STATE OF CALIFORNIA—THE RESOURCES AGENCY

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PETE WILSON, *Governor*

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

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STAFF REPORT AND RECOMMENDATION

ON CONSISTENCY DETERMINATION

Consistency Determination	
No. CD-100-95	U.S. Navy
Staff:	MPD-SF
Filed:	10/17/95
45th Day:	12/2/95
60th Day:	12/17/95
Commission Meeting:	11/16/95

FEDERAL AGENCY: **U.S. Navy**

DEVELOPMENT LOCATION: Northwest corner of the Naval Amphibious Base (NAB), Coronado, San Diego County, (Exhibits 1-3)

DEVELOPMENT DESCRIPTION: Demolition of existing pier and construction of Cyclone-Class Patrol Ship Pier and ramp (Exhibit 3), including 33,000 cu. yds. of dredging, with disposal in three locations: in San Diego Bay near Delta Beach (Exhibit 12), offshore disposal site LA-5, and at Navy "Homeporting" fill area (NASNI) (Exhibits 10-12)

SUBSTANTIVE FILE DOCUMENTS: See page 9.

EXECUTIVE SUMMARY

The U.S. Navy (Navy) has submitted a consistency determination for the construction of a pier to accommodate the anticipated arrival of a new squadron of Cyclone-Class Coastal Patrol ships at the Naval Amphibious Base in Coronado. The project includes: (1) the demolition of existing Pier 15 and construction of a replacement pier 150 feet east of the demolished pier; (2) construction of a boat launching ramp extending 30 feet into the bay from the existing bulkhead; and (3) dredging of 33,000 cu. yds. of material, with disposal in three locations, as follows: (a) 10,500 cu.yds. would be placed in San Diego Bay, near Delta Beach, to provide substrate for eelgrass mitigation; (b) 9,500 cu. yds. would be disposed at offshore disposal site LA-5; and (c) 13,000 cu. yds., unsuitable for ocean disposal, would be placed within the 13.4 acre fill area for the NIMITZ Class Aircraft Carrier (CVN) Homeporting ("Homeporting") project at the Naval Air Station, North Island (NASNI).

The Navy pier and dredging project serves defense-related Navy boating missions and is an allowable use under Section 30233(a)(1) of the Coastal Act. Disposal of uncontaminated material at LA-5 and at the eelgrass mitigation site within the bay will not adversely affect marine resources. Disposal of material determined unsuitable for aquatic disposal in conjunction with the Homeporting project can be summarized as follows: (1) the bay fill is an allowable use; (2) its fill and eelgrass impacts are being mitigated offsite; (3) the dredging and disposal will be performed in the least environmentally damaging manner by, among other things, minimizing turbidity and impacts to least terns; and (4) the material unsuitable for aquatic disposal will be isolated from the marine environment and monitored (see CD-95-95 for more details). Eelgrass impacts from the project will be mitigated. Least tern impacts will be avoided. The project will not adversely affect water quality, marine resources, or environmentally sensitive habitat policies and is consistent with Sections 30230, 30233, and 30240 of the Coastal Act.

Finally, the project will pose no burdens on public access and is consistent with the public access and recreation policies (Sections 30210-30212) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION

I. Staff Summary:

A. Project Description/Background. The Navy has submitted a consistency determination for the construction of a pier to accommodate the anticipated arrival of a new squadron of Cyclone-Class Coastal Patrol (PC-1) ships at the Naval Amphibious Base (NAB) in Coronado. The Navy states the project is needed:

> ... to provide navigational access, cold iron, hotel service, and accessibility to maintenance service for the six new PC-1 class ships. A new pier is needed because the existing piers, which were designed for small craft, are too narrow for crane service, are too closely spaced, have inadequate utility service, are in water that is too shallow, and are deficient from a lateral force resistance standpoint for adequate support of these new ships.

The project includes the demolition of existing Pier 15, dredging, construction of a replacement pier 150 feet east of the demolished pier, and construction of a boat launching ramp (Exhibit 3). The new pier would be 455 feet long by 30 feet wide, and would provide four berths for six double nested PC-1 Class ships. The dredging would involve creation of a navigational berthing basin dredged to -13 feet Mean Lower Low Water (MLLW) within a 400-foot-wide corridor extending 850 feet northwest from the seawall into the Bay (7.8 acres in area). The increased depth necessitates expanding the existing rock revetment along the project shoreline to keep the bank in place. The project includes a 132 ft. by 40 ft. boat launching ramp, which would extend 30 feet into the bay from the existing bulkhead. The ramp would allow the launch and recovery of small craft (would be stored in a new operational storage facility to be constructed under another project).

The project, originally submitted as CD-75-94, initially consisted of 41,170 cu. yds. of dredging, with partial beach disposal at Imperial Beach and partial disposal at Delta Beach for eelgrass mitigation. Subsequent sediment testing (Exhibit 9) showed some of the material to be unsuitable for aquatic disposal, and the project has been resubmitted as a new consistency determination. The Navy has revised the project, reducing the volume of material to be dredged to 33,000 cu. yds., with disposal as follows: (a) 10,500 cu.yds. of clean sandy material would be placed in San Diego Bay, near Delta Beach, to provide substrate for eelgrass mitigation (Exhibit 9); (b) 9,500 cu. yds. would be disposed at the EPA designated offshore disposal site LA-5, located 5.4 miles offshore of San Diego; and (c) 13,000 cu. yds., for which sediment test results indicate it is unsuitable for ocean or beach disposal, would be placed in the 13.4 acre fill area proposed as part of the Homeporting project at NASNI (Exhibits 10-12).

Exhibit 12 depicts a typical cross section of the fill and dikes proposed at NASNI. A full description of this fill is contained in the Commission staff report for the Homeporting project (CD-95-9), which is incorporated by reference into the subject report, and which is scheduled for Commission action at the same meeting as the subject project. To summarize, the dredged material from the subject project would be transported to the fill site by barge and placed in the fill area, along with dredge materials from the Homeporting project that are also unsuitable for aquatic disposal. Clean fill, topped by asphalt, would be placed above the unsuitable materials. The fill would be engineered to withstand seismic and other geologic forces. The fill would be contained along the north, east, and west sides by armor stone dikes, and would include mitigation for the loss of bay bottom, as well as engineering measures and monitoring features to assure the material would remain isolated from the marine environment. Engineering measures include compaction of the fill, use of approximately 21,000 tons of 500-pound armor stone, placement of sand sized material in the 50-ft.-wide fill area nearest the dike, and placement of filter fabric between the fill and armor underlayer in the area subject to tidal influence (from +10 feet to -2 feet MLLW).

The two projects' dredging would be tied together. Assuming the Homeporting project proceeds as scheduled, the subject Pier 15 demolition and dredging of unsuitable material is scheduled to begin at the end of April and last for about 6 to 8 weeks. The remainder of the in-water construction for the subject project would occur outside the April 1-Sept. 15 time frame (i.e., after the least tern nesting season).

B. Status of Local Coastal Program. The standard of review for federal consistency determinations is the policies of Chapter 3 of the Coastal Act, and not the Local Coastal Program (LCP) or Port Master Plan (PMP) of the affected area. If the LCP (or PMP) has been certified by the Commission and incorporated into the CCMP, it can provide guidance in applying Chapter 3 policies in light of local circumstances. If the LCP (or PMP) has not been incorporated into the CCMP, it cannot be used to guide the Commission's decision, but it can be used as background information. The City of Coronado's LCP and the Port of San Diego's PMP have been certified by the Commission and have been incorporated into the CCMP.

C. Federal Agency's Consistency Determination. The Navy 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 resolution:

Concurrence

The Commission hereby concurs with the consistency determination made by the Navy for the proposed project, finding that the project is consistent to the maximum extent practicable with the California Coastal Management Program.

III. Findings and Declarations:

The Commission finds and declares as follows:

A. Habitat and Marine Resources. Section 30230 of the Coastal Act provides:

> 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 30233(a) provides:

> (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 feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:
>
> (1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.
>
> ...
>
> (4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.
>
> ...

(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.

Section 30240 provides:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such 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 such areas, and shall be compatible with the continuance of such habitat areas.

The project involves dredging and filling of a coastal estuary, and therefore triggers the three-part test of Section 30233: (1) the project must be one of the eight allowable uses under Section 30233; (2) the project must be the least damaging feasible alternative; and (3) the project must include feasible mitigation measures to minimize adverse environmental effects.

(1) Allowable Use. The first (allowable use) test is met because the project is a new or expanded port and/or coastal-dependent boating facility. The project therefore qualifies as the first and/or fourth of the eight enumerated uses listed under Section 30233.

(2) Alternatives. The second (alternatives) test is met as the dredging and disposal, as discussed below, will be performed in a manner where materials unsuitable for aquatic disposal will be removed and isolated from the marine environment, and materials that are suitable for aquatic disposal (in San Diego Bay and at LA-5) will be placed in a manner traditionally determined the least damaging alternative by the Commission.

The sediments proposed for dredging and disposal have been evaluated by the Navy pursuant to the procedures described in the 1991 EPA/Corps testing manual, Evaluation of Dredged Material Proposed for Ocean Disposal -- Testing Manual (Green Book). The testing procedures described in the Green Book allow for a tiered approach to analysis of the dredged sediments. This hierarchical approach allows for optimal use of resources by focusing the least effort on dredging operations where the potential for unacceptable adverse impact is clear, and expending the most effort on operations requiring more extensive investigation to determine the potential for impact. It is necessary to proceed through the tiers only until information sufficient to determine compliance or noncompliance with EPA's regulations has been obtained. Only if there is not enough information to determine suitability or unsuitability for ocean disposal after the completion of a tier, will the applicant be required to complete the next tier testing.

Initial testing in 1994 indicated that sediments in Area 2 (Exhibit 7) were suitable for aquatic disposal, whereas sediments in Area 1 were not. The Navy conducted subsequent tests on Area 1 sediments, to attempt to determine whether certain portions, either vertically or horizontally, could be considered suitable for aquatic disposal. The final test results for this project are summarized in Exhibit 9. These results show that the material in Area 2 and Area 1 (Sub-area 1B) (Exhibit 8) is uncontaminated and suitable for ocean disposal. However approximately 13,000 cu. yds. of material in Area 1 (Sub-area 1A, nearer to shore and containing greater quantities of fine-grained sediments) were determined unsuitable for aquatic disposal. This material contained elevated lead and other heavy metals, PAHs, and other contaminants, and did not pass bioassay and bioaccumulation tests. The Navy proposes to dispose of these 13,000 cu. yds. at the 13.4 acre engineered fill area for the Homeporting project at NASNI, along with dredge materials from the Homeporting project that are also unsuitable for aquatic disposal. As discussed below, monitoring will assure that turbidity is minimized and that the material unsuitable for aquatic disposal is placed in an area where it will be removed and remain isolated from the marine environment. With these measures, the Commission finds the project represents the least damaging alternative.

(3) Mitigation. The third (mitigation) test involves analyzing fill, shading, least tern, eelgrass, turbidity, and impacts associated placement of fill material within the Homeporting project fill area.

Since the project would replace an existing pier, the amount of fill and shading are similar to what occurs from the existing pier proposed for demolition. The boat ramp would only extend into bay waters that are already covered by a rock revetment. The revetment expansion would provide habitat benefits equal to or greater than the area covered. The only exception to these situations is where the pier, ramp and revetment would displace eelgrass, an impact which does warrant mitigation as discussed below. With monitoring to assure minimized impacts, the Commission has traditionally determined short term turbidity impacts associated with dredging to be temporary and not warranting mitigation. Therefore no further mitigation, in addition to the proposed eelgrass mitigation, is warranted for these impacts.

Regarding eelgrass, the dredging would result in the loss of 0.12 acres of eelgrass habitat (Exhibit 6), which the Commission considers to be environmentally sensitive habitat. Historically in reviewing Navy San Diego Bay cases where eelgrass losses were posed, the Commission has considered this to be a mitigable impact, and has considered a 1.2:1 mitigation ratio for eelgrass losses to be adequate mitigation. In this case, the Navy proposes 1.2:1 mitigation, or creation of 0.15 acres of eelgrass habitat, near Delta Beach (Exhibit 2). The Navy states:

> Eelgrass lost within the project area shall be replanted at nearby Delta Beach, providing a net increase. Eelgrass mitigation provides the opportunity to create a contiguous, denser eelgrass bed which will be more productive in the long term. Eelgrass mitigation is being closely coordinated with the National Marine Fisheries Service. ... Disposal of 10,500 cubic yards near Delta Beach will provide a large shallow area for

eelgrass mitigation. The eelgrass bed is expected to increase the overall productivity of the San Diego Bay ecosystem contributing benefits to both fisheries and endangered species.

The Navy has prepared an eelgrass mitigation plan ("Eelgrass Mitigation Plan for MILCON P-211, Naval Amphibious Base, San Diego,"), to offset the loss of eelgrass habitat resulting from the proposed project. The eelgrass habitat would be constructed using a portion of dredge spoil sediment from the project, as discussed above. The 0.12 acre of affected eelgrass would be successfully replaced with a minimum of 0.15 acre of habitat, for a 1.2:1 ratio. Any eelgrass planted over that amount would be considered banked.

The eelgrass plan includes monitoring assurances. Monitoring the success of the eelgrass mitigation project would be performed for five years. Monitoring activities would determine the percent coverage and density of plants at the transplant site and would be conducted at 3, 6, 12, 24, 36, 48, and 60 months after completion of the transplant. All monitoring will be conducted during the active vegetative growth period (outside the November through February period). The Navy has worked out the mitigation and monitoring details in consultation with the National Marine Fisheries Service. The Commission finds these measures would adequately mitigate eelgrass impacts.

The Navy will also monitor turbidity caused by dredging, as required by the Regional Water-Quality Control Board (RWQCB). If the RWQCB so requires, the Navy will utilize a silt curtain and/or a water-tight bucket on the dredge to further reduce turbidity.

The project has been scheduled to minimize impacts to the California least tern, an endangered species. Other than the dredging that must occur in conjunction with the Homeporting project, activities potentially affecting the terns will occur outside the least tern nesting season (April 1 through September 15). Aside from this dredging, the only other component of the project scheduled to occur within this time period would be the pier demolition, which should not affect the terns (Exhibit 4). The remainder of the in-water construction would not occur until after the nesting season is over. The Navy has coordinated with the U.S. Fish and Wildlife Service to assure impacts to least terns will be minimal.

Mitigation measures related to the disposal of the "unsuitable" material within the fill area of the Navy Homeporting project at NASNI are addressed in the Commission analysis of the Homeporting project (CD-95-95), incorporated by reference into this report. To summarize, the dredged material would be transported to the fill site by barge and dumped. The fill area would be contained along the north, east, and west sides by armor stone dikes, and would include mitigation for the loss of bay bottom, as well as engineering measures and monitoring features to assure the material will remain isolated from the marine environment.

An effective maintenance and management plan is in the process of being finalized for the rock dike and fill area. This plan will include biological and water quality monitoring, and engineering monitoring (including evaluating the structural integrity of the rock dike throughout its lifetime). The RWQCB will require completion of the monitoring plan within three months of issuance of its waste discharge permit for the Homeporting project, which is currently expected in early January 1966. The Navy has agreed to submit the final monitoring plan to the Commission staff, for its review and concurrence, prior to placing any dredged material within the fill area.

If any of the monitoring measures discussed above indicate impacts are more significant than anticipated, the Navy has agreed to remediation or other appropriate responses to the monitoring results. With these mitigation and monitoring measures, the Commission finds the Navy has provides for avoidance, monitoring, and mitigation measures where necessary to protect water quality, marine resources and environmentally sensitive habitat.

In conclusion, the Commission finds that the project: (1) is an allowable use under Section 30233(a); (2) complies with all applicable water quality standards; (3) is the least environmentally damaging feasible alternative; and (4) provides for avoidance, monitoring, and mitigation measures to protect marine resources and environmentally sensitive habitat. The Commission therefore finds the project consistent with the marine resources and environmentally sensitive habitat policies (Sections 30230, 30233 and 30240) of the Coastal Act.

B. Public Access and Recreation. Sections 30210-30212 provide for the protection and provision of public access and recreation opportunities. In reviewing past consistency determinations for Navy activities at the NAB, the Commission has traditionally determined that military security needs, and a lack of public access burdens generated by such projects, means that no additional public access need be provided in these projects (see Consistency Determinations No. CD-9-89, CD-46-90, CD-48-92, and CD-10-93, which were for Navy projects at the Naval Amphibious Base).

The Commission reiterates its finding that preclusion of access at the NAB is appropriate given military security needs. The Commission therefore concludes that the project will pose no burdens on public access and is consistent with the public access and recreation policies of the Coastal Act.

<u>SUBSTANTIVE FILE DOCUMENTS</u>:

1. Consistency Determinations No. CD-95-95 (Navy Homeporting, NASNI) and accompanying FEIS ("Final EIS for the Development of Facilities in the San Diego-Coronado to support the Homeporting of One NIMITZ Class Aircraft Carrier," October 1995).

2. Consistency Determination CD-75-94 (Navy, previous P-211 consistency determination).

3. Environmental Assessment, P-211 PC Pier Upgrade and P-202 Operational Storage Facility, Naval Amphibious Base, Coronado, California, U.S. Navy, July 1994.

4. Sediment Testing Report, P-211, Coronado Naval Amphibious Base, San Diego, California, U.S. Navy, May 26, 1994.

5. Chemical Analysis and Toxicity Evaluation of Sediments at Construction Project P-211, Naval Amphibious Base, Coronado San Diego, August 1995.

6. Consistency Determinations No. CD-9-89, CD-46-90, CD-48-92, and CD-10-93 (Navy, NAB).

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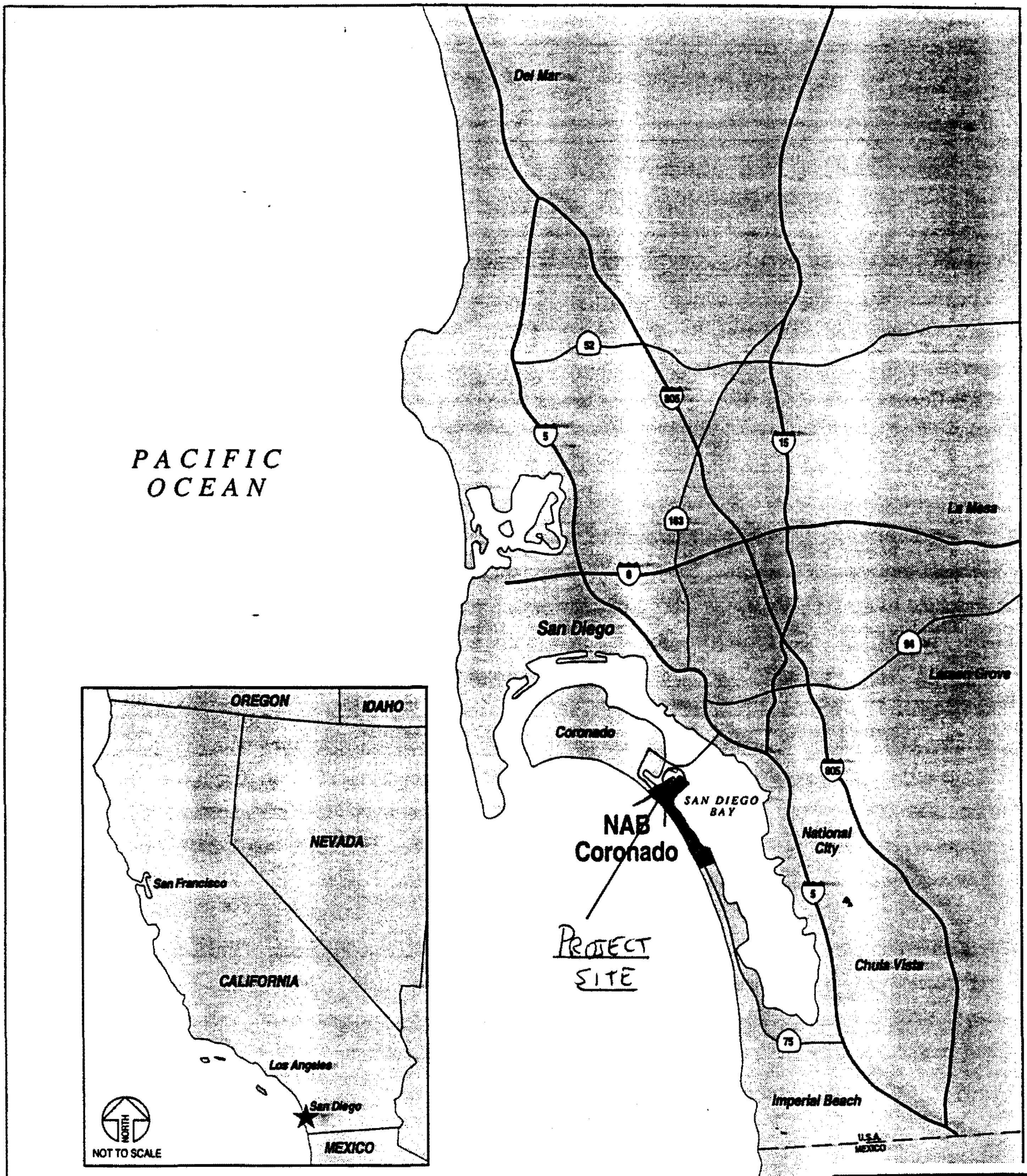


Source: NAB Coronado Master Plan, (U.S. Navy, 1989)

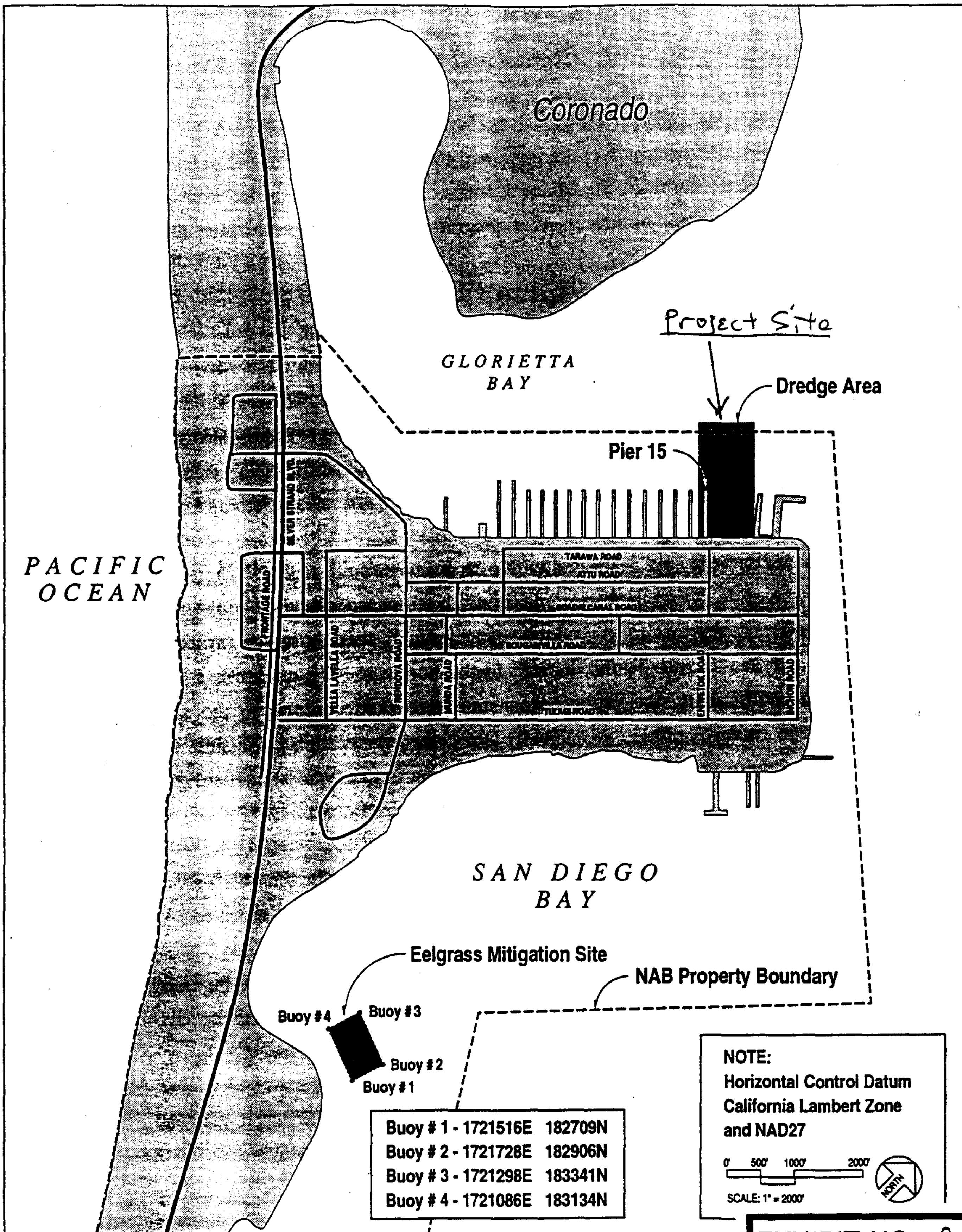
FIGURE 1 *Regional Setting, NAB Coronado*

EXHIBIT NO. 1

APPLICATION NO.

CD-100-95

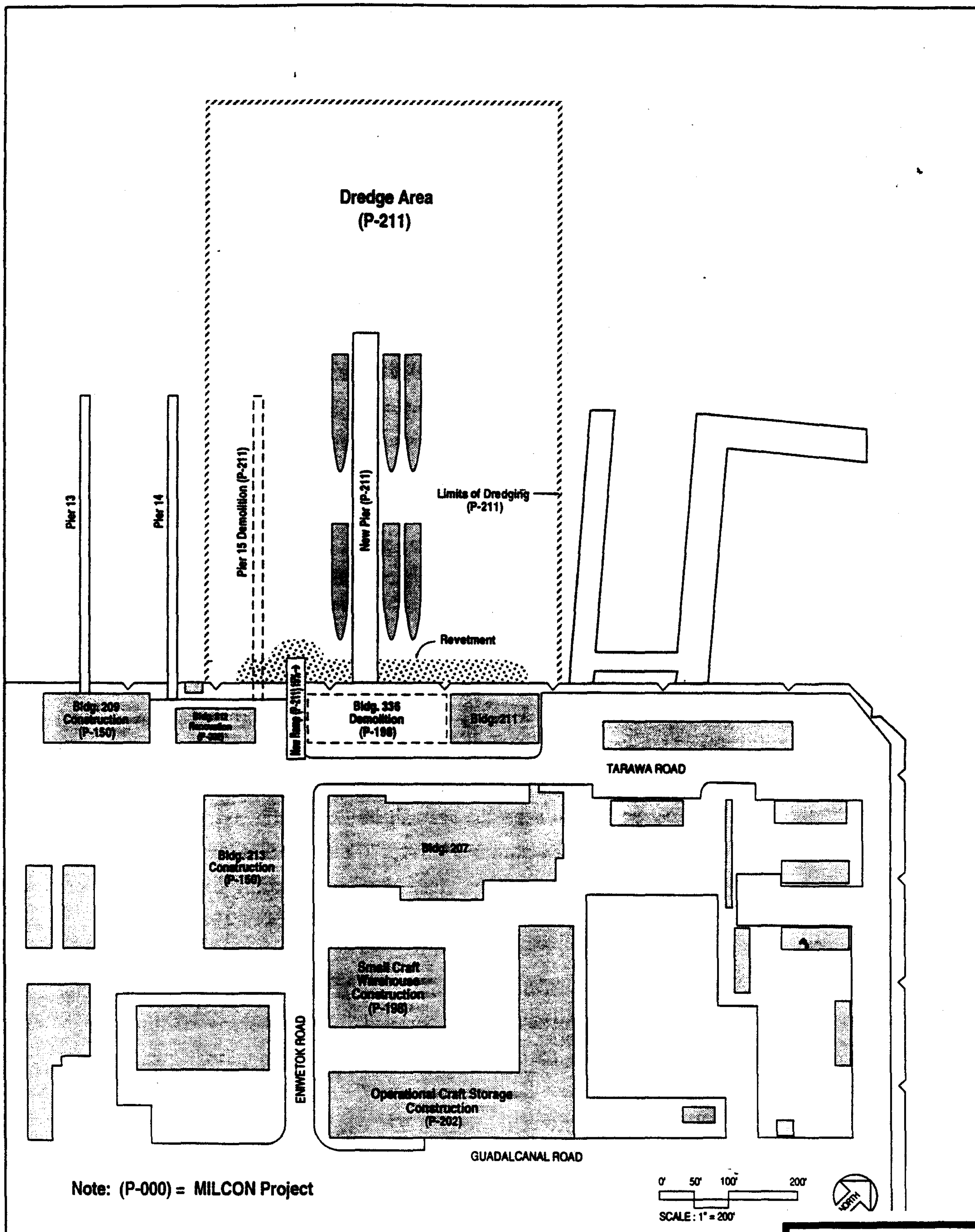
California Coastal Commission



Source: Modified from NAB Coronado Master Plan (U.S. Navy, 1989)

FIGURE 4.3.1-1 *Potential Habitat Area (4.2 acres) for Eelgrass Mitigation*

EXHIBIT NO. 2
APPLICATION NO.
CD-100-95
California Coastal Commission



Source: U.S. Navy 1391, 1993

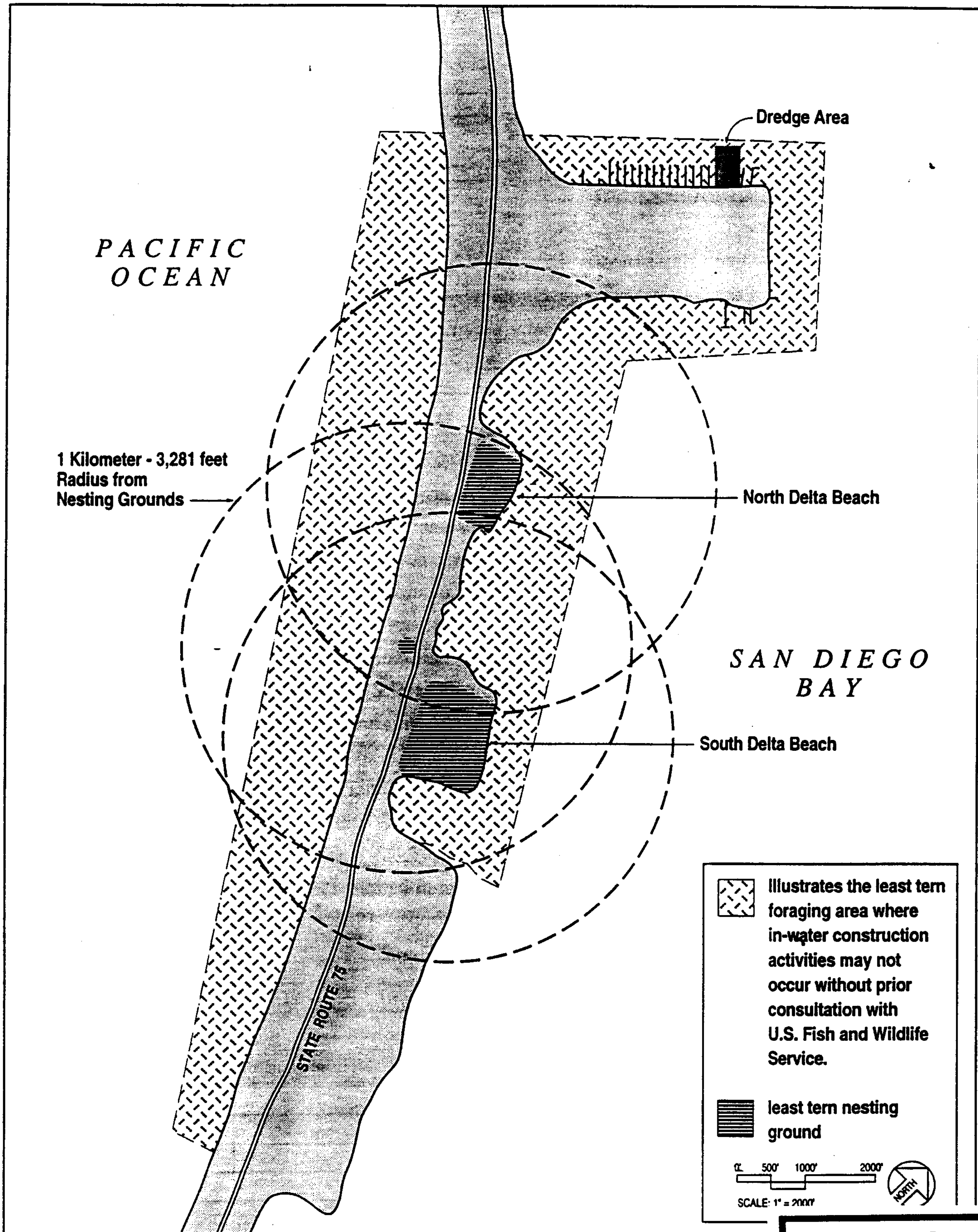
FIGURE 3 *Project Plan for P-211 and P-202*

EXHIBIT NO. 3

APPLICATION NO.

CD-100-95

California Coastal Commission



Source: MOU between U.S. Fish and Wildlife Service and Naval Facilities Engineering Command, 1987; Personal Communication, Tricia Hobell, 1994

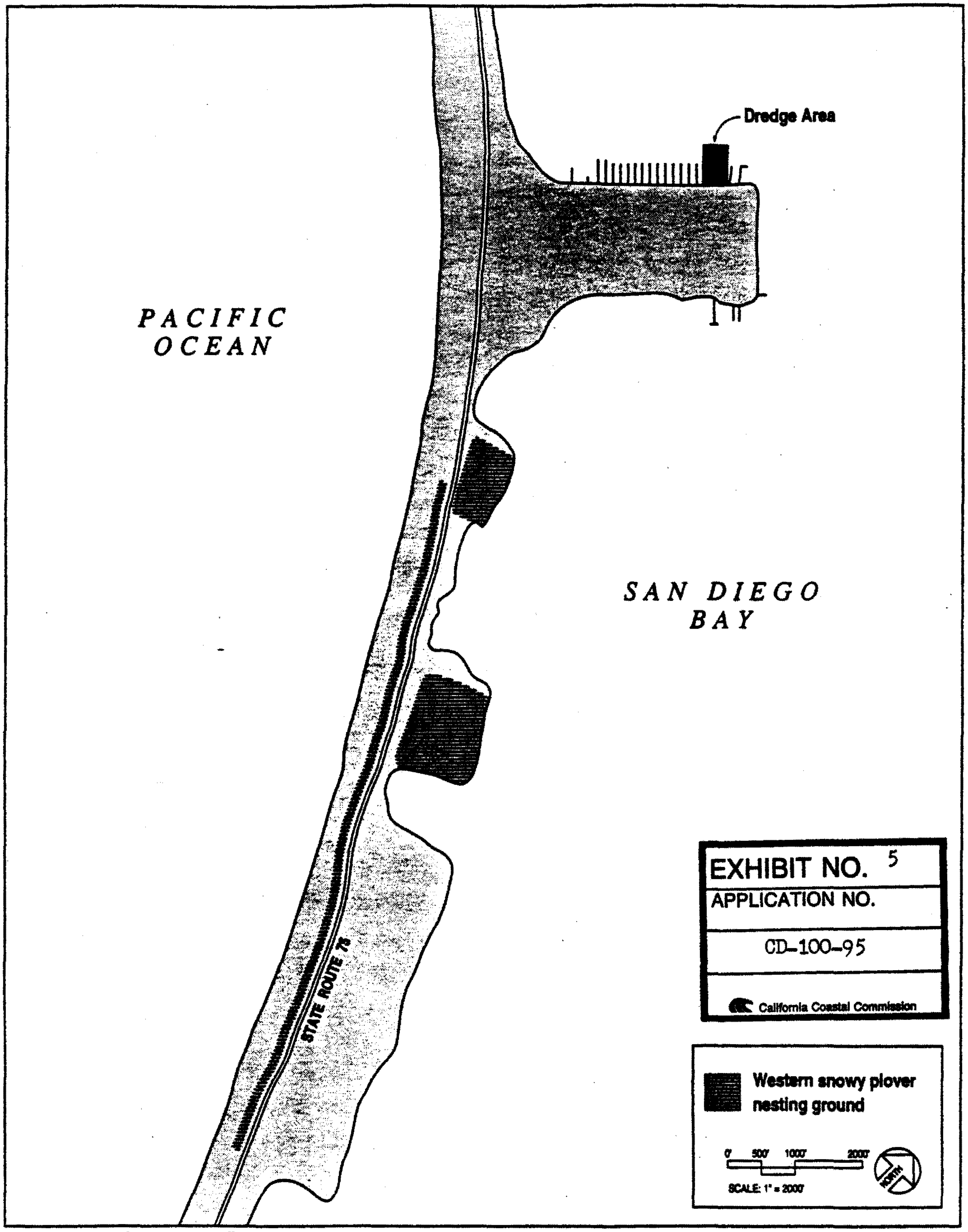
FIGURE 7 *California Least Tern Foraging Area and Nesting Groun[ds] in the Vicinity of NAB Coronado*

EXHIBIT NO. 4

APPLICATION NO.

CD-100-95

California Coastal Commission



Source: Personal Communication, Tricia Hobell, 1994

FIGURE 3.1.1-2 *Nesting Areas of the Western Snowy Plover in the Vicinity of NAB Coronado*

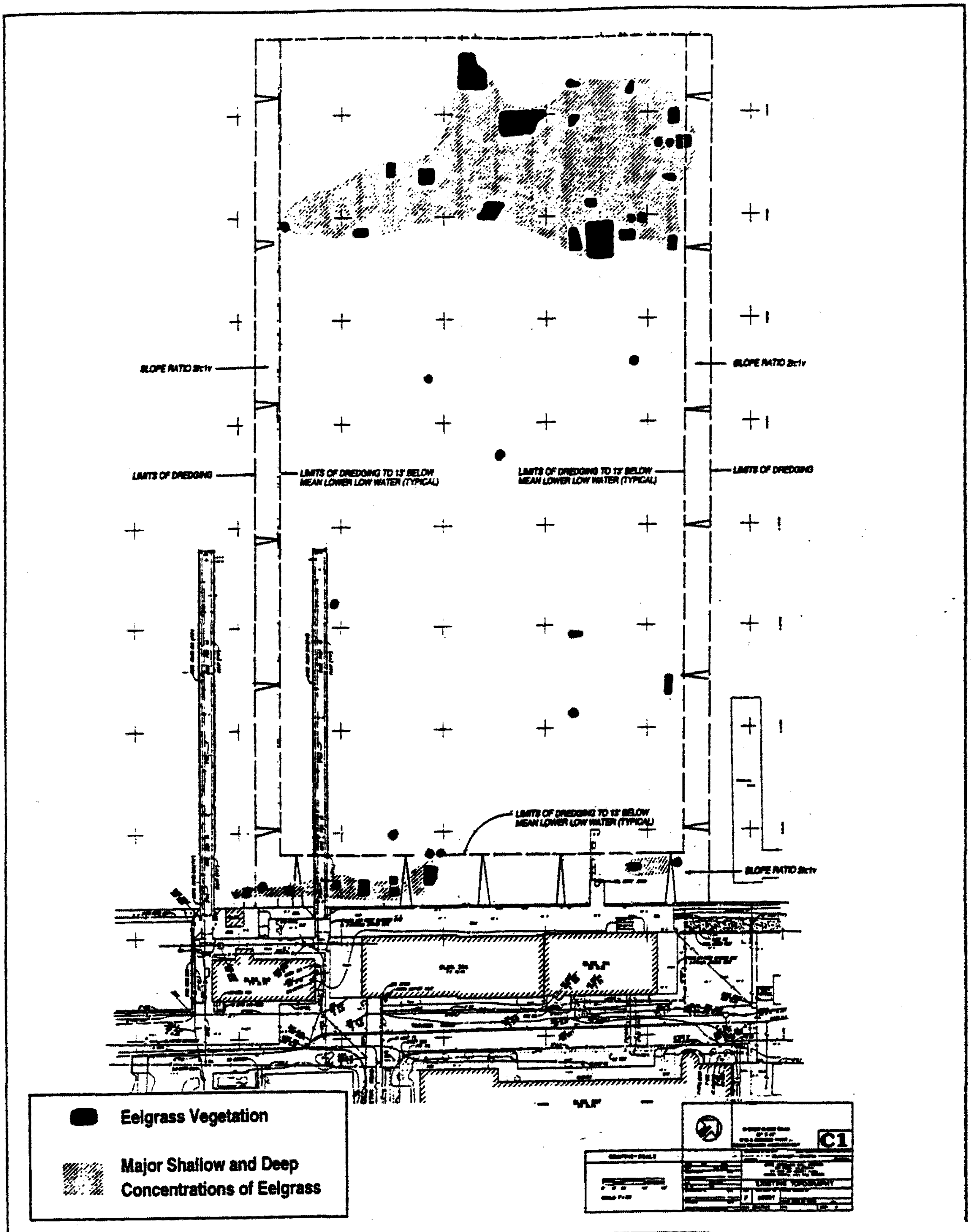


FIGURE 3.3.1-1 *Eelgrass Distribution in Dredge Area*

EXHIBIT NO. 6
APPLICATION NO.
CD-100-95
California Coastal Commission

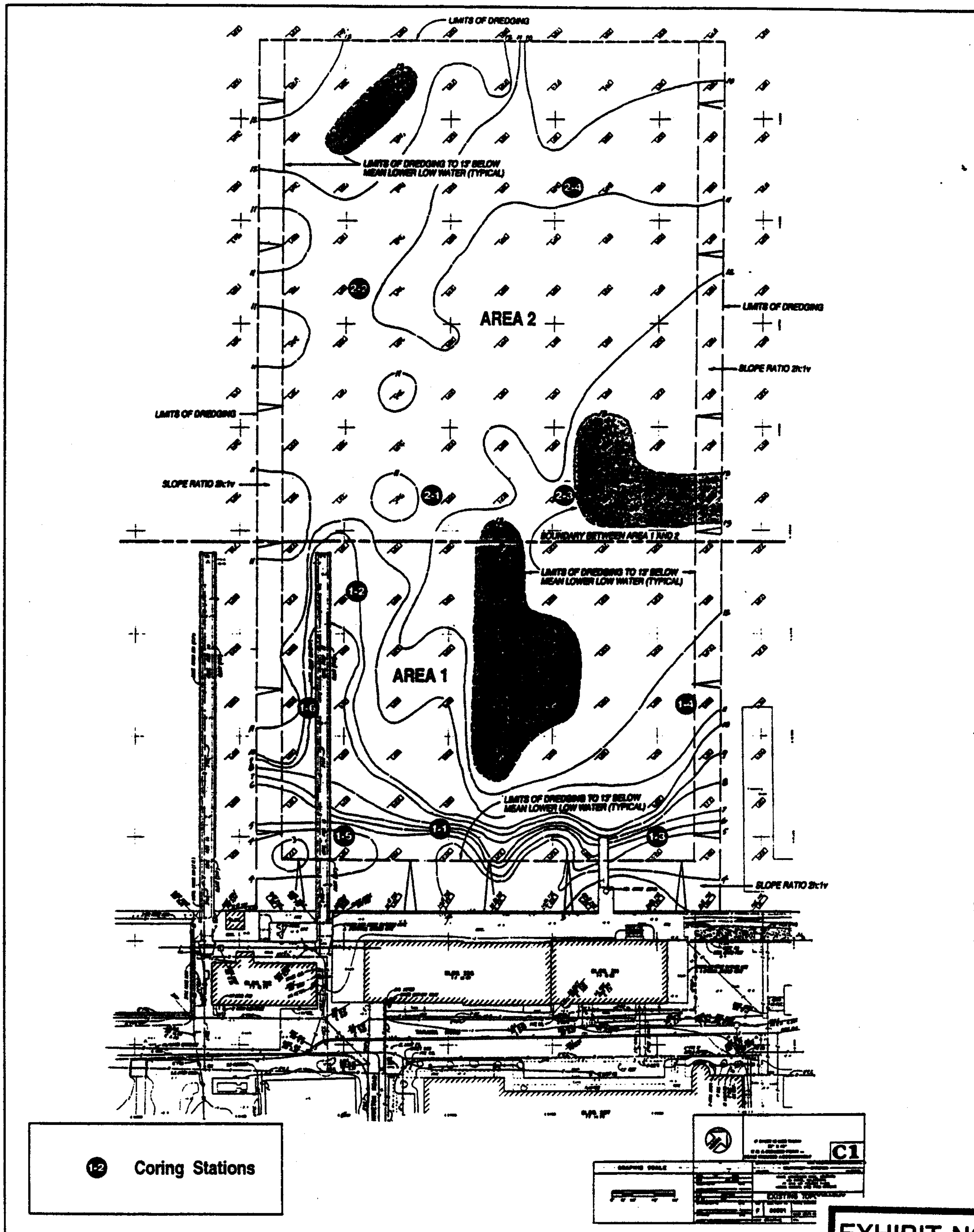


FIGURE 6 *Coring Stations* - INITIAL TESTING

EXHIBIT NO. 7
APPLICATION NO.
CD-100-95
California Coastal Commission

EXHIBIT NO. 8
APPLICATION NO.
CD-100-95

AREA 1 - SUBSEQUENT TESTING

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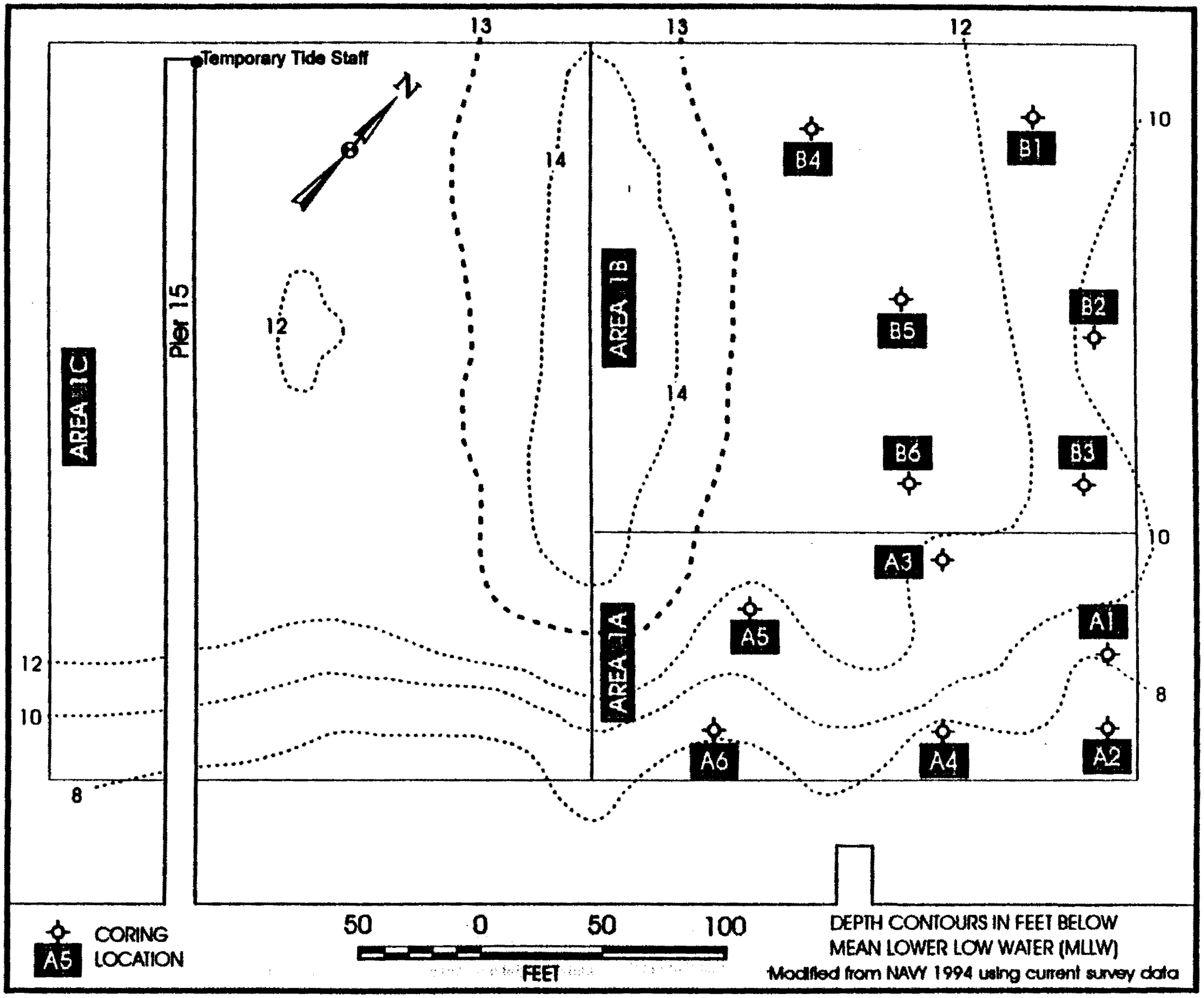

Figure 2. Coring Locations for Construction Project P-211, NAB Coronado

3.0 RESULTS

A total of 18 cores were taken at 12 different stations for sediment sampling at Construction Project P-211. A summary of the vibracore log and core locations are given in Tables 1 and 2. Results of bulk sediment chemical and physical analyses are summarized in Table 3. Detailed analytical reports and QA/QC are presented in Appendix C. Bioassay data are summarized in Tables 4-8 and detailed in Appendix A. Associated bioassay QA data are presented in Appendix B. Bioaccumulation data are summarized in Tables 4 and 5. Tissue analytical data and associated QA/QC are presented in Appendix D. Log sheets from sediment sampling are presented in Appendix E. Chains of Custody are reproduced and included in Appendix F.

3.1 SEDIMENT LAYERING, COMPOSITING AND GRAIN SIZE ANALYSIS

Sediment layering was observed within individual cores based upon changes in texture, color, and odor. Most layering was observed in cores longer than 5 feet (at elevations between -10 and -12 feet MLLW) and predominantly resided in the far eastern corner of Area 1A (Figure 2). Figure 3 diagrams which cores showed sediment layering and their respective lengths. Significant sediment layering was observed at stations A1, A2, and A4 within Area 1A. Sediment layering was also observed at station A6 (core length of 6.4 feet), but the bottom layer was less than two feet and therefore not composited separately (see Appendix E). Only station B2 from Area 1B exhibited any sediment layering. This station was the only core in Area 1B longer than five feet.

Figure 3 presents the compositing scheme for Areas 1A and 1B. Where no sediment layering was observed, the entire core was similar in color and texture to the top layer in the other, stratified cores. Therefore, like materials were composited within each area and resulted in the top layer of stations A1, A2, and A4 being composited with entire cores from station A3, A5, and A6. The bottom layers of stations A1, A2, and A4 were composited as a separate sample. Likewise, the top layer from station B2 in Area 1B was composited with the entire core from stations B1, B3, B4, B5, and B6.

The physical grain size analysis for each of the composite samples is presented in Table 3 and detailed in Appendix C. A summary of grain size analysis is shown in Figure 4 and helps to determine and define the differences in each of the sediment layers. The top layer composite from Area 1A was comprised of finer materials compared to the bottom layer composite. The two samples varied in fine grained materials (<0.062 mm) from 17 to 2.8 percent. Top and bottom composite samples from Area 1B exhibited a similar pattern, with finer materials above than below. However, the difference in fine material in Area 1B was less (10.7 vs 7.7% fines) compared to Area 1A.

The LA5 reference area contained the highest proportion of fine material of all samples analyzed for this project. The percent fine material comprised 19.8% of the total sample weight.

SEDIMENT
TEST RESULTS

EXHIBIT NO. 9
APPLICATION NO.
CD-100-95
California Coastal Commission

3.2 BULK SEDIMENT CHEMISTRY

A total of five samples were analyzed for bulk sediment chemistry (Table 3). These included a top layer and bottom layer composite from Area 1A, a top layer and a bottom layer composite from Area 1B, and a reference sediment. There were no chlorinated pesticides or PCBs detected in any of the four sediment samples from the proposed dredge area. The reference sediment contained 1.9 parts per billion (ppb) of 4,4'-DDE. Those sediment samples collected from the bottom layers of stratified cores did not contain detectable quantities of PAHs, while the samples which were representative of top layer composites within the proposed dredge area did contain measurable PAHs. The higher level of PAHs from Area 1A relative to Area 1B correlates with the higher incidence of core stratification within Area 1A and the higher percentage of fines.

Metals were elevated in top layer composites from Area 1A relative to all other samples, but absolute levels were moderate and are typical of other California industrial harbor sediments (SCCWRP, 1992). There were 24 ppb of dibutyltin in top layer composites from Area 1A. No organotins were detected in the three other proposed dredged material samples or the reference area.

In summary, the top layer composite from Area 1A was moderately contaminated relative to reference and other test sediments. There was a higher percentage of silt/clay and TOC, with associated increases in PAHs, sulfides, and TRPH. Several metals including arsenic, copper, lead, mercury, silver, and zinc were elevated over reference sediment levels.

3.3 BIOASSAY TEST RESULTS

3.3.1 Suspended Particulate Phase Bioassays

Results of the bivalve larvae (*M. edulis*) bioassays are summarized in Appendix A, Table A-1. Survival and normal development exceeded 99% in the undiluted elutriates of all test and reference sediments. Therefore, the 50% and 10% dilutions were not evaluated, and no significant decrease in survival or normal development of *M. edulis* larvae was noted after-48-hour exposure to elutriates of sediments from Area 1A or Area 1B.

Appendix A, Table A-2 presents the results of the speckled sanddab (*C. stigmaeus*) bioassay. Replicate 3 in the controls showed only 20% survival. This data point was evaluated using Dixon's Gap Test (Bliss, 1970). The sample R_1 value was 0.875 and a comparison with the tabled R_1 value of 0.821 indicates that this low survival can be considered ~~as~~ a statistical outlier ($p = 0.005$), and can therefore be legitimately excluded from further consideration. Exposure to undiluted elutriates for 96 hours in a static bioassay resulted in 86% survival in reference sediment, 82% survival in Area 1A sediment and 98% survival in Area 1B sediment. There was no statistically significant reduction in survival over reference levels in either Area 1A or Area 1B sediment elutriates.

Appendix A, Table A-3 summarizes the results of the mysid (*M. bahia*) test. Survival in elutriates of Area 1A and Area 1B sediments was 96% and 94%, respectively, while reference survival was 86%. Clearly there was no significant increase in mortality over reference levels after 96-hour exposure to test sediment elutriate.

3.3.1.1 Initial Mixing Calculations

Since none of the suspended particulate phase bioassays produced LC_{50} or EC_{50} data (because significant toxicity was not seen in undiluted elutriate), initial mixing calculations were not necessary for evaluation of the Limiting Permissible Concentrations (LPCs).

3.3.2 Solid Phase Static Bioassays

Results of the 10-day solid phase bioassay with the amphipod *R. abronius* are presented in Appendix A, Table A-4. Survival in reference sediment was 99%. Survival in Area 1A sediment was 60%, while 93% of amphipods survived in Area 1B sediment. Statistical data analysis shows that there was significantly increased mortality in Area 1A sediment. There was no significant mortality in Area 1B sediment.

3.3.3 Solid Phase Flow-Through Bioassays

Polychaete (*Nephtys caecoides*) and mysid (*Holmesimysis costata*) results are described in Appendix A, Tables A-5 and A-6, respectively. Survival of polychaetes was ≥ 98% in all sediments tested, and there was no significant mortality in either test sediment. Mysid survival was 92% in Area 1A sediment and 91% in Area 1B sediment; neither test sediment produced significantly lower survival than was seen in reference sediment (96%).

3.3.4 Bioaccumulation Assessments

Neither chlorinated pesticides nor PCBs were detected in tissues of clams or worms after exposure to test sediments (Table 4 and 5; Appendix A, Tables A-7 through A-14).

PAHs were not detected in worm tissues (Tables 4 and 5; Appendix A, Tables A-7 through A-14). Pyrene was detected in four of five replicates of clam tissue which had been exposed to Area 1A sediment, and benzo(b)fluoranthene was detected in two of five clam replicates after exposure to Area 1A sediment. Using EPA/ACOE (1991) recommended statistical analysis of bioaccumulation potential for pyrene and benzo(b)fluoranthene tissue data, results indicated neither of these two PAHs were significantly elevated over reference levels after a 28-day exposure to Area 1A sediment. This was due mostly to the tremendous variability among replicate tissue samples for PAH concentration.

Statistical analysis of tissue metals data showed that the level of arsenic in both clams and worms was significantly elevated after exposure to Area 1B sediments when compared with reference tissue levels. It should be noted, however, that the baseline levels of arsenic for both clams and

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worms exceeded the levels of arsenic measured after the 28-day laboratory exposure. Thus, the statistically elevated arsenic tissue burdens in clams and worms can be interpreted as a decrease in the rate of arsenic depuration in Area 1B sediments when compared with that rate in reference sediment. Bulk sediment analysis results show that greater arsenic concentrations occurred in reference sediments than in Area 1B.

The level of lead in clam tissue was significantly higher after 28-day exposure to Area 1A sediment than after similar exposure to reference sediment. There was no detectable lead in baseline clams.

4.0 DISCUSSION

The 1994 sampling and testing program for Construction Project P-211 divided the study into two subareas, Area 1 and Area 2 (inset: Figure 1). Except for minor bioaccumulation of lead and PAHs in the bioaccumulation testing, Area 2 exhibited little solid phase toxicity and was low in bulk sediment contaminant concentrations. Area 2 sediments were judged suitable for ocean disposal and for eelgrass habitat but not for beach replenishment.

The 1994 results failed to qualify Area 1 sediments for disposal at LA5 and precluded their use for either beach replenishment or eelgrass habitat. Statistically significant solid phase toxicity was observed using the mysid, *Holmsemysis*. Large bioaccumulation of PAHs was recorded in the bivalve, *Macoma*, and to a lesser extent in the polychaete, *Nereis*. This composited sample also had fairly high levels of copper, lead, zinc, and PAHs as well. One core (Station 1-3), located in the shallow inner portion of Area 1 showed some sediment layering and was chemically analyzed top and bottom for contaminants. The silty layer on top was found to have high copper, lead, zinc, and PAHs, but the coarser material below was found to be relatively uncontaminated. These findings suggested that additional clean sediments might be found at depth in Area 1. This observation provided the impetus for the investigations discussed herein.

The sampling and testing presented herein was conducted within Area 1 during January and February, 1995. Area 1 was subdivided into three parts to determine if the contamination seen in the 1994 sampling was concentrated close to shore. The eastern portion of the original Area 1 was divided into an eastern and western portion. The eastern part was further subdivided into an inner part designated Area 1A and an outer part designated Area 1B. Sediment layering was encountered (> 2 feet thick) within Area 1A and this material was separated for testing to determine if it was the source of the contamination and toxicity. Area 1C was the western most portion of the original Area 1 and was not sampled because no indication of layering was previously noted here.

It is apparent from these data that there are indeed different physical and chemical compositions both within and between Area 1A and 1B. In general, Area 1A top layers were comprised of finer grain sizes and higher chemical concentrations (particularly copper, lead, zinc, and PAHs). In contrast, Area 1B top layers were generally coarser grained than Area 1A top, and intermediate with respect to bottom materials. Within Area 1A, these top layers were thicker than two feet. Area 1B is located in deeper water and cores from this region were generally not long enough to encounter a distinct horizon as defined by the Army Corps of Engineers.

The top layer of sediments were composited within Area 1A and Area 1B and tested for suspended particulate phase toxicity, solid phase toxicity, and bioaccumulation potential. The data show that Area 1B top layers were not acutely toxic. Area 1A top layer have shown no acute toxicity except for *Rhepoxynius*, an amphipod tested during the solid phase test. Statistically significant bioaccumulation of lead was observed in the clam *Macoma*, from Area 1A top layers when compared to clams exposed to reference sediments. Some high, but variable concentrations of PAHs, were also detected in *Macoma* during the bioaccumulation assessment

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of Area 1A sediments. The bioaccumulation assessment of sediments from Area 1B showed statistically elevated concentrations of arsenic in the tissues of both clams and worms compared to organisms exposed to reference sediments. However, concentrations of arsenic in tissues of these organisms were higher before testing than those after 28 days of exposure. Therefore, these data should be interpreted with caution. Levels of arsenic in bulk sediments from Area 1B were relatively low.

The question of dredge quantities from the Construction Project P-211 construction area has been a thorny issue. Original 1994 engineering calculations estimated that about 41,000 cubic yards would need to be removed from the project area to accommodate new vessels. Of this amount half (20,500 cubic yards) would have to be removed from the nearshore area encompassed by Area 1 with the remainder being dredged from the offshore area, previously designated Area 2.

Area 1C in this (1995) study was not sampled because there was no indication from the 1994 investigation that the sediments in this area might be layered. It was also in this study that the apparent dichotomy between surface:bottom sediments and contaminated:clean sediments was postulated. This difference was offered as a possible means of saving additional disposal costs during dredging operations.

To examine this hypothesis in detail Area 1 was subdivided parallel to Pier 15, the section falling around pier 15 being designated Area 1C while the remainder was designated 1A and 1B. This latter area was divided subequally in areal extent (offshore Area 1B being larger than 1A) but approximately equally in the quantity of dredged material which would have to be removed and disposed. As previously mentioned, the sediments from Area 1B should be found suitabale for ocean disposal while it is unlikely that the surface sediments from 1A will be deemed suitable for other than uplands disposal. The bottom sediments were more similar in chemical composition to those of Area 1B and might, therefore, be found suitable for ocean disposal.

The likely quantity of dredged material in Area 1A may be estimated by first examining the boundary dimensions (~225 feet along the quay wall x 100 feet offshore) and calculating the quantity of sediments in the "wedge" represented by the mean depth along the inner edge to be dredged (~-8 ft MLLW) to the mean depth along the outer boundary (~-12 Ft). This "wedge" contains approximately 2,500 cubic yards of sediments. Next, the volume of sediments contained from this upper -12 MLLW surface to the anticipated dredge depth of -15 ft MLLW was calculated (3,300 cubic yards), resulting in a gross volume estimate of about 5,800 cubic yards.

The clean sediments from Area 1A can only be inferred from these data to occur in a triangular area below 12 ft MLLW defined by the intersection of sample locations A1. A2 and A4 (see Figure 2, these are the samples which exhibited stratification and which were composited). This is essentially an equilateral triangle with 100 foot long sides and contains about 725 cubic yards of sediments that may be suitable for ocean disposal. This is 1.8 percent of the total volume of sediments to be removed for this project.

Dredging is not a precision operation which can easily differentiate between clean and contaminated sediments. It is likely that an over dredge of two feet of contaminated sediments would be required before the underlying clean sediments could be ocean disposed. That is, clean sediments may well be encounter 12 feet below MLLW but the permit conditions placed on dredging would likely required all sediments above -14 feet MLLW to be considered contaminated. This, in turn, implies that the clean sediments available for offshore disposal would likely only be found between -14 and -15 feet MLLW. This is about 250 cubic yards of material, or less than one percent of the volume to be dredged for the project and about 4 percent of the material to be dredged from Area 1A

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5.0 CONCLUSIONS

- From the 1994 sampling and testing results, Area 2 sediments were judged suitable for ocean disposal and eelgrass habitat. The sediments were not suitable for beach nourishment. Chemical testing showed low concentrations of contaminants, toxicity tests were passed, and only low bioaccumulation of lead and PAH were measured.

- From the 1994 sampling and testing results, Area 1 sediments were judged not suitable for ocean disposal, eelgrass habitat and beach nourishment. High concentrations of contaminants were measured, significant bioassay toxicity was measured, and high bioaccumulation of PAHs were observed.

- From the results of the current study, sediments from the outer subarea, Area 1B may be judged suitable for ocean disposal. Chemical testing showed low concentrations of contaminants similar to those of Area 2 and toxicity tests were passed. Bioaccumulation of arsenic was observed, but baseline concentrations of arsenic measured before testing were higher than after the 28 day exposure.

- The upper, silty layer of sediments from Area 1A (approximately the top 4 feet), may be judged not suitable for ocean disposal. Chemical concentrations were again high as reported in the initial testing, a solid phase bioassay was not passed, and high concentrations of lead and PAH bioaccumulated in the tissues of test organisms.

- The bottom, coarser layer of sediments from Area 1A have been shown to be free of high concentrations of contaminants similar to those of both Area 2 and Area 1B which passed tests regarding suitability for ocean disposal. The chemical contaminants of concern have been identified to exist only in the upper, silty layer. Their toxic and bioaccumulation effects have been demonstrated in the upper silty layer. Therefore, these bottom materials may be judged suitable for ocean disposal, although further testing may be required.

- Approximate dredge volume calculations were estimated in order to put a perspective on the area of contamination. Area 1A and 1B appear to have similar dredge volumes estimated near approximately 10,000 cubic yards total. It was estimated that perhaps between 250 to 725 cubic yards of clean sediments from this area might be available for ocean disposal if contaminated sediments could be expeditiously removed. This represents between 2.5 to 7.25 percent of the total sediments which will be dredged from this area. The cost effectiveness of further testing, if required, should be weighed against the cost of simply including this material with the upper, silty layer when dredged.

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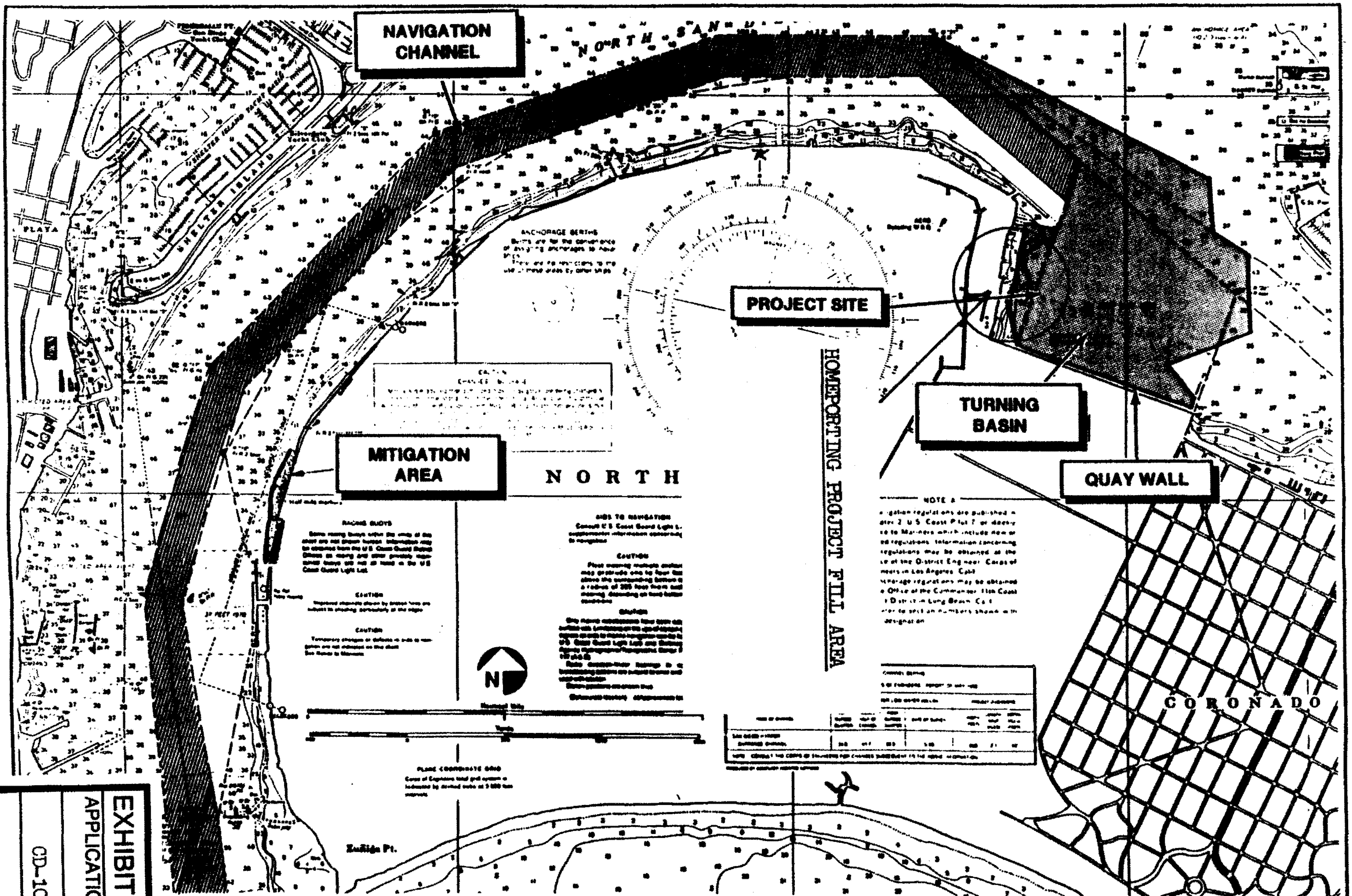
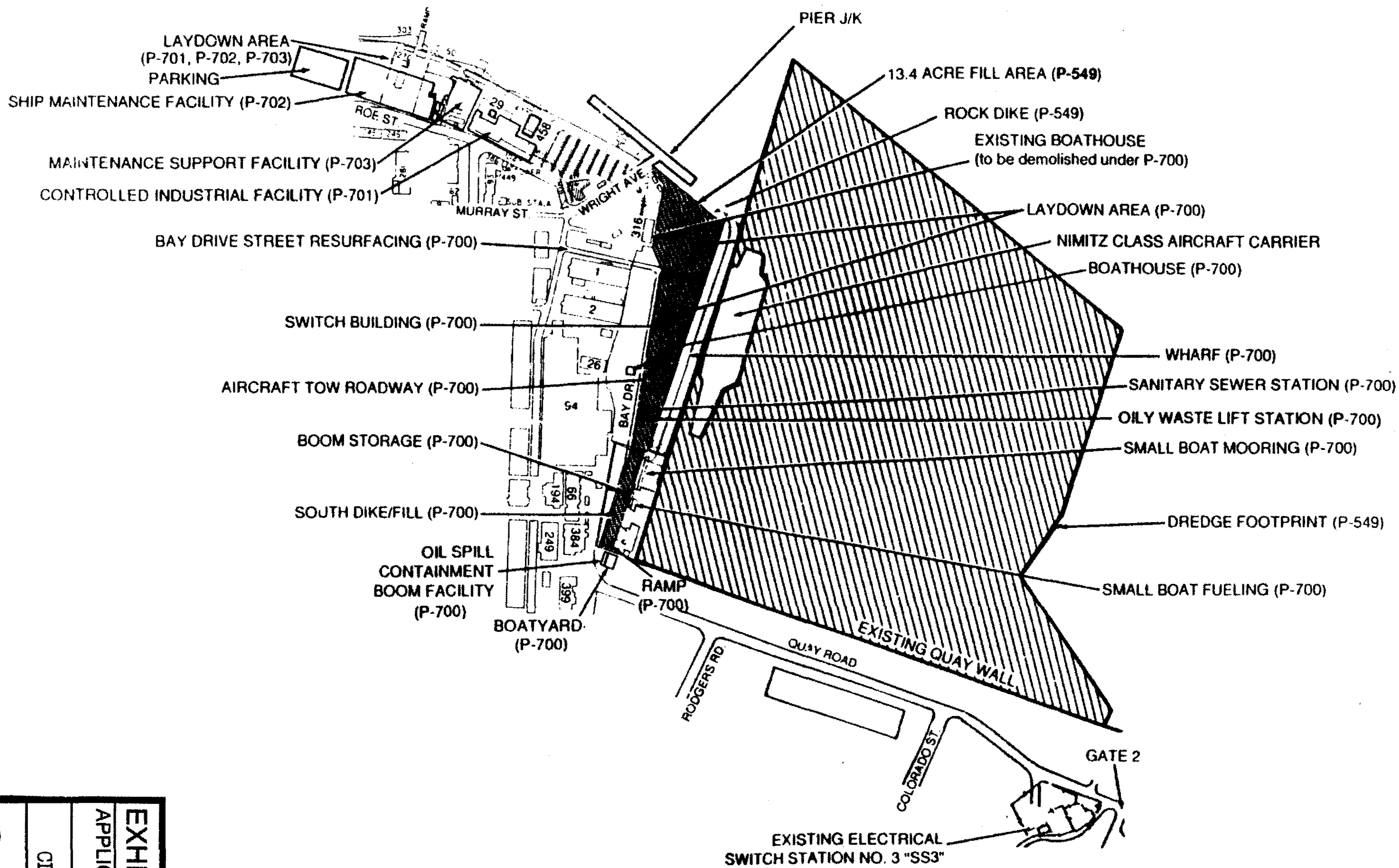


FIGURE 1

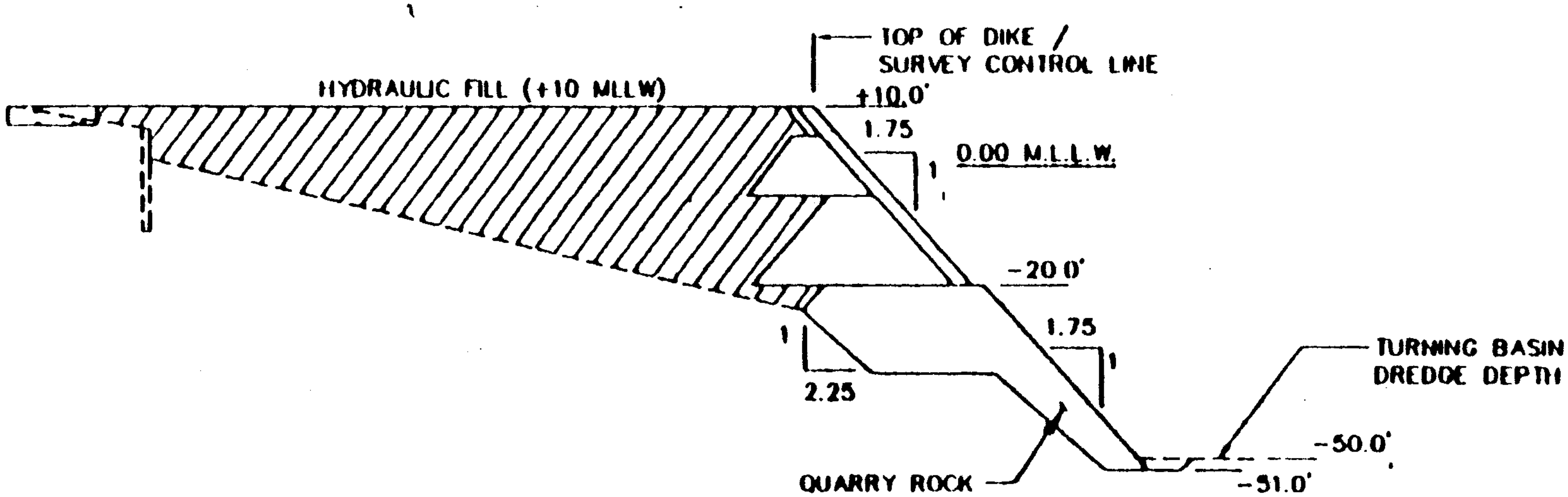
Study Areas for NIMITZ-Class Homeporting Project

EXHIBIT NO. 10
APPLICATION NO.
CD-100-95
California Coastal Commission



Preferred Alternative Site Plan
(P-549, P-700, P-701, P-702, and P-703)

EXHIBIT NO. 11
APPLICATION NO.
CD-100-95
California Coastal Commission



TYPICAL FILL SECTION – NORTH/SOUTH

Y
C15 C15

N.T.S.

FILL FOR HOMEPORTING PROJECT

Cross Section of Rock Dike Structure

EXHIBIT NO. 12

APPLICATION NO.

CD-100-95

California Coastal Commission