CALIFORNIA – THE RESOURCES AGENCY PETE WILSON, *Governor*

CALIFORNIA COASTAL COMMISSION

45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
[illegible]CE AND TDD (415) 904-5200

Tu 11f

STAFF RECOMMENDATION

ON CONSISTENCY DETERMINATION

Consistency Determination No.	**CD-29-97**
Staff:	MPD-SF
File Date:	3/20/97
45th Day:	5/6/97
60th Day:	5/21/97
Commission Meeting:	4/8/97

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

DEVELOPMENT LOCATION: Solana Beach and Oceanside, San Diego County (Exhibits 3-7)

DEVELOPMENT DESCRIPTION: "Phase I" modifications to beach replenishment regime for material dredged as part of the previously-concurred-with Navy project (the Homeporting of a NIMITZ-Class nuclear aircraft carrier at Naval Air Station North Island (NASNI), in Coronado (CD-95-95)(Exhibits 1-3). The Phase I modifications consist of revised sand disposal locations, resulting in placement of 530,000 cubic yards of sand at South Oceanside beaches (Exhibit 5) and placement of 570,000 cu. yds. of sand at Solana Beach (Exhibit 6)

SUBSTANTIVE FILE DOCUMENTS:

1. Consistency Determination CD-95-95 (Navy, Homeporting).

2. Final EIS for the Development of Facilities in the San Diego-Coronado to support the Homeporting of One NIMITZ Class Aircraft Carrier, October 1995.

3. Consistency Determination CD-53-94 (Army Corps, Oceanside Six Year Maintenance Dredging/Beach Disposal).

[Staff Note: The Commission staff did not receive the Navy's consistency determination until one day prior to the mailing for staff reports for the Commission's April 1997 meeting. Ordinarily in this type of circumstance, the time for staff review and report preparation is too short to allow the staff to schedule the item for the next Commission meeting. However in this case the opportunity for substantial public benefits represented by the beach replenishment modifications might be threatened by any delays in Commission review. According to the Navy, scheduling this item for the April is critical to its meeting its own scheduling deadlines. Therefore, due to the substantial public benefits accruing from the project, the staff has scheduled this item for the April meeting. Since this staff report is necessarily incomplete at this time, the staff will prepare an addendum report prior to the Commission meeting, which will be circulated to interested parties as soon as it is available.]

EXECUTIVE SUMMARY

The Navy has submitted a consistency determination for Phase I modifications (covering Oceanside and Solana Beach) to the beach replenishment regime for material dredged as part of the Navy's "Homeporting" of a nuclear aircraft carrier at the Naval Air Station, North Island in San Diego Bay. That original project included disposal of 7.9 million cu. yds. of sand four beaches throughout the county, with the understanding that the disposal regime was likely to be expanded to additional beaches.

The currently-proposed modifications are to the disposal locations and manner for beach replenishment. The original project consisted of nearshore disposal at Imperial Beach, Del Mar, Oceanside, and Mission Beach. The modified project (Phase I) consists of expanding the list of receiver beaches to include South Oceanside and Solana Beach, and placing the sand on the dry sandy beach, rather than in the nearshore zone.

The benefits of the proposal will be that: (1) the sand will be placed directly on beaches, rather than in nearshore areas; and (2) that the locations for sand placement will be in areas that are in great need of additional sand. At the same time, due to project scheduling, the proposed modifications raise additional public access and habitat issues, due to interference with peak summer season recreational beach use, as well as potential impacts to grunions, least terns, and snowy plovers.

The access impacts are not of great concern, primarily because the areas proposed to receive sand are currently devoid of or contain very little sand, and the project's overall recreation benefits from adding the significant quantities of sand to these beaches outweighs the project's relatively minor disruption. The modifications are therefore consistent with the public access and recreation policies (Sections 30210-30220) of the Coastal Act. Addressing potential habitat impacts, the Navy will include measures to minimize and monitor turbidity and the presence of important habitat species such as grunions, least terns, snowy plovers, as well as significant marine vegetation such as kelp beds. Assuming these measures are adequate, the modifications will also be consistent with the marine resources and environmentally sensitive habitat policies (Sections 30230-30240) of the Coastal Act.

[Note: A second phase of disposal modifications will be also reviewed shortly by the Commission and/or its staff, under an upcoming consistency or negative determination. The Phase II submittal will include disposal at North Carlsbad, South Carlsbad, Encinitas and Torrey Pines sites.]

STAFF SUMMARY AND RECOMMENDATION

I. Project Description/History. On November 16, 1995, the Commission concurred with the Navy's previously-submitted consistency determination for the relocation of one NIMITZ class aircraft carrier from the Naval Air Station in Alameda, San Francisco Bay, to the Naval Air Station, North Island (NASNI) in San Diego Bay (CD-95-95) (Exhibits 1-3). As concurred with by the Commission, that project included: (1) dredging of the carrier berthing area, turning basin, and the San Diego Bay navigation channel; (2) disposal of the dredged material as bay fill, at the designated ocean disposal site, and at various beach disposal sites; (3) construction of berthing facilities to accommodate the larger class ship and its greater utility requirements; (4) construction of maintenance facilities equipped and designed to support a NIMITZ class aircraft carrier; and (5) mitigation along the west shore of North Island to replace the loss of shallow bay habitat in the carrier turning basin.

The beach/nearshore disposal portion of that project, as originally concurred with by the Commission, consisted of placing 7.9 million cu. yds. of suitable clean sandy material at four beaches throughout the County. After that concurrence, the Commission concurred with a Negative Determination (ND-72-96) which further refined the dredge/disposal quantities, as follows (see Exhibit 3 for site locations):

Site	Area	Original Volume	New Volume
A	Imperial Beach	1,443,000	1,706,000
C	Del Mar	2,460,000	1,900,000
H	Oceanside	2,460,000	1,900,000
I	Mission Beach	1,500,000	1,360,000

As the Commission anticipated, since the Commission's concurrence with CD-95-95 and ND-72-96, additional discussions have taken place between the Navy, the San Diego Association of Governments (SANDAG), various Countywide local coastal governments, and other interested parties, to attempt to broaden the number of beaches benefiting from the opportunity arising from the Navy's dredging project. As a result of these discussions, the Navy hopes to place sand on beaches at South Oceanside, Solana Beach, North Carlsbad, South Carlsbad, Encinitas and Torrey Pines sites (Exhibit 4).

The Navy has divided the modified beach disposal proposal into two phases, only the first of which is the subject of this consistency determination. Phase I modifications will consist of placing approximately 530,000 cu. yds. at South Oceanside, and 570,000 cu. yds. at Solana Beach. The Solana Beach disposal itself will be two-fold, with 349,949 cu. yds. to placed in front of Cardiff State Beach, and the remainder (219,995 cu. yds.) to be placed from South of Cliff Street to Fletcher Cove. The Navy states:

> *Beach replenishment at South Oceanside involves onshore placement of sand from a point just south of Seagaze Drive to a point just south of the Loma Alta Creek outfall, ... Dredged sediment will be placed on the existing sand beach and graded to form a berm. The top of the berm will reach approximately +5.6 feet Mean Sea Level (MSL) and will be flat, extending out about 130 to 160 feet. From this point, the berm will slope at a 20:1 ratio (horizontal distance:vertical distance) approximately 260 feet into the intertidal zone to an average depth of -6.6 feet MSL. The berm will extend approximately 7,000 feet (1.3 miles).*
>
> *Beach replenishment at Solana Beach will consist of the placement of dredged sediment at two locations: approximately 267,585 m3 (350,039 cy) will be placed at the northerly site along Cardiff State Beach west of San Elijo Lagoon; and approximately 168,217 m3 (220,052 cy) will be placed at the southerly site along Tide Beach Park between Cliff Street and Dahlia Drive, ... Although the northerly site is not within the Solana Beach city limits, it is considered a Solana Beach site due to its proximity to the southerly receiver area. Berms will be constructed at these locations to an elevation of approximately +5.6 feet*

approximately +5.6 feet MSL. The berms will be flat and extend out an average of 130 to 160 feet, then slope at a 20:1 ratio for approximately 260 feet to a depth of -6.6 feet MSL. The northerly berm will extend approximately 3,200 feet (0.6 mile), and the southerly berm will extend approximately 3,600 feet (0.7 mile).

Describing the beach fill operation, the Navy states:

Beach replenishment operations include the use of a hopper barge, which will load sediment from various dredging locations in San Diego Bay and move north to the receiver beaches for sand placement. The hopper barge will anchor approximately 2,000 feet offshore of the receiver beach, and run a 36-inch rubber pump line from the barge onto the beach. In order to anchor the pump line, a steel sinker pipeline will be placed in a surveyed area on the ocean floor. A floating platform called a "mono buoy" will be used to interconnect the steel sinker pipeline and the rubber pump line for support. The mono buoy, which is less than 30 feet in diameter and does not hold any mechanical equipment, will be anchored at the -40 foot MSL mark a minimum of 1,500 feet offshore using four navigational buoys. The mono buoy will remain anchored in the same area off each receiver beach throughout pumping operations. The hopper barge will hook up to the mono buoy, then proceed to hydraulically pump a mixture of sand and sea water through the rubber pump line onto the beach.

Beach fill activities in South Oceanside are planned to occur for 48 calendar days from mid June to mid early August 1997. Beach fill activities at Solana Beach are planned for 30 calendar days from early August to early September 1997.

Phase II modifications, which will be the subject of a future consistency or negative determination, will consist of sand disposal at North Carlsbad, South Carlsbad, Encinitas and Torrey Pines sites. The reason for the two-phased approach is because the Navy currently has sufficient information on biological resources at Solana Beach and South Oceanside (e.g., from the Army Oceanside Harbor maintenance dredging/beach disposal project, and the Lomas Santa Fe Drive grade separation project), whereas additional information will need to be compiled for the Phase II activities.

II. <u>Additional Homeporting Project History</u>. In reviewing CD-95-95, the "Homeporting" consistency determination, the Commission found that the project would not adversely affect marine resources and other environmentally sensitive habitat. In reviewing that project, the Commission found:

> [W]ith the mitigation and monitoring measures ..., the proposed project represents the least environmentally damaging feasible alternative. Homeporting a CVN at a port other than San Diego is not a feasible alternative. The fill proposed is the minimum area and least damaging feasible location. Dredge materials that are suitable for aquatic disposal will be placed in a manner traditionally determined the least damaging alternative by the Commission, either as beach replenishment where materials are predominantly sand, or at LA-5 where they are not. Dredge materials unsuitable for aquatic disposal will be removed and isolated from the marine environment. Therefore, the Commission finds the CVN Homeporting and associated dredging, filling, and other project facilities and activities are consistent with the alternatives test of Section 30233(a).

The Commission also found that the project provided for beach replenishment, as required under Section 30233(b) of the Coastal Act where dredged material is suitable for such use. While some concerns had been raised about sediment contamination potential, the Navy undertook a comprehensive testing program to assess physical and chemical composition of the sediments to be dredged. The Navy's analysis also included testing samples collected from the proposed mitigation site near Pier Bravo. The test results were also independently reviewed by EPA, the U.S. Army Corps of Engineers (Corps), the Regional Water Quality Control Board (RWQCB), San Diego Region. Based on the Navy's analysis, the Commission determined that approximately 7.9 million cu. yds. of the dredged sediment were suitable for beach replenishment.

Because beach erosion is a major problem along so many of beaches in San Diego County, the Navy has continued to attempt to maximize the beach replenishment benefits over as great a region as it could feasibly accomplish. In its EIS for the Homeporting project, the Navy initially looked at nine potential receiver beaches within San Diego County from Oceanside to Imperial Beach were identified as potential sites to receive the beach replenishment material (Exhibit 3). While it looked at the nine sites initially, the Navy consistency determination only proposed disposal at four sites, where it proposed nearshore replenishment: Imperial Beach, Del Mar, Oceanside, and Mission Beach.

Under the original proposal clean beach-compatible sand dredged from the project site was to be transported to an area offshore the receiver beach by barge or hopper dredge and placed into the nearshore zone at a water depth of approximately -10 to -30 feet MLLW on the beach. The Navy agreed that no nearshore disposal would take place if grunion were spawning at the disposal site, and that nearshore disposal would not occur in any environmentally sensitive habitat areas, such as kelp beds offshore of Imperial

Beach (which are below -30 ft. MLLW). While the Commission agreed with the Navy that the nearshore disposal would meet the Navy's legal obligations to provided beach replenishment where materials are suitable, at the same time the Commission and the Navy understood, and the Navy articulated, that:

> Depending on the availability of local, state, or federal funding for beach nourishment in San Diego County, suitable beach nourishment material may be placed directly onshore at the 5 remaining beach receiver sites (i.e., Sites B, D, E, F, and G (Exhibit 3)). The findings of consistency in this report do not apply to these 5 sites. In the event any of these alternative sites are implemented, additional Commission federal consistency or coastal development permit review will be triggered (which of these two processes is used would depend on whether the Navy or a non-federal agency were the applicant).

III. 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 Oceanside's LCP has been certified by the Commission and incorporated into the CCMP. The City of Solana Beach's LCP has not been certified by the Commission or incorporated into the CCMP.

IV. Federal Agency's Consistency Determination. The Navy has determined the project consistent to the maximum extent practicable with the California Coastal Management Program.

V. 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.

VI. Findings and Declarations:

The Commission finds and declares as follows:

A. Environmentally Sensitive Habitat/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 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.*

In reviewing the "Homeporting" consistency determination (CD-95-95), concerning the temporary impacts of beach disposal the Commission found:

> Disposal. Nearshore sand disposal will result in short-term increases in turbidity and burial of a portion of the shallow subtidal habitat offshore the receiver beach. Infauna, epifauna, and mobile invertebrates biota inhabiting the disposal footprint may be covered with a layer of sand and smothered, depending on the rate of sand-placement and dispersal. As with dredging impacts, these impacts would be temporary, and upon completion of the nearshore sand-placement operation, recolonization of the area by infaunal, benthic, and fish species would occur. Also as with the dredging, placement of sediments and monitoring would be conducted in accordance with permit conditions required by the Corps, EPA, and the RWQCB, and again with the Commission receiving and being involved in the development of the permit

will not continue if grunion are spawning at the disposal site, that turbidity will be minimized where necessary, and that beach disposal will not occur in any environmentally sensitive habitat areas.

Due to project scheduling needs, the proposed modifications raise new habitat issues due to the fact that the disposal will take place on the beach and during the summer when and where it has the potential to adversely affect grunions, least terns, and snowy plovers. The California least tern is a state and federally listed endangered species that forages in the project vicinity. The snowy plover is a threatened species that sometimes nests on sandy beaches in the project area. The California grunion is a unique and important fish species that lays its eggs on sandy beach above the mean higher high tide line in the area.

When possible, the Commission has sought to encourage beach disposal in areas frequented by these species to be conducted during spring or fall, to avoid affecting them. When such scheduling has not been possible, the Commission has sought additional monitoring, minimization and mitigation measures to protect these species (see CD-53-94, Army Corps Oceanside 6-Year Maintenance Dredging/Beach Disposal, and CD-28-97 Army Corps Sunset-Surfside beach replenishment time extension, both of which included measures to minimize turbidity and monitor the project's effect on these species). Without monitoring to detect the presence of sensitive species and to assure turbidity is being minimized, the proposed project could interfere with the least tern foraging and grunion spawning by increasing turbidity, and if not properly sited, could smother grunions or their eggs, or snowy plover nests.

To address these and other project concerns, the Navy has tentatively committed to a number of minimization and monitoring measures, including:

> *Kelp beds offshore the Solana Beach receiver sites could potentially be affected by placement of the steel sinker pipeline during pumping operations. Detailed surveys of kelp bed canopies were performed in this area in 1989 and 1996. An additional reconnaissance survey was performed on March 18,1997. ...[T]he proposed placement of the steel sinker line at both receiver sites in Solana Beach will avoid the existing kelp beds. Additionally, the sinker pipeline alignment will be surveyed at least 30 days prior to pumping operations to ensure the kelp beds will not be impacted.*
>
> *Surfgrass beds and rocky reef areas may be affected by sand replenishment operations. These areas may be buried by beach fill transported by longshore or cross-shore currents subsequent to sand placement. However, a monitoring program has been established for these habitats. Monitoring will occur off the Solana Beach receiver areas for a period of five years after sand placement. Any direct or indirect impacts to surfgrass beds or rocky reef areas will be mitigated*
> .....

California grunion may spawn on the beach during sand placement, and sand placement will bury their eggs or change the beach profile and result in mortality. Impacts to the grunion will be considered significant. Grunion runs will be monitored and sand deposition halted in the area after a spawning event, thereby reducing impacts to below a level of significance. Sand deposition will restart within 10 to 14 days, after the eggs have hatched and no other spawns have occurred in the area.

Least terns may forage in the waters off the receiver sites, and may be affected by a reduction in their forage base due to beach replenishment operations. However, terns can forage adjacent to the site if fish vacate the area or an increase in turbidity limits their foraging ability. Thus, significant impacts to least terns will not occur.

Similar to the least tern, western snowy plovers may be affected by a reduction in their forage base due to beach replenishment operations. However, plovers can forage adjacent to the site if fish vacate the area or an increase in turbidity limits their foraging ability. Thus, sand placement operations will not significantly impact western snowy plovers.

Navy plans and specifications for beach replenishment identify the dredging and/or pumping contractor as the responsible party in case of an oil, gas, or petroleum product release caused by the hopper barge, pumping, or grading operations. The Navy will ensure the dredging contractor develops a Spill Prevention Control and Counter-Measure Plan (SPCC) prior to the initiation of pumping operations. The preparation of a SPCC for the proposed action will cover federal and state regulatory requirements.

Additionally, field reconnaissance of the receiver beaches has been performed by marine biologists in order to determine environmentally sensitive areas. Identified sensitive areas will be avoided during the placement of dredged sediment.

Longitudinal dikes will be constructed along the water line prior to pumping operations at the receiver beaches. Dikes are to be used to prevent high turbidity that is typically associated with beach replenishment operations. As dikes will be used to minimize adverse environmental effects, diking is not anticipated to create an adverse environmental condition.

The Commission, the Army Corps, the U.S. Fish and Wildlife Service and other resource agency staffs are continuing to work the Navy in developing its monitoring and mitigation plans. In addition, the US Fish and Wildlife Service has not completed its review of the Navy's proposal as of the date of this mailing. Results of any further Fish and Wildlife Service review will be forwarded to the Commission prior to or during the Commission's scheduled April 8, 1997 public hearing and vote. Once it has had adequate time to review the Navy's submittal, the Commission staff will amend this staff report to more completely analyze the Navy's measures to protect the least tern, snowy plover, grunion, and other potentially affected species. The staff is optimistic that the Navy's submittal will include adequate measures to monitor, protect, and, where appropriate, mitigate any impacts to these species. Assuming these measures will be sufficient, the Commission will be able to find that the proposed project will avoid significant effects on marine resources and environmentally sensitive

habitat, and that the project is consistent with Sections 30230, 30233 and 30240 of the Coastal Act.

B. Public Access and Recreation. Section 30210 of the Coastal Act provides:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30213 provides that "Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred." Section 30220 of the Coastal Act provides that: "Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses."

As was the case with the originally-concurred with project, the project's recreational benefits are significant, given the disposal of 7.9 million cu. yds. of sand on the region's beaches. The access and recreation issue raised by the proposed modifications consist of the fact that due to project scheduling needs, beach replenishment will occur at Oceanside and Solana Beach during the peak summer recreation season, when it has the potential to disrupt summer beach recreation while the sand is being placed on the beach. Ordinarily, the Commission prefers beach disposal to occur during the off-peak season, where disruption of beach use is less extensive. Adverse effects on public beach use include the following: construction noise, the unaesthetic appearance of recently dredged sand, possible bad odors associated with the newly dredged material, and the pipeline interfering with vertical access to the shoreline. Additionally, because of potential safety concerns, the Navy will exclude the public from the disposal area during the operation.

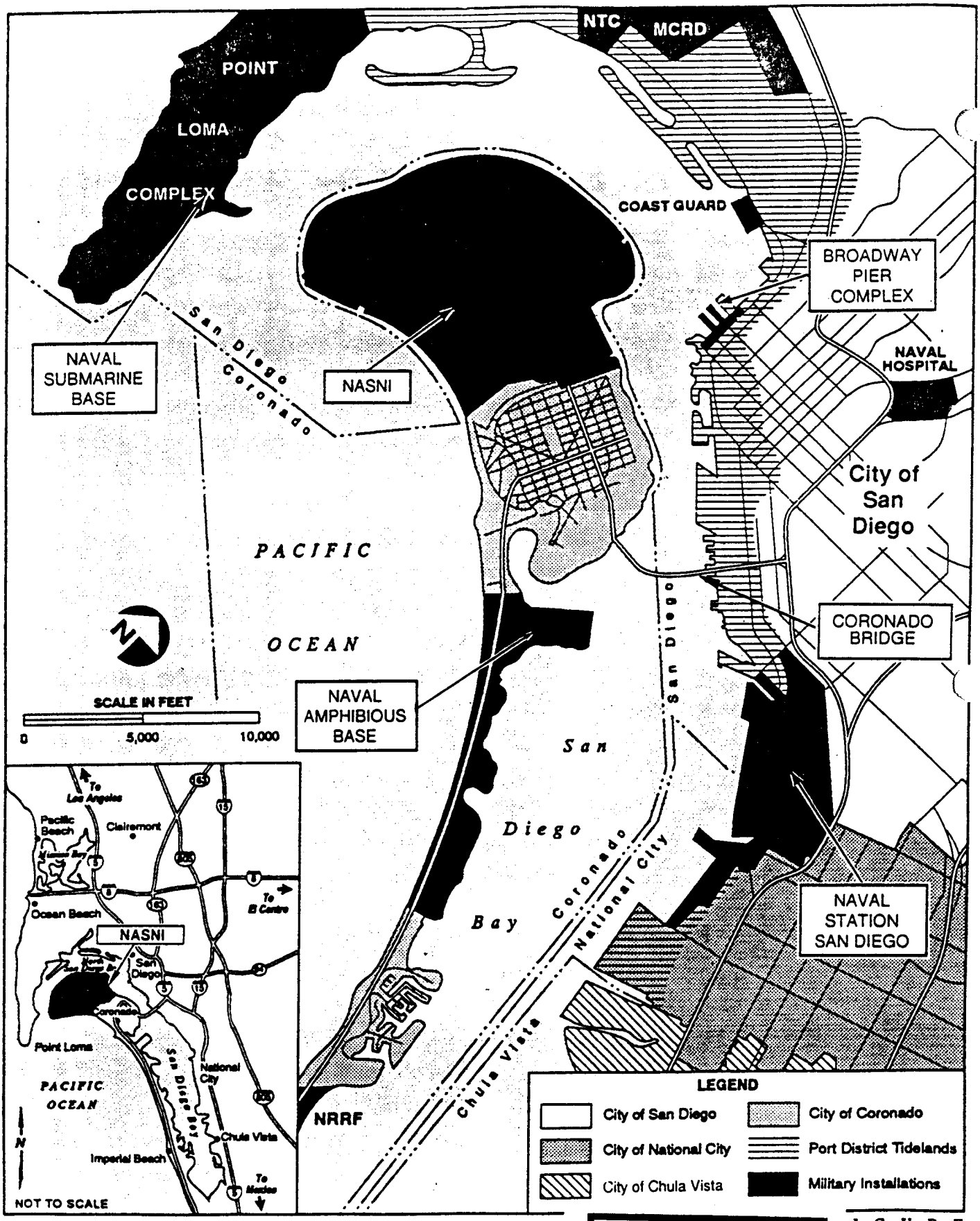
Offsetting this impact are the facts that the loss of beach areas will be temporary, and overall, the project will improve access and recreation opportunities. Clearly, placement of sand on the beaches at Oceanside and Solana Beach will increase the recreational values of this area. Furthermore, the beaches that will receive the sand at both Oceanside and Solana Beach are often eroded, containing no sand during winter months and very little if any during the summer season. Consequently, beach use in these areas is far reduced compared to what occurs at existing nearby sandy beaches, or what can occur if the beaches are supplied with sand. The Commission finds that the

overwhelming project benefits to recreation outweigh the project's temporary impacts, and that the project is therefore consistent with Sections 30210, 30213 and 30220 of the Coastal Act.

C. **Sand Supply**. Section 30233(b) of the Coastal Act provides:

> *(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.*

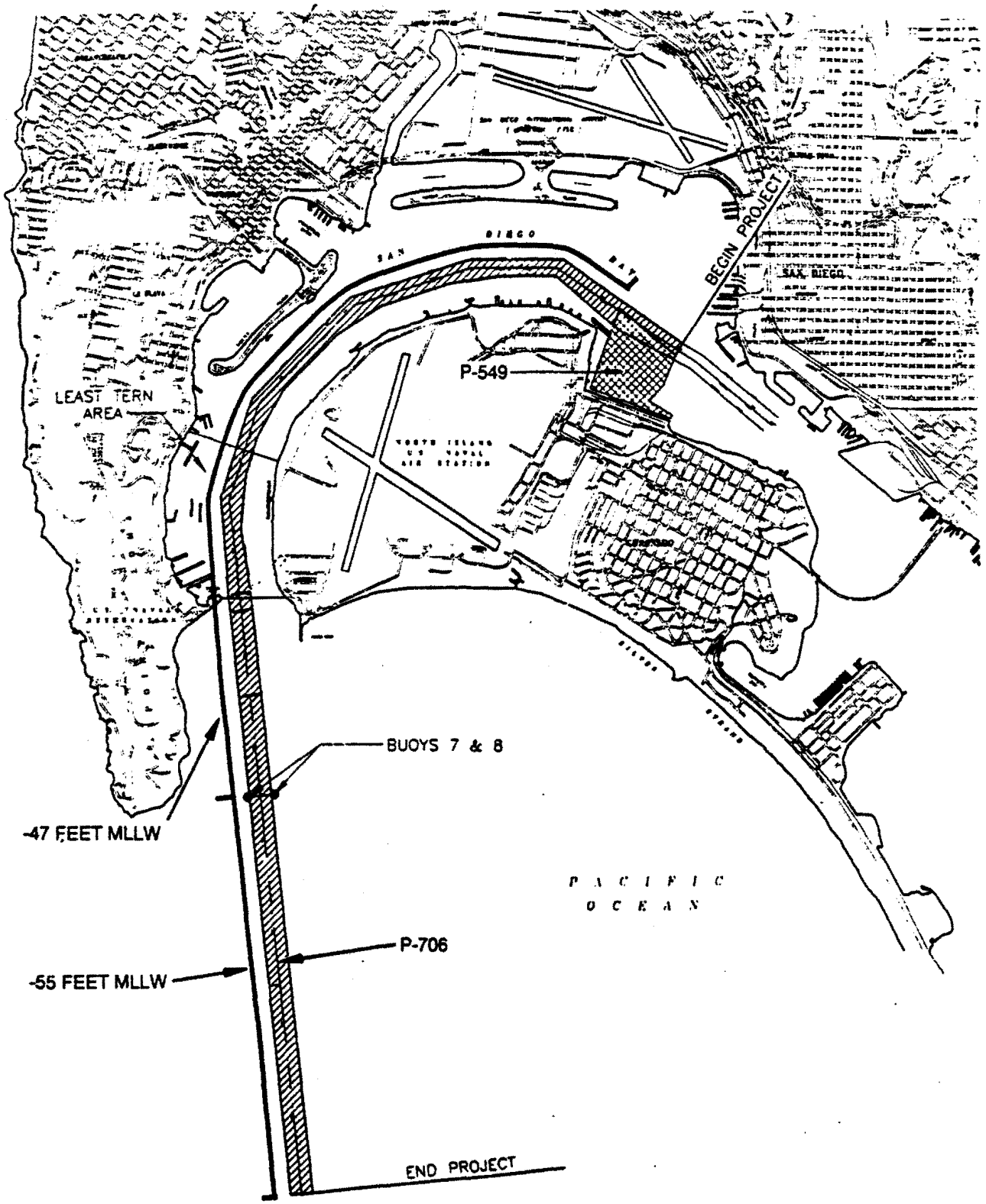
Section 30233(b) provides, in part, that where dredge material is suitable, it should be used to replenishment beaches or be placed within littoral sand systems. The material proposed for dredging is clean sandy material (see page 6) and therefore suitable for beach replenishment. Therefore, the Commission finds that the proposed beach disposal at Oceanside Beach and Solana Beach, as was the case with the original proposal for nearshore disposal, is consistent with the sand resource policy (Section 30233(b)) of the Coastal Act.



San Diego Vicinity Map

FIGURE ES-1

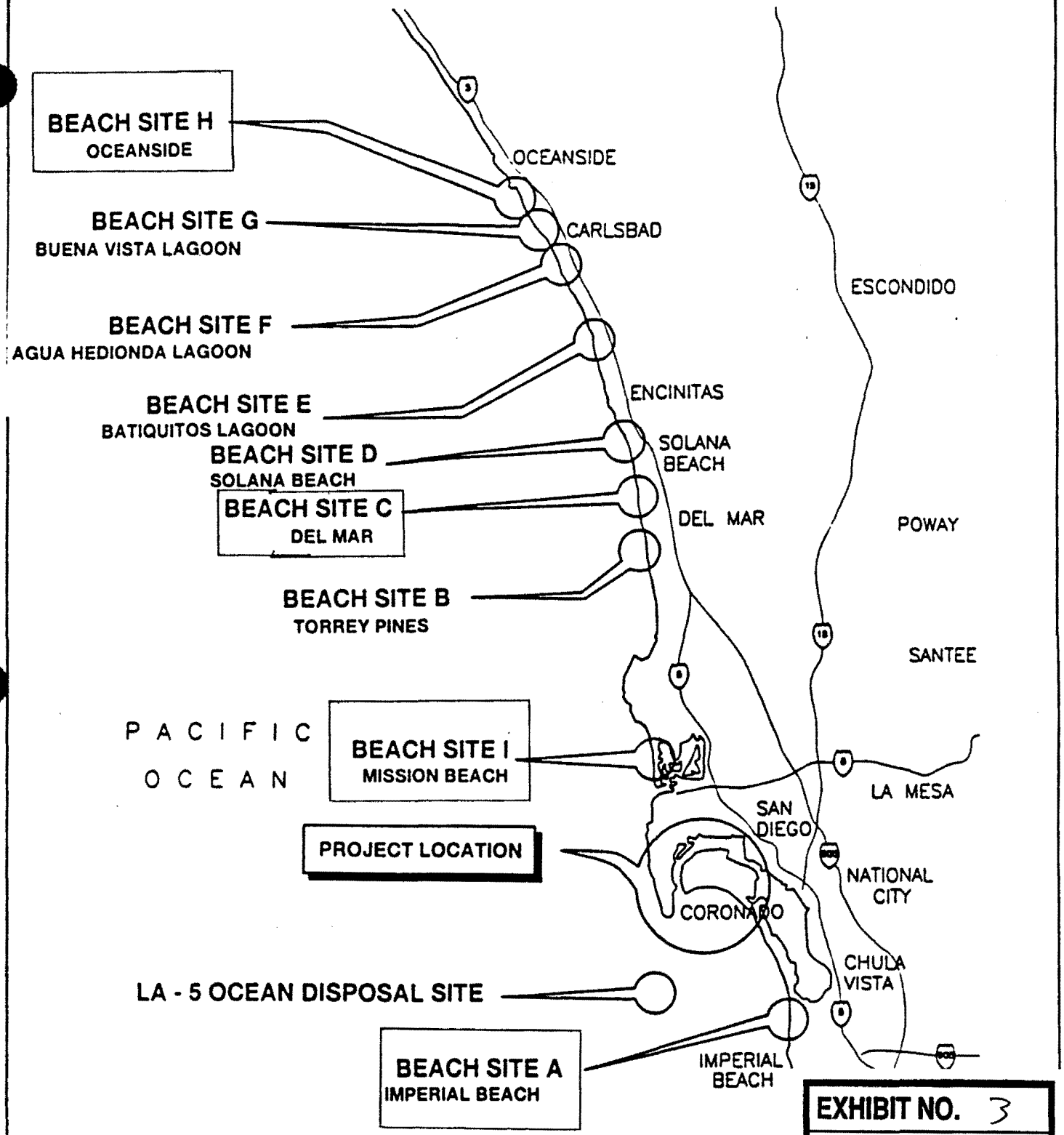
EXHIBIT NO. 1
APPLICATION NO.
CD-29-97



SOURCE: Frederic R. Harris, Inc.

Preferred Alternative
Channel Dredging

EXHIBIT NO. 2
APPLICATION NO.
CD-29-97



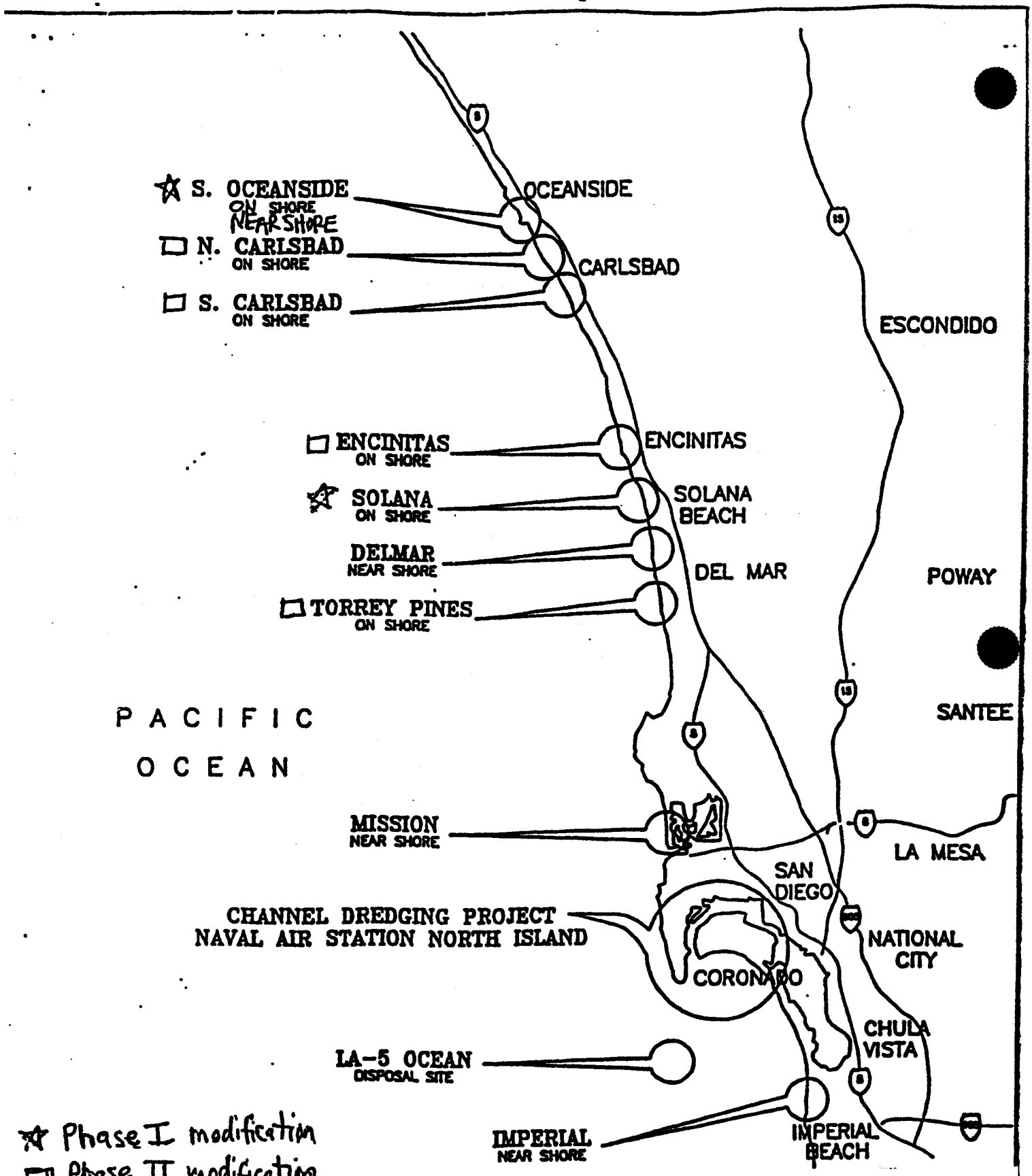
DISPOSAL SITES MAP
NOT TO SCALE

EXHIBIT NO. 3
APPLICATION NO.
CD-29-97

ORIGINAL CD 95-95 PROJECT
DISPOSAL AT SITES: A, I, C, H

Potential Beach Replenishment Sites

FIGURE
3.1-20



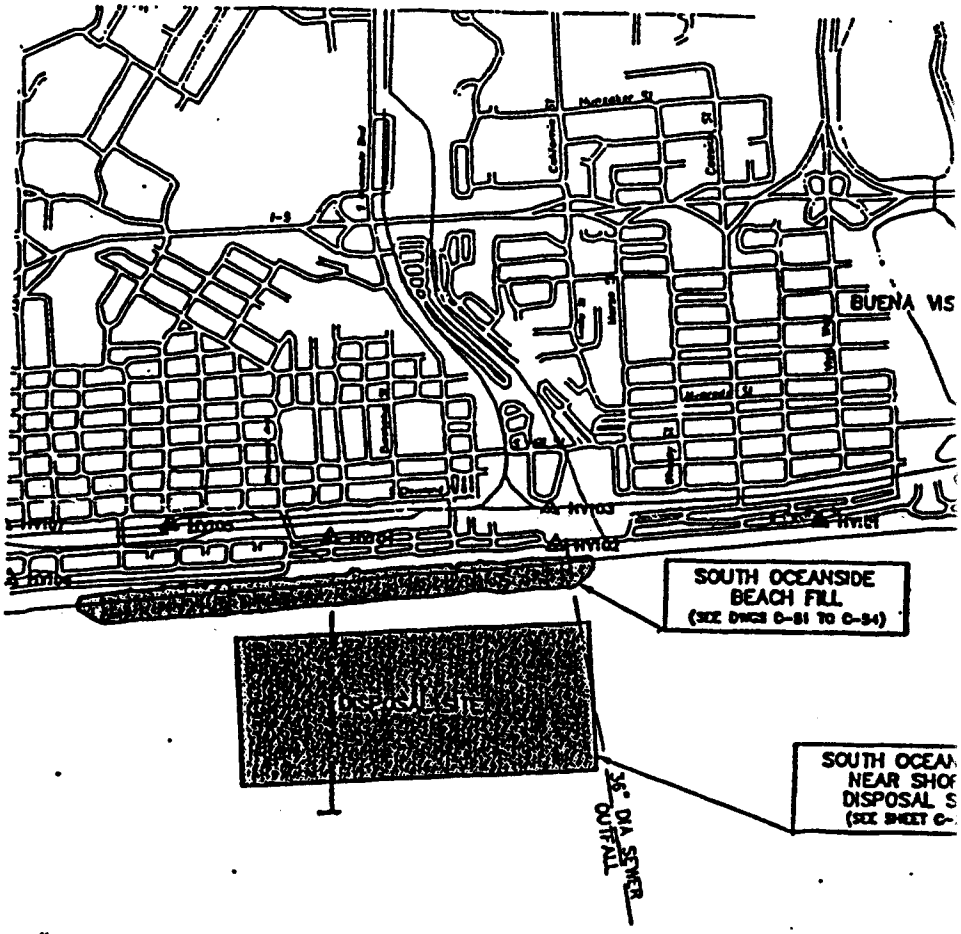
DISPOSAL SITES MAP

NOT TO SCALE

EXHIBIT NO. 4
APPLICATION NO.
CD-29-97

Figure 1

FY-1997 MCON PROJECT P-706
MILITARY CONSTRUCTION PROJECT DATA

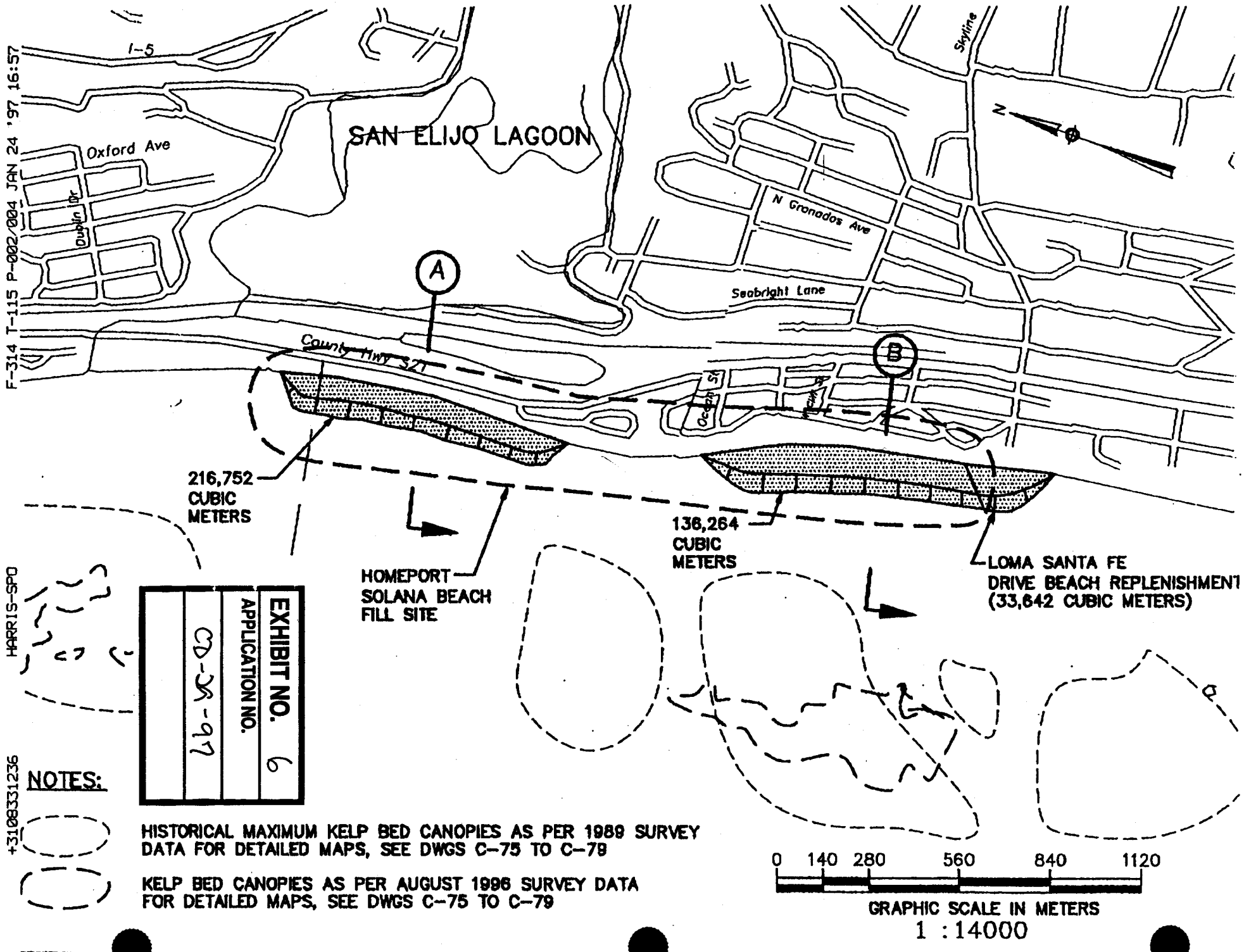


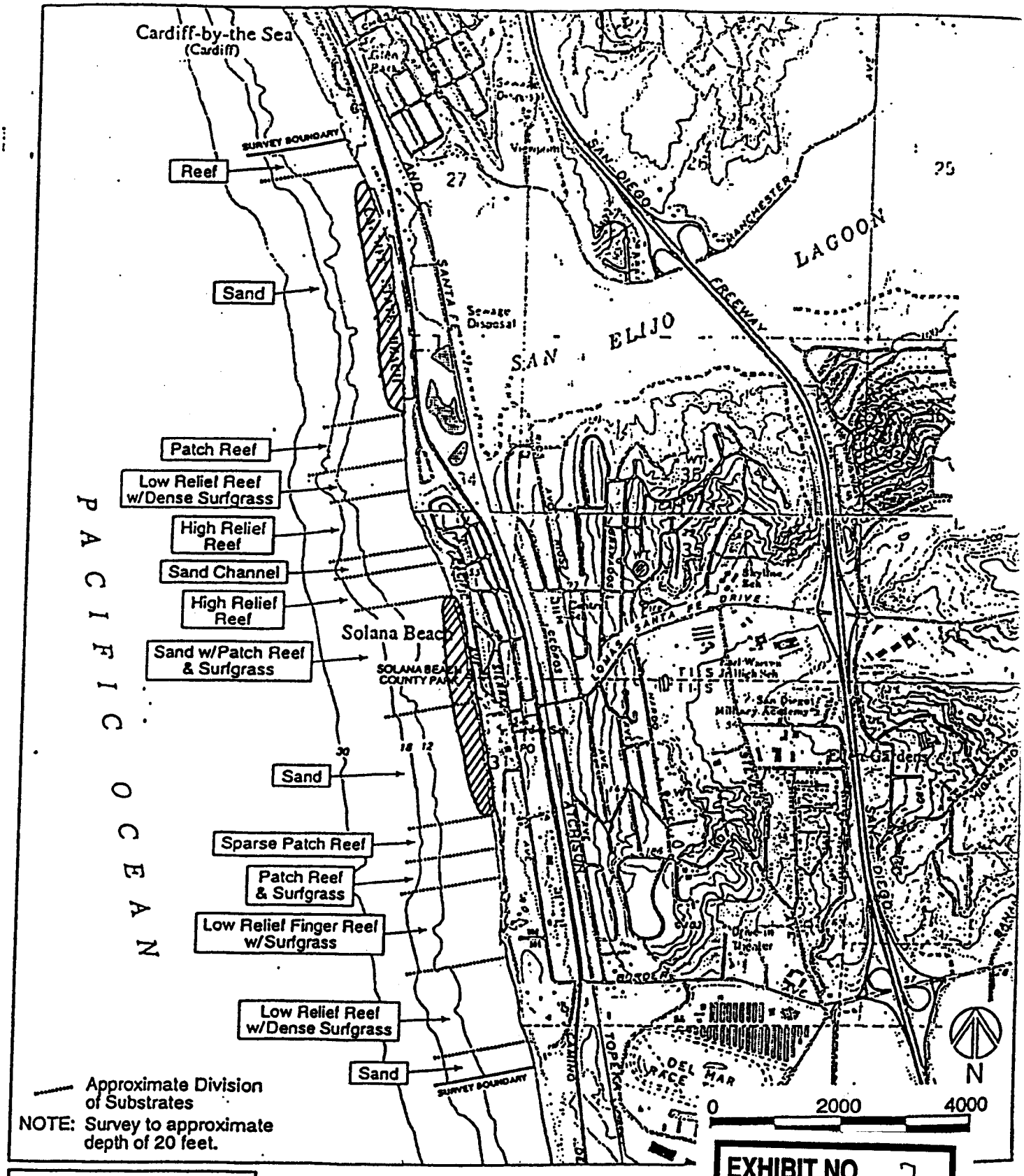
PROPOSED SINKE LINE

EXHIBIT NO. 5

APPLICATION NO.

CD-29-97


F-314 T-115 P-002/004 JAN 24 '97 16:57
HARRIS-SPO
+3108331236
I-5
Oxford Ave
Dublin Dr
SAN ELIJO LAGOON
Skyline
N Granados Ave
Seabright Lane
County Hwy S21
A
B
216,752
CUBIC
METERS
HOMEPORT
SOLANA BEACH
FILL SITE
136,264
CUBIC
METERS
LOMA SANTA FE
DRIVE BEACH REPLENISHMENT
(33,642 CUBIC METERS)
EXHIBIT NO. 6
APPLICATION NO.
CD-38-97
NOTES:
HISTORICAL MAXIMUM KELP BED CANOPIES AS PER 1989 SURVEY
DATA FOR DETAILED MAPS, SEE DWGS C-75 TO C-79
KELP BED CANOPIES AS PER AUGUST 1996 SURVEY DATA
FOR DETAILED MAPS, SEE DWGS C-75 TO C-79
0 140 280 560 840 1120
GRAPHIC SCALE IN METERS
1 : 14000



SOURCE:
MEC Analytical Systems

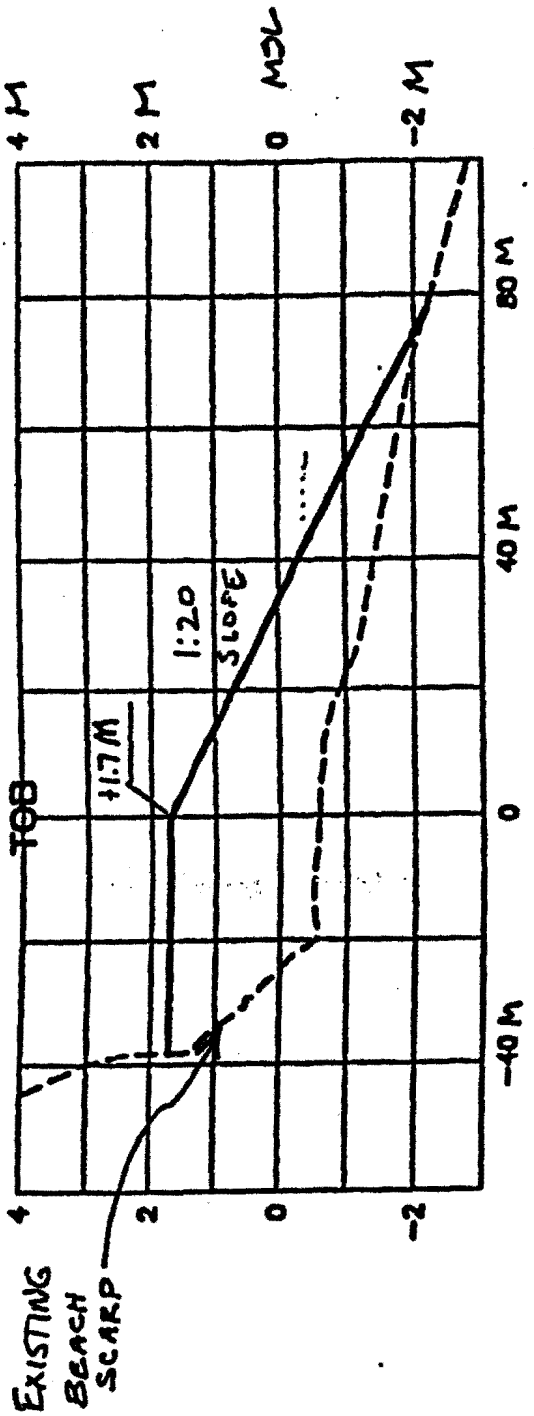
BASE MAP: Encinitas, Del Mar USGS 7.5' Quad. Map

5

Figure ~~11~~. Biological Field Sur

BEACH FILL

EXHIBIT NO. 7
APPLICATION NO.
CD-29-97



TYPICAL CROSS SECTION
BEACH NOURISHMENT

Figure 2

EXHIBIT NO. 8
APPLICATION NO.
CD-29-97