

Based on the results of SP and BP tests, sediment from Area 4B meets the LPC requirements for ocean disposal.

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4.5 QUALITIES OF LARE SEDIMENTS FOR USE IN BEACH NOURISHMENT PROJECTS

Chemical and physical test results were used to evaluate LARE sediment for potential use in beach nourishment projects. While the acceptable content of fines for beach fill is determined on a case-by-case basis, general guidelines indicate that acceptable fines content for potential beach fill may be up to 20% (USACE 2004). It is also recommended that dredged material to be used as beach fill demonstrate a grain size distribution that is similar (within 10 percentage points) to the fines at the receiving beach. Sediment to be used as beach fill should also demonstrate a low or background level of chemical contamination. Using these criteria, LARE sediment from each area was evaluated for its suitability in beach nourishment projects.

In Area 1/2A, the grain size content of sediment from this area was comprised of 35.9% fine-grained materials (24.3% silt and 11.6% clay), which was not within 10% of the percent of fines measured in the Cherry Street Beach sediment (1.62% fine-grained materials). Concentrations of all analytes were relatively low with only a two exceedances of ER-L values for silver and DDT within project sediment (concentrations of these analytes did not exceed ER-M values, and one ER-M exceedance for total chlordanes based on estimated concentrations of the individual chlordane isomers which were below MRLs. Based primarily on the high percentage of fines in Area 1/2A which were much higher than 20%, and because Area 1/2A did not meet the LPC requirements for ocean disposal, sediment from Area 1/2A may not be suitable for beach nourishment projects.

In Area 1/2B, the grain size content of sediment from this area was comprised of 12.9% fine-grained materials (8.14% silt, and 4.75% clay), which was within 12% of the percent of fines measured in the Cherry Street Beach sediment (1.62% fine-grained materials). Concentrations of all analytes were relatively low with only a two exceedances of ER-L values for silver and DDT within project sediment (concentrations of these analytes did not exceed ER-M values), and one ER-M exceedance for total chlordanes based on estimated concentrations of the individual chlordane isomers which were below MRLs. Based primarily on the low percentage of fines in Area 1/2B which were lower than 20% and within 12% of the fines measured in local beach sediment (Cherry Street Beach), and on the low concentrations of chemicals measured in this material, sediment from Area 1/2B may be suitable for beach nourishment projects.

In Area 4A, the grain size content of sediment from this area was comprised of 42.0% fine-grained materials (29.4% silt and 12.6% clay), which was not within 10% of the percent of fines measured in the Cherry Street Beach sediment (1.62% fine-grained materials). Concentrations of all analytes were relatively low with only a few exceedances of ER-L values (cadmium, copper, lead, silver, zinc, and DDT) within project sediment (concentrations of these analytes did not exceed ER-M values), and one ER-M exceedance for total chlordanes based on estimated concentrations of the individual chlordane isomers which were below MRLs. Based primarily on the high percentage of fines in Area 4A which were much higher than 20%, sediment from Area 4A may not be suitable for beach nourishment projects.

In Area 4B, the grain size content of sediment from this area was comprised of 45.1% fine-grained materials (32.2% silt, and 12.9% clay), which was not within 10% of the percent of fines measured in the Cherry Street Beach sediment (1.62% fine-grained materials). Concentrations of all analytes were relatively low with only a few exceedances of ER-L values (cadmium, copper, lead, silver, zinc, and DDT) within project sediment (concentrations of these analytes did not exceed ER-M values), and one ER-M exceedance for total chlordanes based on estimated concentrations of the individual chlordane isomers which were below MRLs. Based primarily on the high percentage of fines in Area 4B which were much higher than 20%, sediment from Area 4B may not be suitable for beach nourishment projects.

5. CONCLUSIONS

- Chemical analyses were performed on project sediments from four areas (1/2A, 1/2B, 4A, and 4B). Chemical concentrations in sediment from Area 1/2A, Area 1/2B, Area 4A, and Area 4B were relatively low with only a few ER-L exceedances (metals and DDTs) and estimated ER-M exceedances (total chlordanes); all other chemicals were below ER-L values.
- SP toxicity tests with the amphipods *E. estuarius* and *R. abronius* were conducted on project sediments from all areas (1/2A, 1/2B, 4A, and 4B). These SP test results indicate that sediment from Areas 1/2B, 4A, and 4B meets the LPC requirements for ocean disposal.
- Results of SP tests with *E. estuarius* on sediment from Area 1/2A demonstrate that this material does not meet LPC requirements for ocean disposal.
- BP tests were conducted on project sediments from Area 1/2A, Area 1/2B, Area 4A, and Area 4B. Based on ERED and CBR guidelines, all contaminant concentrations in tissues of organisms exposed to LARE sediments were below published relevant effect levels. In addition, none of the chemicals in project areas that were measured above reference tissue concentrations have a proclivity to biomagnify in marine food webs. These bioaccumulation test results indicate that sediment from Area 1/2A, Area 1/2B, Area 4A, and Area 4B meets the LPC requirements for ocean disposal.
- Based on the results of all testing and analyses described in this report, sediment from Areas 1/2B, 4A, and 4B meets the LPC requirements for ocean disposal. Sediment from Area 1/2A does not meet the LPC requirements for ocean disposal; however, this is based solely on the results of one SP test with the amphipod *E. estuarius*. It should be noted that SP tests with the amphipod *R. abronius*, BP tests, previous SP tests using *N. arenaceodentata*, and all three previous SPP tests (*M. edulis, M. beryllina,* and *M. bahia*) conducted by Weston (2005a) on Area 1/2 (A and B) sediments met the LPC requirements for ocean disposal.
- Based primarily on the low percentage of fines in Area 1/2B, sediment from Area 1/2B may be suitable for beach nourishment projects. Sediment from Area 1/2A, Area 4A, and Area 4B may not be suitable for beach nourishment projects based primarily on the high percentage of fines in these areas which were much higher than 20%.

EX-8