Teledyne Ryan Aeronautical, and the Coast Guard maintain facilities in the area. In addition, San Diego International Airport (Lindbergh Field) is located within the upland. Harbor Drive, a busy six-lane thoroughfare, also fronts a portion of the shoreline. The Convair Sailing Club, associated with General Dynamics, maintains a pier/dock for small sailboats in the western portion of the Lagoon. Although technically available for public access, there are no readily available shore side access points to the Lagoon; thus, public shore use is limited. Several drains and pipes terminate in the Lagoon, including four large storm drains (a 54-inch drain to the west, a 60-inch drain off a central pier, a 30-inch drain from the airfield, and a 30-inch drain near Teledyne Ryan Aeronautical property). Smaller drains also originate from the Coast Guard Station and the General Dynamics facility.

The configuration of the Lagoon dates to the mid 1930s. It was created as part of an expansive dredge and fill project to develop the upland which currently encompasses Lindbergh Field, the U.S. Marine Corps Recruit Depot, the U.S. Naval Training Center, and the railroad yards. The adjoining U.S. Coast Guard Station, which predates this project, is also constructed on fill material.

Historically, the embayment was used as a dumping ground and retrieval area for derelict vessels (Barker and Davis 1986). Over time, as many as 500 vessels have been scuttled in the Lagoon. Currently, less than five remain. In the 1960s, Convair Lagoon was used by General Dynamics for aerospace and oceanographic research (SDUPD 1985).

Periodically, noticeable amounts of debris have been observed in a scattered pattern along the Lagoon shoreline, in the intertidal zone, and offshore to a distance of approximately 150 feet from the deteriorating retaining wall which borders the Lagoon. Such debris has included tires, boat wreckage, engine batteries, portable radios, cushions, plastic bags, miscellaneous plastic, bottles, cans, wood, and assorted rubbish (TRA 1989).

Under the Unified Port District of San Diego Master Plan, the present uses of Convair Lagoon are designated as commercial, recreation, and harbor services on the land, and craft storage and boat navigation in the water. The Lagoon supports a significant amount of small craft recreational boating traffic, especially on the weekends. Additionally, several vessels anchored in the vicinity of the Lagoon boundary appear to be used as permanent dwellings.

1.2 HISTORICAL PERSPECTIVE OF PCB CONTAMINATION IN CONVAIR LAGOON

In 1977, the RWQCB established the State Mussel Watch (SMW) program to monitor the coastal marine, bay, and estuarine water quality on a long-term basis. SMW used specimens of resident and transplanted mussels (*Mytilus edulus* and *Mytilus californianus*) to evaluate the bioaccumulation of trace metals and synthetic organic compounds. From 1979 to 1985, SMW conducted tissue analysis on Convair Lagoon mussels on five occasions, once during each of the fiscal years. The results of these analyses and additional sediment samples indicated the presence of PCB contamination in mussel tissue and sediment.

Subsequently, a two-phase sampling plan was performed under Cleanup and Abatement Order 86-92 to evaluate the extent of PCB contamination in Convair Lagoon. Phase I of the sampling plan was performed to characterize the vertical extent of PCB and heavy metal contamination in Convair Lagoon. The results of this sampling plan were submitted in a two-volume report entitled, "Characterization of the Vertical Extent of Contaminated Sediments in Convair Lagoon, San Diego Bay," which indicated that elevated PCB levels were present in nearshore areas primarily in the vicinity of the 60-inch storm drain.

Phase II sampling was intended to further characterize both the lateral and vertical extent of PCB contamination in Convair Lagoon. The final report describing the results of Phase II sampling was submitted to RWQCB on May 12, 1989, and a supplemental report was submitted on July 6, 1989. The Phase II sampling results showed overall PCB sediment concentrations ranging from below the limit of detection to 1,800 mg/kg dry weight. The arthimetic mean of the Phase II surface sample concentrations was 36 mg/kg. The Phase II results generally confirmed the Phase I results.

In order to evaluate potential remedial levels for the contaminated sediments, a March 1990 technical report entitled, "Recommendations for PCB Action Levels in Sediments: Convair Lagoon, San Diego Bay, March 1990" was prepared and submitted to the RWQCB. This report contains a range of potential PCB action levels developed for the protection of aquatic biota in contact with sediments. Based on the evaluation of several different criteria, the report recommended an action level of 10 mg/kg total PCBs (dry weight) in the Lagoon portion of San Diego Bay.

On January 25, 1991, a report was submitted to the RWQCB entitled, "Engineering Evaluation Report, Sediment Cleanup Options: Convair Lagoon" (EER). The EER was developed in response to a request from the RWQCB for an engineering analysis to remediate the Lagoon in San Diego Bay (Coe 1990). Pursuant to that request, the report presented information on the feasibility and order-of-magnitude cost of three selected remedial action alternatives for cleanup of PCB-containing sediments in the Lagoon portion of San Diego Bay: removal and disposal, nonremoval (isolated by capping), and a combination of removal and nearshore containment.

Based on the evaluation in the EER, a combination of dredging/nearshore containment was found to be the most cost-effective approach to effectively isolate the PCB-containing sediment. The combination of dredging with nearshore containment has been demonstrated as an effective remedial approach for PCB-containing sediment by EPA and the ACOE during a pilot scale test conducted for the New Bedford Harbor Superfund site. The results of this pilot study formed the basis for EPA's recent decision to propose dredging with nearshore containment to remediate 300,000 cubic yards of PCB-containing sediment from the New Bedford site (EPA 1992).

In addition, this approach has the distinct advantage of minimizing potential impacts. These impacts include both the area to be isolated within San Diego Bay and the modifications to the existing storm drain network. The EER also demonstrated diminishing returns from sediment PCB action levels below approximately 10 mg/kg. The potential volume of sediment that would have to be removed at action levels below this concentration increases dramatically in a non-linear fashion (Figure 1-2a). While the removal volumes would increase dramatically, the associated percentage of PCB removal from the Lagoon would only increase by negligible quantities (Figure 1-2b). Furthermore, the costs associated with the increased removal volumes would increase in direct proportion to the dramatic increase in volume. Therefore, cleanup to levels below approximately 10 mg/kg range would likely have minimal effect on the lagoon, yet have dramatic costs impacts.

The RWQCB adopted Addendum Number 4 to the Order on December 9, 1991. In the addendum, the RWQCB established a PCB action level of 10 mg/kg PCBs (dry weight) in the Convair Lagoon. Addendum Number 4 specifies a specific time schedule for the lagoon remediation. Details of this schedule, its requirements, and their location within the BDR are given in Section 1.3.

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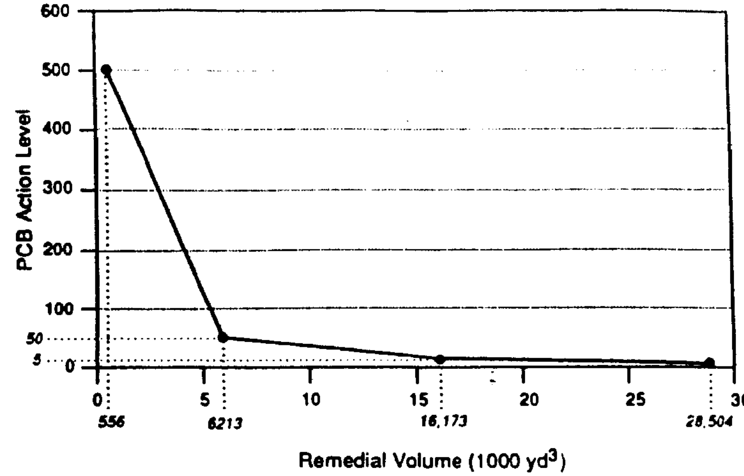

Figure 1-2a. PCB action level/remedial volume relationship for Convair Lagoon, San Diego Bay.

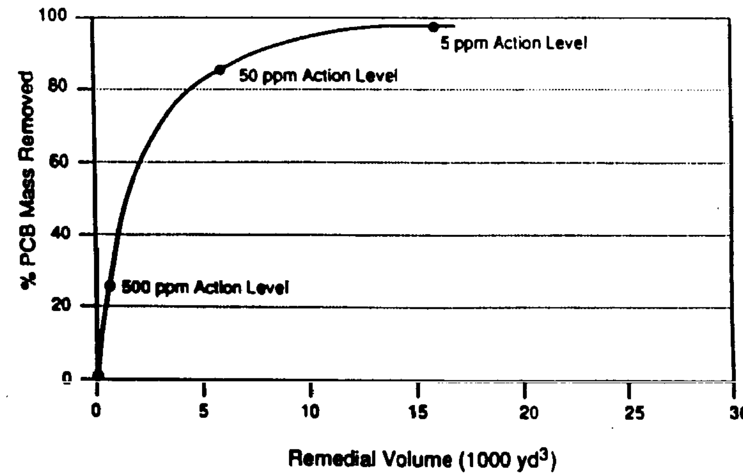

Figure 1-2b. PCB mass removed/remedial volume relationship for Convair Lagoon, San Diego Bay.

It should be noted that the contamination detected in Convair Lagoon is historical in nature and is the result of over 40 years of industrial activity in and around the Lagoon. In particular, discharges through the 60-inch storm drain and activities in Convair Lagoon in the vicinity of the storm drain are largely responsible for the existing contamination. While Teledyne Ryan Aeronautical is the only party named in the Cleanup and Abatement Order, other persons have also contributed to the contamination in the lagoon. Teledyne Ryan Aeronautical has attempted to obtain the voluntary cooperation of other parties whose activities have contributed to the contamination in the lagoon, and will continue to do so. However, a ruling may be sought from the Regional Board to add those parties to the Cleanup and Abatement Order.

1.3 COMPONENTS OF THE PROPOSED CLEANUP PLAN

This section identifies the key components of the proposed cleanup plan for Convair Lagoon required to comply with Directives 1 and 2 of Addendum Number 4 to the Cleanup and Abatement Order Number 86-92 (Coe 1991). These key components include: design (Sections 3 and 4), permitting (Section 4), construction (Section 6 and Appendix C), environmental sampling and monitoring (Sections 3.10 and 3.11), mitigation (Section 4.2) and overall schedule (Section 5.2). Directive 2, which contains the schedule, also includes several specified deliverables as shown in Table 1-1.

It is important to note that many of the deliverables specified in Table 1-1 are dependent upon a preceding activity. Therefore, the schedule cannot be satisfied unless all of the milestones are met, including timely agency review. Furthermore, the deadlines in the schedule are extremely tight and if extensive response to public comments or revisions of permit applications are required, the deadlines given in the order will have to be revised.

Table 1-1. Components of Directive 2, Addendum Number 4 to Administrative Order 86-92.

Requirement	Description	Date
2a	Submit preliminary plan (BDR) for cleanup of Convair Lagoon.	June 1, 1992
2b	Submit a bioaccumulation monitoring program for PCBs in Convair Lagoon.	July 1, 1992
2c	Submit all necessary permit application and government approvals.	October 1, 1992
2d	Submit a description and a schedule of the mitigation project.	October 1, 1992
2e	Submit a final design plan for the cleanup of Convair Lagoon, subject to the approval of the RWQCB.	March 1, 1993
2f	Complete bidding and award construction contract for the approved cleanup project.	September 1, 1993
2g	Submit a post-cleanup plan to verify attainment of the action level.	November 1, 1993
2h	Complete the approved cleanup plan to the prescribed action level.	June 1, 1994
2i	Submit the results of the post-sampling plan.	August 1, 1994
2j	Submit a plan for monitoring the long-term integrity of the cap.	August 1, 1994

2.0 SUMMARY OF SITE INVESTIGATIONS

To develop a sound conceptual engineering design it was necessary to identify a feasible approach for cleanup activities and to quantitatively and qualitatively define the work to be done. To this end, several field surveys were conducted and additional data were obtained. These activities are listed below and are described in greater detail in Sections 2.1, 2.2, 2.3, and 2.4, respectively. Section 2.5 provides a description of the additional information and data that would be required to complete the final design. While a conceptual cleanup plan was developed in the EER, additional information was required to refine the approach and quantify the work elements.

- Perform field surveys of:
  - Pipe outfalls and debris around and in the Lagoon
  - Bathymetry in the Lagoon
  - Landside topography surrounding the Lagoon
  - Sediment contamination in the vicinity of the 60-inch outfall
- Obtain available details of storm drains entering the Lagoon, and perform hydraulic analysis of present conditions and potential modifications to accommodate various potential configurations for the NCF.
- Obtain existing geotechnical data relevant to both the structural design of the NCF and dredging performance.
- Obtain wind, wave, and tide data relevant to the overall layout and structural design of the NCF.

2.1 FIELD SURVEYS

This section describes the data collection and analysis procedures together with results from the marine field surveys conducted at Convair Lagoon from February 2 to February 7, 1992. The purpose of these surveys was to locate pipes and debris in the Lagoon,

produce bathymetric and landside topographic maps, and further define PCB contamination of the sediment.

2.1.1 Pipe and Debris Location Survey

Since pipes and other discrete objects could adversely affect dredging and construction operations, surveys were conducted to identify and map important surficial and subsurface features in the seabed. For this purpose, three field surveys were conducted including a perimeter survey, a surface debris survey using side-scanning sonar, and a subbottom profiling survey. Positioning for the surveys was accomplished by on-site navigation. The procedures used and the results obtained from these three surveys are discussed in greater detail below. In addition, a brief document search was conducted to identify and obtain any drawings, maps, and records which might describe the existence and location of pipes, outfalls, and debris in the Lagoon.

2.1.1.1 On-Site Navigation

Each of the pipe and debris location surveys required accurate positioning data in order to precisely fix sampling locations. These horizontal positioning data were obtained using a laser navigation system. This system uses a laser, placed onshore at a station with known state plane coordinates, to track the survey vessel. The range-azimuth data obtained during tracking were telemetered to the vessel, and displayed and stored on a portable computer at 1-second intervals.

The geodetic coordinates for the laser track station and the backsite were obtained from Randall Ashley of Pelagos, San Diego, California. Position data for several distant reference fixes were provided by the Port of San Diego. Calibration procedures were performed to assess the stability and repeatability of the range-azimuth data. The positioning data were plotted on a large-scale map. After editing and correcting the position information, a trackline data file was generated and used to produce tracking maps for analysis in all the surveys conducted.

The survey area was approximately 600 feet in the north-south direction and 700 feet in the east-west direction. In the general survey pattern, primary survey transects were run in the north-south direction as shown in Figure 2-1. Data validation lines were run in the east-west direction.

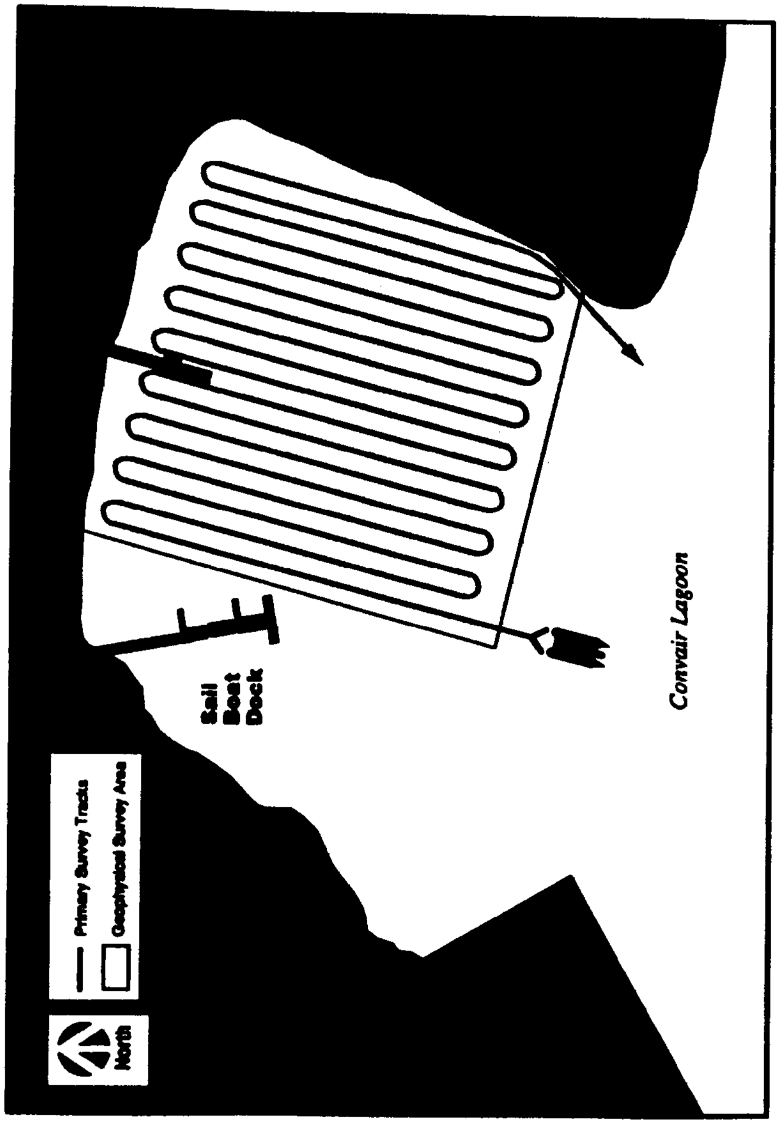

Figure 2-1. Geophysical survey area, showing tracking for bathymetric and sidescan sonar surveys.

2.1.1.2 Perimeter Survey

To locate small discharge points not identified in the literature, a perimeter survey was performed along the shore and shallow waters of the Lagoon. Accurate coordinates were recorded for all discharge pipes, outfalls, and prominent shoreline features using a shore-based laser positioning system. These coordinates were checked against existing maps to produce an accurate perimeter map of the Lagoon that includes all known pipes and outfalls. Table 2-1 gives the locations of all identified pipes and outfalls.

2.1.1.3 Sidescan Survey for Surface Debris

A sidescan sonar survey was conducted to locate and identify surface debris. Certain objects located within an area to be dredged would be relocated within the footprint of the NCF prior to dredging. Survey lines were run on a line spacing of 80 feet in the north-south direction and 100 feet in the east-west direction. Use of a swath width (total distance left and right of the trackline) of 150 feet provided over 50 percent of coverage overlap of the seabed.

A detailed acoustic image of the seabed was obtained and displayed on a variable density recorder set to print a map of the surficial characteristics of the seafloor (Figure 2-2). Variations in reflection characteristics, as well as the presence of discrete targets identified on the sonograms, were plotted on overlays of the trackline maps. These variations and discrete reflections were indicative of changes in sediment type, the presence of eelgrass (*Zostera marina*) or other macrophytes, and the presence of artifacts such as sunken vessels and other discarded debris.

As shown in Figure 2-2, the most pronounced reflection pattern on the seabed was that produced by eelgrass and macroalgae (*Sargassum muticum*). The eelgrass beds were located in the nearshore area adjacent to the outfall, and the macroalgae were found primarily in three small areas near the southeast corner of the site. The macroalgae protrude 2 to 3 feet above the seabed, whereas near the outfall, eelgrass has very little relief.

A number of discrete targets were identified and mapped. Some of these, such as the two sunken vessels, were marked with buoys. Some of the discrete targets were interpreted to be anchors from boats moored in the Lagoon. Other targets are believed to

Table 2-1. Size, description, and coordinates of identified pipes and outfalls.

Size (inches)	Description	Location (state plane coordinates, x, y)
3	Metal pipe, extending from U.S.C.G.	1712690, 205134
12	Plastic pipe, extending from U.S.C.G.	1712830, 205418
30	Concrete drain pipe, northeast corner of lagoon	1712820, 205606
60	Concrete square drain outfall	1712617, 205551
30	Concrete drain pipe, east of sailboat dock	1712366, 205697
54	Concrete drain pipe, extending from General Dynamics	1712274, 205638
2	Metal pipe, at fence near boat dock	1712426, 205701

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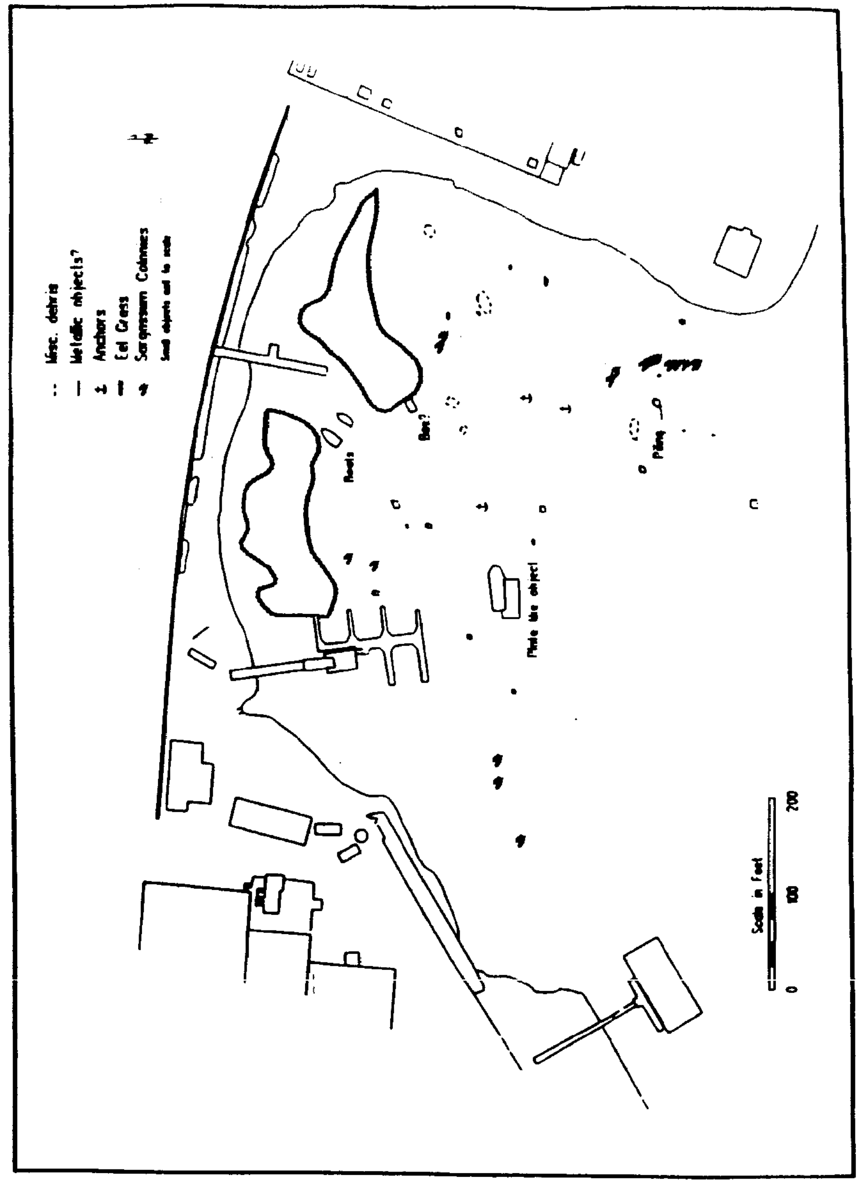

Figure 2-2. Map showing surficial seafloor features in Convair Lagoon.

be metallic objects and miscellaneous debris discarded from boats in the Lagoon. It was not possible to identify many of these objects due to their small size (< 1 foot in cross-section). The maximum height of these discrete objects was 2 feet. An unusual, large, rectangular feature with 1 to 2 feet of relief was identified and mapped in the southwest area of the site. Although this object has not been positively identified, it appears to be a metallic or concrete plate and would not affect the dredging operation because it is located outside the dredging area.

2.1.1.4 Subbottom Profiling Survey

This survey was conducted to locate and identify any buried objects in the Convair Lagoon. The primary survey lines in the subbottom profile survey were run at a 20-foot interval and cross lines were run at 100-foot intervals. In addition, a nearshore profile was made along the entire perimeter of the site.

Locating and mapping subsurface features was accomplished with a 3.5 kHz subbottom profiler. Operationally, this system transmitted an acoustic pulse that traveled through the water column and the sediments below the seafloor. At each interface that represented a change in density (e.g., the water-seabed interface or the interface between subsurface sediments and buried objects), some of the transmitted energy was reflected back toward the water surface. These acoustic reflections were received by the transmitting transducer, converted to electrical impulses, and displayed as a representative profile or cross-section of the seabed, underlying sediments, and buried objects along the survey trackline.

The interpretation of the subsurface reflection data is based on a procedure known as seismic facies analysis. The term seismic facies refers to a sedimentary unit, or reflector, that produces an identifiable and often unique reflection pattern. Common buried objects, particularly pipes and tanks, produce a cone-shaped signature on the reflection record that is easily identified. Using this procedure, significant subsurface reflectors (e.g., sedimentary horizons) and discrete targets were plotted on an overlay of the trackline map (Figure 2-3).

The subsurface reflection data suggest that most of the seabed is covered with fine-grained sediments, possibly silt or clayey silt. In the central portion of the survey area, an acoustic boundary (located 2 to 3 feet below the seabed) was identified and

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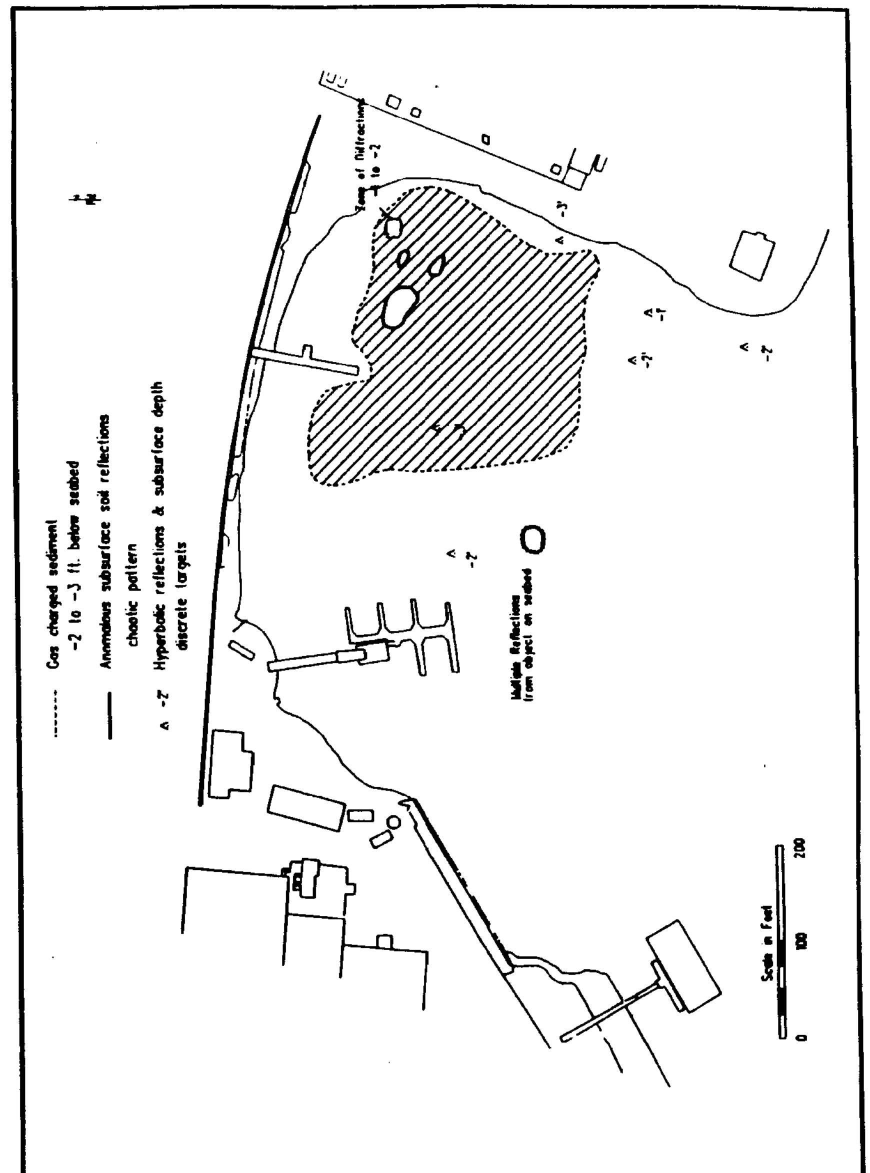

Figure 2-3. Map showing subsurface features in Convair Lagoon

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mapped. This boundary is interpreted to represent the upper surface of gas-charged sediments. The presence of shallow bedrock or biogenic gas in the sediments, both of which represent a significant change in substrate density, creates an acoustic boundary that results in poor subsurface penetration. Therefore, any objects below this layer would not have been detected.

In the offshore area to the south, the sediments appear to be fine- to medium-grained and are in excess of 30 feet in thickness. Several subsurface targets, interpreted to be discrete objects, were identified on the subbottom profile data. There was no evidence on adjacent tracklines of continuity between these targets. Thus, they do not appear to be buried pipes.

The results of the pipe and debris location survey indicate that very little surface or submerged debris is present which would impede dredging and construction activities. The sunken vessels, anchors, and other discrete objects which were located in the subbottom profiling survey and are in the proposed dredging area must be removed before remediation activities can begin. The estimated number of objects to be relocated is less than six.

2.1.2 Bathymetric Survey

The bathymetric survey was conducted to provide a detailed bathymetric map of the Convair Lagoon seabed. This map was subsequently used in conjunction with the sediment PCB data to develop engineering cross-sections for the areas to be dredged. Although initial dredging cross-sections had been developed in the EER, the bathymetric survey was required to calculate accurate cross-sections for dredging volumes and to refine the dredging plan.

The data were obtained with an instrument that provided an analog display of the seabed using procedures similar to those used to map the Lagoon subsurface features. Quality control of the bathymetric data was maintained by conducting calibrations twice a day. Changes in water elevation due to tides were monitored with a tide staff and two internally recording water level gauges. The area and the primary survey transects for the bathymetric survey was the same as those in the pipe and debris survey.

The analog records obtained by the bathymetric survey were digitized at a fixed 10-second interval, corrected for tidal variations, and entered into a Geographical Information System (GIS). Anomalous variations that occurred in the seabed, such as those due to eelgrass or other plants, sunken vessels, or unidentified objects, were noted but not digitized.

Based on the interpretation of these data, the GIS produced 2- and 3-dimensional bathymetric contour maps of Convair Lagoon (Figures 2-4 and 2-5). Water depths in the study area varied from 0 to 11 feet. A prominent ridge, 2 to 4 feet in height, was located near the center of the site and extends offshore from the 60-inch outfall. Presumably, this ridge-like feature is due to the discharge of sediments from the outfall. Other than this feature, the seabed gently slopes offshore and has no unusual bathymetric variations.

2.1.3 Landside Topographic Survey

A landside topographic survey was conducted to provide topographic contours between the Lagoon shoreline and North Harbor Drive, and to identify invert elevations of drainline outfalls and catch basins. County and city offices were contacted to gather detailed information on the storm drainage system's catchment area.

A detailed topographic map was obtained from the San Diego Unified Port District. This map was updated, digitized into the GIS, and then merged with the bathymetric data set to produce a map with a continuous series of landside and marine elevation contours (Figure 2-4). The landside and marine topographic information were integrated based on the zero shoreline elevation contour and the common coordinate grid system.

2.1.4 Sediment Evaluation

To refine the nature and extent of PCB-containing sediment adjacent to the 60-inch outfall, additional sediment cores were collected and analyzed (Figure 2-6). These data were used in combination with the sediment data presented in the EER to refine the vertical and horizontal extent of sediment PCB contamination in order to estimate the volume of sediment to be dredged.

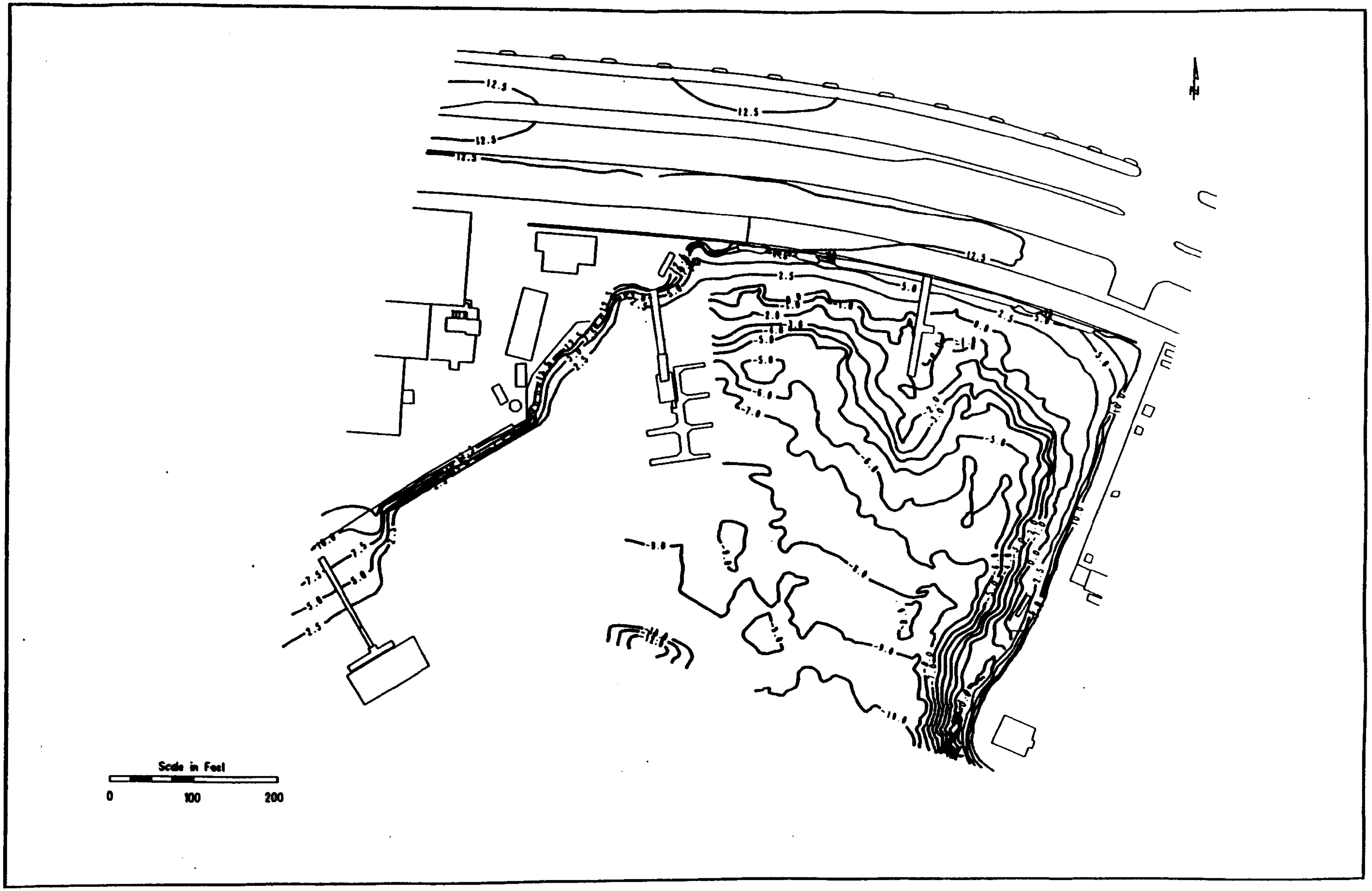

Figure 2-4. Two-dimensional bathymetric contour plot of Convair Lagoon. Elevations are

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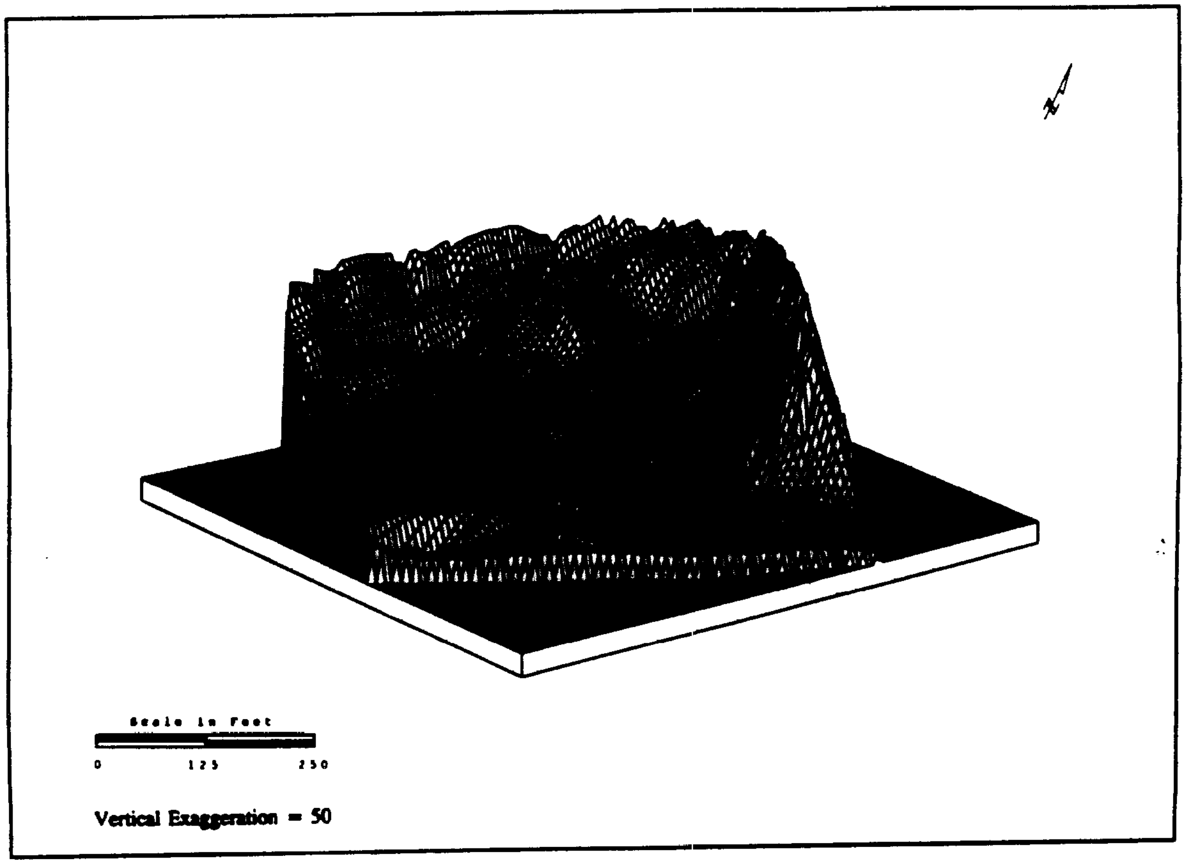

Figure 2-5. Three-dimensional bathymetric contour plot of Convair Lagoon (vertical exaggeration).

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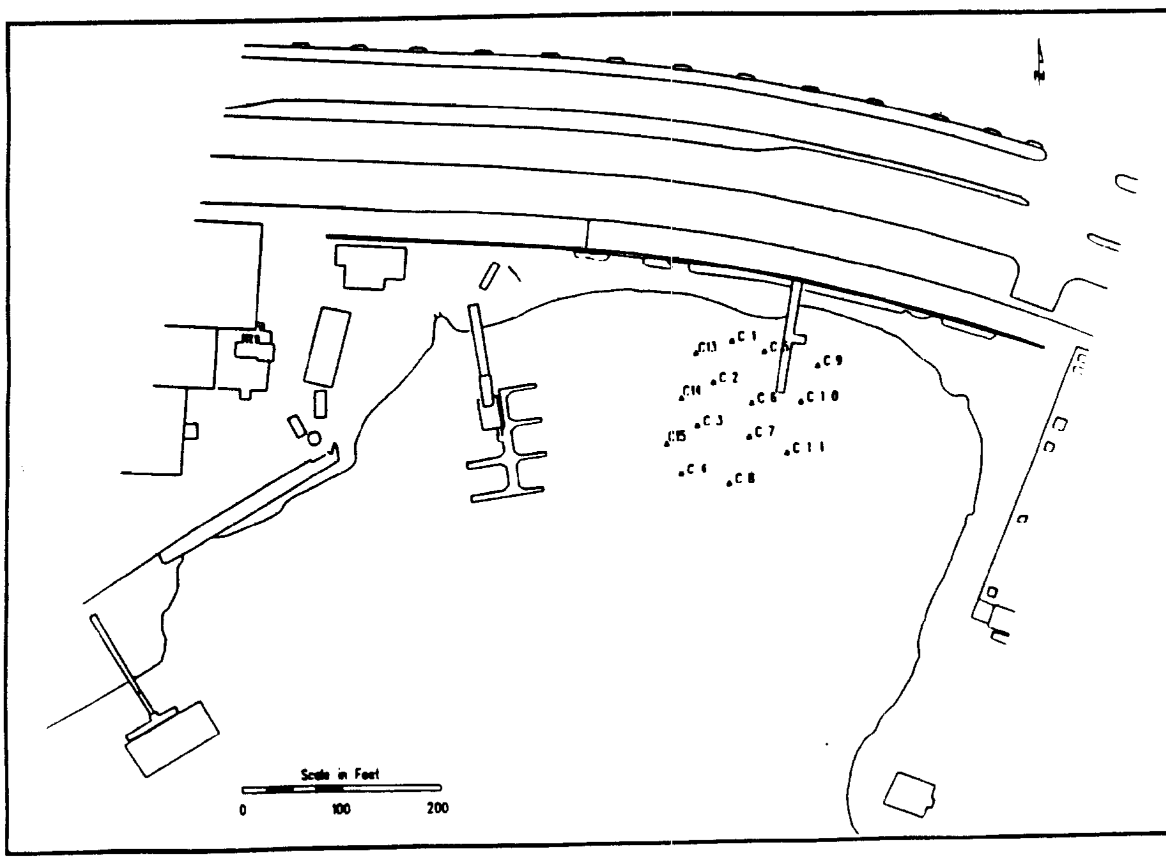

Figure 2-6. Map of sediment core sampling stations in Convair Lagoon.

Fourteen sediment cores were collected in the Lagoon using a vibra-corer sampler. The The sample locations were spaced in a pattern that provided a finer scale grid of the area of highest contamination identified in the Phase II sampling investigation (Figure 2-6). This facilitated the use of both data sets in establishing the nature and extent of contamination. Core depths ranged from 8 to 16 feet depending upon the depth of contamination. PCB analysis was performed on homogenized 1-foot sections of the core to an average depth of 8 feet using EPA method 8080 (gas chromatography with electron capture detector). In addition, 1-foot sections for core C10 were analyzed from 11 to 16 feet to confirm the absence of PCBs in the underlying sediment.

Based on the appearance of the cores, three general horizons were identified: 0 to 4 feet, 4 to 7 feet, and greater than 7 feet. The 0 to 4-foot section was black with an odor of oil and hydrogen sulfide. This section typically consisted of unconsolidated fine-grained sediments with visible oily bands from 1 to 6 inches. Several thin layers, 1 to 3 mm in depth, of a grayish, grease-like material were also found throughout this section. The 4 to 7-foot section was greenish-gray to black with an odor of oil and hydrogen sulfide. These sediments were coarser and more compact than the 0 to 4-foot section. This section also contained several oily bands of varying thicknesses (1 to 6 inches). The 7-foot and deeper sediments were greenish-gray and contained increasing amounts of sand and shells. Several cores had visible oil in the upper 1 foot of this section. Photographs of this pattern are shown in Figures 2-7a and 2-7b. Based on the analyses described above, it was apparent that PCB concentrations greater than the action level did not exceed deeper than 8 feet.

These results confirm the data from the Phase II investigation (TRA 1989) by indicating a general trend of higher PCB concentrations in the vicinity of the 60-inch storm drain outfall. Within this area of contamination, the new (and previous) sampling results indicated no obvious horizontal or vertical concentration gradients. Instead, the contaminant distribution pattern was patchy in the vicinity of the 60-inch storm drain. The highest PCB concentrations were generally located 3 to 5 feet deep; very little sediment containing PCBs was found below 7 feet. The data indicate that PCB concentrations vary in the Lagoon, and are primarily confined to the upper northeast quadrant of the Lagoon in the vicinity of the 60-inch storm drain.

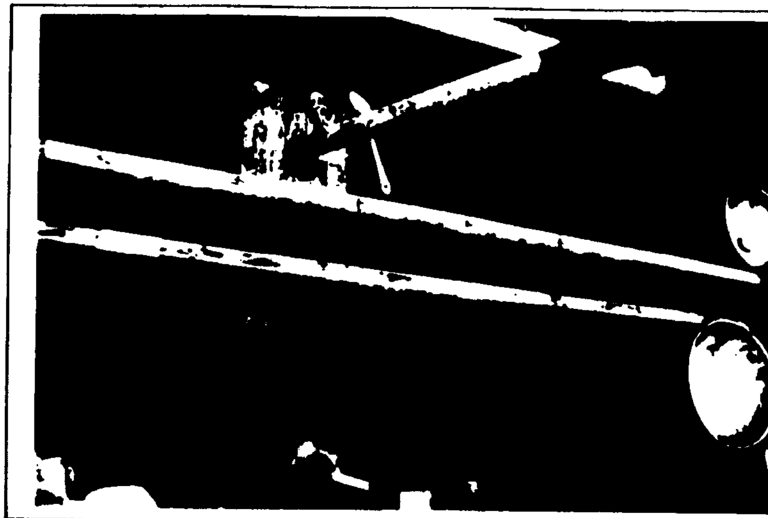

Figure 2-7a. Photograph of sediment core C-9, collected in Convair Lagoon, showing typical appearance of the upper 0-7ft section. This section tends to be black, unconsolidated fine material containing bands of oily material.

Figure 2-7b. Photograph of sediment core C-8, collected in Convair Lagoon, showing typical appearance of the deep 7-15ft section. This section is generally coarse, gray consolidated sands mixed with shells.

2.2 STORM DRAIN SYSTEM OPERATIONS

The construction of a NCF in Convair Lagoon would necessarily cover some of the storm drain outlets located in the Lagoon. In order to evaluate which modifications would be necessary to avoid drainage problems due to the coverage of these outlets, a preliminary analysis was conducted to identify all existing drains and to assess potential impacts. This section presents the results of this analysis.

2.2.1 Existing Storm Drain System

There are several storm drain outlets on the Lagoon shore (Figure 1-1). From west to east at point of discharge into the Lagoon, the four largest drains are:

- A 54-inch reinforced concrete pipe lying west of the Convair Sailing Club dock. This pipe drains the west half of the TRA complex, U.S. Air, and the central part of the runway area of Lindbergh Field. No date was given for the installation of this pipe.

- A 30-inch reinforced concrete pipe (30west), drains a portion of the parking area outside of the TRA complex and the adjacent section of Harbor Drive. This pipe was installed prior to 1942.

- A 60-inch reinforced concrete pipe on the north shore of the Lagoon, contained within a concrete dock which projects further into the Lagoon than does the conduit. This pipe was installed circa 1935 by the ACOE in association with the dredge and fill project which created most of the surrounding land. Its layout has been studied extensively, and its length has been estimated at approximately 1.75 miles to Witherby Street, and its catchment area at several square miles. This pipe receives discharge from several sources: Lindbergh Field and General Dynamics complex drains; Teledyne Ryan Aeronautical (TRA) facility drains; drains from the Pacific Highway, Atchison, Topeka, and Santa Fe railroad yards; and drains from a portion of the Mission Hills residential district beyond the rail yards.

- A 30-inch outlet located in the northeast corner of the Lagoon (30east) drains the east end of the TRA complex and adjacent portions of Harbor Drive, and was in place by 1942.

2.2.2 Potential Modifications to the Storm Drain System

The proposed location of the NCF in the northeast corner of the Lagoon would not cover the 54-inch, the western 30-inch, or the 60-inch drains (drawing C-11 in Appendix C). However, the proposed location would cover the present location of the eastern 30-inch drain outlet (30east) and the smaller Coast Guard drains. Therefore, the impacts of potential modifications to these drains were evaluated.

The location was selected so that modifications to the 60-inch drain would not be required for the following reasons. At higher high tide there is only a 3-foot difference between the water level in the Lagoon and the grade around the plant. The highest tide reaches an elevation of 8.0 feet, which is close to the elevations of adjacent catch basin covers, which range from 10.2 to 12.3 feet. According to the City Engineer's notes (City Drawing 17-D-46, last revised 1938), the 60-inch storm drain pipe carries 461.3 cubic feet per second by design but lies at a very flat slope of 0.07 percent. To carry such a flow, the hydraulic grade line slope of this pipe should be at least 1.7 percent (i.e., 17 feet per 1,000 feet of pipe). Therefore, the 60-inch pipe is already significantly underdesigned for current capacities, and any modification to its alignment or tie-in with the 30east pipe would likely result in upstream flooding. Thus, the 60-inch pipe outlet should not be covered by the NCF footprint.

With respect to the 30east pipe, a brief on-site investigation was conducted to determine modification options. Estimates of flows and profiles for the 30-inch drain, catch basin/manhole surface data, and invert elevation data were obtained. Information contained in several reports, including the topographical survey, indicates that the harbor Drive area is quite flat and that the tops of manholes/catch basins are at about the same elevation. Two alternatives for the 30east drain are discussed below.

In the first alternative, the 30east drain is extended southwest through the NCF to a new outfall location beyond the NCF bulkhead wall. The extension would continue in the same direction as the existing pipe (no bends), would be larger than the existing pipe to reduce backpressure effects due to its greater length, and would be pile-supported across the NCF to avoid settlement damage to the pipe extension. In the second alternative, the 30east drain pipe would be terminated in a manhole at a point landward of the beach and rerouted to the west beyond the NCF and then south to the Lagoon next to the 60-inch outfall. Two new manholes would be required and two changes in direction would be introduced. Hydraulic analysis indicates that the second alternative is the best option for the 30east pipe (See Appendix B). This option is discussed in greater detail in Section 3.4, Storm Drain System Modifications.

The Coast Guard drains that would be covered by the NCF would be redirected to connect with the new 30east configuration.

2.3 GEOTECHNICAL AND GEOLOGIC DESCRIPTION

Available geotechnical and geologic data were compiled to develop a preliminary design of the NCF and to assess the stability of the proposed structure and the surrounding area. A summary of this information is provided in this section.

Convair Lagoon is located along the northern edge of what was previously a marshy part of San Diego Bay. Present topography adjacent to the Lagoon is nearly flat due to the placement of hydraulic fill over recent, poorly consolidated bay mud deposits and the subsequent importation of finish-grade soil materials. Underlying the bay mud is a more consolidated sequence of terrace deposits consisting of sand, silt, and clay. The site is situated in a seismically active area within the Rose Canyon Fault Zone. Geotechnical aspects are discussed in some detail below.

2.3.1 Stratigraphic Units

Descriptions of the materials adjacent to and underlying the Lagoon have been obtained from subsurface investigation reports for several small areas located on the TRA plant site north of the Convair Lagoon (Woodward-Clyde Consultants 1980). Three borings were drilled at TRA Building 120. A summary of the results is given below and a representative boring log is shown in Figure 2-8. This information is confirmed by a subsurface investigation report prepared by Geocon Incorporated which investigated the Harbor Island Hotel site southwest of Convair Lagoon (Geocon 1990).

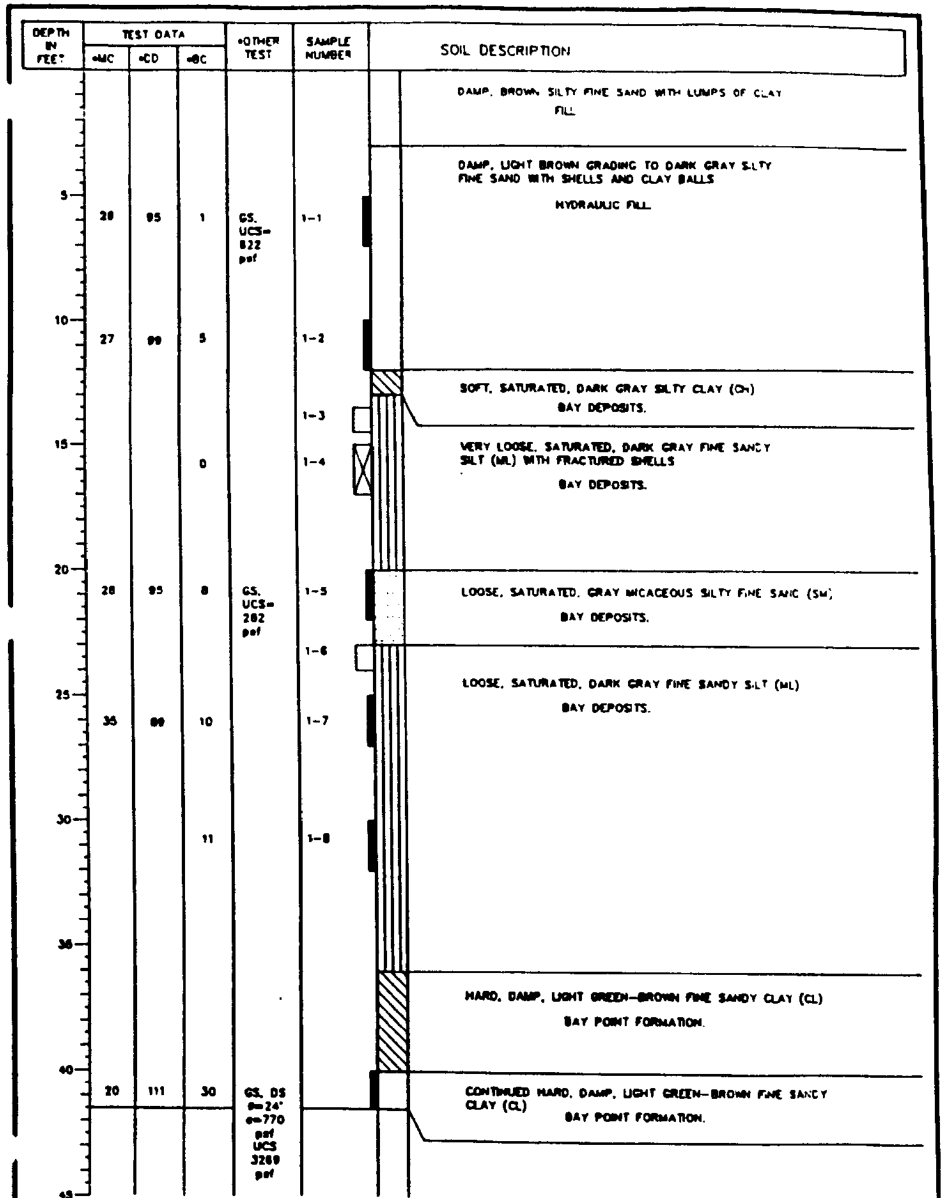

Figure 2-8. Representative soil boring log taken on TRA property near Harbor Drive (Woodward-Clyde Consultants 1980.)

Hydraulic Fill. These materials, dredged from the San Diego Bay, are approximately 10 to 12 feet thick and consist of loose to slightly dense, light-brown to dark-gray, silty fine sand with abundant shell fragments and some clay balls. Occasional thin layers or lenses of fine sandy silt are also present. The bottom of the hydraulic fill appears to be located within 1 or 2 feet below elevation 0 (Port of San Diego Datum), overlying the undisturbed bay mud sediments. Unit dry weight of the hydraulic fill ranges from approximately 95 to 103 pounds per cubic foot (pcf). These materials are essentially saturated below the mean high water elevation of about 5 feet.

Bay Mud Alluvium. Along the shoreline and inland, the Holocene bay deposits are approximately 25 feet thick and consist of loose to medium dense layers of fine sand and silty fine sand. Soft to slightly stiff layers of fine sandy silt and silty clay are also present. Colors range from dark-brown to brownish-gray, gray to dark-gray, and black (due to a high organic silt content). The thickness of this unit decreases proportionately with increasing water depth offshore. Dry unit weights of these saturated materials vary from about 88 to 96 pcf with an angle of internal friction of about 20 degrees, and an apparent cohesion ranging from zero to approximately 100 to 150 pounds per square foot (psf).

Terrace Deposits. Late Quaternary deposits (tentatively correlated with the Bay Point Formation) were encountered at depths ranging from 36 to 38 feet (-24 to -26 feet, PSD Datum) beneath TRA Building 120. These deposits are believed to be at about the same subsurface elevation beneath the Lagoon. Although the total thickness of these deposits in the site's vicinity is not known, they extend beyond the explored depth of 42.5 feet at TRA Building 120 and consist of hard, greenish-brown, fine sandy clay and very dense, brown, clayey sand with fine gravel. Dry density of a single sample was 111 pcf. The results from direct shear tests on the sample indicate a friction angle of 24 degrees and an apparent cohesion of 770 psf. Unconfined compressive strength was measured at approximately 3,270 psf.

2.3.2 Geologic Considerations

The predominant geologic considerations associated with constructing a confined disposal facility in the Lagoon are related to potential seismic activity in the Rose Canyon Fault Zone. These considerations include faulting, seismicity, liquefaction, and subsidence.

Faulting and Seismicity. The Rose Canyon Fault Zone is part of a major north northwest trending fault system passing through the San Diego Bay area. This zone is more than 40 miles long, including the Point Loma Fault Zone, and is more than 5 miles wide in the San Diego Bay area. One fault strand within the zone, the Spanish Bight Fault, has been inferred to pass by the Lagoon within a few hundred yards to the west. Since total offsets in Quaternary deposits within the Point Loma Fault Zone are reported to be nearly 500 feet, the Rose Canyon Fault Zone is considered to be potentially active although it has experienced low seismicity with respect to earthquakes in excess of magnitude (M) 5.0. In 1985, a series of earthquakes inferred to be along the Rose Canyon fault occurred in southern San Diego. The largest of these earthquakes was approximately M4.7. The maximum credible earthquake along the Rose Canyon fault is M6.5, which based on previous studies, has a recurrence interval of 200 to 400 years (Geocon 1990). An earthquake of M5.9 was reported on May 27, 1862, and is believed to have occurred in the Rose Canyon fault zone.

Liquefaction and Subsidence. In order to address the potential for liquefaction and subsidence, a series of geotechnical tests and evaluations would be conducted, including standard penetration tests in the field and grain size characteristic tests in the laboratory. These tests would be performed as part of the geotechnical program discussed in Section 2.5, and the results would be incorporated into the final design of the NCF in order to meet applicable safety criteria.

In general, loose, unconsolidated, cohesionless fine-grained sediments and soils (with shallow water tables) are subject to liquefaction and subsidence during severe and prolonged motion generated by strong earthquakes. Preliminary data from Convair Lagoon and the surrounding area suggest that sediments within the Lagoon as well as soils in the surrounding fill area would be subject to liquefaction during a strong earthquake. However, according to a geotechnical investigation for a proposed hotel on East Harbor Island within 2,000 feet of the Lagoon, a liquefaction analysis for an earthquake of M6.5 indicated that although localized areas of the site would experience liquefaction, general site failure would be unlikely (Geocon 1990).

Similar conclusions are also reasonable for the structural integrity of the proposed NCF since (1) fill material under the proposed hotel is similar to the sediments underlying the proposed NCF; and (2) the structural sheet piling of the NCF and the piling for the hotel would be supported by the Bay Point Formation, which consists of dense, fine to medium-grained silty to clayey sands and is less susceptible to liquefaction. Thus, the results from the nearby geotechnical investigation indicate that although liquefaction of the dredged material and existing sediment may occur during a strong earthquake, failure of the NCF sheet pilings, which would be supported on the Bay Point formation, is unlikely. Site specific geotechnical results for Convair Lagoon would be evaluated to verify this tentative conclusion. Furthermore, the NCF would be designed to meet applicable seismic design criteria.

2.4 EXTREME WIND, WAVE, AND TIDE DATA

Estimates of wind, wave, and tidal conditions are important in the development of the final design of the NCF. Extreme conditions were evaluated as a function of return period (years). The analysis indicated 100-year wind speeds of 61 to 63 miles per hour, a 100-year wave height of 3.2 feet, and a 100-year tide height of 8.8 feet. The wind data were used to evaluate wave conditions, and the wind and tidal data were used to determine the height of the NCF necessary to prevent significant overtopping. Analysis of these conditions is given in Appendix A.

2.5 ADDITIONAL ENGINEERING DATA REQUIREMENTS

To complete the final design of the conceptual cleanup plan presented in this document, additional data and information will be needed. As a first step, additional geotechnical and geochemical information are required for the structural analysis of the NCF and the refinement water treatment processes, respectively. Engineering properties of the sediment must be determined to complete the basis for the design for the NCF walls, settlement estimates, and treatment characteristics. This information would also be used to complete the final basis of design for dredging and dewatering activities and the integration of the water treatment processes.

2.5.1 Geotechnical Investigation

No site-specific geotechnical data is currently available for Convair Lagoon. The closest location of a previous geotechnical investigation data was a study of the TRA complex, inside Building 120, about 1,200 feet from the shore of the Lagoon (Table 2-2). Data from this report primarily consists of three borings to depths of 42 feet (bottom elevation -30 feet) by Woodward-Clyde Consultants (1980). These borings were located about

Table 2-2. Extrapolated Physical Properties and Liquefaction Potential of Stratigraphic Units.

Stratigraphic Unit	Unit Dry Weight (pcf)	Moisture Content (percent dry weight)	Internal Friction Angle (degrees)	Unconfined Compression Strength (psf)	Liquefaction Potential
Hydraulic Fill	95 to 103	18 to 29	22*	620	High
Bay Mud Alluvium	88 to 96	28 to 53	20	280	Moderate
Terrace Deposits	111	20	24	3,270	None
Newly Dredged Sediments	Unknown	Unknown	Unknown	0	High
Granular Capping Materials	Unknown	Unknown	Unknown	0	High (underwater) Moderate (above water table)

*Estimated from other sources.

1,200-1,500 feet north of the project site. A representative boring log from this study was presented and discussed in Section 2.3.

The overall usefulness of the Woodward-Clyde (1980) study is somewhat limited. Although the stratigraphy of the general area is likely to be fairly uniform considering its common origin, there may be a downdip in the top of the Bay Point Formation from Building 120 in the direction of the Lagoon. If such a downdip exists, the length of sheet piles and the thickness of settling layers would be affected. There may also be differences in the properties of the settling layer between Building 120 and the Lagoon since the Lagoon was never filled. The settling layer under Building 120 should be stronger due to the effect of the weight of fill over time. Therefore, the available information from a location 1200 feet away, which has had a different history, is inadequate for final design purposes.

In order to obtain the necessary geotechnical data for Convair Lagoon, five exploratory borings are proposed along the alignment of the sheet pile wall to determine soil properties for sheet pile design. All of these borings would be drilled to approximately elevation -50 feet, with two of the borings drilled a minimum of 10 feet into the underlying dense sands and hard clays of the Bay Point Formation. Standard Penetration Test blow counts would be taken every 5 feet. Four undisturbed 3-inch diameter tube samples would be taken in each boring. Six borings would also be drilled in the dredging area to determine sediment properties pertinent to dredging and containment operations. Minimum boring depth would be 15 feet with continuous 3-inch diameter tube samples for the full length of the boring.

Laboratory tests would also be conducted to obtain sediment properties for the sheet pile wall design. These tests would include unit weights, Atterberg limits, gradations, and triaxial tests on samples from the borings along the wall alignment. These tests would also be used to determine the material's dredging characteristics. Consolidation tests on samples from these borings would also be performed to determine the expected settlement of the foundation sediments following deposition of the dredged material fill. Since dredge production rates and pipe wear are significantly affected by the quantity of shells in the sediment, a laboratory estimate of the quantity of shells in the sediments would also be made.

2.5.2 Water Treatability

In order to complete the final water treatment plant design and to predict the time and volume required for settling of dredged material, additional information must be obtained. Physical and chemical testing of both the sediments and the water associated with the sediments is necessary to identify both soluble and insoluble components in the water. These tests would include elutriate tests as well as settling and compaction tests. Elutriate testing would be performed to identify target chemicals. In this test, sediment and associated water column water are mixed for 30 minutes, allowed to settle, and separated by both centrifugation and filtration (Plumb 1981; EPA/CE-81-1 or equivalent). The clarified water is then analyzed for chemical components using EPA or other approved standard analytical tests. A minimum of five elutriate tests on Convair Lagoon sediments would be performed, and analyzed for target chemicals. Particle size, hydrometer, and bulk density testing would also be necessary.

Bench scale testing would also be conducted to develop a detailed process design. This testing would be performed using appropriate vendors in order to identify equipment configurations, sizes, and expected performance.

3.0 REMEDIAL DESIGN

This section presents the proposed remedial design for cleanup of Convair Lagoon. It includes the remedial objectives, a general sequence of the proposed remedial activities, the relevant criteria for the remedial components, including a summary of the operation and maintenance requirements, and a description of the long-term monitoring program to ensure the performance of the NCF. A separate discussion of several site-specific technical constraints is also provided in this section to highlight remediation aspects not normally encountered during marine construction. The design proposed in the section is a preliminary design (30%) and would be further refined in the final design (100%) to be submitted March 1, 1993.

3.1 REMEDIAL DESIGN OBJECTIVES

The objectives of the Convair Lagoon remediation are: (1) to isolate all Lagoon bottom sediments with greater than 10 mg/kg (dry weight) PCBs from the marine environment, and (2) to minimize disturbance to the Lagoon and the surrounding environment. In order to accomplish these objectives, a combination of dredging and containment within a NCF is proposed. These objectives are the direct result of Directives 1 and 2 given in Addendum Number 4 to the Order (Table 1-1).

3.2 GENERAL SEQUENCE OF REMEDIAL ACTIVITIES

An overview of the sequence of remedial activities is presented below to establish the basis for the proposed cleanup process of the Convair Lagoon. Technical details of these activities are discussed in Section 3.3. Scheduling details are presented in Section 5. The proposed activities listed below would be conducted by the appropriate party.

- Obtain local construction permits not obtained as a part of the environmental permitting process.

- Conduct mobilization activities including installation of a construction support area with environmental, health and safety review and monitoring, as well as administration facilities.

- Relocate General Dynamics Sailing Club dock to facilitate dredging operation.

- Construct a silt curtain in the Lagoon around the area to be dredged.

- Complete storm drain system modifications including relocation of the 30east drain and the coast guard drains.

- Construct the NCF by driving steel sheet piles from a barge and from the land to form a rectangular sediment containment facility in the northeast corner of the Lagoon.

- Install corrugated sheet liner behind the sheet piles.

- Fill space between liner and the sheet pile with bentonite.

- Remove debris from the area of the Lagoon to be dredged and place debris in the NCF.

- Install the water treatment plant next to the NCF to receive flow from the overflow weir box.

- Remove sediment with a small hydraulic cutterhead dredge and pump the dredged material slurry to the NCF.

- Conduct environmental monitoring during dredging to monitor the surface water quality (suspended sediments and turbidity) in the vicinity of the dredging area.

- Conduct confirmational sampling to verify attainment of the 10 mg/kg PCB action level program in the dredging area.

- Reduce the water level inside the NCF to mean sea level, thereby exposing and drying the surface of the dredge spoils after dredging is complete.

- Remove the silt curtain and water treatment plant
- Place a geotextile over dredged material followed by several feet of imported granular fill when the surface of the dredge spoils becomes dry enough to support the activity (this fill will likely be placed in several stages as settlement of the dredged material progresses).
- Install a suitable cover as an infiltration barrier when the settlement of the dredged material is essentially complete.
- Conduct regular maintenance on the NCF to maintain the design life of the sheet pile walls and maintain the integrity of the infiltration barrier.
- Conduct long-term monitoring to ensure continued performance of the cleanup actions.

3.3 REMEDIAL DESIGN CRITERIA

3.3.1 Nearshore Containment Facility

The key objective of the NCF design is to isolate the contaminated sediment while also minimizing the potential impact to wetland areas. The design considerations must include the following: (1) reconfiguration of the storm drain systems, (2) capacity for settling dredging material, (3) capacity for dredged material containment, (4) height limitations, (5) availability and impacts of construction materials and techniques, (6) foundation considerations, and (7) limited construction window to accommodate nesting habits of the endangered species, the least tern. The final NCF configuration would also be compatible with the best beneficial use of the facility. These considerations are discussed in detail in the following subsections.

3.3.1.1 Reconfiguration of Storm Drain System

Since all potential NCF locations within the Lagoon would require a modification to the existing storm drain network, the first step of the design is to evaluate the potential

limitations on the location and configuration of the NCF due to the existing network. A detailed discussion of the storm drain operations and potential modifications is presented in Section 3.3.2. The results of this evaluation indicate that modifications to the 60-inch drain would be problematic due to current hydraulic loadings. Since the 30east and Coast Guard drains do not have these constraints, the northeast corner of the Lagoon would be the best location for the NCF.

3.3.1.2 Capacity for Settling and Dredged Material Containment

In the NCF design process, it is important to consider both the ultimate volume required to contain the dredged sediment and the volume required to settle solids prior to water treatment. However, in order to provide sufficient volume to efficiently settle solids during a standard continuous dredging operation, the NCF would encompass the majority of the Lagoon. To reduce this volume requirement, the sequence and duration of dredging would be modified as follows. The entire NCF would be filled with dredged material prior to operating the water treatment system. Once a sufficient amount of settlement has occurred, the clarified water would be removed and treated. This process would create sufficient capacity within the NCF for dredging to resume. This method of operation would keep the footprint of the NCF to a minimum.

In the proposed remediation scheme, the in situ volume of the sediment to be dredged would be approximately 10,600 cubic yards. In the event that the dredging depth is increased by 1 foot over the entire dredging area, the volume would increase to 13,300 cubic yards. Taking this volume into account as well as assuming a short-term bulking factor of 2, the minimum NCF capacity would be approximately 27,000 cubic yards. The bulking factor is a ratio of the initial in situ dredge material volume, to the short-term settled dredge volume stored in the NCF. Following the completion of dredging, the long-term bulking factor would be on the order of 1.4. The short-term bulking factor would be confirmed by settling tests discussed in Section 2.5.

Based on the above considerations and the site-specific bathymetry, the proposed NCF would be constructed in an area bounded by the northern and eastern shorelines of the Lagoon (Figure 3-1 and Drawing C4 in Appendix C). The approximate outside dimensions of the facility would be 430 feet by 177 feet. The resulting storage volume up to an elevation of 10 feet would be approximately 34,000 cubic yards (see Drawing C11 in Appendix C).

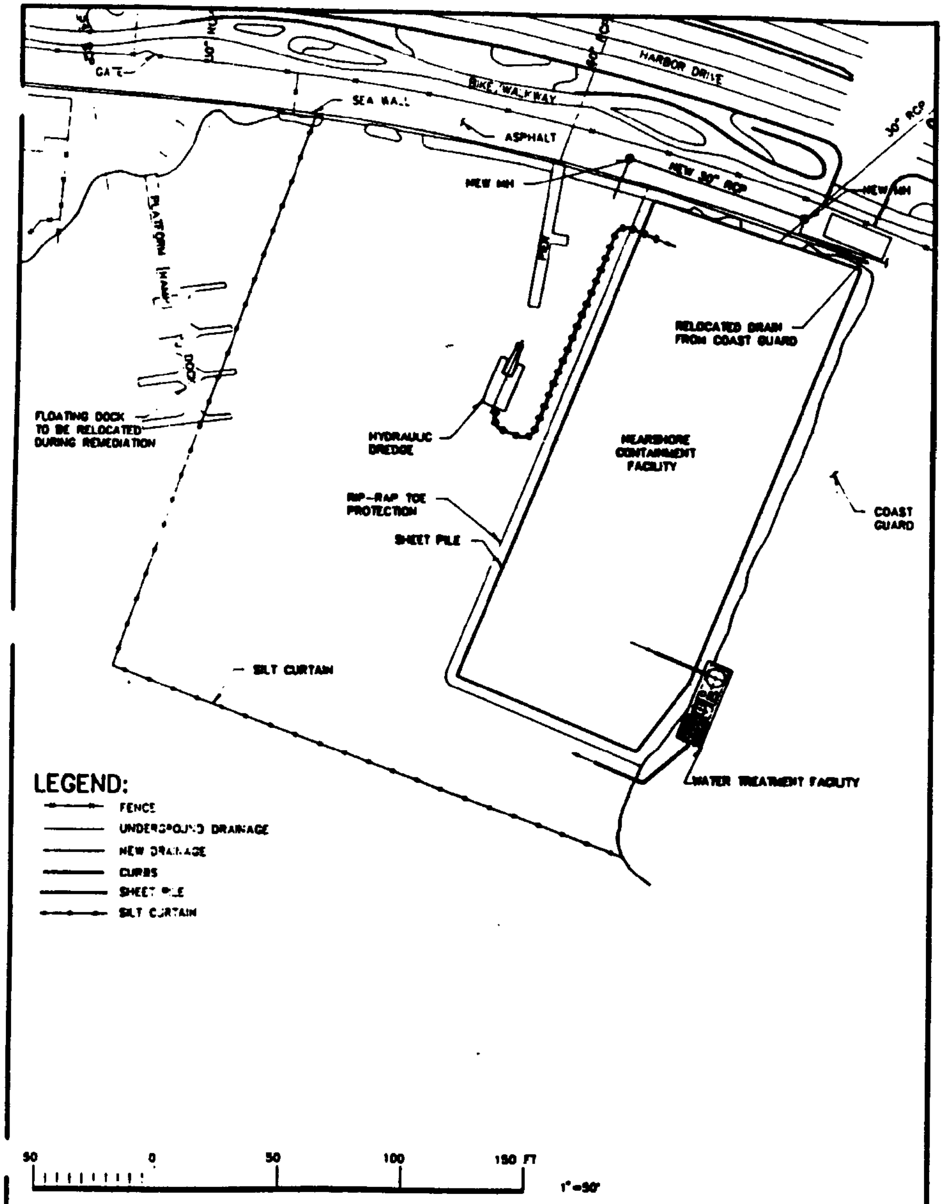

Figure 3-1. Proposed construction plan.

3.3.1.3 Height Limitations

For aesthetic reasons, the height of the NCF must be compatible with the adjacent upland areas. This limits the ultimate elevation of the facility to about 10 feet, which is the elevation of the adjacent Coast Guard property. The sheet piling would initially be constructed to an elevation of 12 feet to provide 2 feet of free board during dredging. The facility walls on the landward sides would then be lowered to a final elevation of 10 feet as part of the site restoration activities. However, for safety reasons, a 2-foot parapet wall would remain on the seaward site for a total seaward elevation of 12 feet (wall plus cover). This elevation is based on the sum of the highest high tide of 8 feet, a 2.5 feet wave height (25-year return period), and a freeboard of 1.5 feet above wave crest (based on data presented in Appendix A). Wave run-up may still overtop the wall; however, the overtopping would not be considered a safety hazard because the 2-foot wall would significantly diminish the impact of the wave activity. Upon completion of the imported fill operation, the wall would have scuppers installed to prevent flooding by draining water from rainfall or waves off the surface.

3.3.1.4 Construction Materials and Techniques

The proposed NCF would be constructed with steel sheet piles because the sediments of the Lagoon floor are not strong enough to bear the weight of a fill dike (earthen embankment) without using a staged construction technique, which would extend the project schedule considerably. In addition, relative to an earthen embankment, the sheet pile wall would reduce the footprint of the facility, thereby minimizing fill area. The sheet pile wall would be structurally designed for an interior flooded condition equal to the height of the wall when the water level in the Lagoon outside the NCF is at lowest low tide (elevation -2 feet). A rip-rap toe protection blanket would be installed on the Lagoon floor outside the wall to minimize erosion due to wave action. The wall of the NCF would bear a head of water during hydraulic dredging. In order to construct the sheet pile wall as a low permeability barrier, an inner liner of bentonite or similar material would be required between the Lagoon bottom and the top of the wall. Details of the NCF and sheetpile assembly are shown in Figure 3-2 and Drawings C11 and C12 in Appendix C.

The proposed sheet piles would be driven through the soft deposits of bay mud and into the hard clays of the Bay Point Formation, assuming that the Formation lies at about the

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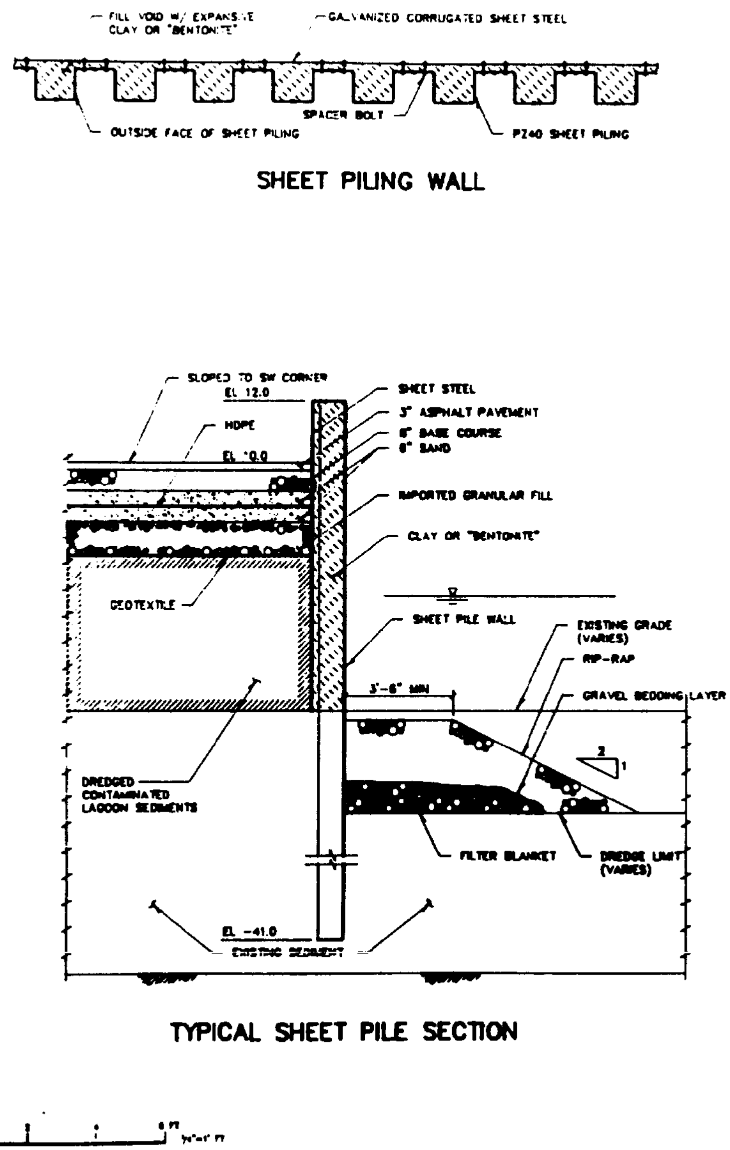

Figure 3-2. Design proposed for NCF piling.

same elevation in the Lagoon as it does 1,200 feet north (Woodward-Clyde Consultants 1980), and 3,000 feet southwest (Geocon 1990), where it is found at about elevation -25 feet. Sheet piles driven to the Bay Point Formation would effectively isolate the dredged sediment from the environment. The final design of the NCF would require confirmatory information regarding the stratigraphy of the soils underlying the Lagoon. A geotechnical program designed to provide the required design data is described in Section 2.5.

After the dredging and water treatment operations are complete, the dredge sediment would consolidate and dry out over a period of several months. The sediment would occupy approximately 1.4 times its in situ volume, or 15,000 cubic yards. The remaining volume in the NCF would be filled to grade with imported fill material covered by a multilayer infiltration barrier. Prior to placing the fill, a woven or synthetic geotextile mat would be placed on top of the dredge sediment to distribute the load from the imported fill. The geotextile would act to consolidate the underlying sediment in a uniform manner and prevent intermixing between the clean fill and the contaminated sediment. Approximately 14,000 cubic yards of imported fill would be required to bring the NCF surface to an elevation of 8 feet. The remaining 2 feet to grade would consist of the multiple layer infiltration barrier. The barrier would be constructed by placing 6 inches of medium sand over the imported fill layer to support an impermeable membrane layer. The 60 mil high density polyethylene (HDPE) membrane would prevent the infiltration of rain and runoff into the NCF. The surface would probably be completed with an asphalt surface layer. An asphalt surface would require a layer of medium sand and a base course material followed by 3 inches of asphalt (Figure 3-2 and Drawing C12 in Appendix C).

The proposed NCF would provide an effective long-term containment of both the PCB-containing sediment removed through dredging and the PCB-containing sediment covered by the footprint of the NCF. The walls and surface of the NCF would be low permeability structures due to the installation of a bentonite layer and a HPDE liner, respectively. The bottom of the facility would consist of Lagoon sediments, which also have a low permeability. The combination of these low permeability features would effectively isolate the PCB-containing sediment from the environment. A monitoring program to demonstrate the long-term effectiveness of the facility is described in Section 3.3.9.

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3.3.2 Storm Drain System Modifications

Storm drain outfalls within the area covered by the NCF must be relocated or extended through the NCF. The design must consider the upstream effects of modifying these drains since added flow resistance introduced through the extension or rerouting of the pipes may increase flooding in the drainage area. In addition, the design must consider the effects of fill settlement upon the extended pipe through the NCF. In such cases, the pipe may have to be enlarged for a substantial distance upstream of the existing outfall to mitigate the effect. Appropriate supports would be provided for any pipe within the affected area.

The existing 30east drainage system located in the northeast corner of the Lagoon consists of 13 catch basins connected by PVC pipes ranging from 8 inches to 18 inches in diameter. This system drains the east end of the TRA complex and adjacent portions of Harbor Drive and runs along the east and south perimeter of Building 120, heads south at the Gate two plant entrance, and then terminates at a city manhole on the north side of Harbor Drive. A 30-inch reinforced concrete pipe (RCP) conveys stormwater from the manhole to the northeast corner of the Lagoon. The invert elevation of the outlet is 5.28 feet, and the outlet is partially submerged at times by the tide. The proposed modifications are described below.

The 30east RCP outlet would be terminated into a manhole at a point landward of the beach and rerouted by adding a new 36-inch RCP going west beyond the NCF and then south to the Lagoon. The new line would be about 185 feet long and have two manholes that would serve as junctions where the pipe changes directions. One manhole would be installed about 30 feet from the outlet end of the existing pipe. From this manhole, 150 feet of 36-inch RCP would be installed heading to the west at a slope of about 4 feet per 1,000 feet and would terminate at a second new manhole. From the second new manhole, a 36-inch RCP would be installed extending south about 35 feet to the Lagoon serving as the new outlet with an invert elevation of about 4.6 feet (see drawing C4 in Appendix C). Details of the hydraulic analysis used in these modifications are given in Appendix B.

A backwater analysis of the existing system was performed to determine if sufficient head is available to pass the required flow without backing up the system when the losses associated with the changes in length and direction are added to the existing system. The

analysis also evaluated the effect of tidal fluctuation on the system performance. This analysis revealed that the capacity of the drainage system upstream of the city manhole is not affected by the elevation of the tide. The 18-inch pipe between CB-155 (the most downstream catch basin of the 30east system) and the city manhole operates under inlet control for the range of flows examined (i.e., 2 to 12 cubic feet per second (cfs); the upper value reflects the 10 year storm). Inlet control refers to the discharge capacity of the pipe, and is controlled at the pipe entrance by the depth of headwater and the entrance geometry. The length of the pipe and the depth of tailwater do not affect the pipe discharge under inlet control. Therefore, the water surface elevation in CB-155 would be the same for a given discharge regardless of the tide elevation in the bay. However, this is not the case for the city manhole. The pipe downstream of the city manhole is much larger and operates under outlet control when the outlet is submerged. Under outlet control, pipe capacity is dependent not only on tailwater depth but also on the length of the pipe. This means that as the tailwater depth or pipe length increase, headwater depth would also increase in order to pass the same flow.

The modifications to the drainline (i.e., lengthening the system and increasing the downstream pipe size from 30-inch to 36-inch RCP) would cause the hydraulic grade line at the existing city manhole to increase about 2 inches for a discharge of 12 cfs when the tide is at elevation of 8 feet. The modifications would not affect the hydraulic capacity of the existing system upstream of the city manhole. Downstream of the manhole, the capacity would be slightly decreased during extreme high tides. However, during low tides, when the system operates under inlet control, there would be no change in capacity. Based on the above analyses, a 36-inch RCP is recommended for the modifications in order to be conservative. No upstream flooding would result from the proposed modifications with a 36-inch RCP.

3.3.3 Mobilization and Site Preparation

The first activities during the NCF construction phase of the proposed Convair Lagoon cleanup are mobilization and site preparation. In order to begin construction, the construction support area must be established with office trailers for administrative purposes, a facility for health and safety equipment, and a contaminant decontamination facility.

To support these facilities and the water treatment operation, temporary utilities would be established. These may include telephone, water supply, electrical power, and sanitary sewage collection. Access control for personnel and vehicles would be controlled by fencing. Unauthorized visitors would not be permitted to enter the active work areas. Where required, security fences would be of chain link type to a minimum height of 6 feet.

Following the initial site setup, the appropriate party would relocate the General Dynamics Sailing Club dock for the duration of construction activities. The silt curtain would then be deployed to reduce surface water turbidity that may arise during dredging or during the construction of the NCF. A silt curtain is essentially a vinyl nylon tarp which extends around the dredging area supported by a float and anchored by a ballast (Figure 3-3). Once the silt curtain is in place, debris within the area of dredging would be relocated inside the footprint area of the NCF.

3.3.4 Sediment Removal

Activities under sediment removal include dredging and sediment placement in the NCF. Based on the sediment PCB distribution data, approximately 10,600 cubic yards of sediment outside of the proposed NCF footprint must be removed in order to comply with the 10 mg/kg action level specified in the Order (Drawing C3 and C5 in Appendix C). In order to determine the dredging volumes, the Lagoon was divided into a grid system with three major grids, A, B, and C. Grid A, the area of the highest contamination, was further divided into 30 cells (A_1, A_2, . . . A_{30}) where PCB data were clustered. Each fifty-by-fifty cell extends to a depth of 10 feet, and is further divided into 1-foot segments creating a three dimensional site block which is comprised of 1-foot by 50-foot subcells.

Based on PCB sampling events described in Section 1.2 and Section 2.1.4, PCB concentrations were assigned to each of these subcells. These concentrations were then compared to the prescribed action level of 10 mg/kg PCBs. Cells in which PCB concentrations exceeded the action level, and cells located above cells with exceedances would be removed in the proposed dredging and containment scheme. The volume of the material to be dredged was based on depth from mudline and adjusted using both the bathymetric survey data and the appropriate engineering side slope cuts. An additional dredging volume of one foot in each grid cell was also calculated in sizing the NCF. In this case, approximately 13,300 cubic yards of sediment would be removed.

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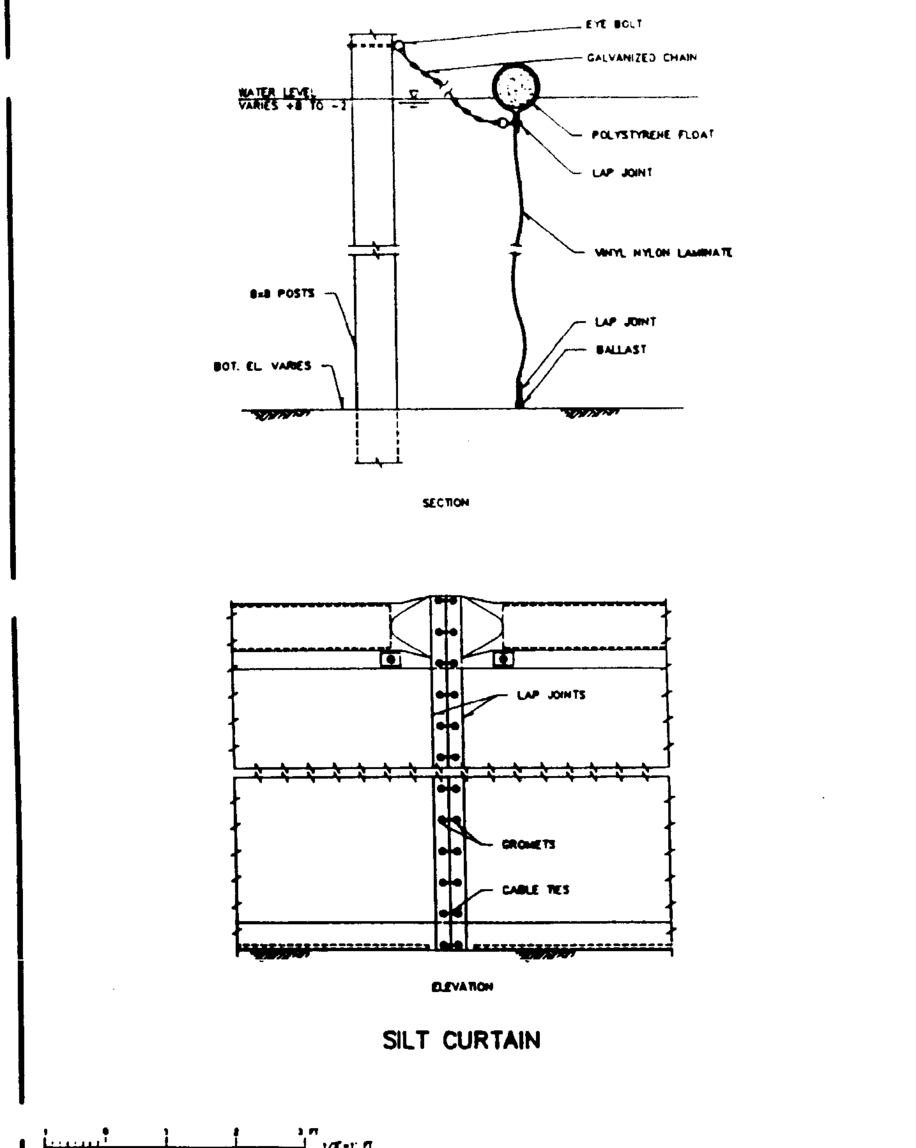

Figure 3-3. Design proposed for silt curtain construction.

The nature of the dredged material and the water depth of the dredging area are important considerations with respect to the dredging plan. The upper 10 feet of Lagoon sediment is generally a fine sandy silt with some clay and primarily results from surface runoff activities. Preliminary settling tests conducted on sediment from the Lagoon suggest that the material settles relatively quickly (within several hours). This should be confirmed by additional testing (Section 2.5.2). Water depths in the dredging areas range from +3.00 mean lower low water (MLLW) along the northern fringe of the Lagoon to -8.00 MLLW at the southern extremity of the dredging area (Figures 2-4 and 2-5). Debris in the general area of dredging depicted in Figure 3-4 would be removed as a part of the site mobilization activities. Any additional debris encountered during dredging activities would also be removed.

The two dredges proposed for sediment removal at the Convair Lagoon include a water-tight clamshell and a hydraulic cutterhead dredge. The selection of these two dredges was site-specific and based on the following criteria:

- Effectiveness in removing the contaminated sediment.
- Resuspension of sediment into the water column.
- Equipment availability, access to site, water depth required for operation.
- Worker and public health and safety.
- The physical/chemical characteristics of the sediment.

The water-tight clamshell dredge is proposed for use along shoreline areas if water depth and access preclude hydraulic dredging. In addition, this dredge could be used from either a land or water-based position to work in areas with large pieces of debris.

The cutterhead dredge, a hydraulic dredge, is proposed for use as the primary dredge for sediment removal. Its demonstrated success in dredging contaminated sediment from New Bedford Harbor (Otis 1990), combined with its versatility under a variety of operating conditions, make the cutterhead a logical choice. In 1989, EPA and the ACOE evaluated three hydraulic dredges (mudcats, matchbox and cutterhead) during the New Bedford Harbor Pilot Study within a cove along the New Bedford shoreline quite similar

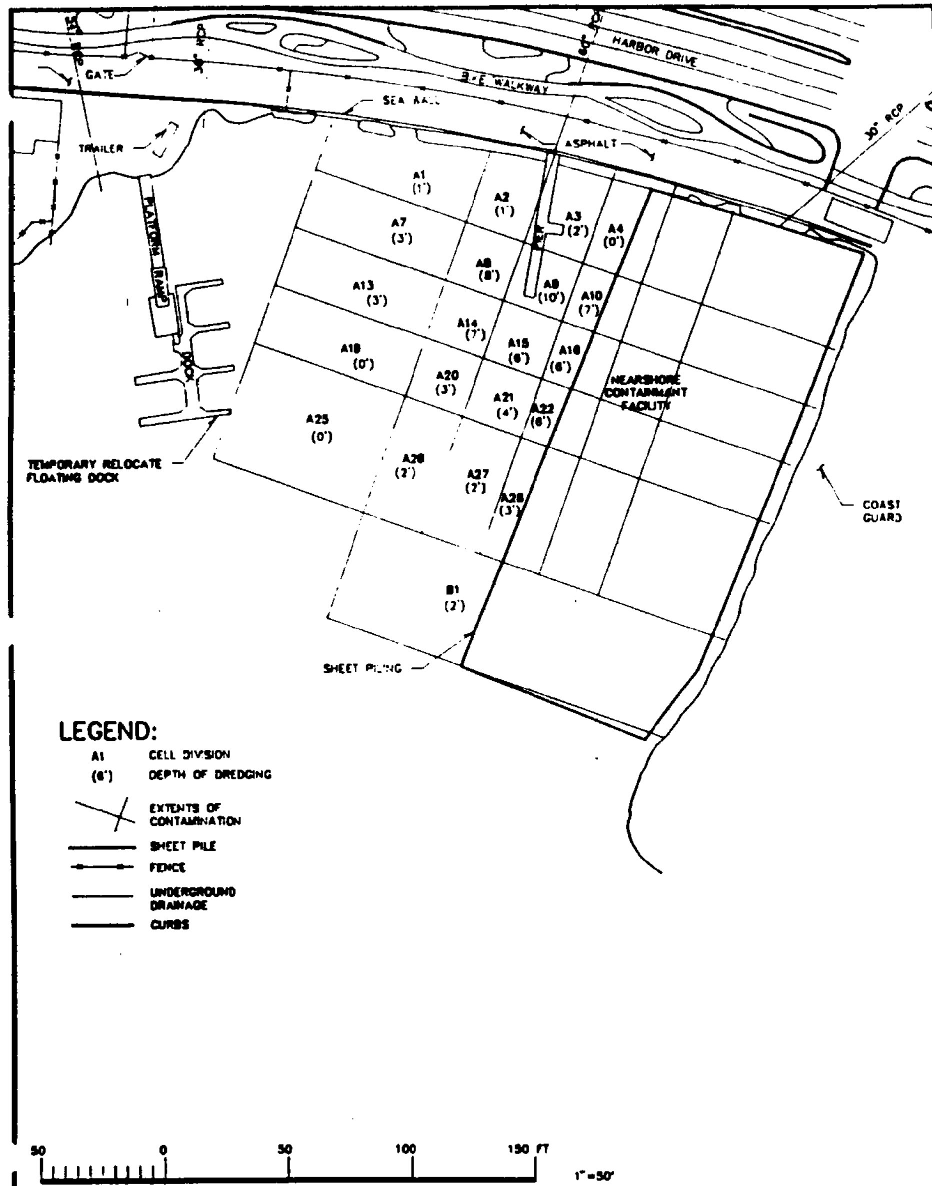

Figure 3-4. Dredging plan, including specific dredging depths.

FIG-2.DWG

CUT 009156

to Convair Lagoon. A total of over 10,000 cubic yards of sediment was dredged, of which approximately 3,000 cubic yards was contaminated with PCBs at levels ranging from 150 mg/kg to 585 mg/kg. The cutterhead dredge removed more than 1,600 cubic yards of contaminated sediment during the study. The results indicated that all three dredges were effective in removing the contamination and minimizing sediment resuspension and contaminant release. However, based on continuous suspended sediment levels and water column PCB measurements, the cutterhead was singled out by the ACOE as the best dredge to minimize sediment resuspension. Therefore, EPA selected this dredge for sediment removal as part of the New Bedford Harbor Hot Spot Operable Unit Record of Decision (EPA 1990). The dredge was also proposed as the sediment removal technology of choice within the Feasibility Study for the remainder of the New Bedford site (Ebasco 1990). A brief operating summary of the cutterhead dredge is provided below.

The dredge operates by loosening the sediment with a rotating cutter that also guides the material into a suction pipe. The dredge is versatile in cutting differing types of material including soft sediment, compacted deposits, hardpan, and weathered rock and is capable of operating in shallow areas. During operation the dredged slurry is drawn into the suction pipe by a centrifugal pump that also pushes the mixture through a pipeline to the point of discharge. A 10-inch cutterhead dredge was used by EPA and the Corps during the New Bedford Pilot study. A similar size dredge is applicable to dredging operations within the Lagoon.

Specialized operating conditions would be required for use of the cutterhead dredge in Convair Lagoon. In Convair Lagoon, the sediment would be removed in 1-foot horizons throughout the dredging area at dredging depths presented in Figure 3-4. The corresponding engineering cross sections are presented in Figure 3-5 and Drawings C7 and C9 of Appendix C. The dredge would be operated in a specialized mode to minimize resuspension. A preliminary list of operating parameters is presented below:

- Swing Speed - 50 percent of dredge capability
- Cutterhead Rotation - 50 percent of dredge capability
- Dredge Pump Speed - Run at maximum RPM (1,570 gpm)

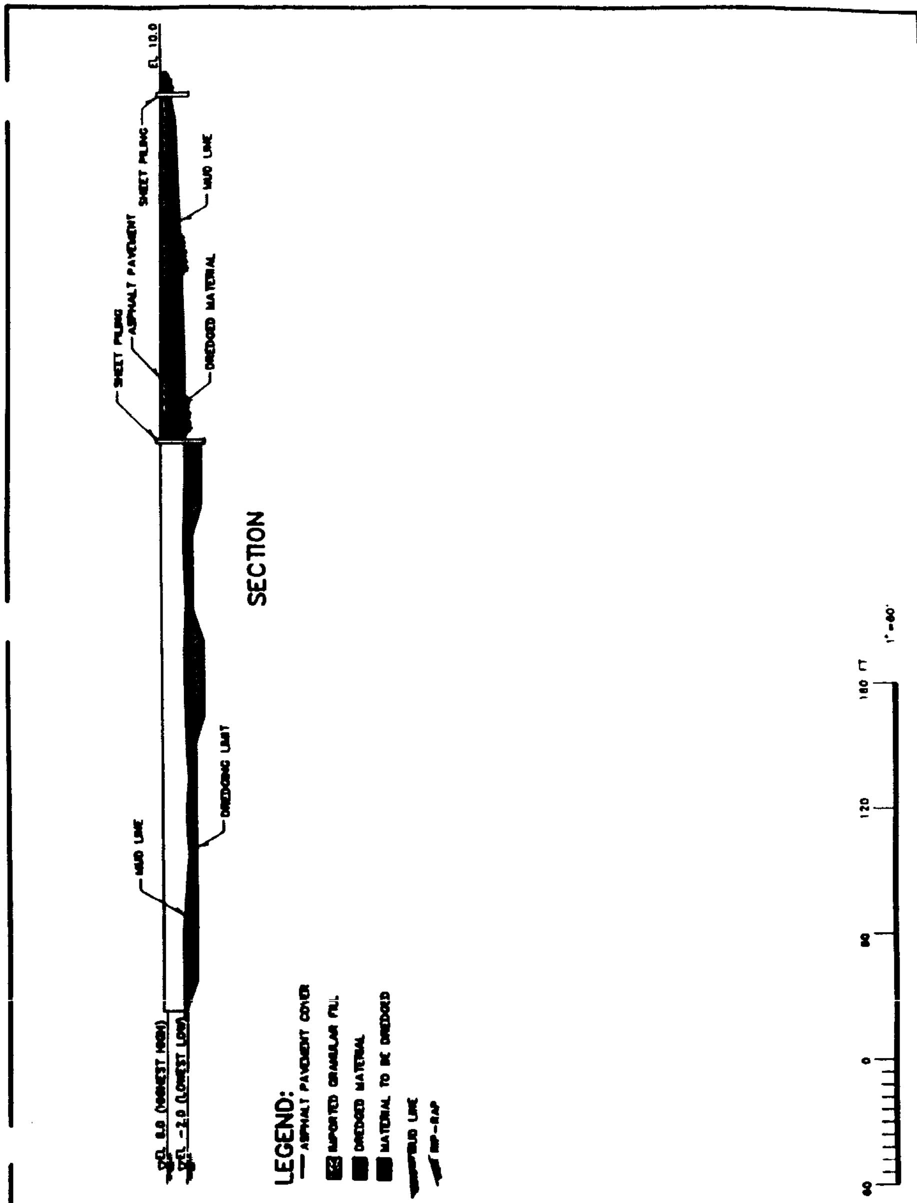

Figure 3-5. Schematic of dredging profile.

- Advance per Swing - 1 foot (cutterhead diameter)
- Swing Anchors - To be placed on shore
- Depth of Cut - Sufficient to remove the top 1 foot of sediment with each pass i.e., cutterhead location at approximately 1 foot (cutterhead diameter) below sediment/water interface.

To estimate the time required to dredge 10,600 cubic yards from the Lagoon, the above operating parameters were applied to the following Lagoon sediment characteristics. Assuming an in situ sediment density of 108 lbs per cubic feet and 70 percent solids, a dredge material slurry of 10 percent, and an efficiency of 75 percent for an 8-hour work day, the dredge would remove approximately 231 cubic yards per day. On an hourly basis, this equates to 29 cubic yards per hour of in situ sediment removal. Only hydraulic dredging was included in this estimate since the mechanical dredging would occur on a parallel track. Also, the small quantity of mechanically dredged sediment would not significantly influence the calculations.

Dredged sediment would be hydraulically pumped through floating pipelines to the NCF, and placed in the NCF with the assistance of a diffuser. The diffuser would reduce the exit velocity of the slurry to minimize mixing within the NCF, and would be movable by crane to prevent the potential buildup of sediment in any particular location of the NCF.

Although increased turbidity in the surface water is only expected in the immediate area surrounding the dredge, a silt curtain would be placed around the entire dredging area. The silt curtain would contain an oil boom as an added contingency. An extensive water column monitoring program would be conducted during the dredging operation to evaluate surface water suspended sediment and PCB levels. Details of the monitoring program are provided in Section 3.3.8.

Based on an in situ volume of 10,600 cubic yards, approximately 46 dredging days would be required. However, since the hydraulic capacity of the proposed NCF would be limited to approximately 6,900,000 gallons, the period of continuous dredging would be limited to a maximum of approximately 12 working days. Following placement within the NCF, a day or two would be necessary for a clear layer of water to develop. This

water would then be transferred to the treatment plant until the water is drawn down to near the top of the sediment in the facility. The dredging would then resume following the same cycle of events until the dredging was complete. This interactive manner of operation is required due to NCF size constraints discussed in Section 3-3. Specifically, water clarification and treatment cannot occur simultaneously during dredging operations since the placement of dredged soils in the NCF provides too much agitation. Based on the preliminary evaluation, it would take approximately six cycles of dredging and water treatment to remove the 10,600 cubic yards of sediment necessary to achieve the 10 mg/kg PCB sediment action level. This process would take about five months. An additional three cycles of dredging and water treatment would be required to remove a total of 13,300 cubic yards of material. The estimated sequence of dredging and water treatment activities is presented in Table 3-1. A bird screen would be installed during the dredging, settling, and drawing periods to prevent wildlife from entering the NCF.

3.3.5 Water Treatment

During the hydraulic dredging and sediment settlement operation, water would be generated which would require treatment. The objectives of the proposed water treatment facility are: (1) to design a system with a rate compatible with the dredging rate; (2) to treat to a 1 μg/L PCB concentration in the effluent; and (3) to achieve the above objectives while minimizing the cost. The design PCB concentration of 1 μg/L was specified assuming a dilution factor of approximately 1:33 at the edge of the mixing zone. This assumption should be easily satisfied in Convair Lagoon.

The following sequential steps were used to develop the water treatment design.

- Available information was gathered on the dredging activity including type of dredging operation, processing rate, size and location of anticipated facilities, and expected operating times and duration.
- Information was obtained to characterize the solids and liquids which would be produced during the dredging activity.
- A conceptual treatment process was developed.

Table 3-1. Schedule of Dredging and Water Treatment.

Cycle No.	Activity	NCF Remaining Capacity (gal)	Duration (days)	Cumulative Duration	Sediment Removed/ Cycle (CY)	Cumulative Sediment Removed (CY)
1		6,866,640			2772	2772
	Dredging		12			
	Water Treatment		27	29		
2		5,746,974			2310	5082
	Dredging		10			
	Water Treatment		22	71		
3		4,813,919			2079	7161
	Dredging		9			
	Water Treatment		18	98		
4		3,974,169			1617	8778
	Dredging		7			
	Water Treatment		15	120		
5		3,321,030			1386	10164
	Dredging		6			
	Water Treatment		13	139		
6		2,761,197			1155	11319
	Dredging		5			
	Water Treatment		11	155		
7		2,294,670			924	12243
	Dredging		4			
	Water Treatment		9	168		
8		1,921,447			693	12936
	Dredging		3			
	Water Treatment		8	179		
9		1,641,531			693	13629
	Dredging		3			
	Water Treatment		6	188		

- Costs and weights for the anticipated equipment were obtained for use in the conceptual treatment process.

The first two steps were discussed in the previous section, and steps three and four are discussed below.

3.3.5.1 Water Treatment Conceptual Design

Approximately 25 million gallons of water would be treated by the water treatment facility. This estimate is based on the dredging and water treatment schedule shown in Table 3-1 and a water treatment flowrate of 150 gallons per minute (gpm). A treatment flowrate of 50 gpm was also considered, but was determined to be impractical due to scheduling constraints.

Three unit processes would be required in the proposed water treatment, including dissolved air flotation (DAF), filtration, and carbon adsorption. These processes would be implemented in series in order to achieve effective treatment. The arrangement of the three process steps is shown in Figure 3-6, and details of the processes are provided below.

DAF is commonly used to remove dispersed/emulsified oil from water. In this process, air is dispersed into the water stream where it attaches to oil droplets. These droplets rise through the water at a accelerated rate and are collected and skimmed off of the top of the water in a flocculation/skimming tank. At the same time, some of the solids present in the water flocculate and settle to the bottom of the tank where they are collected. Flocculating agents are added to increase the flocculation and flotation effects. Depending on the degree of initial settling in the settling basin, a pre-filter may be required prior to the DAF.

Filtration through a granular-media filter removes additional suspended solids. In this process, water is passed through a bed of sandy or other granular material in order to trap and retain suspended solids. When the bed is full of solids, it is backwashed with filtrate, and both the backwashed filtrate and solids are discharged back into the NCF.

Carbon adsorption is used to remove dissolved organics from the water. In this process, water is passed through the bed where it comes into contact with granular activated

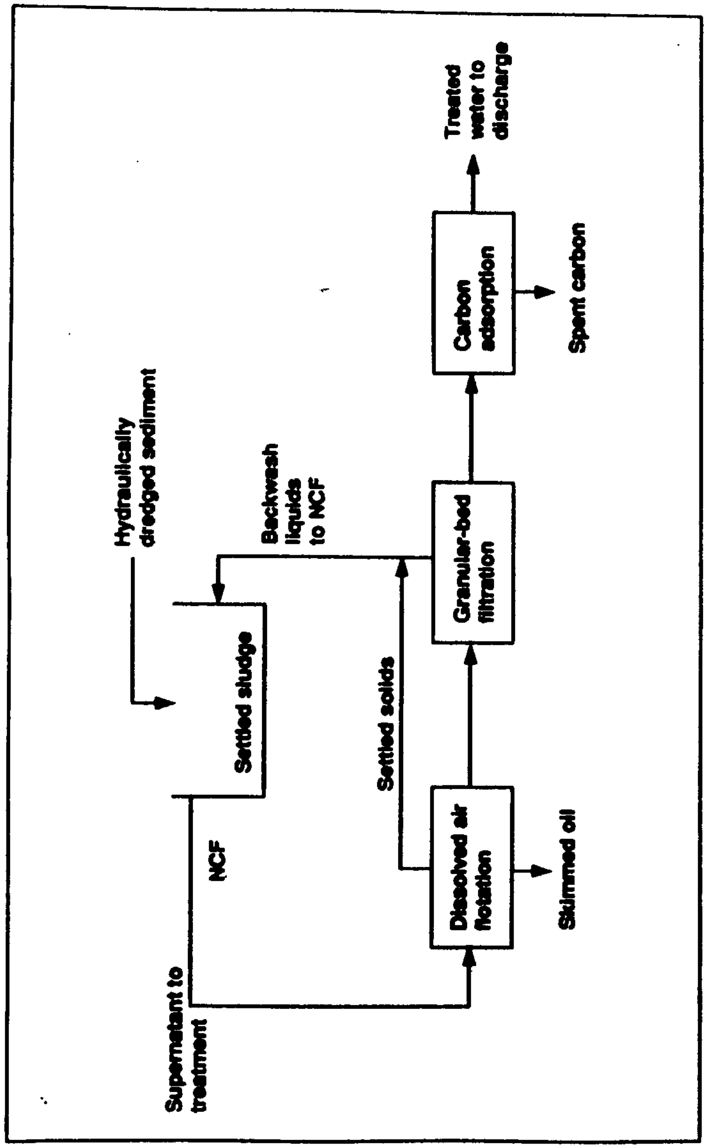

Figure 3-6. Flow diagram of conceptual wastewater treatment system.

carbon (GAC). Dissolved organic molecules are adsorbed onto the surface of the carbon media. As a general rule, hydrophobic compounds, especially those with high molecular weight such as PCBs and PAHs, adsorb strongly to GAC. Although the concentration of PCBs in the water would probably be extremely low, PCBs would absorb to the surface of the carbon. Carbon which is contaminated with traces of PCBs cannot be reactivated and must be managed appropriately. The effluent water from the carbon adsorption unit would be discharged into the Lagoon.

3.3.5.2 Final Water Treatment Design

To complete the water treatment design, additional sediment and water treatability data are required. These data, along with the discharge limits based on the allowable dilution factor, would determine the final treatment system. Analytical testing, suction and discharge line relocation, health and safety monitoring, and other such activities would also be considered in the final design.

In addition, additives would be required for the dissolved air flotation process, and activated carbon would be required for the carbon adsorption unit. The dissolved air flotation process would produce waste oil and solids at the conclusion of the processing. The carbon adsorption process would produce approximately 300 drums of carbon waste. Waste from the treatment processes would be managed appropriately.

3.3.6 Site Restoration

Following completion of the work, all construction equipment, anchors, trailers, debris, and temporary fencing would be removed from the site. The final cover system for the NCF would be installed when settling of the dredge spoils was essentially complete so the surface would be stable. Settlement can be measured and assessed as a function of time to make this determination. An estimated rate of settlement can be further refined after the geotechnical program outlined in Section 2.5.1 has been completed. More than 3 feet of total settlement is expected during the first few years, most of it in the dredge spoils. If an asphalt pavement cover system is to be installed, some differential settlement cracking will occur, and surface renewal after a few years will be required. The end use of the NCF area will determine the best type of cover system.

3.3.7 General Operation and Maintenance

The NCF will require maintenance by the appropriate party to ensure its integrity. To prevent corrosion of the steel sheet piles in the intertidal zone, the piles would be coated with bitumastic or other corrosion inhibitor, which must be renewed at intervals of approximately 10 years. The scupper drains would be kept clear of debris, and if the surface settles below the level of the bottom lip of the scuppers, the scuppers would be cut lower to match the new surface. The cover system will require care depending on its type. The long-term effectiveness of the NCF in isolating PCB-containing sediment would be demonstrated through regular monitoring (Section 3.3.9).

3.3.8 Short-Term Monitoring

The proposed short-term monitoring program would address monitoring issues during a two-year construction time frame. This program would include pre-operational, operational, and post-operational monitoring in the water column, operational monitoring in the sediments, and pre-operational and operational monitoring in the air. The basic components of this program are summarized in the following paragraphs.

3.3.8.1 Water Quality Monitoring

Pre-Operational Monitoring. In order to establish existing baseline conditions, pre-operational monitoring would be conducted in the water column. Based on analytical results from elutriate tests described in Section 2.5, target components for monitoring would be identified considering magnitude, frequency of occurrence, and toxicity. In addition, suspended solids, turbidity, pH, and conductivity would be determined.

The proposed baseline monitoring would be conducted at a minimum of six stations in the dredging area and two stations outside the immediate dredging zone. In order to account for temporal variability, sampling events would be conducted at four different periods, spaced approximately one month apart. Sampling events would include at least one high tide and one low tide period. Monitored parameters would include elutriate testing parameters, suspended solids, turbidity, pH, and conductivity. Both dissolved and total (i.e., dissolved and particulate) concentrations would be determined in the water samples. Samples would be collected from surficial, mid-depth, and bottom water and combined to form a single composite sample.

Operational Monitoring. During the actual construction phase, two issues must be addressed; the resuspension of sediment during dredging and in-water construction, and the discharge of treated water following dewatering of the NCF. The objective of the operational phase monitoring is to demonstrate that any impacts to water quality are near-field and of short duration.

The eight stations identified in the pre-operational monitoring would be sampled again during the operational phase. Sampling would occur on a routine basis during dredging for the first five days, and once in the week following dredging operations. These samples would be analyzed for both dissolved and total concentrations of the same parameters determined in the pre-operational samples. In addition, two continuous reading turbidometers with remote sending capability would be anchored. Tentatively, one would be inside and one would be outside the silt curtain (Figure 3-3), providing water column turbidity measurements during dredging operations. If turbidity levels become excessive, dredging operations could be temporarily suspended or the operational parameters discussed in Section 3.3.4 could be modified. Ten additional grab samples for total suspended solids would also be taken for turbidometer calibration purposes.

Treated water from the NCF treatment plant would be monitored to verify that the discharge complies with NPDES requirements. Composite grab samples would be collected on a periodic basis and analyzed for target compounds. As a rough estimate, a total of 75 samples would need to be analyzed; assumed parameters include pH, BOD, COD, oil and grease, total suspended solids and PCBs.

Post-Operational Monitoring. The objective of post-operational monitoring is to demonstrate that water quality has returned to a quality equivalent or superior to the baseline conditions. For this purpose, the eight previously identified stations would be sampled once a quarter for two quarters following remediation. Samples would be analyzed for the same parameters as in the pre-operational monitoring.

3.3.8.2 Sediment Monitoring

Since the extent of PCB contamination in Convair Lagoon sediments has been well documented by previous studies, no additional pre-operational sediment monitoring would be required. However, post-dredging verification monitoring would be implemented during operations to demonstrate that contaminated material has been removed to the action level of 10 mg/kg PCBs. Approximately one sample for every 50 feet x 50 feet grid cell would be taken. Sampling would be coordinated with dredging operations in such a manner that additional material could be dredged if verification samples test above the action level. Details will be outlined in the post-remediation sampling plan to be submitted to the RWQCB pursuant to Directive 2.g of Addendum 4 of the Order.

3.3.8.3 Air Quality Monitoring

Some volatilization may occur as the PCBs are exposed to the atmosphere during remediation activities. To demonstrate that the release of PCBs does not result in offsite migration through volatilization, an air monitoring program may be required. A typical program would consist of two high volume PSI monitors located upwind and downwind of the NCF and a meteorological monitoring system. Other sampling might include portable hydrocarbon detectors around the NCF perimeter to verify that the project is adhering to the hydrocarbon emissions standards.

3.3.9 Long-Term Monitoring

Through a long-term monitoring program (greater than two years), the integrity of the NCF would be demonstrated to confirm that PCBs have been effectively isolated from the environment. The long-term response of the ecosystem is being addressed separately in a bioaccumulation monitoring program as directed by the Order.

3.3.9.1 NCF Monitoring

Monitoring of the NCF performance would be achieved by the installation of up to eight piezometers. Piezometers provide a measure of flow gradient and would indicate flow conditions of groundwater in the vicinity of the NCF.

Readings would be recorded on at least a quarterly basis for the first three years and then annually for the following years. This program would be further refined in the final design. Results would be presented in a brief report. Every three years, the monitoring program would be reviewed, and modified as appropriate.

3.3.9.2 Storm Drain Monitoring

The remediation plan assumes that PCB sources have been controlled and eliminated. In order to confirm this assumption, effluent and sediment from the four major storm drains discharging to Convair Lagoon would be monitored prior to construction. If storm drain sediments contain PCBs, they would be removed and isolated in the NCF.

Effluent would be collected from each of the four major storm drains at convenient access points such that the collected samples represent discharged water rather than backwash from tidal flushing. The effluents would be analyzed for total PCBs (EPA method 608). Analyses would be performed to determine both dissolved and total PCB concentrations. In addition, a sediment sample would be collected from each of the drains. Sediment would be collected from an appropriate location (e.g. catchbasin or manhole) such that drain sediments rather than resuspended Lagoon sediments are sampled. The sediment samples would be analyzed for total PCBs (EPA method 8080).

3.4 SPECIAL TECHNICAL CONSTRAINTS

Development of the proposed NCF imposes several special technical constraints not normally encountered in marine construction projects. These include (1) the sequential, iterative nature of the dredging and water treatment activities which is necessary to minimize the size of the NCF; (2) the limited construction period of September through March due to the least tern (*Sterna Albifrons Browni*) which utilizes the Lagoon during the months of April through August; and (3) the method of dredging.

The first two constraints significantly impact scheduling. Sequencing the dredging and water treatment cycles extends the construction period compared to continuous operation. In contrast, the narrow operation window constrains the construction period. Since Directive 2 of Addendum No. 4 set very specific dates in the cleanup schedule, accelerated site mobilization, maximized efficiencies in scheduling, and concurrent tasking of activities are required. Therefore, due to the aggressive, yet highly constrained nature of the schedule, any delays or difficulties encountered may have significant impacts on the construction schedule. For example, if the volume of dredged material is as large as indicated by current upperbound estimates, the schedule in the Order for completion of the work may not be met and an extension may be necessary. Currently, nine months are allotted for the completion of the remediation following award of the construction contract. This period is based upon a best-case scenario. Since the NCF construction and the dredging and water treatment activities are sequential, delays in any part of the schedule could result in significant project delays.

Regarding the third constraint, the dredging equipment would be operated in a specialized manner in order to minimize sediment resuspension. Specifically, the dredge would remove sediment in 1-foot layers, with the hydraulic pump at full throttle and the dredge cutterhead and swing speed operated at half speed. While this method produces a rather dilute dredge material (approximately 10 percent solids by weight), it has the advantage of minimizing sediment resuspension. This special method of operation has important implications with respect to the NCF design and the water treatment efficiency so it must be explicitly stated in the dredging contract. Generally, dredging contracts are based upon volume production, but in this case, the contract must be based upon incentives to minimize the sediment resuspension and to accurately follow precise specifications.

4.0 REGULATORY CONSIDERATIONS

The following section details the statutory, regulatory, and permitting requirements applicable to the Convair Lagoon remediation, including Federal, State and Local standards and permits. This discussion outlines the type of information required and presents a suggested timeline for coordination of permit application submissions. Identification of access, easement and right-of-way requirements, and a preliminary discussion of health and safety requirements are also presented.

4.1 FEDERAL STANDARDS AND PERMITS

4.1.1 Section 404 Clean Water Act, Section 10 Rivers and Harbors Act

Section 404 prohibits the discharge of dredged or fill material into the nation's waters without a permit from the ACOE. Under Section 10 of the Rivers and Harbors Act, a permit must also be obtained authorizing structures and work in or affecting navigable waters of the United States. For the proposed Convair Lagoon remediation, a single permit encompassing both Section 404 and Section 10 standards will be issued by the ACOE.

Major application requirements for the Section 10/Section 404 permit include: (1) a detailed description of the proposed Convair Lagoon remediation, including appropriate drawings outlining the approximate dimensions of structures, fills, and excavations; (2) a description of the purpose, need, and intended use of the activity including a detailed work schedule; and (3) a description of the dredged material. During the permit review process, the ACOE evaluates whether the benefits of the project approach outweigh the environmental impacts. General review factors considered include: basic project purpose and need; water dependency; availability of practical alternatives; and environmental impacts.

Discussions with ACOE staff indicate that approximately six months are required for completion of the review and approval process for the Section 404 permit. One of the most critical steps in the process is the review of the application by other Federal and State agencies. A "contingent" permit can also be issued by ACOE if all approvals have not been received. The principal review agencies will be the RWQCB, California Coastal Commission, U.S. EPA, U.S. Fish and Wildlife Service, California Fish and Game, and the National Marine Fisheries Service.

4.1.2 Toxic Substances Control Act (TSCA)

The regulations promulgated by EPA pursuant to TSCA, 40 CFR Part 761, outline disposal standards for materials containing PCBs. Specifically, section 761.60(a)(5) states that such materials must either be incinerated in a facility meeting the requirements of 761.70, disposed of in a chemical waste landfill which complies with 761.75, or disposed through an alternative method approved by the EPA Regional Administrator.

These TSCA disposal standards were developed for situations where PCB-containing materials are to be moved and disposed at an offsite location. Thus, those standards may not apply to a remedial action to contain materials which will not be moved offsite. Consequently, guidance will have to be sought from EPA Region IX as to whether TSCA disposal standards are applicable to the proposed remedial actions.

Even if EPA Region IX determines TSCA regulations are applicable to the NCF, either a dredge material exemption pursuant to 40 CFR 761.60(a)(5)(iii) or a waiver from portions of the chemical waste landfill requirements pursuant to 761.75(c)(4) may be obtained from EPA authorizing construction of the NCF. Regulatory precedent for such alternatives has been established. For example, the first of these two waiver provisions is being proposed by EPA to allow a NCF type facility to be used for sediment containment at the New Bedford Harbor Superfund site. EPA's proposed plan for New Bedford calls for removal of approximately 300,000 cubic yards of sediment at PCB concentrations of up to 4,000 mg/kg to be placed in a series of NCFs along with the New Bedford shoreline.

4.2 STATE STANDARDS AND PERMITS

4.2.1 California Environmental Quality Act (CEQA)

The Guidelines for Implementation of the California Environmental Quality Act set out regulations for implementation of CEQA. Generally, these regulations provide for designation of a "lead agency" to implement the CEQA requirement. The lead agency is

the agency which has "the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment" (CEQA section 21067). The lead agency will determine whether an environmental impact report (EIR) or negative declaration will be required for this project. To date, neither a lead agency or an EIR/negative declaration determination have been made by public authorities for this project.

In general, the CEQA process begins when the Agency conducts a preliminary review to determine whether a particular activity is exempt from CEQA. The project may be granted a statutory exemption (Article 18 of CEQA), a categorical exemption (CEQA Article 19), or determined not to have the potential for significant effect on the environment. An initial study may be prepared to determine if an EIR is required.

CEQA determinations and documentation are also important components to other permit applications including the Coastal Development Permit Application, the State Lands Commission permit application, and the Section 404/Section 10 dredge and fill permit review process.

4.2.2 California Porter Cologne Water Quality Act (PCWQA)

PCWQA requires that waste discharge reports be issued when discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the state. There are two activities for which reports of waste discharge and waste discharge requirements would be required: the discharge of treated water from the dewatering operation and the construction of the NCF. The discharge of treated water from the dewatering operation would require effluent discharge requirements in the form of an NPDES permit. That permit will contain effluent limitations and monitoring and reporting requirements and will be designed to meet applicable water quality standards.

The waste discharge requirements issued by the RWQCB for the NCF would authorize construction of the NCF and set forth specific design criteria to ensure the effectiveness of the NCF structure as a containment barrier. Monitoring and reporting requirements will also be included in those discharge requirements.

4.2.3 State Lands Commission Permit

A permit must be obtained from the State Lands Commission for the dredge and fill operation. The Commission will ensure that CEQA requirements have been met as part of the review process, and will evaluate the volume of material to be disposed and the type of disposal.

4.2.4 Mitigation Requirement

A mitigation plan is required by Directive 2.d of the Cleanup and Abatement Order. The mitigation project shall involve the creation or restoration of beneficial uses in San Diego Bay or other water body. The mitigation plan will be submitted to the RWQCB for review and approval before remediation begins. The mitigation plan will also be described in the ACOE and Port permit applications and reviewed in conjunction with the analysis of any significant environmental effects of the project, as directed under CEQA.

4.3 LOCAL STANDARDS AND PERMITS

4.3.1 Coastal Development Permit

Under the San Diego Unified Port District Coastal Development Permit Regulations, a coastal determination must be made for all projects within the jurisdiction of the Port District. The decision to grant or deny a Coastal Development Permit is based on the project's conformance with the Port Master Plan as adopted by the Board of Port Commissioners. The permit may require amendment of the Master Plan through the formal Master Plan amendment process. Application requirements include a copy of the EIR or negative declaration issued under CEQA, and a project location map document. The application will be reviewed and issued by the Board of Port Commissioners.

4.3.2 General Construction Permits

In addition to the above environmental-related permits, there will be a number of local permits required associated with general construction activities. These may include, but are not limited to, construction permits, building permits, electrical permits, and sanitary permits. These permits will be identified upon completion of the final design and construction bid specifications.

4.4 PERMIT APPLICATION COORDINATION AND SCHEDULE

CEQA determinations and documentation are required components to the Coastal Development permit application, the State Lands Commission permit application, and the Section 404/Section 10 dredge and fill permit review process. Accordingly, early completion of that process is important to the timely permit application submittal and permit receipt. Figure 4-1 outlines a timeline for issuance and receipt of permit applications, and Figure 5-1 shows where permitting fits into the cleanup schedule according to Directive 2 of the Order.

As indicated on the timeline, all permit applications must be submitted by October 1, 1992 in accordance with the Order. The waste discharge requirements and NPDES permit are prepared and submitted concurrently due to their similarity in content. The Coastal Development Permit and State Land Commission permit will not be reviewed by the appropriate agencies until an EIR is available.

4.5 ACCESS, EASEMENTS, RIGHT-OF-WAY

Site access from the land side consists of a small turnout from Harbor Drive. Harbor Drive is very heavily traveled and the turnout is inadequate for construction and earthmoving equipment. Parking and laydown space is confined to the esplanade area above the seawall, which is narrow. Therefore, it is not recommended to plan any substantial material movements from the land side. Necessary easements and/or right of ways must be obtained to gain access to adjoining properties as required.

Water access is comparatively easy. Shallowness is the principal problem in the northeast corner of the Lagoon, which would prevent barge-mounted piledriving equipment from approaching the shore; the shoreward walls of the NCF must therefore be driven by a rig on the land. All other operations associated with remediating the Lagoon should be handled by water, especially those handling bulk materials such as fill.

4.6 HEALTH AND SAFETY REQUIREMENTS

The health and safety requirements of the Convair Lagoon remediation must be tailored to the specific activities associated with this effort. During the final design process,

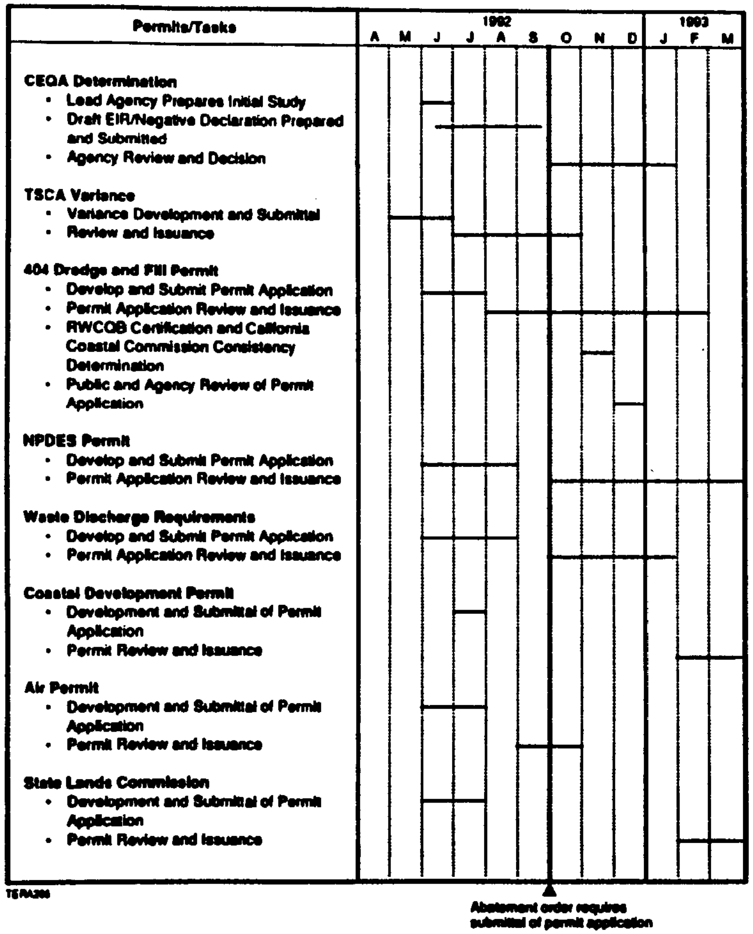

Figure 4-1. Convair Lagoon permit timeline.

health and safety professionals would work with the engineers to incorporate appropriate and regulatory required safety systems into the design.

An evaluation of the potential occupational health hazards associated with sediment removal, treatment of Lagoon water, and maintenance operations would be conducted to fulfill the necessary requirements of the site-specific health and safety plan. An evaluation of the occupational health hazards would define the appropriate engineering controls necessary to reduce occupational health exposures and would be incorporated into the final design.

The health and safety requirements must comply with California Code of Regulations (CCR) Title 8 and OSHA (29 Code of Federal Regulations) which include a site-specific health and safety plan in compliance with 8 CCR Section 5192. A Hazardous Waste programmatic site-specific health and safety plan would also be prepared. In addition, health and safety specifications would be developed to be submitted with the bid specifications.

The contractor(s) would be required to oversee health and safety to ensure compliance with the Health and Safety Plan. In addition, a contractor audit and review of held records during the course of remediation is anticipated to document compliance with the Health and Safety Plan.

5.0 SCHEDULE

This section presents the preliminary construction schedule of the selected remediation. Half-size engineering drawings are attached in Appendix C (C1-C12). The schedule reflects the sequencing and time frames outlined in Addendum to the Order.

The schedule for the cleanup of the Lagoon is based on the requirements of the Cleanup and Abatement Order. The bar chart schedule is shown on Figure 5-1. These requirements are presented as Directives 2.f. through 2.j. of the Order (Coe 1991) (Table 1-1). Reports would be filed quarterly beginning October 1, 1992 to facilitate communication. It is also important to note that complete remediation has been defined as the completion of the dredging phase of the remedial operation necessary to achieve the action level of 10 mg/kg PCBs in the sediment surrounding the NCF. Thus while dredging will be complete by June 1, 1994, overall remediation will not be complete until the Spring of 1995. The order should be modified accordingly.

To facilitate tracking the numerous submittals associated with the Order, the schedule has been organized in a consistent manner. The schedule includes an estimated agency review and approval cycle period of two months for the various submittals. While this is challenging, it must be maintained by the RWQCB if the current schedule is to be met. For example, to meet the submittal date of October 1, 1992 for the permits, the preliminary design will have to be approved by the Board's Executive Officer by August 1, 1992. This would allow only two months to finalize the permit applications consistent with the RWQCB comments on the BDR.

This schedule is based on completing the work by the dates specified in the Order. However, if the volume of dredged material approaches the upper bound of the current estimates, there is not sufficient time allocated to complete the work due to the limitations on the construction period to accommodate least tern nesting. In this case a second construction season would be necessary. In addition, the time for drying the dredge spoils before placement of fill and final surface was estimated from limited sediment characterization data. The actual time required could extend the construction period considerably. Also, the schedule is based on the successful completion of NCF construction followed by a stringent dredging and water treatment schedule. Any interruptions

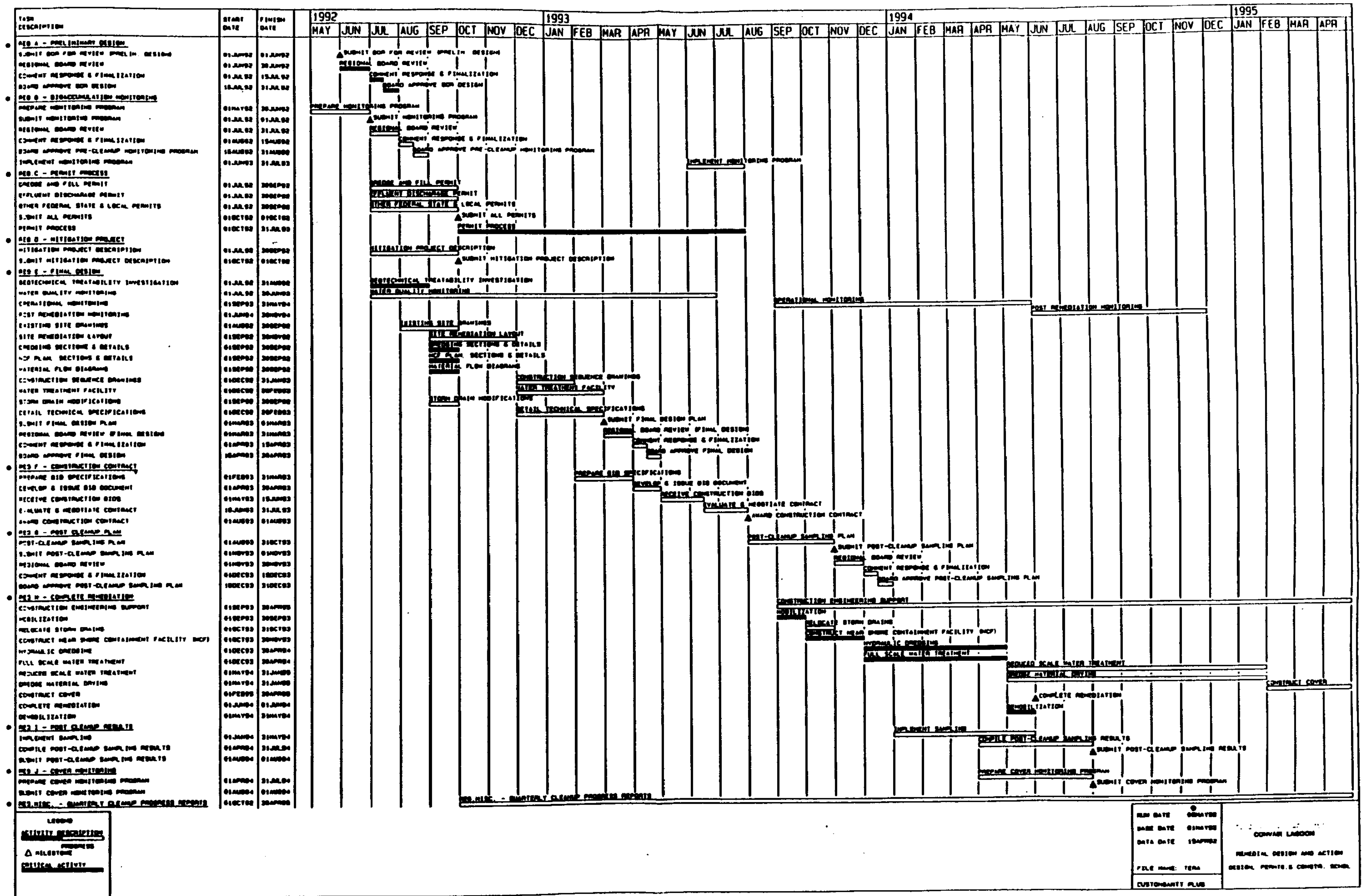

Figure 5-1. Bar chart schedule.

could result in significant scheduling delays. Finally, the schedule is dependent upon prompt agency and board reviews. If extensive revision of permit applications or delays in agency or board reviews occur, the schedule given in Figure 5.1 would have to be modified accordingly.

6.0 CONSTRUCTION DRAWINGS AND TECHNICAL SPECIFICATIONS

This section of the report presents a list of anticipated drawings and technical specifications that will be prepared during the final design of the facility. The drawings will show the existing site conditions, layouts for site remediation, material flow diagrams, suggested layouts for water treatment facility, and the general construction approach to implement the design of the NCF, including the NCF plans, sections, and details. Technical specifications necessary for the implementation of the selected remediation will also be prepared.

6.1 CONSTRUCTION DRAWINGS

The following drawings will be prepared to support the construction.

Drawing Description	Estimated No. of Dwgs.
Overall Site Plan	1
Existing Topography	1
Sampling Location Plan	1
Plot Plan	1
Dredging Plans	6
Dredging Sections	3
Nearshore Containment Facility Plan	1
Nearshore Containment Facility Sections and Details	3
Grading and Paving Plan	1
Grading and Paving Sections and Details	2
Water Treatment Plant Flow Diagram	1
Water Treatment Plant Layout	1
Sediment Control Plan	1
Sediment Control Sections and Details	1
	25

6.2 TECHNICAL SPECIFICATIONS

Technical specifications for the implementation of these selected remedies are an integral part of the technical bid package. The technical specifications that will be developed include the following items:

- Scope of Work
- Applicable Codes and Standards
- Material specifications
- Technical Requirements

6.2.1 Specification Format

The specifications will be prepared in accordance with the Construction Specifications Institute (CSI) format as given in the following Section 01000 - Specification Outline (Table 6-1).

6.2.2 Scope of Specifications

The scope of the technical specifications for the site will include general requirements, site work, concrete, specialties, special construction, mechanical, electrical, and appendices as presented in Table 6-2.

Table 6-1
SECTION 01000
SPECIFICATION OUTLINE

PART 1 — GENERAL

1.1 Summary

1.1.1 The purpose of this Section is to describe the organization and format to which the Specification has been prepared. This Section is intended as an aid to facilitate the use of the Specification.

1.2 Specification Format

1.2.1 The Specification has been prepared in accordance with Construction Specifications Institute (CSI) Format.

1.2.2 The CSI format is subdivided into 16 major divisions. Divisions form the framework of this Specification and contain the technical requirements for the category of work within each Division. Divisions which are not applicable to this Specification are not used.

1.2.3 Sections within each division describe the specific requirements for different units of work based on trade or type of work. Sections within divisions are arranged in a five-digit numerical order in which the first two digits represent the division number. Page numbering is subordinate to section numbering.

1.2.4 Sections are subdivided into three distinct groupings of related information as follows:

Part 1 — GENERAL: Defines the administrative procedural requirements unique to the section.

Part 2 — PRODUCTS: Details the quality and features of items required for this project.

Part 3 — EXECUTION: Details the incorporation of the products into the project.

Most sections contain all three subdivisions, however, they are included only where needed. Within each part, paragraphs and subparagraphs are designated by a number-period system in which the first numeral represents the part number (e.g., 1.1, 1.1.1, 1.2, etc. for Part 1).

1.2.5 Most sections do not stand alone and are related to other portions of the contract documents. Some sections are specific extensions of, or are governed by the general

Table 6-1 (Continued)

SECTION 01000
SPECIFICATION OUTLINE

requirements of Division 1. Requirements of the Contract Documents shall apply as a whole, regardless of any overlapping of various portions of the Specification.

1.2.6 This Specification has been written in the imperative mood and, in some cases, in a streamlined form. The imperative language is directed to the Contractor, unless specifically noted otherwise.

1.3 Clarifications

1.3.1 Most sections begin with a paragraph in Part 1 entitled "Summary" or "Scope of Work." These paragraphs provide a brief description of the work specified in that Section. These descriptions are not intended to be all-inclusive, but provide a brief clarification of the particular subject matter in the Specification.

1.3.2 Some technical sections contain a paragraph entitled "Related Sections" or "Related Work Specified Elsewhere." This paragraph lists some of the related work specified in other sections of the Contract Documents. These listings are not intended to be all-inclusive. They are presented as a means of aiding the Contractor in locating other Specification Sections containing work that has a close relationship with the work specified in that Section. The requirements of the Contract Documents, including all specifications, shall apply as a whole.

1.3.3 Reference standards are incorporated into the Specifications by reference number, title or other designations. The provisions of these standards become a part of the Specification in their entirety. When there is a conflict or discrepancy between a reference standard and the Specification or with another reference standard, the more stringent requirements shall apply.

1.3.4 In the event of a discrepancy between a drawing and the Specification, the Specification shall govern.

1.3.5 No typographical or other error on drawings shall relieve the Contractor from his responsibility to perform the intent of this Contract.

PART 2 — PRODUCTS

Not used.

PART 3 — EXECUTION

Not used.

Table 6-2
SPECIFICATIONS FOR CLEAN-UP PLAN
CONVAIR LAGOON
SAN DIEGO, CALIFORNIA

PART II — TECHNICAL PROVISIONS

TABLE OF CONTENTS

DIVISION NO.	
1	General Requirements
2	Site Work
3	Concrete
10	Specialties
13	Special Construction
15	Mechanical
16	Electrical
Appendix A	Site Data
Appendix B	Process Equipment Design Report

All work included in Divisions 1, 2, 3, 10, 15 and 16

DIVISION 1 — GENERAL REQUIREMENTS

01000	Specification Outline
01005	Definitions and Abbreviations
01010	Summary of Work
01025	Measurement and Payment
01050	Field Engineering
01060	Regulatory Requirements
01065	Health and Safety Requirements
01210	Pre-Construction and Pre-Work Conferences
01220	Project Progress Meeting
01300	Submittals
01305	Letters of Commitment
01400	Site-Specific Quality Management Plan
01410	Testing, Sampling and Chemical Data Management
01420	Air Monitoring
01430	Chemical Testing Laboratory Services

Table 6-2 (Continued)

SPECIFICATIONS FOR CLEAN-UP PLAN
CONVAIR LAGOON
SAN DIEGO, CALIFORNIA

01505	Mobilization/Demobilization
01510	Temporary Site Facilities and Utilities
01540	Security
01550	Spill Control
01560	Temporary Controls/Environmental Protection
01562	Dust Control
01563	Erosion and Sediment Control
01564	Spill Control
01600	Equipment and Material Handling
01640	Off-Site Transportation and Disposal
01700	Project Closeout
01720	Project Record Documents
01725	As-Built Drawings
01730	Safety, Health and Emergency Response

DIVISION 2 — SITE WORK

02050	Demolition and Decommissioning
02100	Site Preparation
02220	Excavation
02221	Backfill and Grading
02500	Paving and Surfacing
02215	Geotextile
02230	Geomembrane
02440	Control Area Signs
02444	Chain Link Fence and Gates
02445	Bumper and Guard Posts
	Drainage
	Sheet Piling

DIVISION 3 — CONCRETE

03200	Concrete Reinforcement/Bentonite
03310	Structural Concrete

Table 6-2 (Continued)

SPECIFICATIONS FOR CLEAN-UP PLAN
CONVAIR LAGOON
SAN DIEGO, CALIFORNIA

DIVISION 11 — EQUIPMENT

Water Treatment Specification
Other Miscellaneous Equipment Specification

DIVISION 13 — SPECIAL CONSTRUCTION

13121	Metal Buildings

DIVISION 14 — CONVEYING SYSTEMS

14100	Dredging
14110	Sediment Transfer System

DIVISION 15 — MECHANICAL

General Mechanical Equipment Specification

DIVISION 16 — ELECTRICAL

16010	Basic Electrical Work

APPENDICES

Appendix A	Site Data
Appendix B	Process Equipment Design Report

7.0 REFERENCES

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The following appendices to the Basis of Design Report are on file with the District Clerk's office and are available for review.

Appendix A - Wind, Wave, and Tidal Data
Appendix B - Hydraulic Analysis
Appendix C - Convair Lagoon Remediation List of Drawings

APPENDIX B

DESCRIPTIONS OF SELECTED CAPPING PROJECTS

Table B-1

DESCRIPTIONS OF SELECTED CAPPING PROJECTS

PROJECT		CONTAMINATED MATERIAL			CAPPING MATERIAL		
Location (date)	Site Characteristics	Vol. of Material (m^3)	Dredging Method	Placement Method	Volume type m^3	Thickness of Cap (m)	Placement Method
Duwamish Waterway, Seattle, WA (1984)	Existing subaqueous depression 12 m deep	840	Clamshell	Scow	2,700	0.3-1.0	Sprinklng from bottom dump scow
One Tree Island, Olympia, WA (1987)	Contained Aquatic Disposal of material 11m deep conical pit	3,000	Clamshell	Scow	3,000 (dredge sand)	1.2m (minimum)	Clamshell
Simpson Tacoma Kraft Co., Tacoma, WA (1988)	In situ capping of 6.9 ha of contaminated near shore area	N/A	N/A	N/A	153,000 (dredge sand)	.6 - 3.7	Hydraulic Dredge with Energy Dissipating Box
Denny Way (CSO), Elliott Bay, WA (1990)	In situ capping of 11,000 m^3 contaminated near shore area	N/A	N/A	N/A	15,300 (dredged sand)	.52 (Minimum)	Sprinkling from bottom dump scow
Portland General Electric Co, Portland, OR (1990)	Low-volume dredging and capping of 900 m^2 of shoreline sediments with armoring	200	Low-volume, hand-held dredge	Upland disposal	5,000; sand gravel, filter, and rip rap	1.8 - 3.6	Clamshell
Pier 53, Elliott Bay, Seattle, WA (1992)	In situ cap approx. 18,400 m^2 in depths of 12 to 22 m	N/A	N/A	N/A	23,000 dredge sand	1.0 (Average)	Clamshell/split hull scow
Seattle Ferry Terminal, Elliott Bay, WA (1989)	In situ capping of 11,600 m^2 contaminated near shore area	N/A	N/A	N/A	6,900 (process sand and quarry spalls)	.5 (Average)	Clamshell

Table B-1 (Continued)

DESCRIPTIONS OF SELECTED CAPPING PROJECTS

PROJECT		CONTAMINATED MATERIAL			CAPPING MATERIAL		
Location (date)	Site Characteristics	Vol. of Material (m^3)	Dredging Method	Placement Method	Volume type m^3	Thickness of Cap (m)	Placement Method
Rotterdam Harbor, The Netherlands (1981-1983)	Phase I: Botlek Harbor excavated to 29.9 m deep	920,000	Trailing suction hopper	Pumpout submerged diffuser	--- (clay)	0.6 - 1.0	Scow, then leveled over site
	Phase II: First petroleum harbor excavated to 24.4 m deep	470,000	Matchbox suction	Pipeline submerged diffuser	--- (clay)	0.6 - 1.0	Scow, then leveled over site
Delfshaven-Rotterdam, Buzenwaal Harbor (1985)	In situ cap of oil contaminated sediment	---	---	---	--- (sand with a geotextile, and clay)	1.0 (average)	Sprinkler barge
New York Bight (1980)	Generally flat bottom 24.3-27.4 m deep	660,000 (mounded to 1.8 m thick)	Clamshell	Scow	1,400,000 (majority fine sand)	Average 1-1.2; Maximum 1.5-2.7	Scow, hopper dredge
Central Long Island Sound Disposal Area (1979)	Stamford-New Haven North: generally flat, bottom 19.8 m deep	26,000 (mounded 1 -1.8 m thick)	Clamshell	Scow	50,000 (sand)	Up to 2.1 - 3.0	Hopper dredge
	Stamford-Hew Haven South: generally flat, bottom 21 m deep	38,000 (mounded 1.2-1.9 m thick)	Clamshell	Scow	76,000 (cohesive silt)	Up to 4.0	Scow
Sorfjord, Norway (1992)	In situ cap 90,000 m^2 of metal contamination	N/A	N/A	N/A	--- (sand and geotextile)	0.3 m sand	Installed specialized geotextile then sand
Central Long Island Sound Disposal Area (1981)	Norwalk: generally flat bottom 19.8 m deep	70,000 (multiple mounds up to 2.5-3.6 m thick)	Clamshell	Scow	280,000 (silt and sand)	Up to 1.8 - 2.1	Scow

Table B-1 (Continued)

DESCRIPTIONS OF SELECTED CAPPING PROJECTS

PROJECT		CONTAMINATED MATERIAL			CAPPING MATERIAL		
Location (date)	Site Characteristics	Vol. of Material (m^3)	Dredging Method	Placement Method	Volume type m^3	Thickness of Cap (m)	Placement Method
Central Long Island Sound Disposal Area (1983)	Cap Site No. 1: generally flat, 18.3 m deep	25,000 (mounded 1 m thick)	Clamshell	Scow	60,000 (silt)	Incomplete coverage	Scow
	Cap Site No. 2 generally flat, 17.0 m deep	30,000 (low mound, 0.6 m thick)	Clamshell	Scow	30,000	Irregular: Maximum 1.4, Minimum 0.2	Scow
Lake Biwa, Japan (1988)	In situ cap two areas, 3700 m^2 and 900 m^2	N/A	N/A	N/A	---(sand)	0.5 to 0.20	Water-dispersal method, studied for cap thickness
Kure Bay, Japan (1984)	In situ cap 1.92 ha and 4.48 ha	N/A	N/A	N/A	--- (sand)	0.5 m max.	Barge unloader and sand spreader
Hiroshima Bay Japan (1979-1980)	Contaminated bottom sediment overlaid in situ with capping material 21 m deep	N/A	N/A	N/A	--- (sand with shell)	0.5	Conveyor to gravity fed submerged tremie. Suction/ pumpout through submerged spreader bar
Central Long Island Sound Disposal Area (1982-1983)	Mill-Quinnipac: generally flat bottom 19.8 m deep	30,000	Clamshell	Scow	990,000 (silt)	Multiple broad area placement; estimated average 1.8 - 3.0	Scow

* All volumes are approximates
--- Indicates volumes are unknown or not reported.

APPENDIX C

MARINE RESOURCES TECHNICAL DATA

Appendix C-1. Summary of Total PCBs (mg/kg dry weight) in Convair Lagoon Sediments from All Studies. Shaded Values Indicate Concentrations above 10 mg/kg Cleanup Level. Sample Locations Highlighed in Bold Box are within the Proposed Cleanup Area.

STATION LOCATION	Depth of Core Segment Below Sediment Surface (ft) 1	2	3	4	5	6	7	8	9	10
PHASE 1 (ERCE 1988)										
AR-60-1	902.1	-	-	-	-	-	-	-	-	-
AR-60-2	141.9	-	-	-	-	-	-	-	-	-
AR-60-3	947.8	-	-	-	-	-	-	-	-	-
AR-60-4	271.7	-	-	-	-	-	-	-	-	-
A-60-1	152.6		-	-	-	-	-	-	-	-
AR-120-1	279.7	-	-	-	-	-	-	-	-	-
AR-120-2	164.6	443.43	49.16	-	-	-	-	-	-	-
AR-120-3	213.9	-	-	-	-	-	-	-	-	-
AR-120-4	71.5	-	-	-	-	-	-	-	-	-
A-120-1	114.2	-	-	-	-	-	-	-	-	-
A-240-1	93.5	129.03	12.57	0.34	-	-	-	-	-	-
AR-500-1	1.5	-	-	-	-	-	-	-	-	-
AR-500-2	0.1	-	-	-	-	-	-	-	-	-
AR-500-3	1.4	-	-	-	-	-	-	-	-	-
AR-500-4	1.9	-	-	-	-	-	-	-	-	-
A-500-1	1.4	-	-	-	-	-	-	-	-	-
B-90-1	0.0	0	2.19	3.32	-	-	-	-	-	-
B-430-1	1.3	0.60		0	-	-	-	-	-	-
B-630-1	0.3	0	0	-	-	-	-	-	-	-
PHASE 1A (ERCE 1988)										
C-20-1	2.9	0.17	0	-	-	-	-	-	-	-
D-20-1	6.6	13.88	0	-	-	-	-	-	-	-
CV-1	0.49	-	-	-	-	-	-	-	-	-
CV-2	1	16.00	0.12	-	-	-	-	-	-	-
CV-3	3.5	-	-	-	-	-	-	-	-	-
CV-4	86	-	-	-	-	-	-	-	-	-
CV-5	170	-	-	-	-	-	-	-	-	-
CV-6	3.3	-	-	-	-	-	-	-	-	-
CV-7	1.03	-	-	-	-	-	-	-	-	-
PHASE 2 (ERCE 1989)										
1-50	6.9	70	46.5	8.2	1.36	0.26	0.099	0	-	-
1-100	4.8	36.8	17.7	8	0	0	0	0	-	-
1-150	1.6	0.6	0	0	-	-	-	-	-	-
1-200	8.51	0.9	0	0	-	-	-	-	-	-
2-0	24.8	2	0	0	-	-	-	-	-	-
2-50	91	96.3	90.6	471	1800	86	1410	45.6	3.2	0.82
2-100	72	108.3	880	304	100	23.8	1.35	0.38	0	0
2-150	49.8	430	25	18	1.42	0.34	0	0	-	-
2-250	53.6	13.6	4.68	0.36	0.17	0.058	0	0	-	-
3-0	75	21	9.6	0.15	0.056	0.136	0	0.081	-	-
3-50	89	1800	400	4.25	2.7	0.85	1.05	0.49	0.197	0.074
3-100	94	570	180	80	11	0.73	1.3	0.31	0.064	0.28
3-150	35.7	54.6	78	9.4	25	6.1	1.8	0.192	0.096	0
4-0	0.42	0.59	0	0	-	-	-	-	-	-
4-50	57.8	36.9	33.8	87	270	85	11	0.44	0.36	0.16
4-100	42.8	70.9	63	180	230	20.8	1.62	0.55	0.16	0.096
4-150	57	25.2	160	18.2	0.68	11.3	0.28	0	-	-
4-250	23.2	56.7	14.9	4.37	0.24	0.063	0	0	-	-
5-0	6.8	6.5	15	0.091	0	0	0	0.055	-	-
5-50	28.7	44.8	34.9	2.78	150	16	5	0.42	0.055	0
5-100	52.7	50.5	44.4	1800	11.6	31	0.73	0.073	-	-
6-0	4.6	11	0.3	0	0	-	-	-	-	-
6-50	4.08	3.66	4.5	17.5	180	6.4	2.78	0.64	0.17	0.153
6-100	20.9	13.3	95.4	10.2	2.32	0.16	0	0	-	-
6-150	11.3	69	211	7.5	2.07	0.47	0	0	-	-
6-250	17.1	59.5	30.6	3.95	0.61	0	0	0	-	-
PHASE 3 (EBASCO ND)										
C1	14.6	130	1100	31	93	7.68	1.91	0.54	-	-
C2	26.5	360	290	42.8	8.1	1.63	0.54	0.487	0.069	-
C3	28	160	240	41	14.9	1.07	1.3	0.791	-	-
C4	380	81	24	4.52	0.141	0.183	0.228	-	-	-
C5	110	290	11	1.5	0.079	0	0.1	27	-	-
C6	46.6	67.5	140	220	49	70.4	12	2.03	0.41	-
C7	54.8	450	71	48.7	21.6	3.41	0.65	0.366	-	-
C8	22.1	410	88	32.7	9.7	2.5	1.01	0.87	-	-
C9	57.6	99.7	97	950	71	45.3	20.2	2.93	0.483	-
C10	34.1	120	210	150	1800	166	107.8	16.5	14.8	15.1
C11	39.5	55	43	47.8	22	19	3.12	0.9	0.309	0.097

Appendix C-2. Heavy Metals Concentrations (mg/kg dry weight) in Convair Lagoon Sediment Near Storm Drains, May 2 AND 3, 1985.

Data from Regional Board Staff Sampling, Table 17, RWQCB 1986
Sample Locations Highlighed in Bold Box are within the Proposed Cleanup Area.

	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Regulatory Guidelines							
NOAA-ERL (1) (shaded)	5	80	70	35	0.15	30	120
NOAA-ERM (1) (boxed)	9	145	390	110	1.3	50	270
WSMS (2) Bold	5.1	260	390	450	0.41	—	410
Sample Location							
30" Drain							
30A	<1	120	32	43	1.1	<1	77
30B	3	229	93	103	0.5	11	210
30C1	3	231	152	142	<0.5	12	280
30C2	<1	100	23	55	0.5	6	69
30C3	11	611	399	393	1.1	28	745
30D	8	526	421	321	1.1	39	680
60"Drain							
60A1	10	758	122	299	0.5	18	480
60A2	12	696	183	417	<0.5	21	570
60A3	10	811	163	292	0.5	23	540
60B	26	859	179	414	<0.5	24	700
60C2	9	732	229	484	1.1	25	780
60C3	17	720	168	309	3.7	16	550
54"Drain							
54A	<1	59	15	40	<0.5	2	53
54B	4	140	53	85	2.1	8	97
54C1	<1	152	59	82	<0.5	11	122
54C2	<1	21	7	7	<0.5	4	20
54C3	5	132	68	91	<0.5	11	122
54D	4	201	82	83	1.1	15	230

(1) NOAA 1990
(2) Washington State Dept of Ecology 1991

Appendix C-3. Concentration (mg/kg dry weight) of Metals in Convair Lagoon Based on Phase 1 Sampling (ERCE 1988). Sample Locations Highlighed in Bold Box are within the Proposed Cleanup Area.

Sample		Cadmium	Chromium	Copper	Lead	Mercury	Zinc
Regulatory Guidelines							
NOAA-ERL (1)	(shaded)	5	80	70	35	0.15	120
NOAA-ERM (1)	(box)	9	145	390	110	1.3	270
WSMS (2)	**Bold**	5.1	260	390	450	0.41	410
Sediment Depth =1 ft							
AR-60-1		28.13	1290.5	183.5	276.8	0.55	799.7
AR-60-2		25.81	1367.7	92.1	211.6	2.45	690.3
AR-60-3		24.18	1565.9	252.7	320.1	0.65	2115.4
AR-60-4		29.44	1631.3	123.9	366.0	0.45	928.4
A-60-1		32.87	1692.1	114.6	398.1	0.57	1123.4
AR-120-1		13.85	1015.4	219.6	317.5	0.48	597.2
AR-120-2		17.98	1769.7	205.1	536.5	0.32	821.6
AR-120-3		16.18	1085.6	159.1	357.0	0.28	641.7
AR-120-4		10.97	928.5	92.0	440.2	0.30	563.5
A-120-1		15.37	1124.5	273.8	373.4	0.32	808.2
A-240-1		10.05	666.7	331.6	435.6	0.95	677.2
D-20-1		1.48	213.8	44.3	57.5	0.30	100.5
AR-500-1		1.97	112.7	60.5	59.2	0.64	165.4
AR-500-2		1.19	79.6	59.9	49.3	0.31	79.6
AR-500-3		1.87	103.0	61.2	66.9	0.66	143.2
AR-500-4		1.93	105.1	61.2	74.6	0.54	148.7
A-500-1		2.11	107.4	56.1	46.6	0.63	157.9
A-750-1		0.54	43.6	37.3	22.1	0.32	88.9
AR-1000-1		0.44	30.6	19.2	15.6	0.27	54.5
AR-1000-2		0.43	31.1	29.7	18.7	0.21	32.0
AR-1000-3		0.46	33.0	32.9	22.0	0.20	33.0
AR-1000-4		0.37	30.9	31.1	19.9	0.23	30.9
A-1000-1		0.44	32.6	28.1	20.6	0.21	72.8
B-90-1		0.26	25.2	11.1	6.6	ND	37.4
B-430-1		1.75	100.6	63.2	45.0	0.47	139.1
B-630-1		0.79	48.0	25.0	14.7	ND	48.0
C-20-1		2.44	73.8	38.8	87.3	0.52	77.3
Sediment Depth = 2 ft							
A-60-02							
A-120-2		38.07	1727.8	325.7	451.1	0.26	1342.8
A-240-2		101.14	1886.1	218.2	605.3	1.20	1571.2
D-20-2		1.99	406.7	25.2	40.9	ND	72.4
A-500-2		1.10	56.5	18.0	14.9	0.41	77.9
A-750-2		0.38	26.8	15.7	7.1	ND	41.8
A-1000-2		0.33	25.2	12.8	6.8	0.18	39.8
B-90-2		0.85	44.4	14.0	8.7	0.17	56.3
B-430-2		2.29	103.0	25.3	26.7	0.20	103.3
B-630-2		ND	15.6	6.4	1.3	ND	15.6
C-20-2		1.34	60.4	7.0	19.6	0.32	32.7
Sediment Depth = 3 ft							
A-60-3							
A-120-3		41.79	2458.8	74.4	684.3	0.17	1992.2
A-240-3		71.50	2247.8	78.1	3.0	1.12	1946.9
D-20-3		8.87	548.9	49.4	86.6	0.37	237.3
A-500-3		ND	16.4	6.5	1.7	ND	25.8
A-750-3		ND	16.4	11.2	4.4	ND	32.4
A-1000-3		ND	13.7	6.2	2.3	ND	22.8
B-90-3		7.13	376.5	62.2	88.7	0.70	378.1
B-430-3		ND	19.1	9.4	3.7	ND	33.6
C-20-3		1.61	66.3	11.1	9.7	0.15	47.0
Sediment Depth = 4 ft							
A-240-4		52.89	1375.9	73.8	415.0	0.82	1717.7
B-90-4		1.88	124.3	76.3	69.9	0.43	172.0
B-430-4		0.14	23.5	14.0	6.4	ND	46.3

(1) NOAA 1990
(2) Washington State Dept of Ecology 1991

APPENDIX C-4

MARINE RESOURCES TECHNICAL DATA

The regulatory guidelines applied to the trace metals data include National Oceanic and Atmospheric Administration (NOAA) Effects Range Low (ER-L) and Effects Range Median (ER-M) values (Long and Morgan 1990) and the Washington State Marine Sediment Quality Standards - Chemical Criteria (Washington State Department of Ecology 1991). Long and Morgan (1990) define ER-L as a concentration at the low end of the range of data reviewed in this document in which effects had been observed. They define an ER-M as a concentration approximately in the the middle of the range of reported values associated with biological effects. These two values were determined using a method similar to that used by Klapow and Lewis (1979) in establishing marine water quality standards for the State of California. For each chemical of interest, they assembled available toxicity data from spiked-water bioassays, examined the distribution of the reported LC_{50} values and determined the lower 10- and 50-percentile concentrations among the ranges of values. In Long and Morgan (1990), the ER-L values are concentrations equivalent to the lower 10 percentile of the screened available data and indicate the low end of the range of concentrations in which toxic effects were observed or predicted. They are used in the document to indicate concentrations above which adverse effects may begin or are predicted among sensitive life stages and/or species or as determined in sublethal tests. The ER-M values for the chemicals are the concentrations equivalent to the 50 percentile point in the screened available data. They are used in the document to indicate the concentration above which effects are frequently or always observed or predicted among most species.

Appendix C-5. Historical State Mussel Watch Tissue Data for Metals (mg/kg dry weight) in Convair Lagoon.

Station Number	Location	Collection Date	Al	Cd	Cr	Cu	Pb	Mg	Hg	Ag	Zn	Report
	Transplanted Mussels											
894	SD BAY E. COMM. BASIN	1/7/82	575.23	7.13	**5.13**	17	**15.13**	24.37	0.195	0.677	278.8	SWRCB 1988
894	SD BAY E. COMM. BASIN	12/29/82	143.27	5.03	1.77	15.23	6.87	18.17	0.175	**0.75**	269.33	SWRCB 1988
894	SD BAY E. COMM. BASIN	2/19/85	NA	NA	NA	NA	NA	NA	NA	NA	NA	SWRCB 1988
894	SD BAY E. COMM. BASIN	1/3/86	453.29	4.67	**7.71**	**29.76**	**29.78**	20.69	0.125	**0.853**	329.41	SWRCB 1988
894	SD BAY E. COMM. BASIN	12/21/88	412.06	7.67	***5.22***	***43.06***	***16.28***	19.94	0.194	1.433	365.72	SWCRB 1990
894	SD BAY E. COMM. BASIN	12/21/89	420.52	7.65	***7.34***	***37.69***	***15.52***	12.88	0.206	***1.295***	392.32	SWCRB 1991
894.1	E. BASIN SOFT BOTTOM	1/4/84	356.23	**11.8**	**6.03**	15.3	9.87	14	0.443	0.608	368.27	SWRCB 1988
894.1	E. BASIN SOFT BOTTOM	12/21/88	361.13	5.13	2.8	***76***	2.2	25.93	0.34	0.547	348.87	SWCRB 1990
	Sediment											
894	SD BAY E. COMM. BASIN	9/1/89	13810	10.58	12.7	136.35	157.8	876.92	0.215	0.05	397.79	SWCRB 1991

Bold values indicate that concentrations of an analyte exceed 85% of all measurements of that analyte in similar samples at all other sites in the Mussel Watch Program (EDL 85).

Bold and boxed values indicate that concentrations of an analyte exceed 95% of all measurements of that analyte in similar samples at all other sites in the Mussel Watch Program (EDL 95).

Italicized EDL values were calculated with wet weight results. The data presented here are dry weight estimates.

* Sample types are Transplanted California Mussels (TCM) and Sediment (SED).

ND Not Detected

Appendix C-6. Historical State Mussel Watch Tissue Data for PCBs and Organics (ug/kg dry weight) in Convair Lagoon.

Station Number	Location	Collection Date	Alpha Chlordene	Chlor-pyrifos	Total Chlordane	Cis Chlordane	Trans Chlordane	Cis Nonachlor	Trans Nonachlor	O,P' DDD	P,P'- DDD	O,P' DDE	P,P'- DDE	O,P' DDT	P,P' DDT	P,P' DDMS	P,P' DDMU	Total DDT
	Transplanted Mussels																	
894	SD BAY E. COMM. BASIN	1/7/82	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894	SD BAY E. COMM. BASIN	12/29/82	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894	SD BAY E. COMM. BASIN	2/19/85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894	SD BAY E. COMM. BASIN	1/3/86	ND	ND	82.2	25	26	7.2	24	ND	120	ND	120	ND	ND	ND	ND	240
894 ‡	SD BAY E. COMM. BASIN	1/3/86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894	SD BAY E. COMM. BASIN	12/21/88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894	SD BAY E. COMM. BASIN	12/21/89	***9***	***29.9***	95.8	29.2	25	9.7	22.9	43.8	145.8	*68.7*	52.1	ND	ND	*41*	22.2	373.6
894 ‡	SD BAY E. COMM. BASIN	12/22/90	ND	ND	52	19	14	5.1	14	26	69	ND	38	ND	5.2	ND	ND	140
894 ‡	SD BAY E. COMM. BASIN	12/21/91	ND	ND	49	15	15	5.8	13	45	98	73	120	ND	17	ND	18	370
894.1	E. BASIN SOFT BOTTOM	1/4/84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894.1	E. BASIN SOFT BOTTOM	12/21/88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894.2 ‡	CONVAIR LAGOON DOCK	12/21/88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
894.3 ‡	CONVAIR LGN. MID-CHAN.	12/21/88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Sediment																	
894	SD BAY E. COMM. BASIN	9/1/89	6.4	ND	66.9	17.7	21.8	6.5	14.6	59.9	231.3	163.3	62.6	136.1	421.8	12.2	29.2	1170
894 ‡	SD BAY E. COMM. BASIN	9/7/90	6.2	ND	65	14	22	3.5	12	81	240	260	51	ND	4.7	13	48	700
894 ‡	SD BAY E. COMM. BASIN	8/31/91	3.5	ND	99	32	35	5.4	17	100	450	380	630	2	57	21	44	1700

Bold values indicate that concentrations of an analyte exceed 85% of all measurements of that analyte in similar samples at all other sites in the Mussel Watch Program (EDL 85).
Bold and boxed values indicate that concentrations of an analyte exceed 95% of all measurements of that analyte in similar samples at all other sites in the Mussel Watch Program (EDL 95).
Italicized EDL values were calculated by SWCRB with wet weight results. The data presented here are in dry weight.
‡ EDLs not calculated or available for that sample(s) by SWCRB for that year. EDLs are estimated by comparing to past values.
* Sample types are Transplanted California Mussels (TCM), Resident Bay Mussels (RBM), and Sediment (SED).
** indicates values that exceed 2.0 PPM wet weight
ND Not Detected
NA Not Analyzed

Appendix C-6. Historical State Mussel Watch Tissue Data for PCBs and Organics (ug/kg dry weight) in Convair Lagoon. (Continued)

	PCBs					Gamma-	Hexa-	
					Alpha-	HCH	Chloro-	Report
Dieldrin	Total PCB	1248	1254	TBT	HCH	(Lindane)	Benzene	
NA	7300	ND	7300	NA	NA	NA	NA	SWRCB 1988
NA	24000**	11000	13000**	NA	NA	NA	NA	SWRCB 1988
NA	12000**	4300	7700	NA	NA	NA	NA	SWRCB 1988
5	12200**	4200	8000	1770	ND	ND	ND	SWRCB 1988
NA	12000	7500	4400	NA	NA	NA	NA	SWCRB (unpub.)
NA	*18500***	*8800*	*9700*	NA	NA	NA	NA	SWCRB 1990
3.5	*8472.22*	*3680.6*	*4791.7*	899.93‡	ND	*6.2*	ND	SWCRB 1991
5	9100	4500	4600	NA	ND	ND	ND	SWCRB (unpub.)
ND	8200	3300	4900	NA	ND	ND	ND	SWCRB (unpub.)
NA	19000**	7000	12000	NA	NA	NA	NA	SWRCB 1988
NA	*3020*	*320*	*2700*	NA	NA	NA	NA	SWCRB 1990
NA	5500	1100	4400	NA	NA	NA	NA	SWCRB (unpub.)
NA	13000	3900	9200	NA	NA	NA	NA	SWCRB (unpub.)
3	NA	NA	NA	NA	1.1	ND	1.2	SWCRB 1991
ND	58000	42000	ND	NA	ND	ND	7.4	SWCRB (unpub.)
1.3	107000	86000	ND	NA	ND	ND	5.1	SWCRB (unpub.)

APPENDIX D

MITIGATION MONITORING AND REPORTING PROGRAM

To be included in Final EIR

APPENDIX E

INITIAL STUDY

INITIAL STUDY

Port of San Diego

and Lindbergh Field Air Terminal
(619) 291-3900 · P.O. Box 488, San Diego, California 92112

ENVIRONMENTAL MANAGEMENT DEPARTMENT

Project Title: CONVAIR LAGOON REMEDIATION

Project Location: CONVAIR LAGOON, SAN DIEGO

Applicant: Teledyne Ryan Aeronautical

Date Submitted: September 18, 1992 Date Accepted: September 18, 1992

SAN DIEGO UNIFIED PORT DISTRICT (SDUPD) MASTER PLAN DESIGNATIONS

Planning District: LINDBERGH FIELD / HARBOR ISLAND, Dist. #2

Planning District Subarea: EAST BASIN INDUSTRIAL

Land/Water Use: Harbor Master Berthing / Boat Navigation Cor. / Recreation Boat Berthing

PROJECT AND PROCESSING PERMITS

	Numbers	Dates
SDUPD Environmental Management File Number:	UPD # 225	
State Clearinghouse (SCH) Number:	SCH # 92091011	
SDUPD Engineering File Number:		
SDUPD Property Plat Number:		
SDUPD Resolution Number of Adopted Negative Declaration (ND) or Certified Environmental Impact Report (EIR):		
SDUPD Document Number of Adopted ND or Certified EIR:		
Coastal Development Permit Number:		
U.S. Army Corps of Engineers Public Notice/ Permit Number:		
Air Pollution Control District (APCD) Authority to Construct & Permit to Operate Number:		
Regional Water Quality Control Board (WQCB) National Pollutant Discharge Elimination System (NPDES) Permit Number:		

WORKING PROJECT TITLE: CONVAIR LAGOON REMEDIATION

APPLICANT'S REFERENCE
NUMBER (if applicable): ______

ENVIRONMENTAL ASSESSMENT
(To be completed by Applicant)

Applicant	Preparer of EA
(Name)	Elaine Dorward-King (Name)
(Title)	Project Director (Title)
Teledyne Ryan Aeronautical (Organization)	Ebasco Environmental (Organization)
2701 Harbor Drive P.O. Box 85311 (Address)	10900 NE 8th Street (Address)
San Diego, CA 92186-5311 (State, Zip Code)	Bellevue, WA 98004 (State, Zip Code)
(619) 291-7311 (Telephone)	(206) 451-4613 (Telephone)

I. PROJECT DESCRIPTION

1. Describe the type of development proposed, including all phases of project construction and operation, in a self-explanatory and comprehensive fashion. Discuss the need for the project and include site size, square footage, building footprint, number of floors, on-site parking, employment, phased development, and associated projects. If the project involves a variance, indicate the reason and any related information.
The project involves the remediation of Convair Lagoon through a combination of dredging and containment activities. Up to 13,300 cubic yards of PCB-containing sediments will be hydraulically dredged from the Lagoon and placed in a nearshore containment facility (NCF) of approximately 430 feet by 177 feet constructed within the Lagoon. The elevation of the NCF will be 10 feet, which is the elevation of the adjacent Coast Guard property. A 2 foot parapet wall on the seaward side of the NCF will also be constucted, increasing the total height of the structure to 12 feet. The dredging volume reflects the quantity of sediment required to remove sediment which exceeds 10 ppm (dry weight) PCBs. Settling of dredged material within the NCF generates water which will be treated in a temporary treatment facility adjacent to the NCF. Treatment would occur at a rate compatible with the sequential dredging and settling schedule, and three

treatment processes in series will remove PCBs and other contaminants from the water. After the material has dried in the NCF, clean fill will be placed over the dredged material and an infiltration barrier will be installed. Preliminary regulatory implications have been reviewed. If the design is finalized, any regulatory concerns will be addressed as appropriate. See the Basis of Design Report for additional regulatory and construction details.

2. Describe project appearance, any proposed signs, and how the design of the project would be coordinated with the surroundings.
The facility would appear as an extension of the Coast Guard property into the Lagoon. The final use of the cover has not yet been determined.

3. Describe how the public would be affected by the project:
The public may be impacted by the final use of the cover, which will be determined based upon environmental, safety, and economic considerations. Improved water quality following remediation may improve beneficial uses of the Lagoon, although area for recreational boating will be decreased.

4. Describe how the project could attract more people to the area or enable additional people to use the area, and what additional service businesses would be required:
Use of the area will depend upon the final use of the cover, which is not yet decided.

II. ENVIRONMENTAL SETTING

1. Describe the existing project site and surrounding area including: the type and intensity of land/water use; structures, including height; landscaping and naturally occurring land plants and animals, and marine life; land and water traffic patterns, including peak traffic and congestion; and any cultural, historical or scenic aspects.
The present uses of Convair Lagoon are designated as commercial, recreation, and harbor services on the land, and craft storage and boat navigation in the water. The Lagoon supports a significant amount of small craft recreational boating traffic, especially on weekends. Harbor Drive, a busy six-lane thoroughfare, fronts a portion of the shoreline. Teledyne Ryan Aeronautical, the Coast Guard, and General Dynamics all have facilities in the area and General Dynamics has a boat dock in the western portion of the Lagoon. Eelgrass and other macrophytes are present on the seafloor, and wildlife and biota utilize the site as habitat.

III. ENVIRONMENTAL ANALYSIS

1. Compare the existing project area, improvements, and activities with what would exist after implementation of the proposed project. Data concerning the present condition should be entered before the slash (/); those after the project is completed should be given after the (/).

(a) Existing/proposed land area: 0 / 76,110 sq. ft.
water area: 436,000 / 360,000 sq. ft.

(b) Existing/proposed land area for:
structures: 0 / up to 76,110 sq. ft.
landscape: 0 / up to 76,110 sq. ft.
pavement: 0 / up to 76,110 sq. ft.
undeveloped: 0 / up to 76,110 sq. ft.

(c) Number of existing/proposed floors of construction: 0 / 0.

(d) Principal height of existing/proposed structures: 0 / 12 ft. (Approximately 5 ft. below water, 5 ft. above water surface, 2 ft. for parapet wall on seaward side of NCF.)

(e) For land development, indicate extent of grading:
excavation: 0 cu. yds., 0 sq. ft.
fill: 0 cu. yds., 0 sq. ft.
Describe method, source of fill, and location of spoil disposal:
N/A

(f) For water development, indicate extent of dredging and fill:
dredging: up to 13,300 cu. yds., 82,000 sq. ft.
fill: up to 29,000 cu. yds., 76,110 sq. ft.
Describe method and location of spoil disposal:
Up to 13,300 cubic yards of sediment will be hydraulically dredged and placed into the NCF. After bulking, this dredged sediment would occupy approximately 15,000 cubic yards. This sediment would be overlain by 14,000 cubic yards of clean fill and topped with a multilayer infiltration barrier, for a total of up to 29,000 cubic yards of total fill material.

(g) Describe existing/proposed method of solid waste disposal and amounts involved:
Solid waste and debris generated during construction activities will be transferred to a local landfill.

(h) Describe existing/proposed drainage system improvements and what materials other than domestic wastes, are/would be discharged into the sewer system:
There would be no discharges into the sewer system. Existing drainage into the Lagoon would have to be modified. The existing 30" drainage outfall would be modified to route drainage around the NCF. Small drains from the Coast Guard would also be modified.

(i) Describe the existing/proposed fire protection needs of the site and proposed project, and the nature and location of existing/proposed facilities:
Fire protection needs should not change significantly.

(j) Describe existing/proposed public access to San Diego Bay through the project site, including any controlled access:
There are no readily available shore side access points to Convair Lagoon; thus, public shore use is limited. Controlled access is presently available to employees through the General Dynamics dock, which would be temporarily removed. Future access will depend upon the final use of the cover which has not yet been determined.

(k) Existing/proposed slips, piers: 1 / 1
docks or marine ways: 1 / 1

(l) Existing/projected employees per day: NA / NA

(m) Existing/projected customers or visitors per day: NA / NA

(n) Explain the projections for (l) and (m):
The final use for the cover is not yet decided.

(o) Existing/projected daily motor vehicle round trips associated with the site and proposed project: NA / NA

(p) Existing/projected mileage for daily motor vehicle round trips associated with the site and the proposed project: NA / NA

(q) Existing/projected total round trip daily motor vehicle miles traveled associated with site and the proposed project: NA / NA

(r) Explain the projections for (o), (p), and (q): NA

(s) Existing/proposed parking spaces: On site: NA / NA
Other if used by project: NA / NA
Specify location(s): NA

(t) Explain the parking space requirements and compare with applicable standards: NA

(u) Existing/projected water consumption: NA / NA gal./day

(v) Existing/projected electrical power consumption: NA / NA kwhr./month

(w) Existing/projected gas/oil consumption: NA / NA therms/day or gal./day

2. Indicate whether or not the following may result from or may apply to the proposed project or its effects.

	YES	NO
(a) Substantial change in the existing land/water use of the site.	X[1]	
(b) Incompatibility with approved Port Master Plan.	X[2]	
(c) Part of a larger project or series of projects.		X
(d) Involve the demolition or removal of existing improvements, including landscaping.		X
(e) Substantial change in the existing features of San Diego Bay, tidelands, or beaches.	X[3]	

[1] See Response I 1 (Project Description).
[2] Regarding construction of the NCF within the lagoon water.
[3] See Response IV 1(a).

	YES	NO
(f) Significant increase in demands on parking or transportation facilities.		X
(g) Substantial increase in demand for municipal services (police, fire, etc.)		X
(h) Significant increase in amounts of solid waste or litter.		X
(i) Involvement with potentially hazardous materials, such as toxic substances, flammables or explosives.	X[4]	
(j) Substantial increase in fossil fuel consumption (electricity, oil, natural gas, etc.) or in water consumption.		X
(k) Interference with scenic views or vistas from existing residential areas or from adjacent uplands.		X
(l) Decreased access to public facilities or recreational resources.		X
(m) Substantial change in the employment base of the community.		X
(n) Substantial increase in dust, ash, smoke, fumes or odors in project vicinity.		X
(o) Significant change in San Diego Bay water quality or alteration of existing drainage patterns into San Diego Bay.	X[5]	
(p) Increase the possibility of erosion of tidelands or siltation of San Diego Bay.		X
(q) Substantial increase in existing noise or vibration levels in the vicinity.		X
(r) Require any variance from existing environmental standards (air, water, noise, etc.)	X[6]	

[4] Remediation involves PCBs, which will be handled in an environmentally safe manner in accordance with regulations.
[5] Cleanup of sediments containing PCBs should improve water and sediment quality.
[6] At this time, the possibility exists for a mixing zone variance request for water treatment effluent. Other regulatory concerns may arise during final design, which will be addressed as appropriate.

		YES	NO
(s)	Involve soil stability or geological hazards.	___	X
(t)	Substantial decrease in the habitat of any land plants or animals, or marine life.	X[7]	___

IV. ENVIRONMENTAL EFFECTS

1. Describe environmental effects which could result from the project:

(a) Physiographic changes in San Diego Bay, tidelands, or beaches:
Approximately 76,110 square feet of Convair Lagoon would be filled to grade in the northeast corner of the lagoon, adjacent to the Coast Guard property.

(b) Increased demands on urban support systems, including: parking streets, sewers, utilities, transportation:
None following construction.

(c) Increased energy consumption due to operation of the project:
None following construction.

(d) Change in appearance of the project site and views from/to the site which could be affected by the project:
The appearance of the project site will be dependent upon the final use of the cover. No views would be obstructed.

(e) Changes in air quality from both stationary and mobile sources, including any dust, odors, fumes, chemical vapors, water sprays, etc.:
Following construction, no changes in air quality are expected. No significant impacts to air quality are expected during construction. Mitigation measures will be employed to reduce odors if necessary during construction.

(f) Changes in bay water quality, including those which could result from the removal and/or construction of structures in the water:
During construction, local short-term water quality will be degraded to a minimal extent through dredging activities. Following construction, water quality should be as good or better than at present.

[7] See Response IV 1 (h).

(g) Changes in the sound environment which could occur on or off-site, both from construction and operational noise generated by the project:
There will be no operational noise. Construction noise will be at normal levels.

(h) Describe any change to plant or animal life, including landscaping:
Approximately 76,110 square feet of marine intertidal habitat would be replaced by the NCF. The remaining marine habitat should be improved due to removal of PCB-containing sediments.

V. MITIGATING MEASURES

1. Describe **all** proposed mitigating measures, or those already incorporated in the project to mitigate potentially significant environmental effects, if any:
1) Through construction of the NCF and dredging activities, up to 13,300 cubic yards of PCB containing sediments will be effectively isolated from the environment and biota which occupy Convair Lagoon. This volume is consistent with removal of sediments to a level of less than 10 ppm (dry weight) PCBs in the remaining sediment. This action restores suitable habitat in over 80% of Convair Lagoon. In other words, approximately 360,000 square feet of the total 436,000 square feet of Convair Lagoon will be restored.
2) Dredging activities will be conducted using a modified technique to minimize sediment resuspension. A silt curtain will be installed around the dredging site to minimize the extent of disturbance.
3) Construction activities will be conducted from October to March to accommodate habitat requirements within the Lagoon.
4) A sequential dredging/settling schedule has been developed to minimize the size of the NCF.

2. Specify how and when the mitigating measures will be carried out:
Removal of the PCB-containing sediments will begin following approval of a Final Design by the RWQCB and approval of all necessary permits by the appropriate regulatory agencies.

3. Explain the extent and effectiveness of mitigation expected and how this was determined:
The effectiveness of remediation will be documented through water quality monitoring before, during, and following dredging and isolation activities to ensure continuing water quality. In addition, piezometers will be installed to monitor the long-term performance of the NCF. Sediment sampling will be conducted to document removal of PCBs to a less than 10 ppm (dry weight) concentration.

4. Describe other mitigation measures considered and indicate why they were discarded:
Other alternatives considered to remove PCB-containing sediments were considered less acceptable due to engineering or environmental considerations.

VI. BACKGROUND INFORMATION

1. Pre-Application Project Processing

(a) Indicate if the conceptual plans have been presented to the Board of Port Commissioners or Port Staff. If so, describe in what form, and give date and result:
Conceptual plans were contained in the basis of design report. See below.

(b) Indicate if project plans have been submitted to Port Staff: Yes.
If so, describe in what form, to whom submitted, give date and result:
The Board of Port Commissioners received a Basis of Design Report for Convair Lagoon remediation from Teledyne Ryan Aeronautical and gave conceptual approval of the proposal on July 14, 1992. The Board has directed the preparation of an environmental impact report to evaluate the potential effects of such an activity and its alternatives.

(c) List all environmental consultations and processing contacts with other agencies, firms or individuals in connection with this project. Give agency, name, phone, date, subject and result of consultation:
1) U.S. Army C.O.E.: Elizabeth White and David Zoutendyk: 619-455-9422: 2/25/92: gave very preliminary preview of RWQCB order and initiation of basis of design report (BDR): received input on permitting process from C.O.E.
2) RWQCB: David Barker: (619) 265-5114: 2/26/92: discussed regulatory implications of project.
3) USFWS: Martin Kenney: 619-431-9440: 2/27/92: gave very preliminary preview of RWQCB order and initiation of BDR: received input on process from USFWS.
4) National Marine Fisheries Service: ~~Richard Nitzoe~~: 213-590-5174: 2/27/92: gave very preliminary preview of RWQCB order and initiation of BDR: received input on process from National Marine Fisheries Service.
5) California Fish and Game: ~~Bob Hoffman~~: 310-980-4043: 2/27/92: gave very preliminary preview of RWQCB order and initiation of BDR: received input on process from California Fish and Game.

6) USFWS: Martin Kenney: 619-431-9440: 6/17/92: regarding mitigation alternatives.

(d) Last project plans or working drawings approved by the Port at this site:
Title: Basis of Design Report for Convair Lagoon Remediation
Date: July 14, 1992
Port Engineering File Number: NA

2. Permit Background

(a) List all other public agencies which have approval or permit authority related to this project and indicate type required, e.g., City building permits, Coastal permit, WQCB, APCD, Army Corps, EPA, FAA, Coast Guard, etc.
U.S. Army Corps of Engineers: Section 404/Section 10 Permit.
Port of San Diego: CEQA and Coastal Development Permit.
Regional Water Quality Control Board: NPDES permit, possibly Waste Discharge Requirements.
State Lands Commission: Dredge and Fill Permit.
City of San Diego: General Construction Permits.

(b) Pending permits or variances at this site:

(1) Indicate any permits or variances applied for. Agency, type, file number, date, phone number, and name of person who is processing the permit application or variance request must be included:
No permit applications have been submitted at this time. The permitting process is still under development. See the Basis of Design Report for schedule details.

VII. CERTIFICATION

1. Certification: This Environmental Assessment was prepared by me (for) as the applicant and I hereby certify that the statements furnished above and in the attached exhibits disclose relevant information to determine environmentally significant effects, as required for the San Diego Unified Port District Initial Study. It has been prepared to the best of my ability, and the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

[signature] (Signature of Preparer) — 9/15/92 (Date)

George Faison (Print Name) — Manager, Waste Policy and Regulatory Analysis (Title)

Ebasco Environmental (Organization) — (206) 451-4649 (Telephone)

10900 N.E. 8th Street (Address)

Bellevue (City) — Washington (State) — 98004-4405 (Zip Code)

2. Applicant Certification:

I hereby certify that the project-related facts, statements, and information furnished above and in the attached exhibits, and in any other form to the preparer of this Environmental Assessment or to the San Diego Unified Port District are true and correct to the best of my knowledge and belief. I am duly authorized to and do hereby accept and commit the applicant to the implementation of all mitigation measures listed in this Environmental Assessment and of the project as herein described. I understand that non-compliance with any of the mitigation measures, or changes in the project as herein described shall be grounds to invalidate any or all project approvals or permits regardless of the stage of project development or operation. I will notify the San Diego Unified Port District immediately in writing of any changes in the proposed project, and I acknowledge that project changes may require additional environmental evaluation. I shall hold the San Diego Unified Port District harmless of any cost or damages resulting from consequences of non-compliance or unapproved project changes.

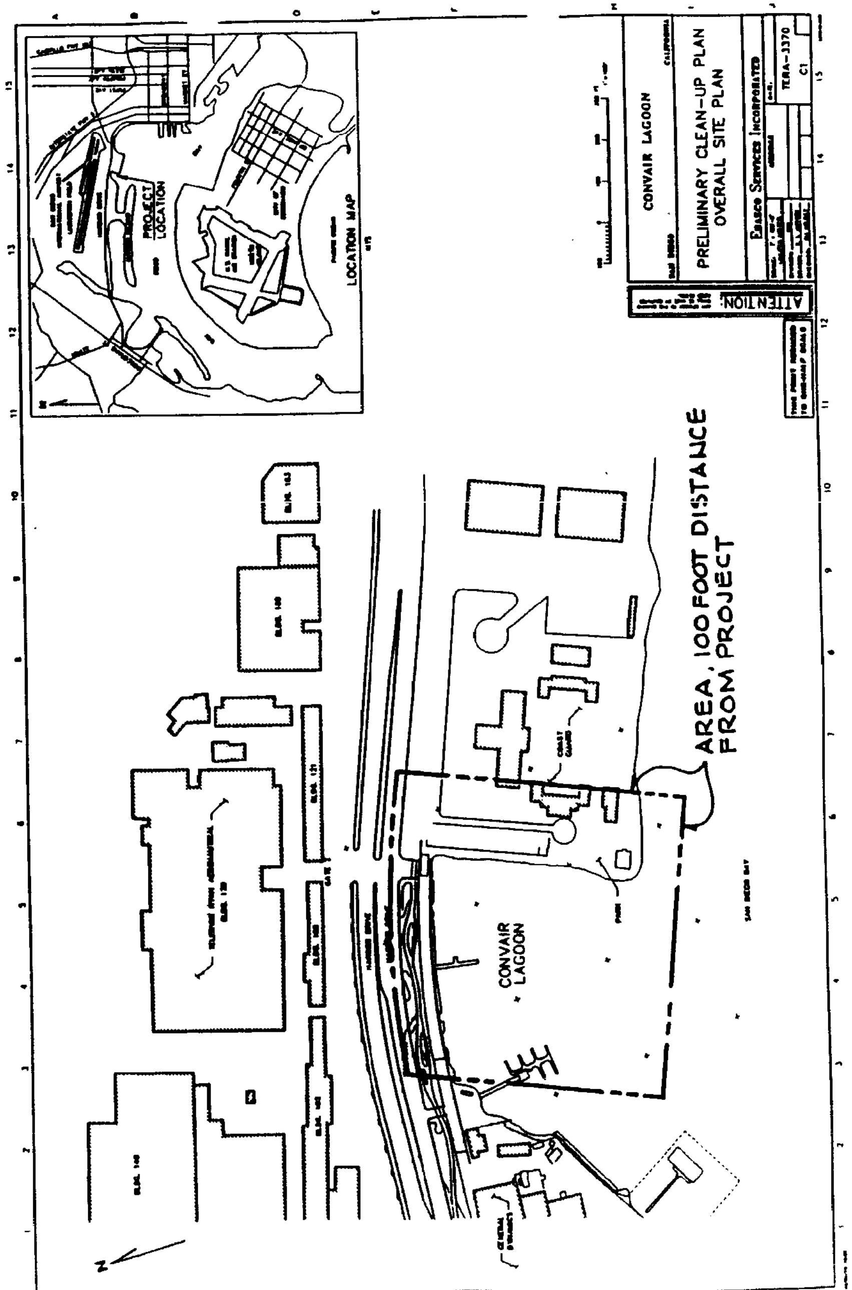
[signature] (Signature of Applicant) — September 17, 1992 (Date)

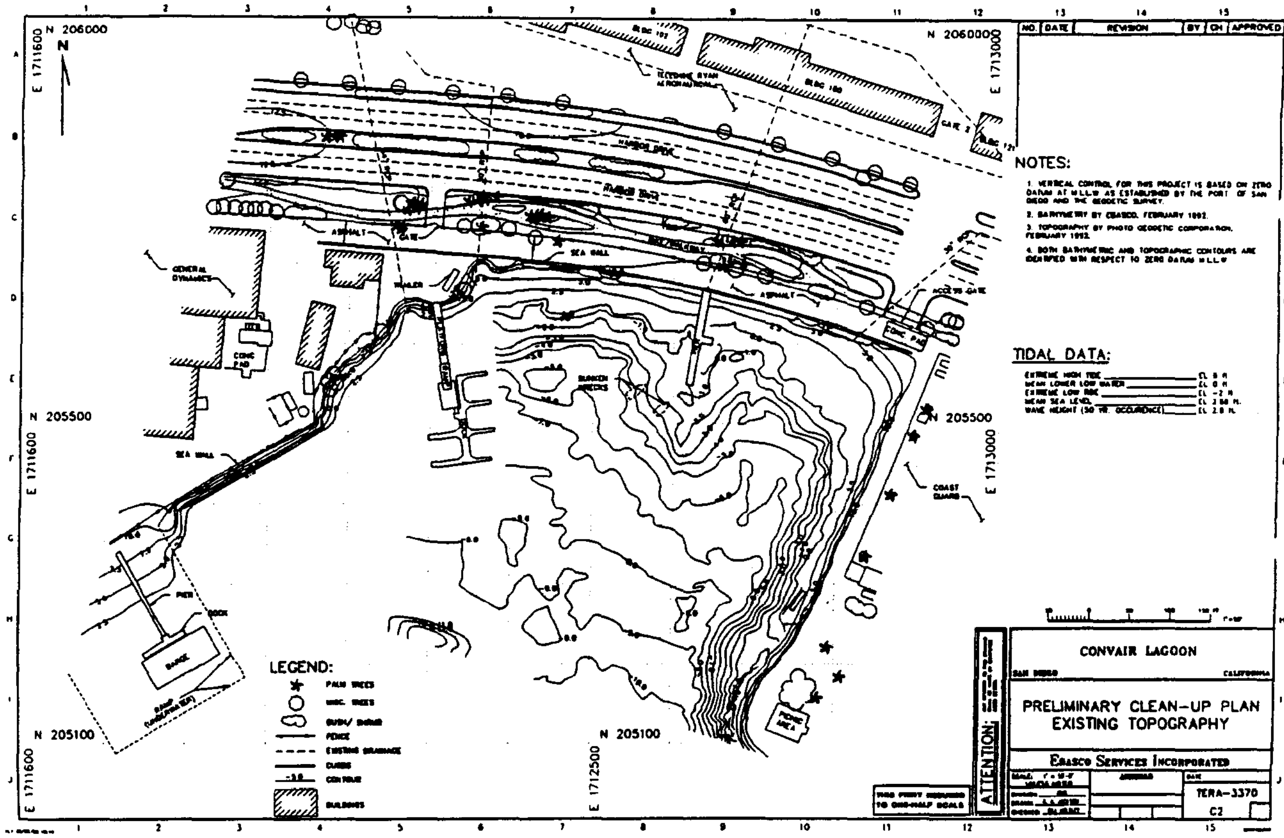
Donald J. Wilkins (Print Name) — General Counsel (Title)

Teledyne Ryan Aeronautical (Organization) — (619) 291-7311 (Telephone)

2701 Harbor Drive, P. O. Box 85311 (Address)

San Diego (City) — California (State) — 92186-5311 (Zip Code)





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2. BATHYMETRY BY EBASCO, FEBRUARY 1992.
3. TOPOGRAPHY BY PHOTO GEODETIC CORPORATION, FEBRUARY 1992.
4. BOTH BATHYMETRIC AND TOPOGRAPHIC CONTOURS ARE IDENTIFIED WITH RESPECT TO ZERO DATUM M.L.L.W
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CONC PAD
COAST GUARD
PICNIC AREA
LEGEND:
PALM TREES
MISC. TREES
BUSH/ SHRUB
FENCE
EXISTING DRAINAGE
CURBS
CONTOUR
BUILDINGS
NO. DATE REVISION BY CH APPROVED
CONVAIR LAGOON
SAN DIEGO CALIFORNIA
PRELIMINARY CLEAN-UP PLAN
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EBASCO SERVICES INCORPORATED
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ATTENTION:
TERA-3370
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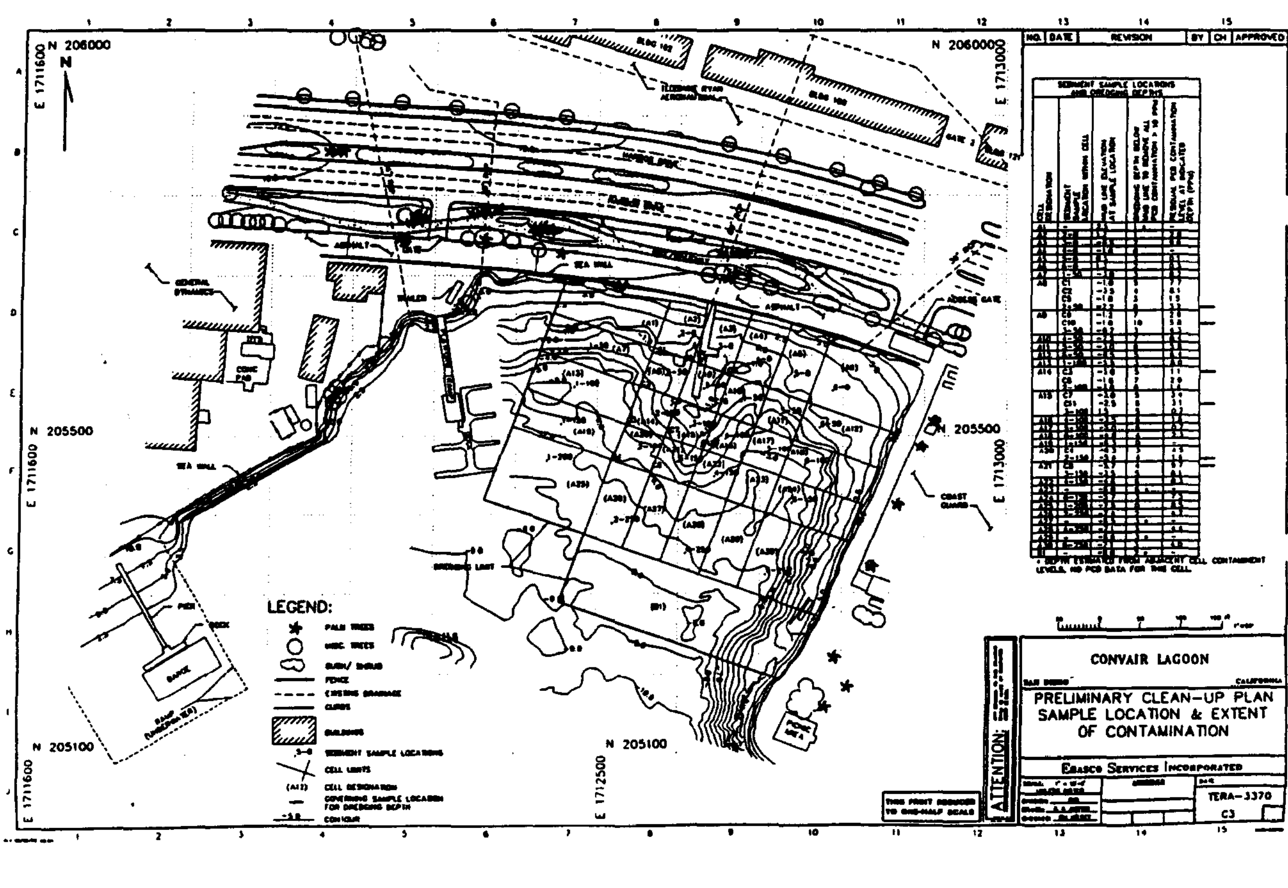

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* DEPTH ESTIMATED FROM ADJACENT CELL CONTAMINANT LEVELS, NO PCB DATA FOR THE CELL.
SEA WALL
GENERAL DYNAMICS
CONC PAD
ASPHALT
PIER
DOCK
BARGE
DREDGING LIMIT
ACCESS GATE
COAST GUARD
PICNIC AREA
LEGEND:
PALM TREES
MISC. TREES
BUSH/ SHRUB
FENCE
EXISTING DRAINAGE
CURBS
BUILDINGS
SEDIMENT SAMPLE LOCATIONS
CELL LIMITS
CELL DESIGNATION
GOVERNING SAMPLE LOCATION FOR DREDGING DEPTH
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CONVAIR LAGOON
SAN DIEGO CALIFORNIA
PRELIMINARY CLEAN-UP PLAN
SAMPLE LOCATION & EXTENT OF CONTAMINATION
EBASCO SERVICES INCORPORATED
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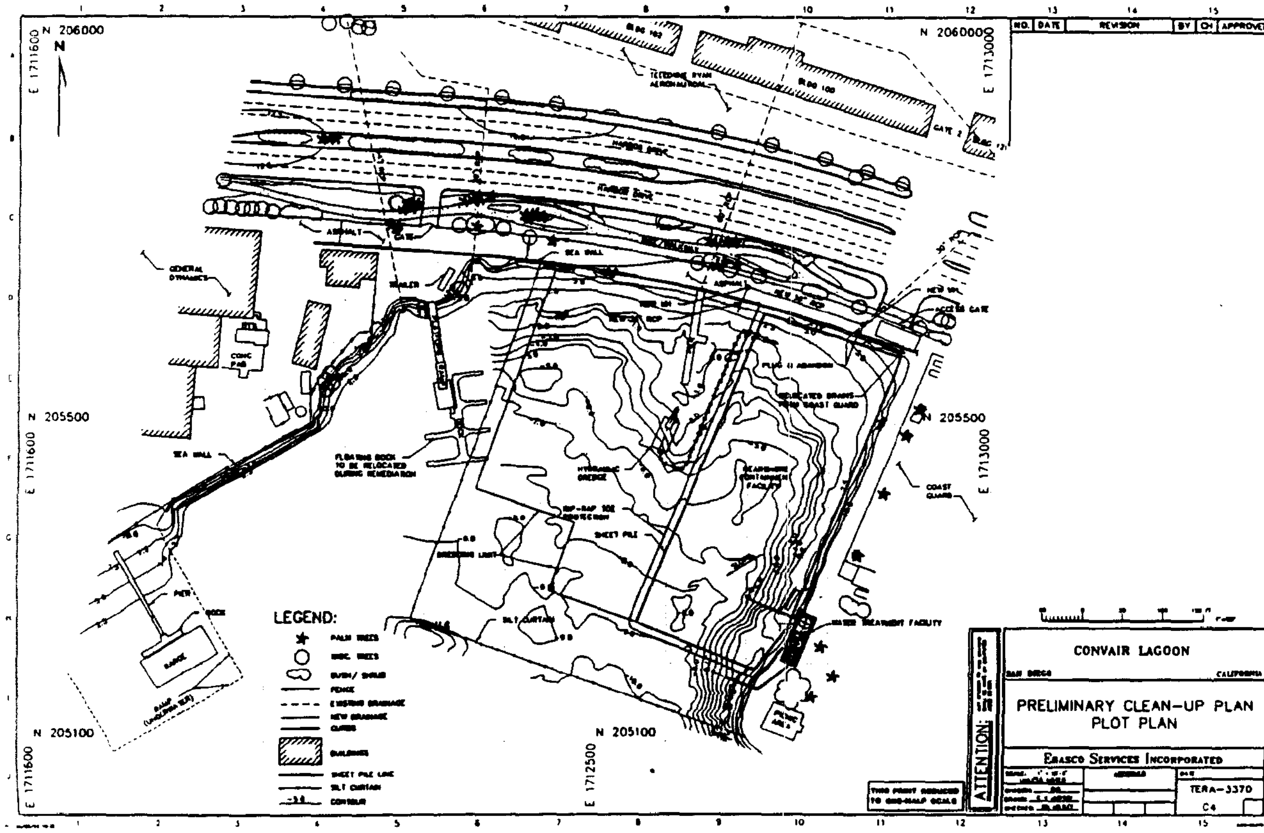
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PLOT PLAN
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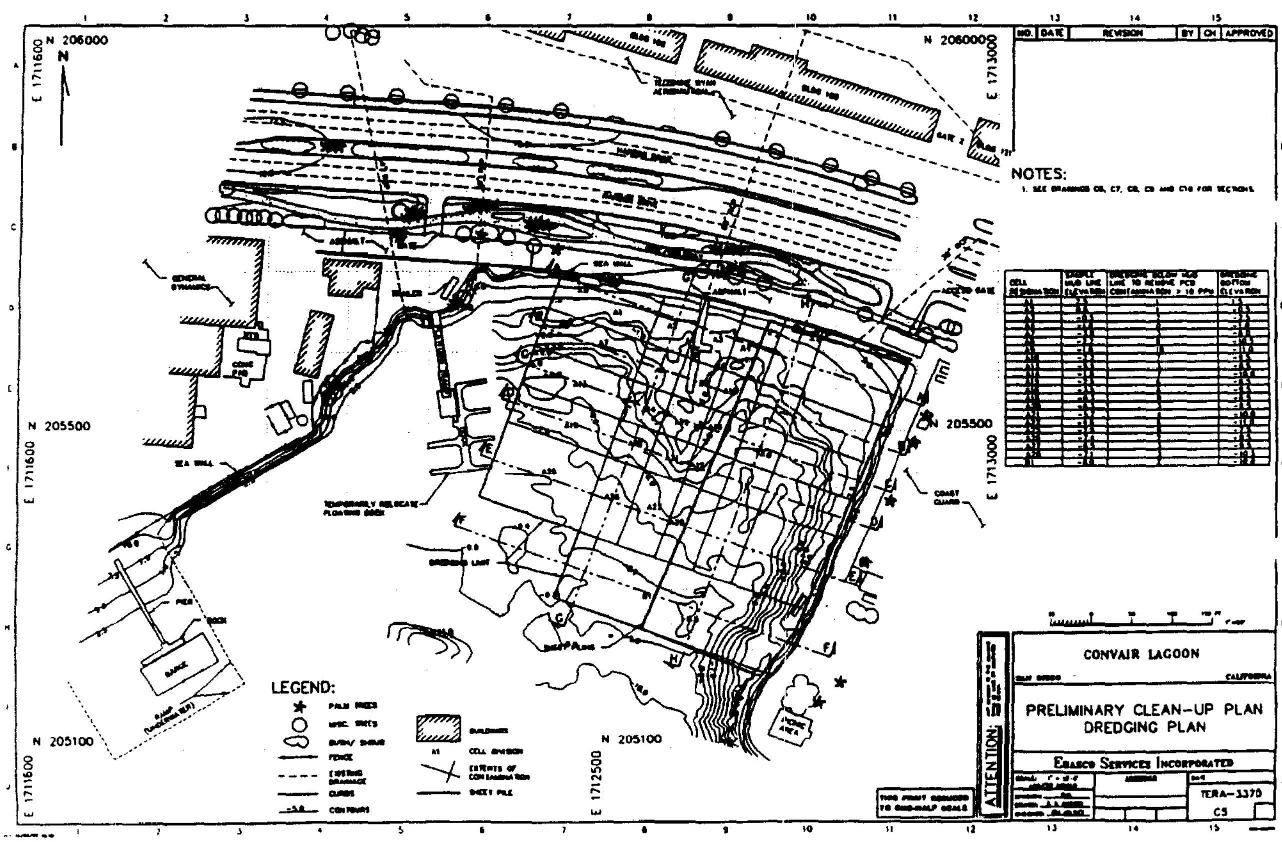
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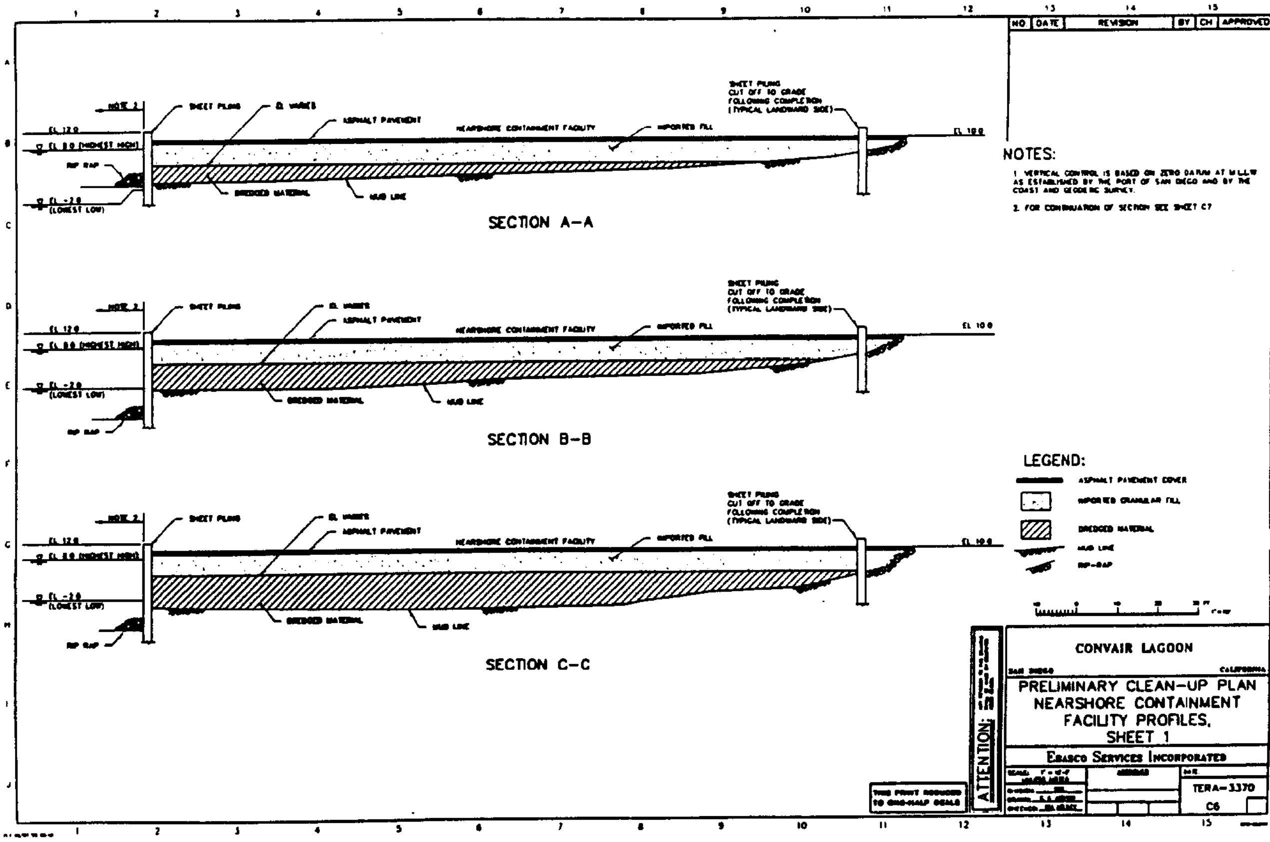
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SECTION C–C
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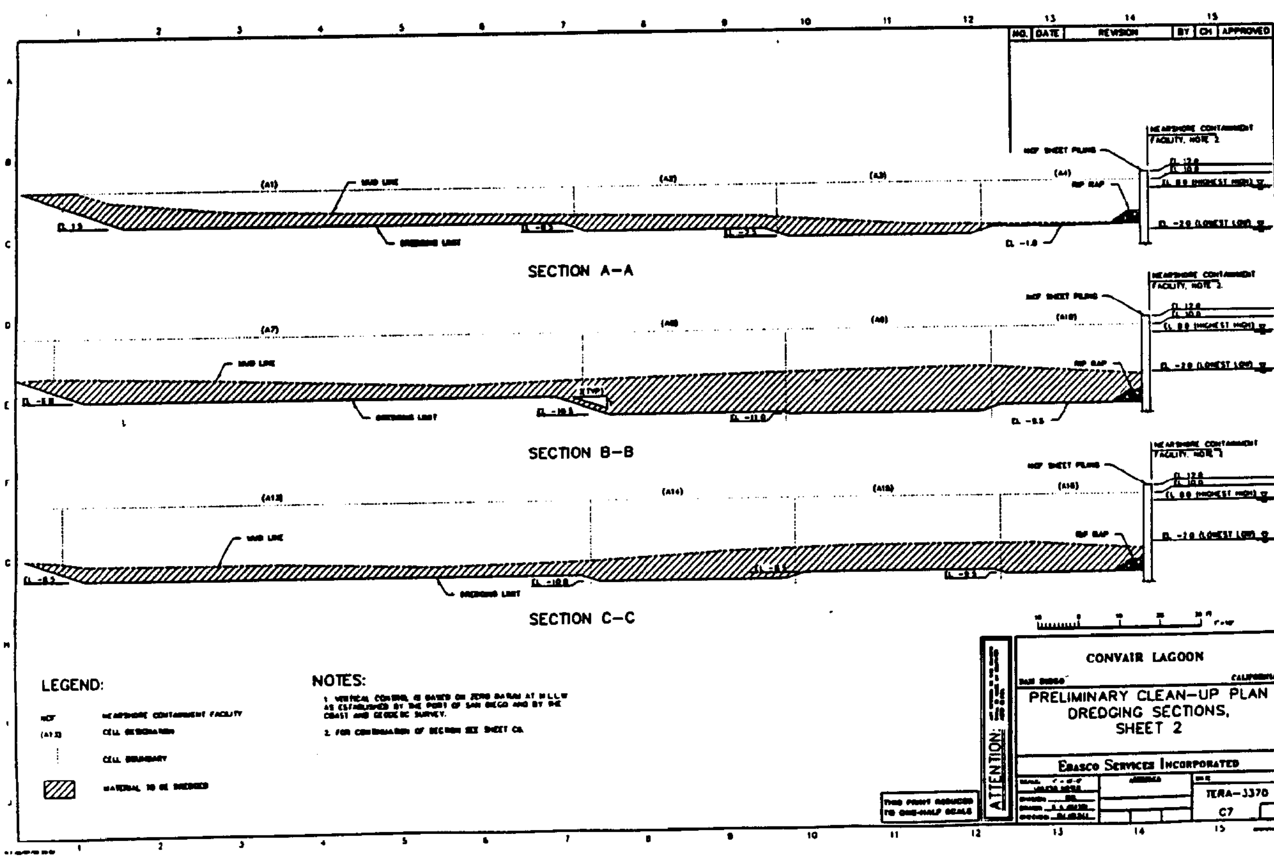
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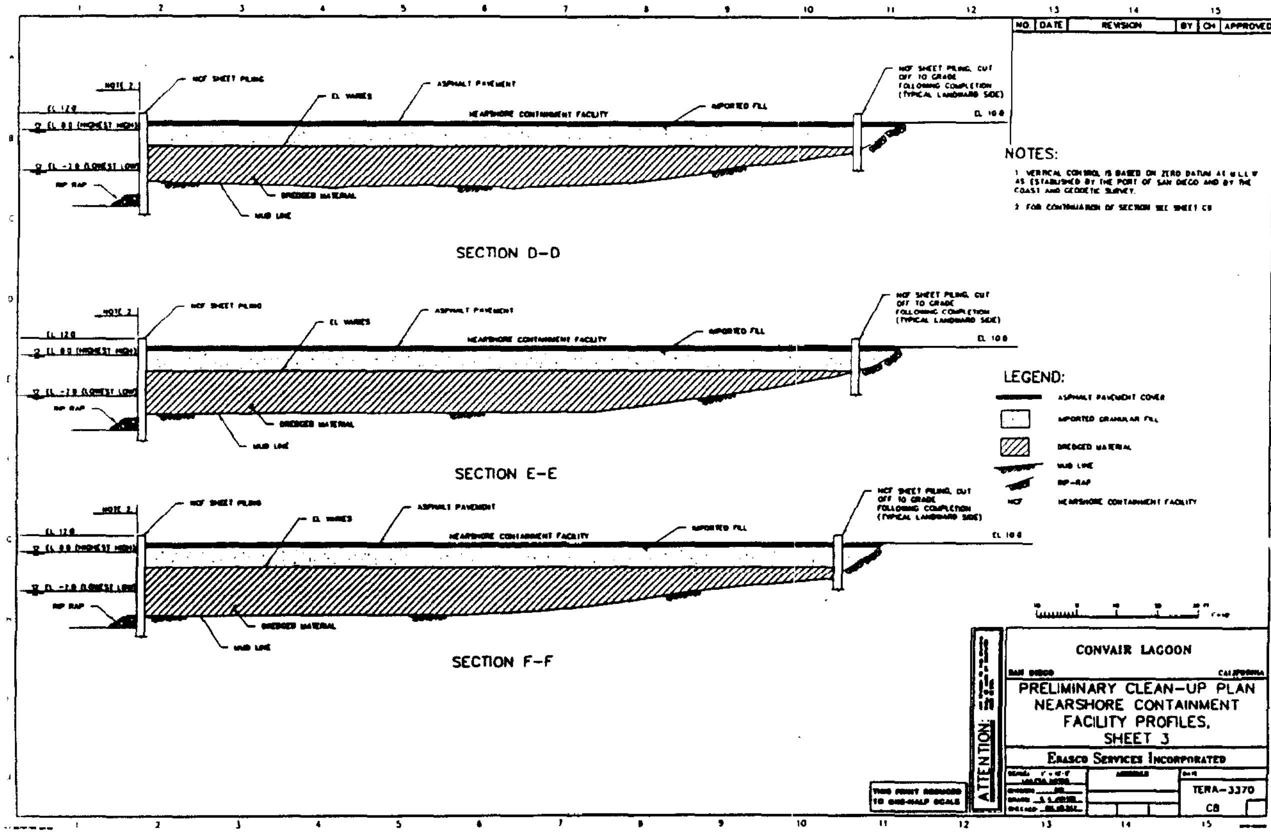
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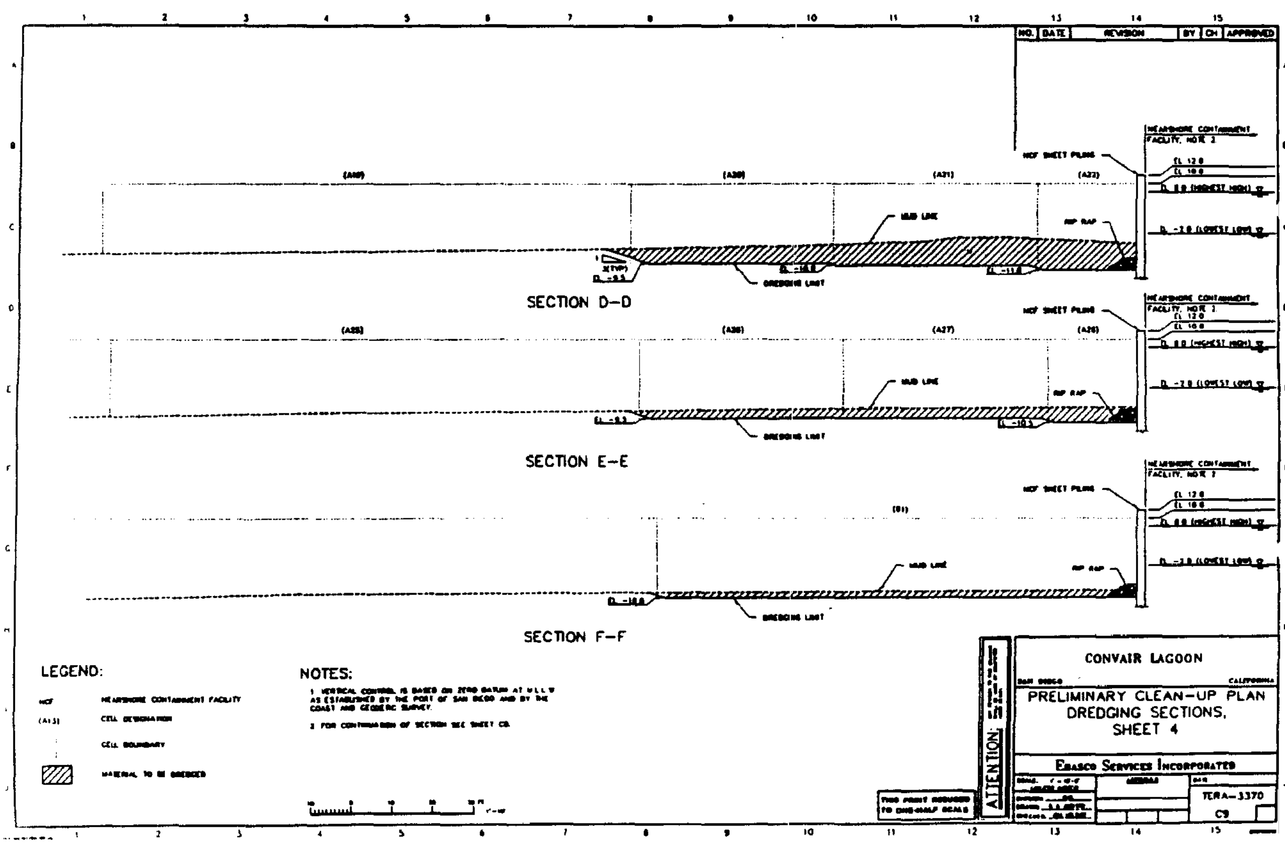
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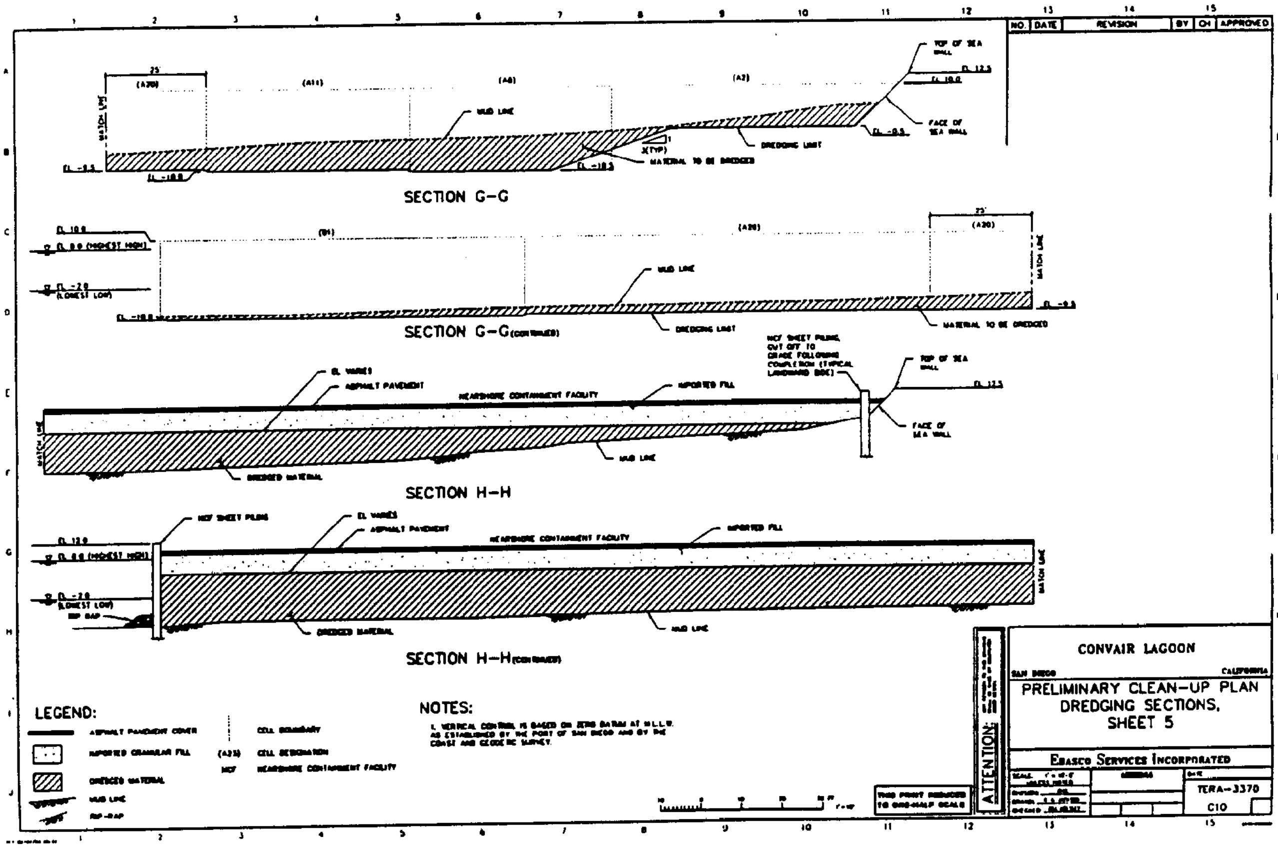
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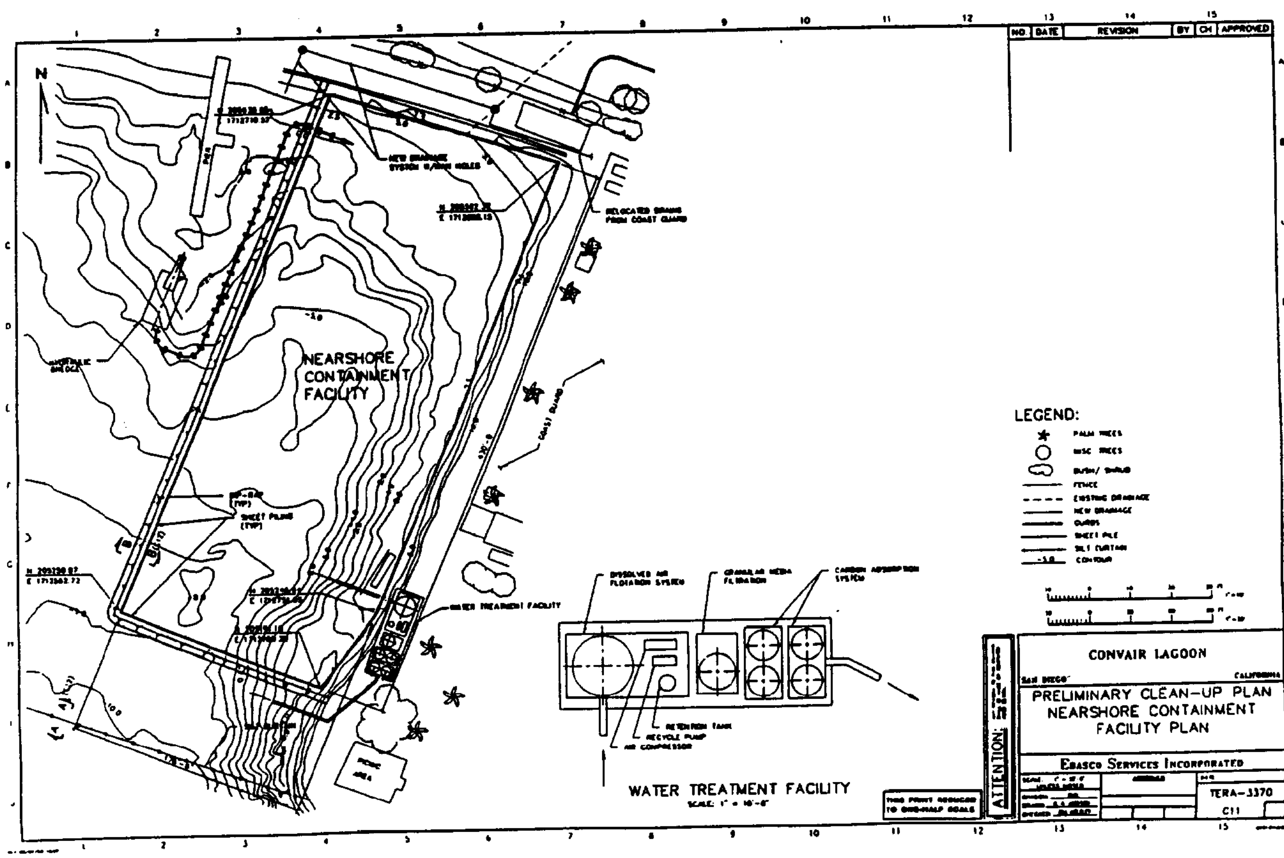
N
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FACILITY PLAN
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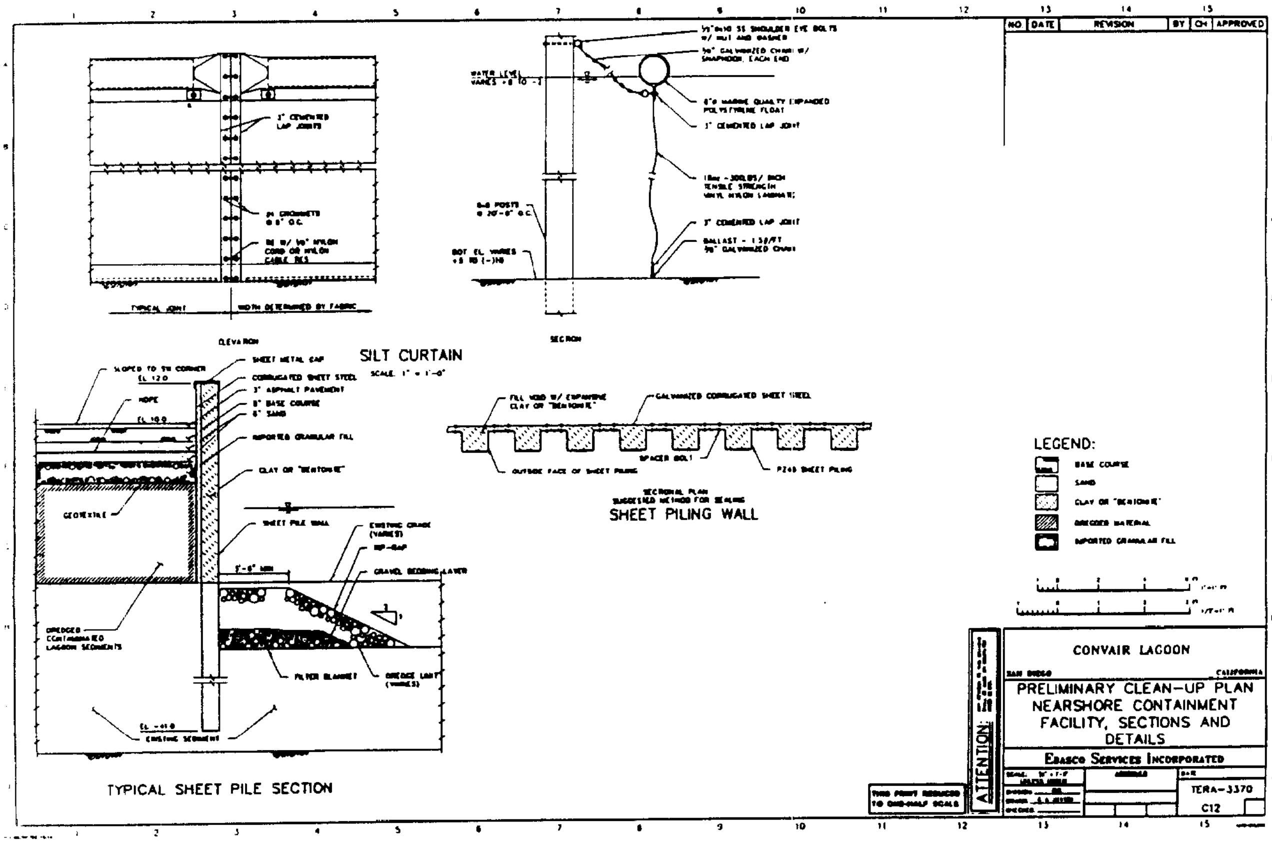
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ELEVATION
SECTION
TYPICAL JOINT
WIDTH DETERMINED BY FABRIC
WATER LEVEL VARIES +8 TO -2
SHEET PILING WALL
SECTIONAL PLAN SUGGESTED METHOD FOR SEALING
SPACER BOLT
OUTSIDE FACE OF SHEET PILING
PZ45 SHEET PILING
CLAY OR "BENTONITE"
GALVANIZED CORRUGATED SHEET STEEL
TYPICAL SHEET PILE SECTION
SHEET METAL CAP
CORRUGATED SHEET STEEL
3" ASPHALT PAVEMENT
8" BASE COURSE
8" SAND
IMPORTED GRANULAR FILL
CLAY OR "BENTONITE"
SHEET PILE WALL
EXISTING GRADE (VARIES)
RIP-RAP
GRAVEL BEDDING LAYER
GEOTEXTILE
HDPE
EL 12.0
EL 10.0
DREDGED CONTAMINATED LAGOON SEDIMENTS
FILTER BLANKET
EXISTING SEDIMENT
LEGEND:
BASE COURSE
SAND
CLAY OR "BENTONITE"
DREDGED MATERIAL
IMPORTED GRANULAR FILL
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CH
APPROVED
CONVAIR LAGOON
SAN DIEGO
CALIFORNIA
PRELIMINARY CLEAN-UP PLAN NEARSHORE CONTAINMENT FACILITY, SECTIONS AND DETAILS
EBASCO SERVICES INCORPORATED
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EVALUATION
(To be completed by the San Diego Unified Port District)

VIII. ENVIRONMENTAL EVALUATION

1. Attachments

Site Plan	Attached	Other	______
Draft Coastal Application	______		______
Draft Army Corps Application	______		______

2. Additional Information

______

3. Environmental Assessment Analysis:

(a) Specific questions were raised on the following EA entries:

Item #	Question	Explanation

VIII. Environmental Evaluation (continued)

(b) In addition to the analysis of the EA, the following were considered:
Would the proposed result in:

	Yes	Maybe	No
(1) Land Use:			
(a) Substantial alteration of the present or planned land use of an area?	✓		
(b) Non-conformance with the SDUPD Master Plan?	✓		
(2) Earth:			
(a) Substantial changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream, or the bed of the ocean or San Diego Bay, or San Diego Bay channel?	✓		
(b) Exposure of people or property to significant geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?			✓
(3) Transportation/Circulation:			
(a) Generation of substantial additional vehicular movement?			✓
(b) Significant effects on existing parking facilities, or substantial demand for new parking?			✓
(c) Substantial impact upon existing transportation systems?			✓
(d) Significant alterations to present patterns of circulation or movement of people and/or goods?			✓
(e) Substantial alterations to waterborne, rail or air traffic?			✓
(f) Significant increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?			✓

VIII. Environmental Evaluation (Continued)

Item	Yes	Maybe	No
(4) Public Services:			
(a) Significant effect upon, or result in a need for new or substantially altered governmental services including:			
(1) Fire protection?			✓
(2) Police protection?			✓
(3) Parks or other recreational facilities?			✓
(4) Maintenance of public facilities including roads?			✓
(5) Utilities:			
(a) Significant need for new systems, or substantial alterations to the following utilities:			
(1) Power or natural gas?			✓
(2) Communications systems?			✓
(3) Water?			✓
(4) Sewer?			✓
(5) Storm water drainage?		✓	
(6) Solid waste and disposal?			✓
(6) Energy:			
(a) Use of substantial additional amounts of fuel or energy?			✓
(7) Aesthetics:			
(a) Obstruct any scenic vista or view open to the public, or result in the creation of an aesthetically offensive site open to the public view?			✓
(8) Light and Glare:			
(a) Significant levels of new light or glare?			✓
(9) Recreation:			
(a) Significant decrease in the quality or quantity of existing recreational opportunities?		✓	

VIII. Environmental Evaluation (Continued)

Item	Yes	Maybe	No
(10) Population:			
(a) Significantly alter the location, distribution, density, or growth rate of the human population of an area?			✓
(11) Housing:			
(a) Significant effects to existing housing, or create a demand for additional housing?			✓
(12) Human Health:			
(a) Exposure of people to potentially significant health hazards?		✓	
(13) Risk of Accident:			
(a) A substantial risk of explosion or the release of hazardous substances (including but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident?		✓	
(b) Possible interference with an emergency response plan?			✓
(14) Air Quality:			
(a) Substantial additional air emissions or deterioration of ambient air quality, beyond Regional Air Quality Maintenance Plan projections?			✓
(b) The creation of objectional odors?			✓
(15) Hydrology and Water Quality:			
(a) Significant changes in currents, or the course or direction of water movements?			✓
(b) Significant changes in soil absorption rates, drainage patterns, or the rate and amount of surface water runoff?			✓
(c) Significant alterations to the course or flow of floodwaters?			✓
(d) Significant change in the surface area of San Diego Bay waters?	✓		
(e) Substantial discharge into San Diego Bay or in any significant alteration of water quality, including but not limited to temperature, dissolved oxygen or turbidity?		✓	

VIII. Environmental Evaluation (Continued)

	Yes	Maybe	No
(16) Noise:			
(a) Significant increases in existing noise levels?			✓
(b) Exposure of people to severe noise levels?			✓
(17) Plant Life:			
(a) Significant change in the diversity of species of plants (including trees, shrubs, grass, and aquatic plants)?		✓	
(b) Reduction of the numbers of any unique, rare or endangered species of plants?		✓	
(c) Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?			✓
(18) Animal Life:			
(a) Significant change in the diversity of species, or number of any species of animals (mammals, birds, reptiles, amphibians, fish, or invertebrates)?		✓	
(b) Reduction of the numbers of any unique, rare or endangered species of animals?			✓
(c) Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?			✓
(d) Significant deterioration to existing fish or wildlife habitat?		✓	
(19) Cultural Resources:			
(a) Significant alteration of or the destruction of a prehistoric or historic archeological site?			✓
(b) Adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?			✓
(c) Potential to cause a physical change which would significantly affect unique ethnic cultural values?			✓

VIII. Environmental Evaluation (Continued)

(c) Mandatory Findings of Significance:

Does the project have:

	Yes	Maybe	No
(1) The potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			✓
(2) The potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)		✓	
(3) Impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impacts on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)			✓
(4) Environmental effects which will cause substantially adverse effects on human beings, either directly or indirectly?			✓

(d) The following have been consulted about the project:

Agency	Person	Phone	Disposition	Date
COE		( )		
		( )		
CFG		( )		
		( )		
		( )		
		( )		
City of:		( )		
		( )		
APCD		( )		
		( )		
WQCB		( )		
		( )		

IX. DETERMINATION

1. The ENVIRONMENTAL MANAGEMENT DEPARTMENT OF THE San Diego Unified Port District on Convair Lagoon Rem. reviewed and considered above proposal entitled, ______ (UPD # ______).

On the basis of the Initial Study, the Environmental Management Department found:

☐ The proposal could NOT have a significant adverse effect on the environment and a Categorical Exemption will be prepared, under: Class ______, which reads in part: ______ : and Class ______, which reads in part: ______.

2. The ENVIRONMENTAL REVIEW COMMITTEE of the San Diego Unified Port District at its meeting on ______ reviewed and considered above proposal entitled, ______ (UPD # ______).

On the basis of the proceedings at this meeting and the Initial Study, the Environmental Review Committee found:

☐ The proposed project could NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Although the proposed project COULD have a significant effect on the environment, there will NOT be a significant effect in this case because of the mitigation measures proposed in the Initial Study, and a NEGATIVE DECLARATION with mitigation conditions will be prepared.

☒ The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT will be prepared.

[signature]
Preparer of Initial Study

Sept. 19 1992
(Date)

______
RALPH T. HICKS, Chairman
Environmental Review Committee

______
(Date)

(Revised 7/91)

File 02-0381

Final Environmental Impact Report/ Final Remedial Action Plan

CONVAIR LAGOON REMEDIATION

TELEDYNE RYAN AERONAUTICAL
CONVAIR LAGOON
WDR ORDER: 98-21
REPORT **FILE** : 4 01/1994-12/1995
STATUS: C
02-0381.03

ENVIRONMENTAL IMPACT REPORT
(UPD #83356-EIR-225; SCH #92091011)
REMEDIAL ACTION PLAN

CONVAIR LAGOON REMEDIATION

Report by

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October 1993

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1.0 PROJECT SUMMARY AND MAJOR ENVIRONMENTAL CONSEQUENCES

1.1 INTRODUCTION

The purpose of this Environmental Impact Report/Remedial Action Plan (EIR/RAP) is to determine and address the possible environmental impacts resulting from the remediation of polychlorinated biphenyls (PCBs) from the environment in Convair Lagoon in accordance with the Regional Water Quality Control Board's (RWQCB's) Cleanup and Abatement Order No. 86-92. Convair Lagoon is located in San Diego Bay, just west of the United States (U.S.) Coast Guard facility and south of Harbor Drive.

The proposed project entails the construction of a Nearshore Containment Facility consisting of a sheet-pile bulkhead with a riprap base to accommodate the volume of dredge material and effectively isolate the PCBs from the environment. In addition, a preferred remediation alternative of sand capping the Lagoon and the No Action alternative are evaluated.

The EIR/RAP is an information document written in compliance with the California Environmental Quality Act (CEQA) and Health and Safety Code Section 25356.1 for both the decision makers and the public. Sections of this document to follow: (1) describe the proposed project and its alternatives, their context and environmental setting; (2) evaluate potential environmental impacts resulting from the project and alternatives; and (3) describe measures to mitigate any potential impacts to a level of less than significant. The San Diego Unified Port District is the lead agency responsible for preparation of this document in compliance with CEQA.

Each of the alternatives (i.e., the proposed project, the Sand Capping alternative and the No Action alternative) are summarized below in Section 1.2. A discussion of potential impacts and mitigation for the proposed project (Nearshore Containment Facility) and the preferred alternative (Sand Capping) is also included in Section 1.2 as well as a summary table (Table 1) that compares the significance of impacts between all three alternatives for each of the applicable issue areas.

1.2 SUMMARY OF PROPOSED PROJECT AND VIABLE ALTERNATIVES

Following is a summary of the Nearshore Containment Facility, the No Action alternative, and the Sand Capping alternative. More detailed descriptions are provided in Section 3.0 Description of Proposed Project.

1.2.1 Proposed Project - Nearshore Containment Facility

The proposed project would hydraulically dredge approximately 13,300 cubic yards (cy) of sediment from Convair Lagoon and pump the material into a Nearshore Containment Facility (NCF). The NCF would occupy an area approximately 430 feet x 177 feet along the north side of the U.S. Coast Guard facility and would consist of sheet-pile bulkhead with a rip-rap toe protection blanket installed on the Lagoon floor outside the steel sheet wall to minimize erosion due to wave action. Construction of the inner facility would include placement of an impermeable inner liner of bentonite or similar material to prevent leaching of PCBs. The NCF would accommodate approximately 34,000 cy of dredged material.

A temporary water treatment facility is proposed adjacent to the NCF on U.S. Coast Guard property to treat water generated by the settling of dredged material within the NCF. Water treatment would occur at a rate compatible with the dredging and settling schedule and would consist of three treatment processes in series to remove PCBs and other contaminants before pumping the water back into the Lagoon.

After the dredged sediment has dried and consolidated, a high density polyurethane membrane would be laid over the top of the sediments followed by approximately 14,000 cy of imported fill to bring the facility to an elevation level with shoreside topography. One U.S. Coast Guard 30-inch drain outlet (30 east) as well as smaller drains would need to be relocated to accommodate the NCF.

Measures incorporated into the project to minimize its environmental impacts include the use of a silt curtain to contain suspended sediments within the project area and the replanting of eelgrass once the dredging activities are completed.

1.2.2 No Action Alternative

The No Action alternative would retain the project site in its current condition without cleaning up the PCBs. This is contrary to the RWQCB's Cleanup and Abatement Order No. 86-92.

1.2.3 Sand Capping - Preferred Alternative

The Sand Capping alternative would cover the existing sediment in Convair Lagoon with a layer of uncontaminated "clean" material, consisting of sand, gravel filter material, and riprap (or smaller quarry rock). The layer of clean material would vary according to the concentrations of contaminants, potential wave action, and the depths at which elevated concentrations of PCBs occur, but would be approximately 3 feet in thickness throughout the Lagoon area. Rock would be used in the intertidal areas where protection from wave action is needed. Sand would be used in the other areas of the Lagoon. Since PCBs have a tendency to stay entrained with the marine sediments and to sink deeper into the sediments, a sand cap can provide an effective barrier with minimal biological disturbances. Preliminary design of this alternative also includes the extension of an existing 60-inch storm drain to be anchored with rock.

Measures incorporated into the Sand Capping alternative to minimize its environmental impacts include the use of a silt curtain to contain suspended sediments within the project area, the replanting of eelgrass once the capping activities are completed, and the implementation of a long-term monitoring plan to ensure that the integrity of the cap is intact.

1.2.4 Environmental Comparison of Proposed Project and Preferred Alternative

An analysis of the project and its viable alternatives was conducted to determine significant impacts to the environment. Table 1.2-1 provides a comparative analysis of the level of environmental impact for the Nearshore Containment Facility, No Action alternative, and Sand Capping alternative. Impacts are discussed in greater detail in Section 5.0 Environmental Analysis of Potentially Significant Impacts.

Table 1.2-1

LEVEL OF ENVIRONMENTAL IMPACT FOR THE PROJECT AND TWO ALTERNATIVES BY IMPACT CATEGORY

	Water Quality	Marine Resources	Avian Resources	Utilities	Geotechnical/ Seismicity	Human Health and Safety	Land/Water Use Compatibility	Coastal Access	Coast Guard Operations/ Security	Recreational Boating/Navigational Safety
Nearshore Containment Facility	Significant - Mitigated	Significant - Mitigated	Significant - Mitigated	No Impact	Significant - Mitigated	Significant - Mitigated	No Impact	No Impact	Significant - Mitigated	Adverse - Not Significant
No Action	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Sand Capping	Beneficial	Significant - Mitigated	Beneficial	No Impact	Significant - Mitigated	Beneficial	No Impact	No Impact	No Impact	Significant - Mitigated
(Levels of Impact - Beneficial, No Impact, Adverse - Not Significant, Significant - Mitigated, Significant - Not Mitigated)										

1.2.4.1 Water Quality

Proposed Project

Disturbance and suspension of PCB-contaminated sediment is expected to occur due to NCF construction and the hydraulic dredging process. The resuspended sediment would eventually settle out, primarily within the project area due to the planned use of a silt curtain, but the contaminants would be spread out over the entire bottom surface within the silt curtain.

The design lifetime of structures such as the proposed NCF is typically in the order of several decades. Therefore, leakage of metal-bearing water into the Lagoon may eventually occur. This is considered to be a significant long-term impact of the proposed project.

Mitigation and monitoring for water quality impacts includes: the dredging of the project area with the highest levels of contamination first, moving from cell to cell in order of the level of contamination, and finally dredging the entire surface of the dredge and silt curtain area, even in those areas that did not originally require dredging; extensive sampling during dredging operations to confirm that the PCB-contaminated sediment has been removed and to determine where final dredging should be performed to remove recontaminated sediments; a continual monitoring program to verify that no leakage of the contaminants is occurring out of the NCF; and repairs of the facility as indicated by the continual monitoring program.

If mitigated as discussed above, long-term beneficial impacts to water quality would occur as a result of this alternative.

Sand Capping Alternative

The Sand Capping alternative has the potential for contaminants to migrate to the surface of the cap through chemical diffusion or bioturbation. However, the alternative includes a monitoring and repair program designed to identify and repair any "leaks" in the cap before significant amounts of contaminants have migrated. The design and precautionary measures already planned for use with this alternative (i.e., the removal of large debris from the area to be capped prior to installation of the cap and the use of a silt curtain during the capping activities) would prevent significant sediment suspension and migration. Therefore, no significant impacts to water quality would occur as a result of this alternative.

Long-term beneficial impacts to water quality would occur as a result of this alternative.

1.2.4.2 Marine Resources

Proposed Project

Approximately 0.39 acres of eelgrass, benthic biota inhabiting the 1.42-acre dredge footprint, and organisms inhabiting 0.31 acres of intertidal habitat in the combined dredge and silt curtain footprint would be lost during dredging operations as a result of the proposed project. This is considered to be a cumulatively significant, although temporary, impact and the project plans to reintroduce the eelgrass once the dredging activities are complete.

Another 1.75 acres of tidally influenced habitat, including 0.21 acres of upper intertidal, 0.29 acres of middle intertidal, 0.24 acres of lower intertidal, and 1.0 acres of subtidal habitat (with 0.39 acres of eelgrass meadows) would be permanently lost as a result of construction of the NCF. These habitat losses are also considered cumulatively significant.

To mitigate significant impacts to marine resources, the following mitigation and monitoring should be incorporated into the project: monitoring outside the silt curtain using real-time turbidity and water column chemical monitoring; return of the Lagoon bottom within the dredge footprint to its original depth using clean sand once the contaminated material is removed; the creation of new intertidal habitat and shallow subtidal habitat; a continual monitoring program (including a mussel watch station and tissue analysis of burrowing organisms) to verify that no leakage of the contaminants is occurring out of the NCF; repairs of the facility as indicated by the continual monitoring program; and sampling after dredging operations to determine if final dredging should be performed to remove recontaminated sediments. Several of these measures are similar to what is recommended as mitigation for water quality impacts.

If mitigated as discussed above, long-term beneficial impacts to marine resources would occur as a result of the proposed project.

Sand Capping Alternative

Construction of the cap would result in the modification of approximately 4.8 acres of tidally influenced habitat, including the modification and replacement of approximately 0.98 acres of lower intertidal habitat and the loss of 0.98 acres of subtidal habitat. The project design, however, includes the construction of a new intertidal area of equal size to the area lost through construction of the cap. Bioturbation, i.e., the potential for burrowing organisms to compromise the integrity of the cap, is considered to be potentially significant, but would be monitored closely by the post-construction monitoring program.

Recommended mitigation and monitoring include: the placement of an 1-foot layer of crushed rock on the existing lagoon bottom to act as a deterrent to deep-burrowing organisms; conducting additional field studies and lab investigations to identify the types of deep-burrowing organisms that might occur and how they might compromise the sand cap integrity; and a contingency plan to describe how significant damage to the cap will be repaired.

If mitigated as discussed above, long-term beneficial impacts to marine resources would occur as a result of this alternative.

1.2.4.3 Avian Resources

Proposed Project

The proposed NCF would extend the northeastern shore of the Lagoon, reducing the open water surface and other marine habitats by 1.75 acres. This loss is considered to be a cumulatively significant impact to avian resources, including the endangered California least tern. Short-term disruption to foraging habitats due to dredging activities is not considered to be significant as long as the dredging activity occurs during the non-breeding season.

Mitigation measures for impacts to avian resources include: limiting remediation activities to the period from late September through early March; providing for the restoration of bottom habitats, specifically eelgrass beds, in the portion of the Lagoon not permanently lost to shoreline extension; and enhancement of degraded eelgrass beds in one other shallow portion of San Diego Bay at a 1:1 ratio for areas of permanent loss of marine habitats.

Sand Capping Alternative

No significant impacts would occur. In fact, increased intertidal habitat with eel grass will provide forging areas for other avian species such as the least tern; this is a beneficial impact.

1.2.4.4 Utilities

Proposed Project

No significant impacts would occur; the proposed project includes the reinstallation of an existing 30-inch storm drain that would otherwise be adversely affected by the project.

Sand Capping Alternative

No significant impacts would occur; the Sand Capping alternative includes the extension of an existing 60-inch storm drain that would otherwise be adversely affected by the project.

1.2.4.5 Geotechnical/Seismicity

Proposed Project

Potentially significant geologic and soil constraints to the proposed project include ground settlement due to consolidation of the estuarine/fluvial deposits and the artificial fill soils on site and seismic hazards, including ground shaking, surface displacement, liquefaction and tsunamis. Mitigation for these conditions include incorporating the results of a site-specific geotechnical engineering investigation into the design and construction of the project. A site-specific geotechnical engineering investigation should be performed for each proposed separate structure and should include adequate subsurface explorations and analyses to determine the potential for, and degree of, short- and long-term settlement, expected seismic ground acceleration values, and the potential for seismic ground failure (including liquefaction). Site modification to improve the support capacity of those existing soils, and to reduce long-term post-construction settlement may also be necessary. An evaluation should also be made to consider the stability of the embankment during expected seismic and hydraulic conditions. A site-specific hydrology study should also be performed to address such issues as flooding during high-tide conditions and the effect of wind-driven waves generated within San Diego Bay.

Sand Capping Alternative

The potential for the integrity of the cap to be disturbed and recontamination to occur as a result of boat anchoring is considered to be a potentially significant impact of this alternative. Mitigation includes the adoption an ordinance by the San Diego Unified Port District (SDUPD) that prohibits anchoring within Convair Lagoon. Upon adoption of this ordinance, the SDUPD should notify the San Diego Harbor Police and the U.S. Coast Guard of the anchoring restriction and signs should be posted within the water area along the mouth of Convair Lagoon notifying boaters of the anchoring restriction.

1.2.4.6 Human Health and Safety

Proposed Project

No significant direct short-term or indirect long-term adverse human health impacts should occur as a result of the proposed project as long as exposure to PCB-containing sediment is minimized. To that end, a human health and safety plan that addresses the appropriate use of personal protective equipment and guidelines for containment procedures that minimize contamination migration from the site should be implemented.

Sand Capping Alternative

Significant human health impacts could occur due to direct short-term exposure and indirect long-term exposure if the integrity of the cap is not maintained; however, a monitoring plan would be prepared and implemented to determine whether short-term and/or long-term exposures to PCB-containing media are reintroduced.

1.2.4.7 Land/Water Use Compatibility

Proposed Project

No significant impacts to land/water use would occur as a result of the proposed project; therefore, no mitigation measures would be required.

Sand Cap Alternative

No significant impacts to land/water use would occur as a result of the Sand Capping alternative; therefore, no mitigation measures would be required.

1.2.4.8 Coastal Access

Proposed Project

No significant impacts to coastal access would occur as a result of the proposed project; therefore, no mitigation measures would be required.

Sand Cap Alternative

No significant impacts to coastal access would occur as a result of the Sand Capping alternative; therefore, no mitigation measures would be required.

1.2.4.9 Coast Guard Operations/Security

Proposed Project

No significant long-term impacts to the Coast Guard facilities would occur as a result of the proposed project; therefore, no mitigation measures would be required.

Sand Capping Alternative

No significant impacts to the Coast Guard facilities would occur as a result of the Sand Capping alternative; therefore, no mitigation measures would be required.

1.2.4.10 Recreational Boating/Navigational Safety

Proposed Project

The project has the potential to optimize use of the Lagoon for recreational boating activities by correcting the inadequacies of the size of the land side support. No significant impacts to recreational boating/navigational safety would occur as a result of the proposed project; therefore, no mitigation measures would be required.

Sand Capping Alternative

The potential for the integrity of the cap to be disturbed and recontamination to occur as a result of anchoring within the Lagoon is considered to be a potentially significant impact of this alternative. Mitigation includes the adoption an ordinance by the SDUPD that prohibits anchoring within Convair Lagoon. Upon adoption of this ordinance, the SDUPD should notify the San Diego Harbor Police and the U.S. Coast Guard of the anchoring restriction and signs should be posted within the water area along the mouth of Convair Lagoon notifying boaters of the anchoring restriction.

1.2.4.11 Short-Term vs. Long-Term Productivity

Proposed Project

The proposed project would result in short-term impacts such as disruption of the water and the Lagoon bottom during dredging, construction-related impacts on noise and security to the adjacent U.S. Coast Guard facility, and temporary closure of the Convair Sailing Club. However, the project would create gains in the long-term productivity of the Lagoon area in terms of an overall improvement in water and sediment quality and a reduction in significant bioaccumulations of PCBs in fish and shellfish. A decreased health and safety risk to the human population would result from the project and the creation of a developable water frontage as a result of the proposed fill activities could allow for future long-term socioeconomic benefits.

Sand Capping Alternative

The Sand Capping Alternative would also result in short-term impacts such as disruption of the water and the Lagoon bottom during capping and construction-related impacts on noise and security to the adjacent U.S. Coast Guard facility. The alternative would create gains in the long-term productivity of the Lagoon area in terms of an overall improvement in water and sediment quality and a reduction in significant bioaccumulations of PCBs in fish and shellfish. A decreased health and safety risk to the human population would also result.

1.2.4.12 Cumulative Impacts

No significant unmitigable adverse cumulative impacts are expected to occur as a result of either of the two alternatives. Either of the two alternatives in conjunction with the proposed removal of copper contaminated sediment at the Paco Terminal would, however, result in a cumulative improvement in both water and sediment quality in San Diego Bay. The cumulative improvement in water quality would also improve conditions for certain marine and avian resources as well as for human health and safety.

1.2.4.13 Growth Inducement

No growth inducement would occur as a result of either of the two alternatives.

1.2.4.14 Unavoidable and Irreversible Significant Environmental Effects

The proposed remediation project or its alternative would result in the incremental loss of water area within San Diego Bay. This is not considered to be significant.

1.3 Staff Recommendations

The Draft EIR/RAP has undergone an extensive public and agency review process, including submittal to the California State Clearinghouse and to various Federal Regulatory Agencies.

To finalize the document, staff has prepared the District's Response to Comments Section which was distributed to the correspondents, the Board, and the EIR/RAP consultant. All correspondents, and those who requested, have been individually advised of the date and time that the Final EIR/RAP is before the Board of Port Commissioners for certifications. The District's Response to Comment Section is included in this Final EIR/RAP and is printed on blue pages.

The Convair Lagoon Remediation EIR/RAP assesses the environmental consequences of constructing a Nearshore Containment Facility (NCF) or the placement of a Sand Cap to effectively isolate PCB contaminated material, as well as other remediation alternatives.

The Draft EIR/RAP specifically evaluated the potential effects of the NCF and Sand Cap remediation programs on water quality, marine/avian resources, utilities, geotechnical/seismicity, human health and safety, land/water use compatibility, coastal access, Coast Guard operations/security, and recreational boating/navigational safety.

Comments received to the Draft EIR/RAP were concerned principally with adverse impacts associated with bioturbation and long-term monitoring.

To address the concerns expressed in the comments received to the Draft EIR/RAP (and to mitigate potentially significant effects to water quality, marine/avian resources, geotechnical/seismicity, Coast Guard operations/security, human health and safety, and recreational boating/navigational safety to environmentally acceptable levels), staff recommends that the Final EIR/RAP be certified and that the Board of Port Commissioners make the following Findings and Determinations:

- that the EIR/RAP was prepared to evaluate the environmental consequences of implementing either the Nearshore Containment Facility (NCF) or Sand Cap remediation programs, and determined that the Sand Cap was the environmentally superior alternative;

- that the potentially feasible and environmentally superior Sand Cap alternative would cover the existing sediment in Convair Lagoon with a layer of uncontaminated "clean" material, consisting of sand, gravel filter material, geo-textile liner, and riprap (or small quarry rock). The layer of clean material would vary according to the concentrations of contaminants, potential wave action, and the depths at which elevated concentrations of PCBs occur. It is anticipated that approximately 3 feet in thickness throughout the Lagoon area would be required for capping. The Sand Cap also includes the replanting of eelgrass to provide a biological "armor" and offset eelgrass lost through capping. In addition, the 60-inch storm drain will be extended and anchored with rock;

- that the Sand Cap alternative includes a post-capping monitoring plan that is designed to verify that contaminants are contained, and are not migrating to the surface through bioturbation or chemical diffusion. If contaminants are detected in the clean capping material, the placement of additional capping material or other repairs should return the cap to full integrity. With monitoring of the cap, and repair when conditions that could lead to potential breakthrough are detected, the impacts to water quality and human health/safety will be mitigated to below a level of significance;

- that potentially significant environmental effects to marine/avian resources, geotechnical/seismicity, and recreational boating/navigational safety associated with the Sand Cap will be reduced to insignificant, acceptable levels by implementation of specific mitigation measures as described in the Final EIR/RAP are required as follows:

  1) Placement of a 1-foot layer of crushed rock on the existing lagoon bottom may act as a deterrent to deep-burrowing organisms such as ghost shrimp. Additional

field studies shall be conducted to determine what species created the burrows in Convair Lagoon and estimate the depth of those systems. Finally, additional field and lab investigations shall be conducted to determine the effectiveness of the proposed rock layer as a deterrent to burrowing for the organisms identified as responsible for the burrow systems since these are likely to colonize the Sand Cap after construction.

2) A long-term monitoring program shall be designed to evaluate and monitor the effectiveness of the cap. This will involve sediment core samples to evaluate contaminant migration into the cap, biological samples to evaluate the significance of bioturbation, and the transport of capped chemicals to surface sediments where they may be redistributed. Finally, a contingency plan shall be prepared describing how significant damage to the cap will be repaired.

3) The District shall work with the Responsible Party(ies) to establish an adequate annuity or other financial account to provide funds necessary for long-term Sand Cap monitoring and maintenance.

4) An ordinance prohibiting anchoring within Convair Lagoon shall be adopted by the District.

5) The District shall, upon adoption of the ordinance, notify San Diego Harbor Police and the US Coast Guard of the anchoring restriction within Convair Lagoon.

6) Signs shall be posted within the water area along the mouth of Convair Lagoon notifying boaters of the anchoring restriction in the Lagoon area;

- that other environmental consequences of the environmentally superior Sand Cap alternative have been evaluated in the Final EIR/RAP and that no additional conditions or mitigation measures beyond those recommended are necessary;

- that the EIR/RAP has been completed in compliance with CEQA and State CEQA guidelines, and California Health and Safety Code Section 25356.1;

- that the Board of Port Commissioners has reviewed and considered the information contained in the Final EIR/RAP including letters of comments and District response;

- that the Board is making findings and conclusions therefrom;

- that for the reasons and findings herein, the environmentally superior Sand Cap alternative, incorporating the above mitigation measures and conditions, will not have a significant (adverse) effect on the environmental; and

- that the Board is certifying the Final Environmental Impact Report/Remedial Action Plan and is directing the filing of a Notice of Determination.

The Regional Water Quality Control Board also has discretionary approval power over the project and will issue a National Pollution Discharge Elimination System (NPDES) Permit, a Report of Waste Discharge Requirements, and a State Water Quality Certification under Section 401 of the Clean Water Act. In the event that the Regional Water Quality Control Board chooses to select the NCF, staff recommends that the Board make the following alternate Findings and Determinations:

- that the Project consists of the dredging and construction of a NCF to isolate PCBs from the environment at the Convair Lagoon. The NCF would occupy an area approximately 430 feet x 177 feet along the north side of the US Coast Guard facility and consist of a sheet-pile bulkhead with a riprap base. Approximately 13,000 cubic yards of sediment would be hydraulically dredged from the Lagoon and pumped into the NCF;

- that potentially significant environmental effects to water quality, marine/avian resources, geotechnical/seismicity, human health and safety, and Coast Guard operations/security associated with the NCF will be reduced to insignificant, acceptable levels by implementation of specific mitigation measures as described in the Final EIR/RAP are required as follows:

1) To minimize the impacts of recontamination of surface sediment following resuspension of contaminated sediments during the dredging operations, the dredging shall begin in those areas of the Lagoon with the highest levels of contamination. The dredging shall then move from cell to cell in order of the level of contamination. Finally, the entire surface of the sediment in the project area shall be dredged to remove contaminated sediment that has settled in areas that originally did not require dredging.

2) Extensive sampling shall be conducted during the dredging operations to confirm that the PCB-contaminated sediment has been removed in accordance with the Cleanup and Abatement Order. Sampling shall also be conducted to determine where final dredging should be performed to remove recontamination from settled sediments.

3) A continual monitoring plan shall be in place to verify that leakage of contaminants does not take place out of the NCF.

4) The District shall work with the Responsible Party(ies) to establish an adequate annuity or other financial account necessary for long-term NCF monitoring and maintenance.

5) Impacts associated with turbidity and redistribution of particulates will be minimized by enclosing the construction area within a silt curtain. This action will minimize the dispersion of fine particulate material disturbed during construction activities. Success of this measure shall be monitored using real-time turbidity and water column chemical monitoring at designated sampling locations outside the silt curtain. If turbidity and water chemistry criteria are not met, construction operations will be interrupted and modified to attain compliance.

6) The potential toxicity of the discharge shall be tested using appropriate EPA-approved bioassay tests. Moreover, the potential area influenced by the discharge plume shall be estimated on the basis of physical oceanographic conditions and discharge water volume.

7) Construct 0.75 acres of intertidal area of equal size west of riprap wall of the NCF elevating the existing lagoon bottom to -0.2 feet MLLW. Fill 0.75 acres of a nearby deep water area (>18 feet MLLW) of the bay with clean sand to a depth of less than 18 feet to create new shallow subtidal habitat.

8) Implementation of a restoration program involving the planting of 0.94 acres of eelgrass to mitigate the loss of 0.78 acres of eelgrass and monitoring its development to document mitigation success shall be conducted.

9) Long-term deterioration of the NCF shall be monitored by implementation of a routine inspection and maintenance program for the life of the facility. This plan shall include a biological and water quality monitoring program including a mussel watch station and tissue analysis of burrowing organisms to allow detection of bioaccumulation in resident biota that may indicate a breach in the integrity of the facility.

10) After dredging is complete, redeposited contaminants in the silt curtain footprint shall be evaluated by testing for surficial sediments to determine if contaminant levels require further remediation. If contaminant levels are elevated, the upper layer of sediment shall be removed with the dredge and placed in the NCF. The area potentially affected will be minimized by placing the silt curtain as near the dredge footprint boundary as possible.

11) Due to the presence of the endangered California least tern in the spring and summer months, remediation activities shall be limited to the period from late September through early March, if feasible.

12) Temporary barriers for the containment of suspended contaminated sediment from dredging shall be in place to prevent further spread of contaminants into the bay during the operation.

13) Enhancement of degraded eelgrass beds in one other shallow portion of San Diego Bay at a 1.2:1 ratio shall be done for areas of permanent loss of marine habitats within the Lagoon. This ratio will compensate for the permanent loss of open water.

14) The results of a site-specific geotechnical engineering investigation shall be incorporated into the design and construction of the project. A site-specific geotechnical engineering investigation shall be performed for each proposed separate structure as a condition of issuance of construction permits. Each investigation shall contain adequate subsurface explorations and analyses to determine the potential for and degree of short- and long-term settlement, expected seismic ground acceleration values, and the potential for seismic ground failure (including liquefaction). Each investigation shall contain detailed foundation recommendations, and shall be subject to review by the appropriate regulatory agencies. Site-specific geotechnical study shall specifically address

post-construction settlement potential and recommend methods to mitigate post-construction total and differential settlement to acceptable ranges, given the types of improvements at particular locations. Geotechnical studies shall specifically address seismic analysis based on site-specific subsurface data. As a minimum, seismic analyses shall address seismically-induced slope failure, liquefaction, and ground surface accelerations.

15) The design of the cantilevered sheet-pile containment wall for the NCF shall be either a cantilevered sheet-pile, tied-back sheet-pile, or trapezoidal rock section design to reduce impacts associated with liquefaction.

16) An evaluation shall be made to consider the stability of the embankment during expected seismic and hydraulic conditions.

17) A site-specific hydrology study shall be performed for the site, addressing such issues as flooding during high-tide conditions and the effect of wind-driven waves generated from within San Diego Bay.

18) Implementation of a health and safety plan that addresses appropriate use of personal protective equipment, and guidelines to minimize contamination migration from site shall be required prior to construction.

19) To mitigate short-term security impacts during the dredging/construction phase of the proposed project, a fence shall be installed by the SDUPD between the Coast Guard property and the Convair Lagoon project site, and around the temporary water treatment facility. The fence shall be permanent if determined by the Coast Guard to be necessary to ensure long-term security;

- that other environmental consequences of the NCF have been evaluated in the Final EIR/RAP and that no additional conditions or mitigation measures beyond those recommended are necessary;

- that the EIR/RAP has been completed in compliance with CEQA and State CEQA guidelines, and California Health and Safety Code Section 25356.1;

- that the Board of Port Commissioners has reviewed and considered the information contained in the Final EIR/RAP including letters of comments and District response;

- that the Board is making findings and conclusions therefrom;

- that for the reasons and findings herein, the NCF, incorporating the above mitigation measures and conditions, will not have a significant (adverse) effect on the environment ; and

- that the Board is certifying the Final Environmental Impact Report/Remedial Action Plan and is directing the filing of a Notice of Determination.

CUT 004731

2.0 INTRODUCTION

2.1 ENVIRONMENTAL PROCEDURES

This Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act of 1970 (Public Resources Code, 21000, et seq.), as amended, the Guidelines for Implementation of the California Environmental Quality Act of 1970 (California Code of Regulations, Section 15000, et seq.), as amended, and the Port District's Procedures for Environmental Review (Resolution 83-356). Additionally, this document and its referenced documents meet the requirements for a Remedial Action Plan (RAP) per California Health & Safety Code 25356.1.

2.1.2 Environmental Impact Report

The District has CEQA, Coastal Permit, and public trustee responsibilities for this project. It should be noted that typically hazardous waste remediation activities are exempt from CEQA review under a Class 8 Categorical Exemption. CEQA Guidelines, Section 15308 states that "Class 8 consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption."

Because Teledyne Ryan intends to pursue a remediation activity that involves significant construction (the proposed nearshore containment facility) which involves constructing a bulkhead containment structure, the proposed project is outside the scope of a Class 8 exemption. Therefore, CEQA would require an EIR. As such, the District will act as the lead agency under CEQA.

This EIR/RAP evaluates the environmental effects associated with the remediation of PCBs in Convair Lagoon by constructing a Nearshore Containment Facility (NCF) adjacent to the U.S. Coast Guard station and placing the contaminated sediments within the NCF. This EIR is intended to serve as an informational document in considering whether or not to approve or grant discretionary approvals or permits in connection with the proposed project.

The Port District is designated as the Lead Agency under CEQA in the preparation of the EIR while the Regional Water Quality Control Board is the lead in approving cleanup levels and methods. The project may require the Port's approval of an amendment to the Port Master Plan and issuance of a Coastal Development Permit.

The Regional Water Quality Control Board also has discretionary approval power over the project and will issue a National Pollution Discharge Elimination System (NPDES) Permit, a Report of Waste Discharge Requirements, and a State Water Quality Certification under Section 401 of the Clean Water Act.

The U.S. Army Corps of Engineers (Corps) is a federal agency, and, therefore, is not a Responsible Agency pursuant to CEQA; the Corps, nevertheless, is expected to consider the EIR in granting Section 404/Section 10 Permits.

2.1.2 Remedial Action Plan

Health & Safety Code Section 25356.1 states the potential responsible parties shall prepare a Remedial Action Plan (RAP) for removal and responses to release of hazardous substances. All RAPs are modeled after the National Oil & Federal Substances Pollution Contingency Plan, 40CFR 300.61 et seq. Either the Health Department or Water Quality Control Boards have the authority to approve a RAP.

The contents of a RAP include health and safety risks posed by the hazardous conditions at the site, affects of contamination upon future land uses, beneficial uses or threatened resources in the area, and the affect of remediation efforts on groundwater. A RAP addresses site specific characteristics including mobility of hazardous materials, types of soil and hydraulic conditions, and determine the background level of contaminants prior to the current contamination.

Like an EIR, a RAP evaluates the environmental impacts associated with remedial action alternatives that address treatments which significantly reduce the amount of contaminants or their mobility. Offsite transportation and disposal of hazardous materials will not be considered if other cost effective technologies will treat the contaminated material. In addition, the cost effectiveness of each alternative needs to be included in the evaluation. Each cost needs to address the public health risk and the environmental health risk for each alternatives associated with that cost.

In order for a RAP to be approved by the Health Department or the Water Quality Control Board, the draft document needs to be circulated for 30 days for public comment including, but not limited to, notifying local and state agencies, newspaper notices, and notifying owners of adjacent properties. Public meetings can be held with the lead agencies and responsible agencies overseeing the cleanups. The final RAP will be issued by the Health Department or the Regional Water Quality Control Board after considering all public comments and revised the draft plan, if necessary.

2.1.3 Functional Equivalent Document

This combined EIR/RAP has also been prepared to satisfy the requirements of both the CEQA Guidelines and Health & Safety Code 25356.1 pursuant to Public Resources Code 21080.5 for functional equivalent documents.

2.2 RESPONSES TO THE NOTICE OF PREPARATION

The District circulated a Notice of Preparation (NOP) to the Governor's Office of Planning and Research, Responsible and Trustee Agencies, and other interested parties. The District received responses from the following agencies, organizations, and individuals:

- National Oceanic and Atmospheric Administration
- California Department of Fish and Game
- State Lands Commission
- California Coastal Commission
- Environmental Health Coalition
- County of San Diego, Department Health Services
- City of San Diego, Planning Department
- Citizens Coordinate for Century 3
- Thomas K. Wilson

The following issues were raised by the respondents:

- Water quality
- Marine resources and habitats including eelgrass
- California least tern

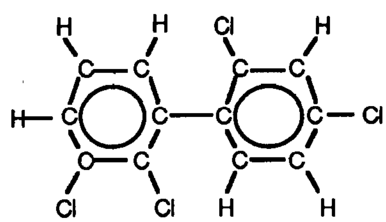
- Land/water use compatibility
- Geotechnical/seismicity
- Human health/safety

2.3 Background

Convair Lagoon was created during the 1930s as part of a major project to reclaim land from San Diego Bay. This filled-in portion of the Bay is now occupied by Teledyne Ryan, portions of San Diego International Airport, General Dynamics, and other commercial and industrial activities. The current storm drain system was installed at that time.

The nature and chronology of the events that led to the contamination of Convair Lagoon with PCBs (polychlorinated biphenyls) is unknown. However, much, if not all, of the contamination is suspected to have resulted from industrial and commercial activities taking place on properties north of the Lagoon. The PCBs are suspected to have been accidentally spilled during operations on these properties, entering the storm drains, and ultimately entering the Lagoon.

The term "polychlorinated biphenyls" refers to a large number of chlorinated biphenyl compounds with the following general structure:



The foundation of a PCB molecule is the biphenyl ring (two benzene rings connected together). Any combination of chlorine (Cl) and hydrogen (H) atoms may be connected to the ten available positions on the outside of the ring. Up to 209 combinations are possible.

PCBs were manufactured and commonly used as industrial chemicals with a wide variety of applications for several decades up until the mid-1970s, when production was stopped. In the United States, PCBs were manufactured by Monsanto Chemical Company and were marketed under the trade name "Aroclor." A number of commercial grades were manufactured and were categorized by the relative amount of chlorine atoms in the molecule.

The properties that made PCBs desirable as products in the past also create the environmental and health hazards. These properties include very high stability, especially at high temperatures; very low volatility (ability to evaporate at ambient temperatures); low solubility in water and a high affinity for organic compounds; nonflammability; and a density greater than water. In the environment, PCBs can accumulate to high concentrations in biological tissues, they are relatively resistant to biological degradations, and they adhere strongly to soil and sediments, particularly clays and fine sediments. For these reasons, PCBs are persistent, presenting a long-term environmental impact.

The presence of PCB contamination in Convair Lagoon was first determined during tissue sampling associated with the State of California's Mussel Watch Program (SMW). In 1977, the Regional Water Quality Control Board (RWQCB) established the SMW program to monitor the coastal marine, bay, and estuarine water quality on a long-term basis. SMW used specimens of Bay and California mussels (*Mytilus eduliss* and *Mytilus californianus*) to evaluate the bioaccumulation of trace metals and synthetic organic compounds. From 1979 to 1985, SMW conducted tissue analysis on Convair Lagoon mussels. Results of these analyses and additional sediment samples indicated the presence of PCB contamination in mussel tissue and sediment.

On October 17, 1986, the RWQCB Executive Officer issued "Cleanup and Abatement Order No. 86-92 for Teledyne Ryan Aeronautical near Lindbergh Field, San Diego County" for alleged violations of the "Comprehensive Water Quality Control Plan for the San Diego Basin," and for allegedly contributing to the condition of pollution in the Convair Lagoon portion of San Diego Bay. These violations pertain to the alleged discharge of waste containing PCBs, several trace metals, and volatile organic compounds to the storm drains on Teledyne Ryan Aeronautical property. Cleanup and Abatement Order No. 86-92 required cleanup and sampling of certain storm drain lines and sumps located on the Teledyne Ryan Aeronautical leasehold, sampling in Convair Lagoon, and full characterization of contaminated sediments in Convair Lagoon. On December 9, 1991, the RWQCB issued a final order to Teledyne Ryan to clean up the PCBs in the Lagoon below 10 parts per million (ppm) by June 1, 1994.

On July 14, 1992, the Board of Port Commissioners (Board) considered Teledyne Ryan's proposed remediation project to remove PCB-contaminated sediments in Convair Lagoon, San Diego, California. The Board directed the preparation of an environmental document to evaluate the potential environmental effects of such a project and consider alternatives to the intrusiveness of the confined disposal facility.

3.0 DESCRIPTION OF PROPOSED PROJECT

3.1 PURPOSE AND OBJECTIVES OF THE PROJECT

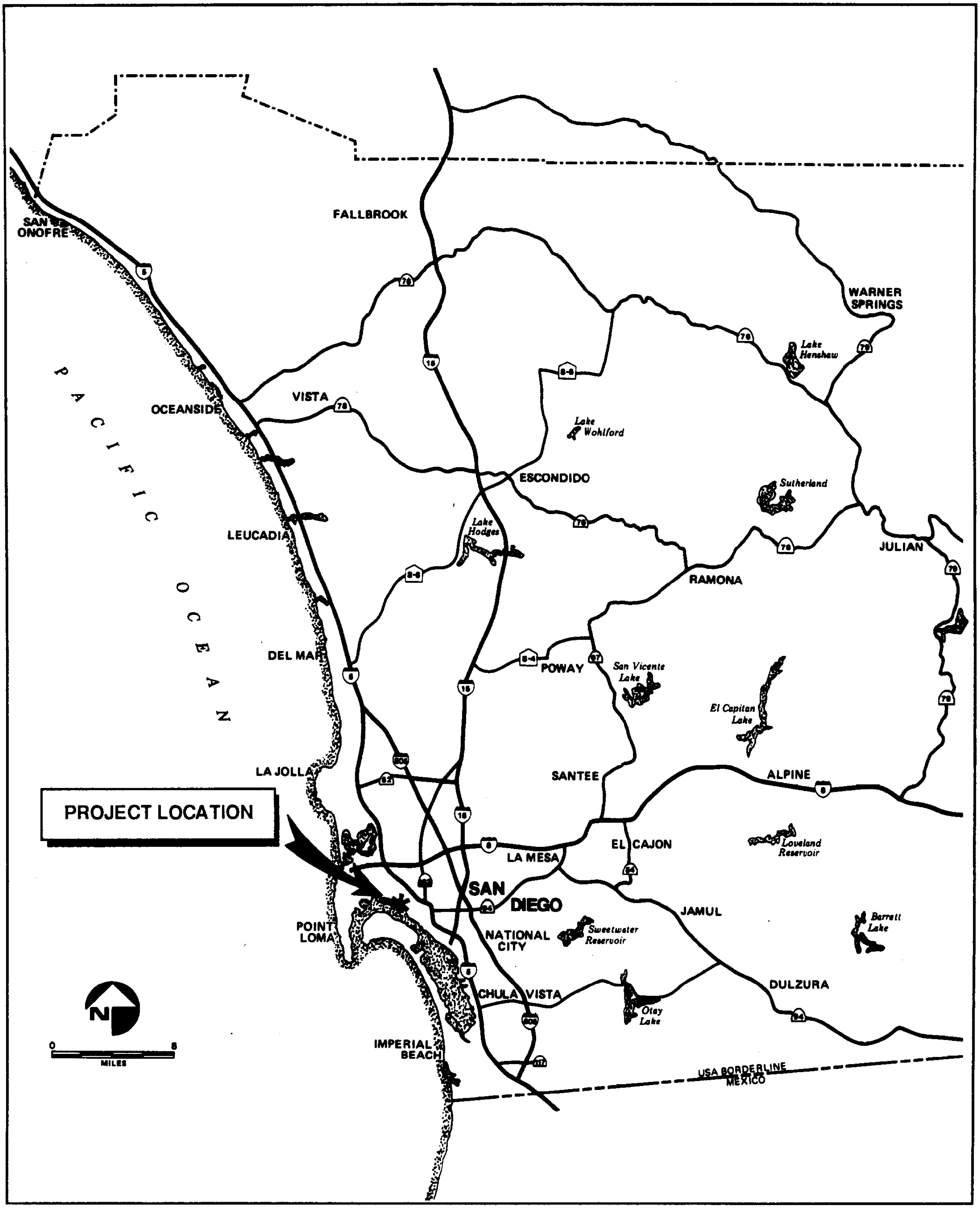
The purpose of the project is to isolate PCBs from the environment. On October 17, 1986, the Regional Water Quality Control Board (RWCQB) Executive Officer issued "Cleanup and Abatement Order No. 86-92 for Teledyne Ryan Aeronautical Near Lindbergh Field, San Diego County" for alleged violations of the "Comprehensive Water Quality Control Plan for the San Diego Basin," and for allegedly contributing to the condition of pollution in the Convair Lagoon portion of San Diego Bay. Cleanup and Abatement Order no. 86-92 required cleanup and sampling of certain storm drain lines and sumps located on the Teledyne Ryan Aeronautical leasehold, sampling in Convair Lagoon, and full characterization of contaminated sediments in Convair Lagoon. On December 9, 1991, the RWQCB issued a final order to Teledyne to clean up the Lagoon below 10 ppm by June 1, 1994.

3.2 LOCATION

The proposed Convair Lagoon Remediation Project is located within the eastern portion of Convair Lagoon, San Diego Bay, in the City of San Diego, in San Diego County (Figures 3-1 and 3-2). The proposed project is located immediately west of the U.S. Coast Guard facility and immediately south of Harbor Drive.

3.3 PROJECT DESCRIPTION

The proposed remediation project for Convair Lagoon consists of a combination of dredging and containment to isolate PCBs from the environment. Approximately 13,300 cubic yards of sediment would be hydraulically dredged from the Lagoon and pumped directly into a Nearshore Containment Facility (NCF). A detailed "Basis of Design Report" was prepared for the NCF in Convair Lagoon and is included as Appendix A. The NCF would consist of a sheet-pile bulkhead with a riprap base which would accommodate the volume of dredge material, provide sufficient volume for the settlement of dredge material, and effectively isolate PCBs from the environment by construction of impermeable walls and the installation of an impermeable surface liner (Figure 3-3).



FIGURE

OGDEN

Regional Location of Project Site

3-1

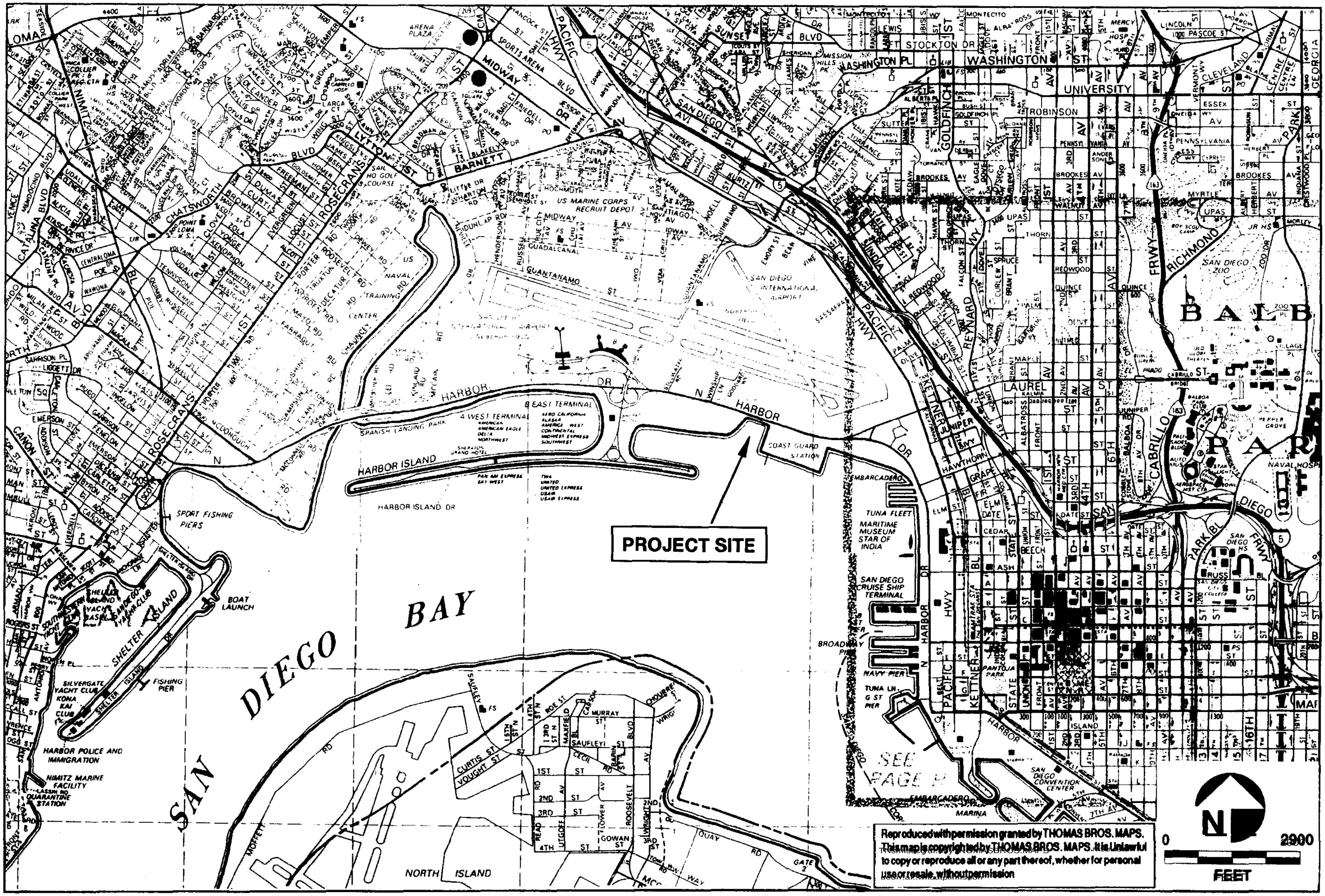
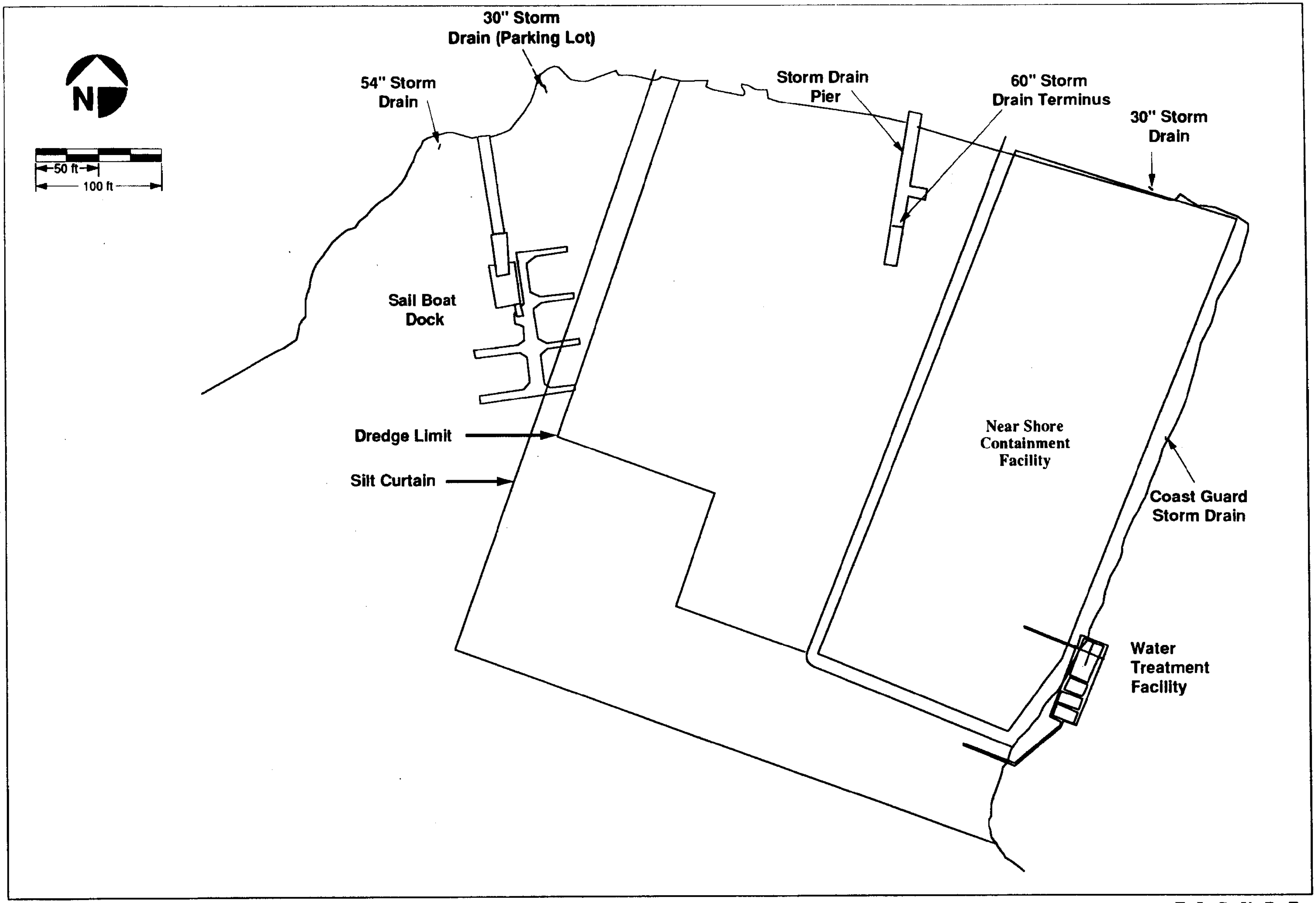


FIGURE 3-2

OGDEN

Site Vicinity Map



OGDEN

Proposed Nearshore Containment Facility

FIGURE 3-3

The NCF would occupy an area approximately 430 feet x 177 feet along the north side of the U.S. Coast Guard facility. The facility would accommodate approximately 34,000 cubic yards of dredge material and the steel sheet piling would be constructed to an elevation of 12 feet to provide 2 feet of freeboard dredging. The riprap toe protection blanket would be installed on the Lagoon floor outside the steel sheet wall to minimize erosion due to wave action. Construction of the inner facility would include placement of an impermeable inner liner of bentonite or similar material to prevent leaching of PCBs into the Lagoon.

Settling of dredged material within the NCF will generate water which must be treated in a treatment facility; a temporary water treatment facility (WTF) is proposed adjacent to the NCF on U.S. Coast Guard property. Treatment would occur at a rate compatible with the dredging and settling schedule, and three treatment processes in series would be used to remove PCBs and other contaminants from the water which would then be pumped back into the Lagoon. Monitoring would be conducted in the sediment and in the water column during and immediately following the remediation to document the success of the dredging and to ensure continuing water quality. In addition, piezometers would also be installed to monitor the long-term performance of the NCF.

After a period of several months, the dredged sediment would consolidate and dry out, at which time approximately 14,000 cubic yards of imported clean fill would be placed on top of the sediments to bring the facility to an elevation level with shoreside topography. Prior to placement of this fill material, a high density polyurethane membrane would be laid over the top of the facility to prevent infiltration of rain or runoff.

The proposed location of the NCF in the northeast corner of the Lagoon would not cover the 54-inch, the western 30-inch, or the 60-inch drain outlets. However, the proposed NCF would cover the present location of the eastern 30-inch drain outlet and the smaller Coast Guard Station drains.

Based upon an onsite investigation, two alternatives for the 30 east drain were identified. In the first alternative, the 30 east drain would be extended southwest through the NCF to a new outfall location behind the NCF bulkhead wall. The extension would continue in the same direction as the existing pipe (no bends), would be larger than the existing pipe to reduce backpressure effects due to its greater length, and would be pile-supported across the NCF to avoid settlement damage to the pipe extension. In the second alternative, the

30 east drain pipe would be terminated in a manhole at a point landward of the beach and rerouted to the west beyond the NCF and then south to the Lagoon next to the 60-inch outfall. Two new manholes would be required and two changes in direction would be introduced. Hydraulic analysis indicates that the second alternative is the best option for the 30 east pipe.

Estimated cost for constructing and monitoring the NCF, excluding the mitigation cost for filling in the bay, is about $10,000,000.

3.4 ALTERNATIVE FORMS OF REMEDIATION

CEQA requires that an EIR "(d)escribe a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project, and evaluate the comparative merits of the alternatives." For the purpose of this EIR, four alternatives have been identified which could eliminate or reduce the impact resulting from the presence of PCBs in Convair Lagoon. These alternatives are subsurface bioremediation, chemical fixation, incineration, and capping of contaminated bottom sediment. CEQA also requires that the specific alternative of "no project" be evaluated. This EIR evaluates all viable alternatives at the same level of specificity as the proposed project to allow the Board of Port Commissioners and other decision-making bodies to reach consensus on a reasonable approach to remediating the impacts.

Because the purpose of this project is to remediate the impacts of PCBs in Convair Lagoon, alternative sites will not be considered.

3.4.1 No Action

The No Project or No Action alternative would retain the project site in its current condition including the presence of PCB contaminated sediments. This alternative would be contrary to the RWQCB's "Cleanup and Abatement Order No. 86-92 for Teledyne Ryan Aeronautical Near Lindbergh Field, San Diego County." "Where short term risks and effects can be tolerated and statutes do not require remediation or establish other preferences . . ., the preferred remedy is to implement pollution prevention measures and source controls and to allow natural cleanup processes such as biodegradation and the deposition of clean sediments to restore the site (EPA 1992)."

3.4.2 Incineration

This alternative first involves the removal of contaminated sediments by dredging in increments to the desired depth. The removed sediment slurry would then be pumped to a barge for dewatering. Recovered water would be treated as necessary and returned to Convair Lagoon. The dewatered sediment would be transported by truck to an incinerator specially permitted to burn PCBs in accordance with TSCA (Toxic Substances Control Act) standards.

Incineration is a demonstrated technique for effectively destroying PCBs. For materials containing high concentrations of PCBs, incineration is the preferred method of treatment. However, in this application to the remediation of Convair Lagoon, the option of dredging and incineration creates a number of negative impacts. Dredging of the sediment creates the potential to resuspend and redistribute contamination within the Lagoon and possibly into San Diego Harbor if silt curtains are not completely effective. Dewatering would require treatment of the resulting water prior to discharge into the Lagoon.

Approximately 22,000 cubic yards of sediment would have to be dredged out of the Lagoon in this alternative. Loading of the sediment into trucks, and transportation to a licensed PCB incineration facility would involve considerable logistics. The closest incinerators capable of treating the quantity of sediment that must be dredged from Convair Lagoon are in Texas and Arkansas. Transportation of 22,000 cubic yards of sediment would involve over 2,000 truckloads of sediment.

Shipment of the sediments would have to be done in leakproof covered containers (such as roll-off bins) or truck trailers. Liquids cannot be allowed to drain out of the bottom of the container. The shipment of the sediment would create the potential for a release of PCBs as a result of a traffic accident. Although a release would not create an immediate acute hazard (such as a release of toxic vapor), there would be the potential for skin contact. Also, extensive cleanup would have to be done to meet PCB spill cleanup requirements mandated by the Environmental Protection Agency. For example, a spill of PCBs onto the ground or onto pavement would require thorough cleaning of the soil or pavement, or removal, followed by the collection and analysis of samples to confirm that the cleanup or removal was effective. The handling and conveyance of the sediment from the dredging equipment through dewatering and into the trucks would also create the opportunity for an accidental spill of PCB-contaminated sediment in the staging area adjacent to the Lagoon.

Although incineration is a demonstrated technique for destroying PCBs, the cost of the process is high. The estimated cost depends upon the amount of sediment to be removed, the dredging and dewatering systems, transportation fees, and incineration fees. The combined cost could likely range from $40 to $100 million. Factoring in the cost of the alternative, and the potential for impacts on human health through accidental releases during handling and transportation, this alternative is not considered to be viable.

3.4.3 Subsurface Bioremediation

Bioremediation is a process by which organic chemicals are literally consumed as a food or energy source by microorganisms (typically bacteria). Bioremediation has been applied extensively to the cleanup of hydrocarbon fuels, such as gasoline and diesel fuel, in soil on land. Although PCBs are known to be very resistant to microbial degradation, research has shown that under the right conditions, they may be degraded. However, the rate of degradation of PCBs is considerably slower than for hydrocarbon fuels.

This alternative proposes to use an experimental system consisting of a hollow caisson, such as a vertical concrete storm drain pipe section, with a rotating impeller suspended through the axis of the pipe. This technology is believed to be adaptable from similar applications. Remediation occurs as the caisson is advanced into the PCB-contaminated sediments. The impeller mixes the sediment as nutrients are added. With the addition of nutrients, the native PCB-degrading microorganisms are stimulated to degrade the PCBs.

Although this alternative is theoretically possible, a number of problems prevent this alternative from being successful during the time frame necessary to complete this project. Bioremediation is not effective in completely removing contaminants, but rather accomplishes only bulk removal. Theoretically 90% degradation of PCBs may be achievable with bioremediation; however, this level of removal would not meet the cleanup criteria of 10 ppm in the more heavily contaminated areas of the Lagoon.

Compared to other common remediation processes for contaminated soil, bioremediation is a relatively slow process, even for readily biodegradable materials, such as gasoline. PCBs are slower to degrade than fuel hydrocarbons. Current research indicates that the microbiological degradation of PCBs is a two-stage process. The first stage is anaerobic in which specific microorganisms essentially remove chlorine atoms from the PCB molecules.

The second stage is aerobic in which a different group of microorganisms degrade the biphenyl foundation to relatively harmless by-products. The two stages require significantly different conditions and cannot be done simultaneously.

Even with multiple caissons, mixing sediment and nutrients in one area, and then moving on to another area, this process is expected to require years, and still not reach the necessary cleanup levels. The effects of the elevated levels of heavy metals on the microorganisms are unknown, and would require treatability testing to determine their viability. Also, bioremediation is not an effective technique for destroying or removing heavy metal contaminants.

This technique would homogenize the sediment, causing some of the more heavily contaminated areas to be brought up to the water-sediment interface. This could potentially create impacts on water quality, and ultimately, marine resources.

Bioremediation has not been demonstrated on a large scale in a marine environment, such as would be required in Convair Lagoon. A series of bench- and pilot-scale treatability tests would be necessary to demonstrate the viability of this alternative, and to develop full-scale design criteria.

With the lack of definition of this alternative and the lack of comparable demonstrated experience on the scale of this project, it is difficult to accurately estimate the cost of this alternative. However, with the considerable processing and handling necessary, this alternative is anticipated to cost at least $40 million.

Considering that the likelihood of success of this alternative is uncertain at best, and considering the long time necessary to accomplish the cleanup (and the shortfall in attaining the mandated cleanup level), this alternative is not considered viable.

3.4.4 Chemical Fixation

Chemical fixation is performed in a specially designed processing unit by adding a predetermined reagent formulation to the waste material. Through a series of chemical reactions, the contaminated soils or sediments become encapsulated, rendering them safe, non-polluting, non-leachable, and chemically and physically stable. Following stabilization, the material may be placed back into the site or sent to a municipal landfill.

Chemical fixation involves a chemical bonding of the contaminants to the binding agent. It is unlikely that a single binder will fix both the PCBs and the heavy metal contaminants in the sediment. However, other processes (including stabilization, solidification, and encapsulation) are available that create a solid matrix that immobilizes and isolates the contaminants from the environment. Binders for stabilization, solidification, and encapsulation typically include cement, pozzolanic agents (similar to cement), silicaceous compounds, and polymers. For the purposes of this discussion, all of these related processes are included. It is important to recognized that some areas of PCB contamination in the Lagoon exceed the maximum limits of 200 parts per million established by some of the particular processes.

For this application, it is anticipated that 22,000 cubic yards of contaminated sediment would be dredged from the Lagoon and pumped to a processing unit on the shore adjacent to the Lagoon. In this unit, the sediment would be dewatered as necessary, followed by mixing with the binding agent and other chemicals as necessary. The slurry of sediment, water, and binding agent would then be pumped to a location where it would be allowed to set or cure. Once cured, the resulting solid matrix would be broken or ground up and returned to the Lagoon or transported to a landfill.

This alternative has been identified as potentially applicable to Convair Lagoon, but has not been well defined. In addition to the uncertainty of the technical feasibility, a number of factors have been identified that jeopardize the viability of this alternative. These factors are described below.

The long-term viability of the process depends on the ability of the matrix to remain intact. Should the matrix break down, the PCBs and/or metals could be released into the environment. The marine environment is particularly aggressive, and as such, the matrix would be more susceptible to degradation. The processes that use cement or pozzolanic materials may be complicated by the fact that PCBs and oil in the sediments, and halides, such as the chloride, in seawater retard the setting process. This would lengthen the setting time, and could reduce the strength of the solid matrix which, in turn, would jeopardize the ability of the matrix to retain the contaminants. Halides also tend to be easily leached from the solid matrix, potentially compromising the stability of the matrix.

Adding a binder to the sediment would increase the volume of material that is either returned to the Lagoon or sent to a landfill. If the material is returned to the Lagoon, the additional volume could reduce the amount of intertidal habitat available or create new uplands. Also, since the solid would be in the form of rock-like chunks or gravel, the nature of the matrix may not be compatible with the desired flora and fauna in the Lagoon. Even though the stabilized material would immobilize and isolate the PCBs and metals, it is likely to be difficult to find a municipal landfill that would accept the resulting solid since it would still contain PCBs.

Polymers may also be used to stabilize the sediment. Polymers that have been used for stabilizing contaminated soils include thermoplastics and urea-formaldehyde resins. Both of these processes introduce hazardous materials into the process, either through the use of the original monomers or through plasticizers that participate in the reactions. PCBs and oils may retard the set of urea-formaldehyde polymers.

Dewatering is likely to be required for any of the processes. As such, wastewater treatment, similar to the requirements for the nearshore containment facility, would be necessary. The processing equipment and space to set or cure the solid will require area that is limited in the vicinity north of the Lagoon.

The processes required for chemical fixation would require considerable handling and processing. The ability of these processes to effectively treat the PCB and metal contamination is best characterized as uncertain. A series of treatability tests would be necessary to determine the effectiveness of the process, as well as to develop the data necessary to design the process. The long-term viability of the solid matrix is also unknown. Although the PCBs and metals would be better isolated under this alternative than under the No Action alternative, long-term monitoring would be necessary to ensure that the contaminants continue to remain out of the environment.

This alternative is not well defined and an accurate estimate is not possible without additional testing and design. However, with the considerable processing and handling necessary, this alternative is expected to cost at least $30 million. Combining this with the uncertainty of the technical feasibility and other issues, this alternative is not considered viable.

3.4.5 Capping of Contaminated Bottom Sediment

The Sand Capping alternative would cover the existing contaminated sediment in Convair Lagoon with a layer of uncontaminated "clean" material. Based upon similar capping projects, the feasibility level costs for this alternative may range from $1-2 million. The following discussion provides an overview of the capping technology, the physical and biological constraints to capping in Convair Lagoon, and a conceptual capping plan.

3.4.5.1 Overview of the Capping Technology

Capping Concept

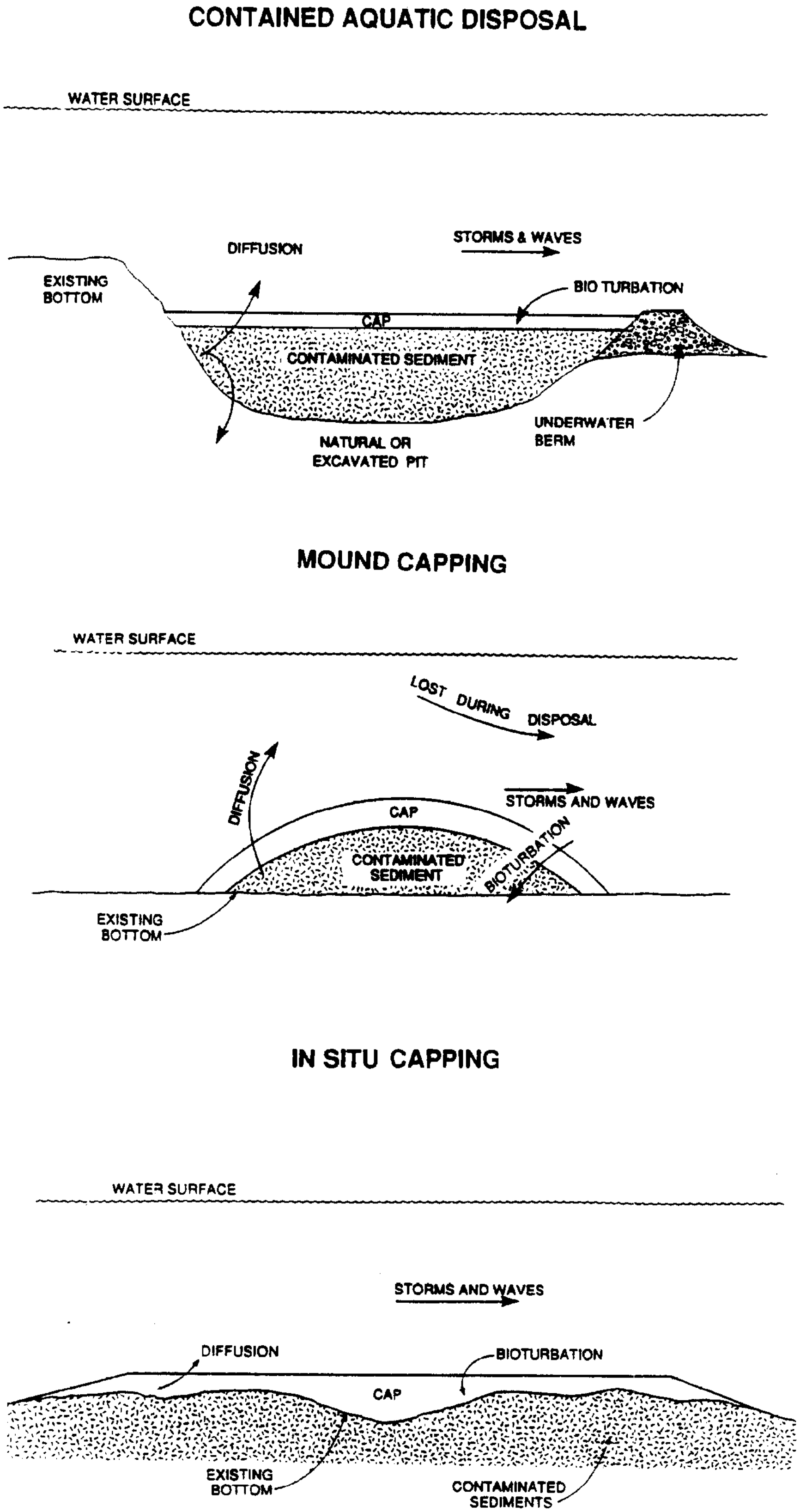
Capping is used as a containment technology for contaminated sediments in rivers, bays, estuaries, and oceans, both nationally and internationally. As defined in this context, capping is the controlled and accurate placement of a clean isolating layer of material over clean or contaminated subaqueous material (sediment). Capping has been used for isolating contaminants in material that has been removed or "dredged" and placed in a subaqueous environment, and for containing sediments that remain in place. The following provides a definition of the capping methodologies used:

- Contained aquatic disposal (CAD): removal of sediments and placement of the sediments into an existing depression or pre-excavated disposal pit followed by capping with clean dredge sediment or sand.

- Mounding: level bottom dumping of materials in a discrete mound, followed by capping. Mounding is often used in subtidal areas where is it impractical to excavate a pit for containment. Material is dumped in a cohesive mass that forms a mound and is then capped with clean sediments.

- *In situ* capping: emplacement of clean material over in-place contaminated material. *In situ* capping is used when it is preferable to contain the sediment in place rather than to remove it. The majority of the materials used in ***in situ*** capping are clean dredge material and processed sand. Liners have not been routinely used and are experimental.

Figure 3-4 illustrates the three forms of capping defined above.



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Three Forms of Capping

FIGURE 3-4

Development Status and Overall History of Application

One of the first documented projects to apply the capping technology was conducted in 1977 by the Army Corps of Engineers, New England Division (O'Connor 1983). Discussions with the Army Corps of Engineers (Dr. Fredette 1991), indicate that capping of contaminated sediments to protect the environment has also been conducted by de facto (not mandated by regulatory agencies) as early as 1967. The concept of containing sediment contamination by placing a clean layer of isolating media has been used in government dredge disposal projects (New York Mud Dump), Superfund remediation (Simpson Kraft), and for privately funded remediation projects (Portland General Electric) (see Appendix B). Capping has also been used for bottom stabilization of sediments (Lofgren 1990) as well as contaminant isolation.

Appendix B lists selected capping projects both nationally and internationally. All of these projects involve capping of contaminated sediment with inert material (most frequently dredge sand). *In situ* capping projects include:

- Denny Combined Sewer Overflow (CSO) constructed in 1990, Seattle, WA.
- Pier 53 in Elliott Bay constructed in 1992, Seattle, WA
- Simpson-Kraft constructed in 1988, Tacoma, WA
- Several Japanese projects (Kure Bay, Lake Biwa, and Hiroshima Bay) constructed in the 1980s

Examples of contained aquatic disposal (CAD), level bottom dumping (LBD), as well as *in situ* capping are also described in Appendix B. The Duwamish Waterway project is a CAD project constructed in 1984 that has been monitored since construction to determine the effectiveness of the capping in containing polychlorinated biphenyls (PCB) contamination. Other projects in New England involving mound capping also provide insight into the long-term application and effectiveness of capping.

Principles and Objectives

The principle of the capping technology is to contain the sediment contamination in the nearshore and aquatic environment, and prevent exposure to the biota and physical surroundings by placing an isolating media over the contaminated sediments. The cap material may also be required to provide a suitable biological habitat.

The objective in applying capping is to confine the contaminated sediment and prevent chemical and biological exposure. Cap integrity should be maintained given physical factors such as wave action and boating impacts. These cap design objectives should be met given the following considerations:

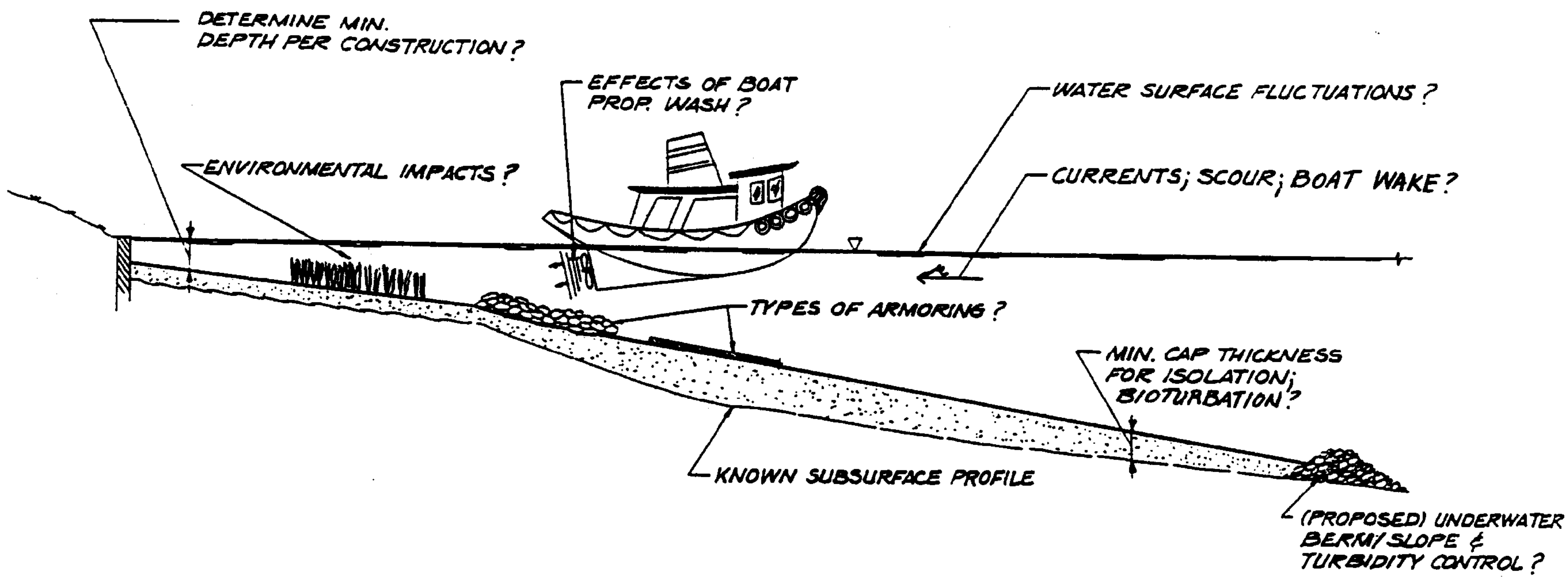
- the characteristics of the sediment to be capped
- cap material characteristics
- site characteristics: physical and biological
- cap placement and construction
- short and long-term monitoring

Factors that Impact the Effectiveness of Capping

A cap is effective if it isolates the contaminants given the physical and biological influences at the site. A cap must be designed to account for potential failure due to chemical diffusion, bioturbation (the action of biota burrowing and tube building in the sediment), and physical effects such as currents and boat propwash. Figure 3-5 illustrates the issues impacting a capping project. The type of material, thickness, and placement all impact the effectiveness of the cap. The impacts of diffusion, bioturbation, and physical constraints are briefly reviewed as follows.

Cap Thickness and Chemical Diffusion

Both laboratory and field studies have been conducted on the effectiveness of varying types of capping material (O'Connor, Brannon, Sumeri, Stanton studies). The effectiveness of capping contaminated sediments using various materials of differing thickness has been researched in laboratory studies (Brannon 1987). These laboratory studies attempted to simulate the water column in determining the required cap thickness for chemical isolation.



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Capping Issues

FIGURE 3-5

Brannon's study (1985) used laboratory reactor cells to test sand and silt caps for chemical isolation. In all cases, a 50-centimeter (cm) cap provided adequate isolation when non-burrowing clams and burrowing polychaete were added. It should be noted that some chemical isolation was found with as little as 5 cm (2 inches) of cap, with the greatest chemical isolation found with a 50 cm (20 inches) cap thickness.

Similar laboratory studies were conducted (Gunnison, et al. 1987) to determine the minimum thickness of cap to prevent chemical diffusion and bioturbation. Small reactor cells were used to assess the cap thickness. The study showed that a 30 cm (12 inches) cap effectively isolated the contaminated sediment (polycyclic aromatic hydrocarbons (PAHs), PCBs, and heavy metals) from the overlying water and biota. To protect against burrowing biota an additional 20 cm (8 inches) of cap was recommended for a total cap thickness of 20 inches.

Various types of capping material (sand, silt, clay) have been tested to determine their ability to control chemical diffusion and limit bioturbation (Bosworth 1990). In the study by Wang et al. (1991) four different types of capping material were tested that varied in composition, bulk density, and organic carbon. The capping material was tested in a reactor cell that mimicked the aquatic environment. The goal was to determine the "break through time" of the cap, or the time when contaminants are not contained by the cap. This data provides valuable information on the impacts of varying material characteristics (such as organic carbon and grain size) on the effectiveness of the cap.

In summary, chemical isolation varied with differing cap materials and thickness. In general, a minimum of 20 cm (8 inches) and up to 50 cm (20 inches) was found to maintain chemical isolation.

Cap Stability and Physical Impacts

Field studies and long-term monitoring also provide valuable data on the effectiveness of capping. Both sand and silt were used to cap contaminated sediment at the Central Long Island Sound site. Fine, silty material was capped with sand in one location and silt at another location. The two sites were then monitored to determine the effectiveness of the different cap material in isolating the contaminated sediments (O'Connor 1983).

Both materials were found to successfully contain the sediments; however, since the sand cap was not cohesive, it was placed more uniformly than the cohesive silt. This even coverage resulted in a more stable cap design. Subsequent investigations have shown that the sand cap remained in place during major hurricane events, while the silt cap experienced some erosion (Stanton undated).

Cap material selection must consider the hydraulic conditions at a site. The capping project at Portland General Electric was a high-energy intertidal site that required special design to prevent erosion of the cap (Sanders 1990). The cap design accounted for the impact of wave action and boat wakes as well as storm events on the cap. The cap was composed of a sand layer and a layer of "armor" material. The armor material prevented the erosion of the protective sand layer.

Capping for Biological Isolation

Of key interest in the *in situ* isolation of contaminants is the potential of disruption of the clean sediment layer. The clean sediment layer should isolate both chemically and biologically; therefore, the impacts from benthic organisms redistributing sediment by burrowing, ingestion/excretion, tube building, and other activities (called bioturbation) are a key concern. The depth of bioturbation is very site dependent. The cap must be of adequate thickness to prevent the majority of burrowing aquatic organisms from reaching the contaminated sediment and should provide a suitable media for their recolonization. The activities of these benthic organisms should be well known prior to proposing any action at any contaminated sediment site. More detailed discussions of bioturbation at Convair Lagoon are presented in Section 5.2.

Previous studies and projects indicate that capping has been used to effectively isolate contaminated sediments. Capping has been applied to both subtidal and nearshore environments (see Appendix B).

For a cap to be effective it must be designed and constructed to maintain physical, chemical, and biological isolation. Suitable capping material should be selected to insure effectiveness of the cap given the site conditions. The cap should be designed and constructed to resist erosion and bioturbation.

To determine if capping can be applied effectively at a given site, physical and biological characteristics or constraints of the site must be identified.

Case Studies for Capping Contaminated Sediment

The long-term monitoring of past capping projects presents information on the effectiveness of capping in isolating contaminated sediment. Observations of capping projects over several years (over 11 years in New England and over 7 years in Puget Sound) indicate that the cap has effectively isolated the contaminants (Sumeri, et al. 1991).

Contaminated dredge sediment was capped in Central Long Island Sound in 1979. Results from the 1990 sediment coring project of the cap indicate that chemical diffusion had not occurred. The cap isolated the PCBs, PAHs, and metals in the sediment. With cap thickness ranging from 54 to 140 cm, only the lower 10 cm (4 inches) was considered the transition zone where some mixing of the cap and sediment occurred.

Similar results were obtained at the Mud dump site in New York. In a cap with an average thickness of 1.1 meters, there was a sharp chemical interface between the cap and the contaminated material. The cap continues to effectively isolate the contaminants (PCBs, pesticides).

In Seattle, Washington, the capping project on the Duwamish Waterway was carefully monitored over a five-year period (monitoring is ongoing to date). Sediment cores were taken to determine if the cap was effectively isolating the PCB contaminated sediment. The sediment profiles showed that there had been no diffusion between the contaminated sediment and the cap. Similar results have been found in a recent Seattle capping project. Monitoring of the Denny CSO capping project has found no observable movement of the contaminated sediment into the sand cap.

A short-term monitoring plan to mitigate the impacts of construction and insure accurate cap placement is also proposed. A long-term monitoring plan is also presented to ensure that the cap integrity is maintained.

3.4.5.2 Physical and Biological Constraints to Capping in Convair Lagoon

The primary physical and biological characteristics constraints of Convair Lagoon and how they impact capping are discussed in this section. Descriptions of the existing conditions were taken from existing reports and studies. The majority of the site information was taken from the "Convair Lagoon Basis of Design Report" by Ebasco Environmental for Teledyne Ryan Aeronautical (1992) and Sections 3.2, 4.0, 5.1.1, 5.2.1, 5.3.1, 5.4.1, and 5.5.1 of this EIR/RAP.

Site Description

Convair Lagoon is not an actual lagoon but rather a small (less than 10 acres), shallow (depths to -11.0 MLLW) embayment within San Diego Bay. The lagoon is located northeast of Harbor Island and west of the U.S. Coast Guard. The adjacent shore is used primarily for industrial purposes with General Dynamics, Teledyne Ryan Aeronautical, the Port of San Diego, and the Coast Guard maintaining facilities in the area. A six-lane thoroughfare, Harbor Drive, is located adjacent to the shoreline.

The shoreline access is restricted (fenced) and not available to the public. Some recreational use of the western portion of the lagoon is available as a sailing club maintains a dock in that area.

Storm drains from adjacent properties and upland drainage basins (Lindbergh Field) terminate at the lagoon. Several large storm drains (60-inch storm drain from the pier, 54-inch to the west and several small lines) outfall into the lagoon. Maintaining these drains is a priority for this site as they drain a significant area shoreward of the site.

Convair Lagoon has been used as a storage, retrieval, and dumping area for derelict vessels. Noticeable amounts of debris can be observed along the shoreline. Additional field investigations using sidescan sonar were used to more precisely locate the debris. Two sunken vessels, piping, and miscellaneous debris were documented. The approximate location and type of debris was mapped. This information will be valuable in developing the conceptual capping plan.

The sidescan sonar also located eel grass beds in the nearshore area. Approximately 1 acre of area appears to have eel grass or macroalgae. Figure 3-6 shows the location of the storm drains, bathymetry, and approximate location of eel grass beds.

Physical Characteristics

Prior site investigations used to develop the "Basis of Design Report" for the Nearshore Containment Facility provide information on the physical characteristics of the site (refer to Appendix A). Knowledge of these physical characteristics is important in the development of the conceptual capping plan. The following information is necessary to determine an appropriate capping approach:

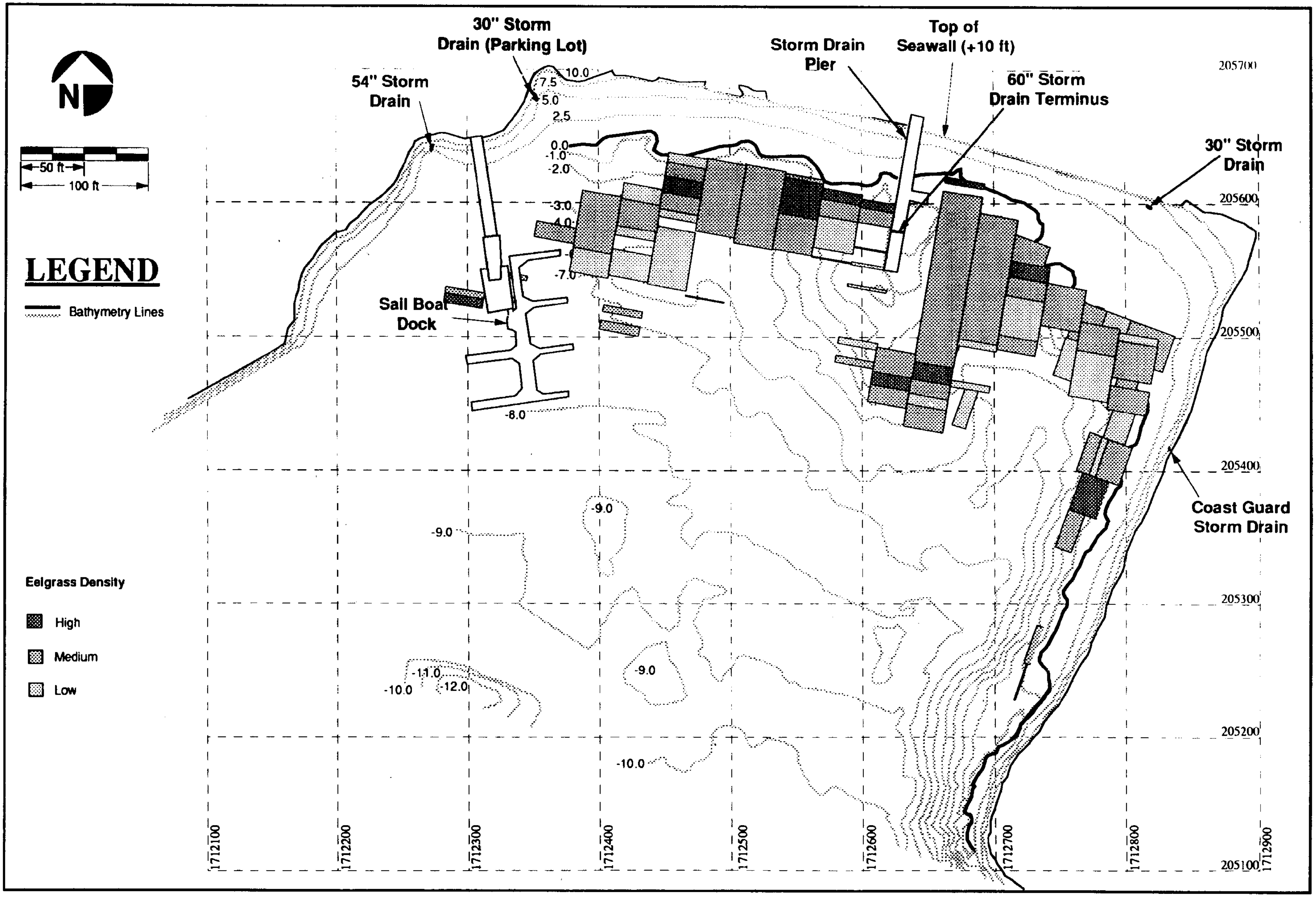
- water depths and hydrodynamic conditions
- sediment characteristics and stability issues
- extent of contamination
- subsurface obstructions and debris
- potential utilities impacted by cap
- recreational uses and boating impacts

Presently, there is limited information on the hydrodynamics of the site. A description of the circulation, bottom velocities, and other hydrodynamic data is lacking. Information does exist for tidal data and 50-year occurrence wave height. While this information should be verified, it currently provides the only information on the site's hydrodynamics.

A bathymetric survey was conducted for the site in conjunction with sediment sampling. In general, the lagoon is a shallow nearshore embayment with water depths from 0 to 11 feet. Shallow areas offshore occur at the 60-inch storm drain pier where there is a mounded area.

From these water depths the slope of the sediment can be determined. The lagoon has a shallow gentle slope seaward. At the eastern side adjacent to the Coast Guard area, the slopes steepen; however, the steepest slope is no greater than 6 feet horizontal to 1 foot vertical. Given these slopes, a cap should not greatly impact the stability of the sediments.

Although the sediment characteristics vary throughout the site, sub-bottom profiling indicates that the seabed is covered with fine-grained sediments of silt or clayey silt. Cores of the sediment confirm these results. The upper 4 feet of sediment is fine-grained and



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Eelgrass, Storm Drains, and Bathymetry

FIGURE 3-6

unconsolidated. From 4 to 7 feet, the sediment becomes coarser-grained and more compact.

The contamination is mostly contained in the upper 7 feet of sediment. The highest concentration of PCBs was located at 3 to 5 feet in depth. Moreover, the highest contamination is found in the northeast quadrant of the lagoon near the 60-inch storm drain pier.

The location of subsurface debris has been mapped and is presented in the Basis of Design Report. Much of the debris at the site appears to be relatively large objects such as derelict boats, piling, and other objects. While small objects can be readily capped (and in some cases larger objects), the presence of large debris will require modifications to the capping plan.

The primary utilities that would be impacted by capping are the existing storm drain lines. Several large storm drain pipes discharge into Convair Lagoon. The 60-inch storm drain pier, a 54-inch concrete storm drain near the sail boat dock, and two smaller (30-inch) storm drain pipes. Presently, the 54-inch pipe appears to be out of the area that would be impacted by a cap. The 60-inch storm drain pier is the primary pipe that would be impacted by the cap. The conceptual capping plan must account for modification of this discharge.

The site is also used by recreational boating. The impacts from boat wakes and anchoring need to be considered in the conceptual capping plan. In some areas, recreational boating may have to be restricted. Anchorage at Convair Lagoon would be prohibited in the areas that are capped.

Biological Characteristics

Convair Lagoon is a biologically sensitive area that provides habitat for the California least tern, eelgrass, and a wide range of biota. A complete description of the biological characteristics of the site is provided in Sections 5.2 and 5.3.

The intertidal habitat and foraging areas of Convair Lagoon are considered in the conceptual capping plan. The cap should maintain or improve the present biological habitat at the site. Cap material selection should consider the habitat requirements of the site. Enhancement for the loss of eelgrass by planting new eelgrass is assumed in the conceptual capping plan.

The addition of a cap over the contaminated sediment will increase the elevation of the site while reducing the subtidal area. This increase in intertidal habitat is a beneficial impact. Capping has been used to increase the intertidal area and provide additional habitat in several projects. Monitoring of the Simpson Kraft capping project in Tacoma, Washington, where *in situ* contaminated sediment was capped with clean dredge sand, has shown that the biological community increased and diversified after capping (Parametrix 1989).

Of key interest in the *in situ* isolation of contaminants, is the potential of disruption of the clean sediment cap. The clean sediment cap should isolate the contaminated sediment both chemically and biologically. Therefore, the impacts from benthic organisms redistributing sediment by burrowing, ingestion/excretion, tube building, and other activities (bioturbation) is a key concern. Preliminary studies of the benthic organisms at Convair Lagoon are discussed in Section 5.2.

These investigations indicate that deep burrowers, particularly "ghost shrimp," may be present in portions of Convair Lagoon (Section 5.2). In studies by Suchanek (1986), ghost shrimp were found to burrow to depths from 1 to 2 meters. Maintaining the integrity of the cap, given this burrowing depth, is a key concern in the development of a conceptual capping plan.

3.4.5.3 Conceptual Capping Plan

The information used for the development of the following conceptual capping plan (CCP) was taken from the Basis of Design Report and gathered from field observations and sediment sampling. Engineering judgment was used to develop the capping concept in the absence of more detailed information.

The capping plan was developed to address the physical and biological constraints of Convair Lagoon. In addition, the capping plan was developed to be readily constructed given known materials and construction techniques. Efforts were made to develop alternatives that reduced the overall environmental impacts to the site.

Short- and long-term monitoring programs are recommended. Short-term monitoring involves reducing the environmental impacts during construction by implementing controls.

Long-term monitoring will monitor the effectiveness of the cap over time. The proposed monitoring plans are outlined in this conceptual plan. Plan specifics should be developed after final capping plans are approved.

Proposed Cap Configurations

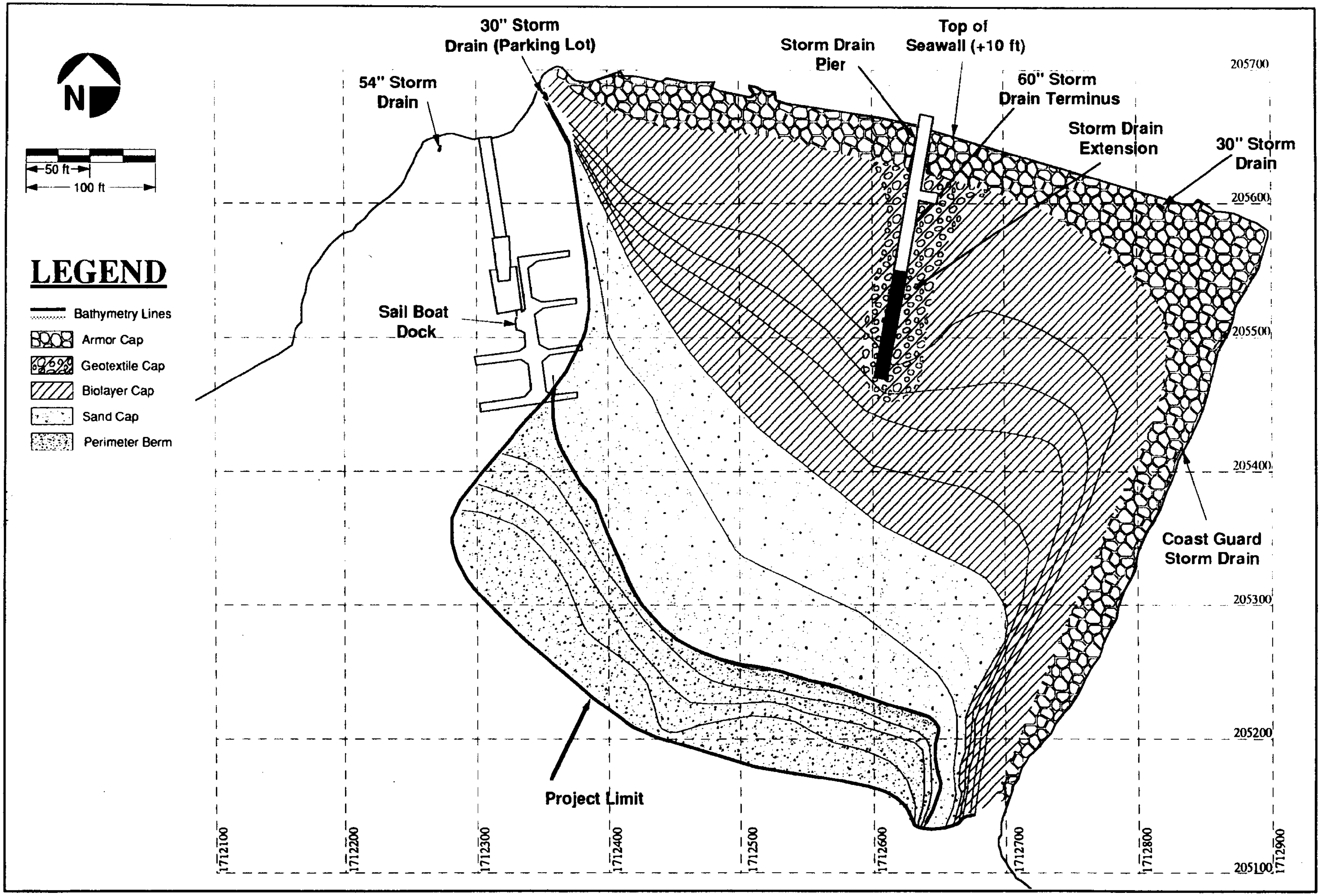
Several capping configurations are recommended for Convair Lagoon. These different configurations account for the varying site conditions observed in Convair Lagoon. The cap configurations account for high-energy conditions, biological disturbances, and quiescent site conditions. Different cap configurations were developed given the site constraints and will be used as warranted within the lagoon.

High-Energy Cap Configuration

Although there is limited hydrodynamic data for the lagoon, the site appears to be relatively quiescent with limited erosion. The Basis of Design Report indicates that fine grain sediment exists throughout the embayment area, which indicates limited erosive conditions.

Areas of shallow shoreline contamination may be exposed to wave action and boat wakes. The wave action may cause erosion of the cap. These areas are referred to as "high-energy" areas; therefore, a shallow energy area (such as the embayment) may also have a higher energy area "nearshore" that would be impacted by boat wakes and waves. The importance of distinguishing these areas is that the cap material must be protected from erosion in these locations. Suitable armoring material must be placed over the cap to ensure the long-term cap integrity.

A high-energy cap is a thick-section cap consisting of sand, gravel filter material, and riprap (or smaller quarry rock). The sand provides the chemical isolation, and the gravel filter and riprap are used to protect the cap from erosion. This type of high-energy (armor) cap design was used in capping the PGE Station L site on the Willamette in 1990. This cap configuration was designed to withstand boat wakes and waves in excess of 3 feet. It is anticipated that a similar cap should meet Convair Lagoon's 50-year-occurrence wave of 2.8 feet. Figure 3-7 shows the proposed location of the high-energy cap. Figure 3-8 provides further detail of the high-energy cap configuration.



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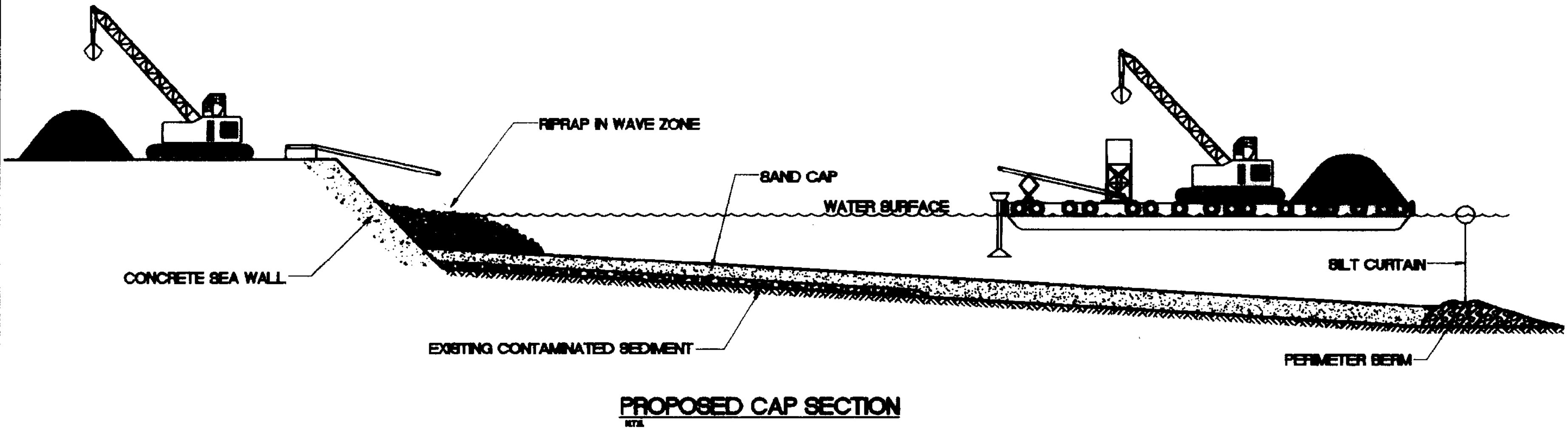
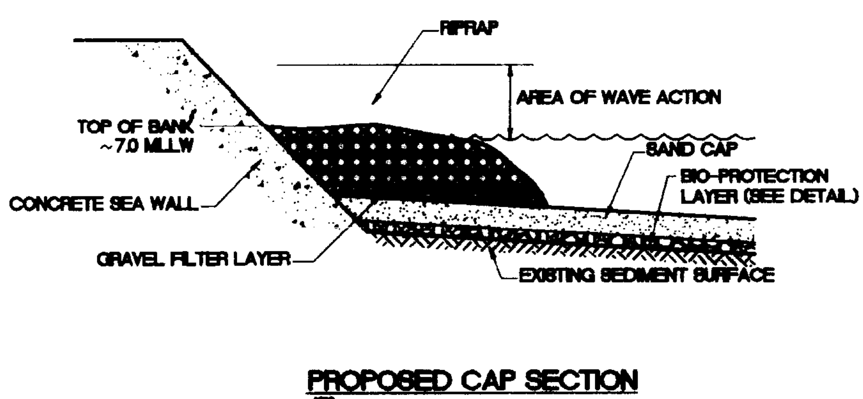
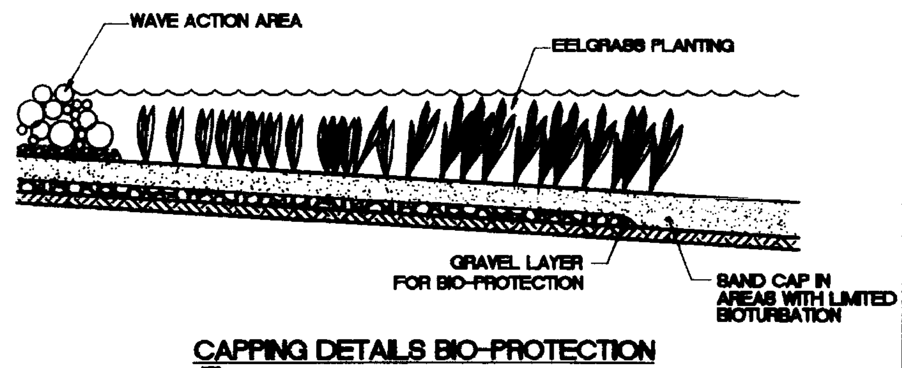
Conceptual Capping Plan

FIGURE 3-7







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Capping Details

FIGURE 3-8

Geotextile/Cap Configuration

Capping in the area of the 60-inch storm drain pier presents a challenge. While the smaller storm drains would require little or no modification to accommodate a cap, the 60-inch storm drain system would require modification to cap the contamination in this area. Since the sediments in the vicinity of the storm drain pier contain higher levels of contamination, capping in this area is a primary concern. Therefore, prior to any modification to the storm drain pier the following measures should be implemented:

- Prepare the surface by removing debris.
- Place a geotextile liner in the area where construction will occur. A thin layer of sand should be placed on the liner to reduce the buoyancy. The geotextile should prevent disruption of the contaminated sediment.
- A high-energy cap section or similar should be placed along both sides of the pier to isolate the contaminated sediment and provide equipment access for pier extension.
- The new discharge of the storm drain pier should contain energy dissipators (concrete or rock blocks) to slow the discharge and prevent erosion of the cap.

Modification of the 60-inch Storm Drain Pier

The Basis of Design Report indicates that the 60-inch storm drain system is significantly underdesigned for its current capacity (461 cubic feet/sec). This storm drain system drains a significant area north of the lagoon including Lindbergh Field. Modifications to the storm drain should not further restrict the capacity of this line.

Since capping would raise the bottom in the area of the drain terminus, the drain should be extended to deeper water. The capacity of the line would not be significantly affected given its present use. The drain should be modified in the following manner:

- Enclose the two end piling with precast "L" sections to further extend the existing structure. Place a concrete slab or concrete liner on grade. The concrete slab would cause some settlement in the sediment to provide a shallow slope for drainage. No dredging is anticipated.

- Use precast-concrete, inverted "T" sections to extend the channel. The storm drain should be extended approximately 80 feet.

- Cap and armor on both sides of the channel and at the discharge point.

These modifications provide several advantages. First, they can readily be made using existing material and technology. Second, they limit exposure of contaminated sediment to humans or the environment since there is no removal of the sediment. Furthermore the highly contaminated material is isolated under a liner, the new concrete pier, and armoring. The capacity of the line is not decreased and in cases of high flow the channel can overflow.

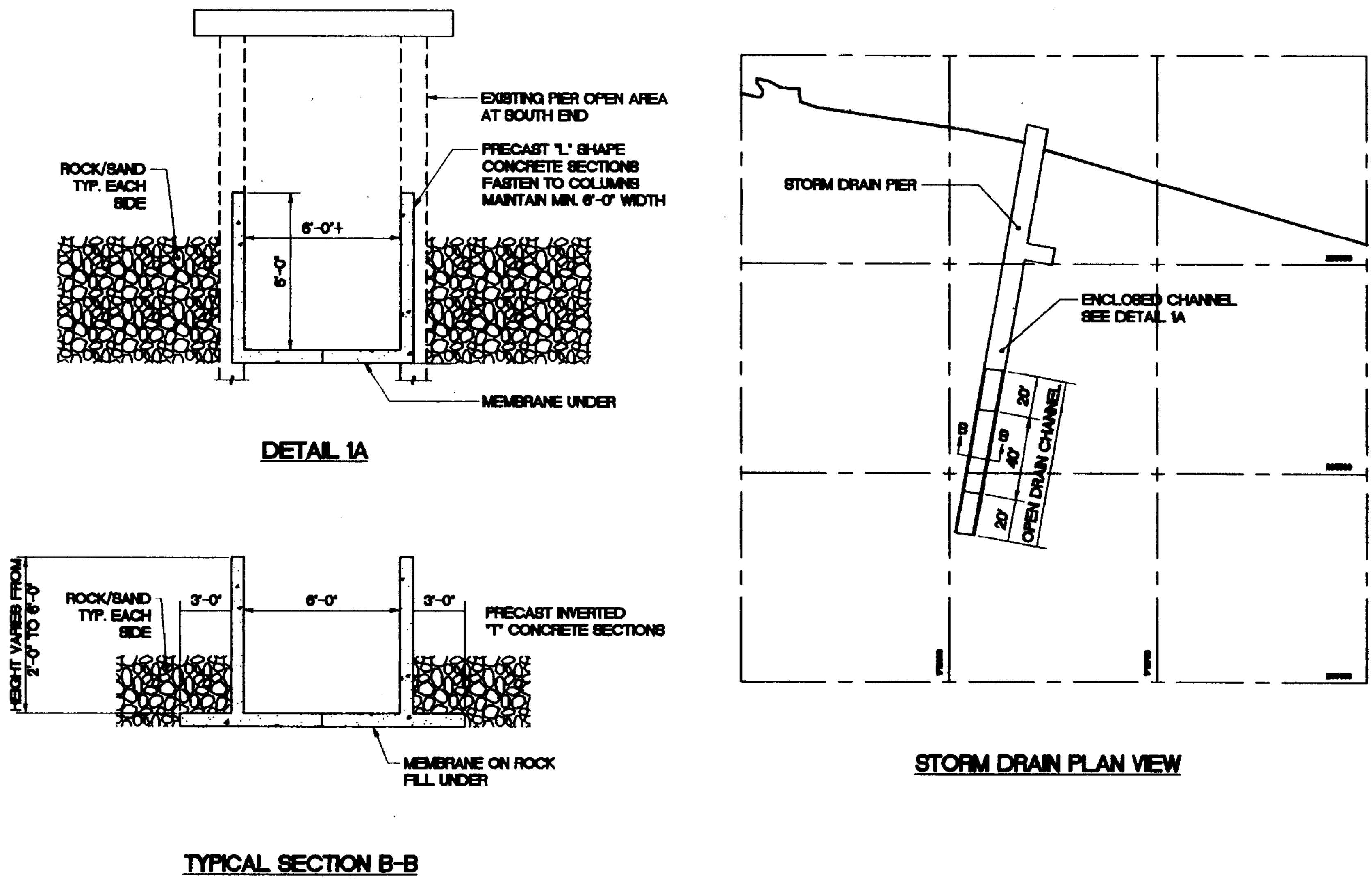
Figure 3-9 provides the details for the proposed 60-inch storm drain modifications. Smaller storm drains discharging at the seawall (30-inch line) and at the Coast Guard (12-inch drain) would not be significantly impacted by the cap (refer to Section 5.4). These drains could be modified by adding a flair section at the discharge end and/or extending the pipe.

Bio-Protection Cap Configuration

Sand or dredge sediments have been used for the majority of *in situ* capping projects. Sand is easy to place, readily available, enhances the stability of underlying fine grain sediment, (Bokuniewicz 1988), and provides suitable habitat for biota.

The thickness of the cap material directly influences its ability to chemically and biologically isolate the contaminated sediment. Studies by Wang (1991) and Brannon (1985, 1986) provide valuable information concerning the ability of a cap to chemically and biologically isolate the contaminated sediment. While chemical isolation can be achieved with a 20 cm cap (Brannon, Gunnison et al.), the cap must also protect against bioturbation.

The impact of bioturbation is very site dependent. Section 5.2 describes the presence of deep burrowers such as ghost shrimp and other organisms that may impact the integrity of the cap over time.



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Proposed Storm Drain Modifications

FIGURE 3-9

A bio-protection cap configuration is proposed to limit burrowing into the contaminated sediment. Several options were considered. A thin layer (6 inches) of precast concrete liner could be placed over the sediment followed by several feet of sand. This liner would prevent bioturbation into the contaminated sediment while the overlying sand would establish a suitable media for biota. The liner would allow gases from the sediment to escape as organic material erodes. The disadvantages of using this type of liner is that it requires preparation of the subsurface prior to placement (extensive debris removal) and is more costly than using rock.

A layer of coarse rock (minimum 1 foot) should provide isolation of the contaminated sediment and inhibit deep burrowers from penetrating into the contaminated sediment and distributing contamination into the sand cap. A rock layer is also much less costly than a concrete liner and easier to install. However, this will be confirmed using field and laboratory experiments with the organism responsible for burrows in Convair Lagoon.

Figure 3-8 shows the proposed bio-protection cap. The locations are assumed (Figure 3-7) until the distribution and density of the deep burrowers are further defined. A bio-protection cap would be placed in areas known to have deep burrows and in areas where significant contamination could be disturbed if no bio-protection layer was in place.

Eelgrass Habitat and Cap Stability

The sand cap conceptual design includes planting approximately two acres of eelgrass on the sand cap after installation to reduce wave energy from boat wake and natural waves, enhance the stability of cap sediments, and reduce shoreline erosion. Recent studies by Fonseca and Cahalan (1992) indicate that when seagrasses occur in broad shallow meadows and occupy most of the water column they substantially reduce wave energy, enhance sediment stability, and reduce turbidity in the water column. In addition, the eelgrass meadow will increase the overall biological productivity of the Lagoon.

Sand Cap Configuration

A standard sand cap should be suitable for the areas of Convair Lagoon that are not exposed to excessive bioturbation. Generally, the sand cap would be covering areas with lower levels of surface contamination. In these areas, the high levels of contamination occur at depths greater than 2 feet below the surface. (See Section 5.2). A sand cap would provide additional isolation of the surface contaminated sediment.

The sand cap thickness should be a minimum of several feet. This conservatively accounts for chemical, biological, and operational characteristics of the site. Shields (1984) suggests a minimum of a 3-foot (1 meter) cap to assure accurate installation. Given the operational constraints, a thicker cap would allow for irregularity in thickness and would be more consistent with the resolution and accuracy of monitoring and placement equipment (Palermo et al. 1989). However, capping thickness should be minimized to reduce the filling of the lagoon. Approximately 3 feet of sand and rock could be placed in the lagoon without significant shoreline alteration, aside from the area around the 60-inch storm drain pier.

Cap Constructability

The following describes the material and construction techniques considered in capping Convair Lagoon.

Materials

Imported material or clean dredge material would be suitable material for a sand cap. Dredge material is often less expensive and provides a "beneficial use" when used for capping projects. Dredging projects in the vicinity of San Diego Bay may provide a sufficient volume of capping material for the entire site. The composition of the material including the grain-size, total organic carbon, porosity, and bulk density should be known before use.

Additional capping material including gravel, riprap, geotextile liners, and concrete revetment mats can be supplied by local vendors.

Construction

Various construction techniques may be required for placement of the different cap configurations. Construction constraints for cap placement include water depth, slope, subsurface material type, debris, and material being placed. Placement methods would be highly dependent on water depth and access for the equipment. Although the construction contractor may determine other methods that meet the design requirements, the following approach should meet the construction constraints for Convair Lagoon:

> The clean sand cap material should be delivered to the site by barge and/or stockpiled on shore for later placement. In shallower areas, capping material may be offloaded from a barge by a conveyor and placed with or without the aid of a diffuser. A diffuser is a mechanical device that is placed on the submerged discharge to allow the gradual, controlled placement of material. In other areas, the cap may be have to be placed directly from shore by a clam shell dredge, standard excavation equipment, or conveyor. Figure 3-10 shows methods of onshore and offshore placement.

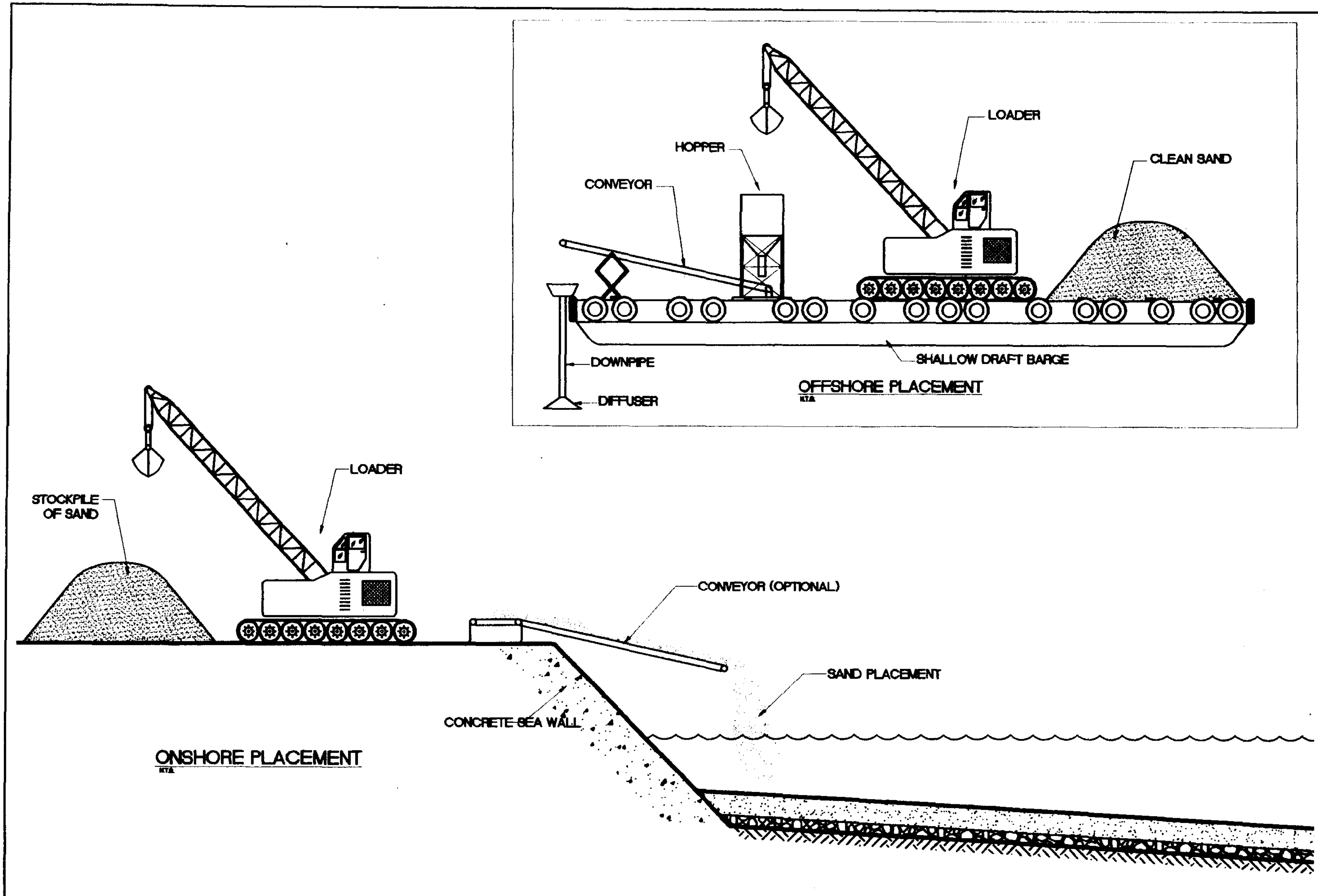
The submerged diffuser placement of sand over naturally deposited silt-clay was successfully used on the Terminal 1 project for the Port of Portland, Oregon (Hardin et al. 1988). Submerged diffusers allow accurate and controlled placement of material in the aquatic environment. Field and laboratory analysis support their effectiveness in reducing sediment resuspension (Neal et al. 1978).

The thick-section high energy cap (gravel and riprap) would be placed with a clam shell dredge or standard excavation equipment from the shoreline. Placement of geotextile and gravel along the 60-inch storm drain pier would be required to provide access for construction equipment from the shoreline.

To avoid impacts to the endangered California least tern in the spring and summer months, construction should be limited to the period from late September through early March, if possible.

<u>Perimeter Berm</u>

A perimeter berm would be constructed of large rock and smaller graded rock prior to cap placement. The berm would serve to reduce movement of the sediment during capping (mud waves), provide a turbidity barrier, and act as an artificial reef following construction. A perimeter berm was used effectively in the capping of the PGE site on the Willamette River (Sanders 1990). In addition, a silt curtain would surround the site during capping. Figures 3-7 and 3-8 show the details and location of the perimeter berm.



OGDEN

Placement Techniques

FIGURE 3-10

Turbidity Barriers

Turbidity barriers may be effective in reducing the turbidity in the water column outside of the barrier. Turbidity barriers such as silt curtains are restricted to conditions where the currents are less than 1 ft/sec and the tidal flux is minimal (American Marine vendor data). Silt curtains can reduce the turbidity by 80 to 90 percent (Palermo 1988); however, frequent movement of the curtain and storm events can impair the curtain's effectiveness. In the New Bedford pilot study, the highest levels of sediment resuspension were observed during initial deployment, periodic movement, and final removal of the curtain (Otis 1990).

The prolonged use of the curtain should be effective. Movement and redeployment of the curtain should be kept to a minimum. The silt curtain would be anchored to the perimeter berm throughout the construction (see Figure 3-8) Moreover, in many cases the curtains are not necessary to keep turbidity below the requirements implemented by regulatory agencies. During capping, the majority of suspended material in the water column would be the clean capping material.

Monitoring

A monitoring program is recommended to ensure the effectiveness of the capping. Although the specific monitoring plan is dependent on regulatory guidance and recommendations, the purpose of the monitoring plan presented is to verify that the objectives of the conceptual capping plan are achieved.

Two types of monitoring programs are identified: short-term monitoring or construction monitoring, and long-term performance monitoring. Construction monitoring would assure adequate controls to limit the impact to the environment during cap construction. Long-term monitoring would evaluate the effectiveness of the cap over time.

Short-term Monitoring

Short-term monitoring should be conducted during the construction process including the following components:

- Capping should be accompanied by in-field real time turbidity measurement to ensure permit objectives are met and to track the sediment plume.

- Water quality should be monitored at designated reference (background) stations and near the point of cap placement during construction. Water samples should be collected for analysis of PCBs and other contaminants to verify that dissolved and resuspended material meets regulatory requirements.

- At the end of each day, soundings should be made of the area capped and mapped. Weekly reports summarizing the soundings of the site should be prepared for review.

The health and safety of the workers should be assured by adherence to a health and safety plan and by the use of trained onsite personnel. The workers that may come in contact with the contaminated sediment should be required to participate in proper training prior to participating in any construction activities.

Long-term (Post-Implementation) Monitoring

The three components of long-term monitoring are physical, chemical and biological monitoring. A brief description of these components follow.

Physical Monitoring

Physical monitoring serves to show changes in surface conditions by consistently monitoring the bathymetry at the site. Over time, the stability of the sediment and/or cap can be assessed.

Bathymetric surveys determine the underwater topography of the site. The depth relative to a known datum allows one to determine the contours of the site and how stable they are over time. The impacts of sediment transport at the site is of key concern. The stability of the site can be evaluated by recording the bathymetry of the area of interest over time, and the impacts of erosion and shoaling assessed.

Sub-bottom profiling and sidescan sonar surveys also provide valuable data. Sub-bottom profiling gives some idea of the Lagoon's stratigraphy. This may be valuable in determining consolidation of the cap. Sidescan sonar surveys provide a underwater picture of the Lagoon bottom. Rock outcrops, bedforms, and capping material can be noted. Both of these forms of physical monitoring are helpful in the initial stages of the project and can be conducted intermittently over the life of the project. (Initial sub-bottom and sidescan surveys were conducted by Ebasco for the Basis of Design Report.)

A sediment profile camera profiles *in situ* sediment. These photos allow one to see the depth of bioturbation, the sediment cap interface, sediment grain size, and specific benthic/ infaunal information. The sediment profiling camera is used before capping and as part of the long-term monitoring to establish the impacts of dredging and/or capping on benthic recolonization of the cap.

Chemical Monitoring

Sediment cores and chemical monitoring allow one to determine if the cap is working and serve to provide an "early warning" system. The primary components of long-term chemical monitoring are sediment coring and chemical analysis.

Sediment cores would be analyzed for the constituents of concern to analyze the rate of vertical migration of the contaminated sediment through the cap and to predict the movement of contaminants (sediment transport). The core should penetrate through the cap to a minimum of 2 feet into the contaminated sediment. If a geotextile liner is used, core sampling should not penetrate the liner, so as to avoid breaking the liner.

Biological Monitoring

Biological monitoring would be necessary to show the impacts of the alternative on the organisms inhabiting the sediment or exposed to the sediment. A variety of techniques could be used including bioassay and bioaccumulation studies and field characteristics of biota inhabiting the cap.

Biological monitoring will be necessary to characterize the biological assemblages that colonized the sand cap and riprap perimeter berm after construction is complete and determine the success of the eelgrass planting. The type of burrowing organisms and the depth of their burrows should also be evaluated to determine if chemicals are escaping into the cap and or the water above the cap and if they are biologically detrimental. This could include measurement of PCBs in sediments expelled from burrows, the toxicity of this sediment, and bioaccumulation of chemical contaminants by biota inhabiting the sediment and overlying water column.

Monitoring Frequency

The first year should include two sampling events: one post-construction and one at 6 months. Through year 5, there should be one sampling event per year. From year 6 through year 10, sampling should be done every other year. At the end of 10 years, the sampling plan should be reviewed to see if monitoring procedures and frequencies are adequate. At that time, sampling could be conducted once every 5 years for a total sampling period of 30 years. Physical monitoring would be required after significant storm (25-year storm) or other natural events that could impact the cap integrity.

The nature and frequency of the Convair Lagoon monitoring program would impact the project costs; however, frequent monitoring in the first 5 years is essential to verify cap effectiveness.

Contingency Plan

Monitoring would provide information on the effectiveness of the cap in isolating the contaminated sediment from the clean cap sediment and the water column the upper layer of sediment where most biological activity occurs. A contingency plan could be developed to address extraordinary events that might impact the cap integrity such as:

- Continuing sources of contamination
- Major storm events eroding the cap
- Excessive bioturbation

Identifying potential ongoing sources such as storm drains and adjacent contamination, and eliminating these sources, is necessary prior to cap construction to assure that the cap is not recontaminated. Continuing sources of contamination, if not eliminated prior to capping, will contaminate the cap.

If erosion of the cap occurs during a storm event, the cap should be sampled to determine thickness and sediment quality of the cap. If there is risk that contaminated sediment could be exposed, than additional capping material could be placed; however, the initial cap design should account for the majority of storm conditions.

Excessive bioturbation is a potential concern at the Convair Lagoon site. A protective rock or concrete liner should limit penetration of burrowing organisms into the contaminated sediment and redistribution of contaminated material. The activities of burrowing in the overlying sand cap should not impact its integrity; however, frequent monitoring in the first few years is recommended.

A pilot study using a variety of capping materials to inhibit bioturbation by ghost shrimp or other species is recommended. Field and laboratory studies would produce valuable information on the nature of these burrowers. This information would greatly aid cap design.

4.0 ENVIRONMENTAL SETTING

The Convair Lagoon Remediation project site encompasses approximately 4.8 acres within the eastern portion of Convair Lagoon, northern San Diego Bay, in the City of San Diego. The project site is currently fenced from public access and contaminated water warning signs are posted around the Lagoon. A small pier approximately 45 feet in length extends into the water from the asphalt pavement along the northeast boundary of the Lagoon area.

Surrounding land uses in the immediate project vicinity are primarily industrial and include Teledyne Ryan Aeronautical to the north, General Dynamics to the northwest, and the United States (U.S.) Coast Guard facility to the southeast. Harbor Drive, a six-lane thoroughfare, is located directly north of the project site. In addition, San Diego International Airport (Lindbergh Field) is located within the adjacent uplands. A 1.3-mile pedestrian walkway/bicycle path which follows the bayside alignment of Harbor Drive passes the project site to the north.

Within the Lagoon to the west of the project site, the Convair Sailing Club, which is associated with General Dynamics, maintains a pier and floating dock for small sailboats. Approximately 12 sailboats are currently docked at the pier. Harbor Island, a commercial recreation area which is developed with uses such as hotels, restaurants, marinas, and marine-related commercial businesses, is located to the southwest of the Lagoon.

Several drains and pipes terminate in the Lagoon, including four large storm drains (a 54-inch drain to the west, a 60-inch drain off a center pier, and two 30-inch drains from Teledyne Ryan Aeronautical property). Smaller drains also originate from the Coast Guard Station and the General Dynamics facility.

The configuration of the Lagoon dates to the mid 1930s. It was created as part of an expansive dredge-and-fill project to develop the upland area which currently encompasses Lindbergh Field, the U.S. Marine Corps Recruit Depot, the U.S. Naval Training Center, and the railroad spur. The adjoining U.S. Coast Guard Station, which predates that project, is also constructed on fill material.

The San Diego Unified Port District has jurisdiction over waterfront property along the bay excluding federal, private, and ungranted lands. Under the San Diego Unified Port District Master Plan, the present uses of Convair Lagoon are designated as commercial recreation, and harbor services on the land, and recreational boat berthing and boat navigation in the water.

5.0 ENVIRONMENTAL ANALYSIS OF POTENTIALLY SIGNIFICANT EFFECTS

The environmental analysis of potentially significant effects focuses on the impacts that would result from implementation of the nearshore containment facility (proposed project), the sand capping alternative (preferred alternative), and the no action alternative. Alternatives involving incineration, bioremediation, and chemical fixation as described in Section 3.0 were not considered sufficiently viable to warrant an analysis of their impacts.

5.1 WATER QUALITY

5.1.1 Existing Conditions

At the present time, the primary hazards associated with the contamination of Convair Lagoon are believed to be associated with the sediment, rather than the water column above the sediment. PCBs are relatively insoluble in water and have a high affinity for soil and sediments, and hydrocarbons.

Ogden and Ebasco Environmental collected and analyzed water samples for a variety of chemical and physical properties during August of 1992. The samples were collected from three locations within the Lagoon. Each sample was split in two so that one subsample was filtered before analysis, and the other sample was analyzed without being filtered. Filtration was performed to help in assessing whether the PCBs were present in suspended solids in the water and whether they were dissolved in the water. The results of the three water samples are shown in Table 5.1-1.

The results of the water samples indicate that low, but detectable, levels of PCBs are found in the water above areas of the Lagoon where the sediments are known to be contaminated with high levels of PCBs. The fact that the PCBs are detected only in unfiltered samples suggests that the PCBs are attached to suspended solids in the water, rather than being dissolved. Even at the relatively low concentrations revealed in these analyses, PCBs are available to the marine organisms in the contaminated sediment and the water column above the sediment.

Table 5.1-1

RESULTS OF PREVIOUS WATER SAMPLES IN CONVAIR LAGOON

Sample ID		Sample location	Aroclor compound (in parts per trillion) 1248	1254
A8	unfiltered	approximately 50' NW of the end of the 60-inch storm drain pier	<20	52
	filtered		<20	<20
A10	unfiltered	approximately 70' E of the end of the 60-inch storm drain pier	65*	51
	filtered		<20	<20
A21	unfiltered	approximately 100' SSW of the end of the 60-inch storm drain pier	<20	<20
	filtered		<20	<20

* Sample analyzed after standard holding time had expired
Note: <20 means that the Aroclor compounds were not detected at a detection limit of 20 parts per trillion
Source: Ogden and Ebasco Environmental 1992.

The EPA has established chronic toxicity criteria for PCBs of 0.030 micrograms per liter (µg/L), which is approximately equal to 30 parts per trillion. This criteria represents the concentration of PCB in seawater that will result in adverse effects in the most sensitive marine life over an extended period of exposure. The sampling results indicate that the PCB concentrations detected in two of the three seawater samples exceed the criteria established by the EPA.

5.1.2 Impacts

5.1.2.1 Proposed Project - Nearshore Containment Facility

The NCF would result in two potential impacts to the water quality in San Diego Bay. The first impact pertains to resuspension and redistribution of the contaminants during construction of the NCF and dredging operations. The construction of the NCF is expected to disturb the sediment where the containment walls are constructed, resulting in the suspension of PCB-contaminated sediment. Also, the hydraulic dredging process for removing contaminated sediment from the Lagoon and placing it into the NCF would unavoidably result in a small fraction of the sediment being suspended in the surrounding water. The resuspended sediment would eventually settle out; however, it is expected to be distributed in the Lagoon. The proposed silt curtain is expected to prevent significant migration of contaminants out of dredging area; however, it is strongly suspected that as dredging takes place the contaminants would be spread over the entire bottom surface within the silt curtain.

A small fraction of the resuspended contaminated sediment is expected to pass through the silt curtain and eventually settle to the bottom of the Bay beyond the project area. The amount of sediment resuspended from a particular dredging location that eventually passes through the silt curtain depends on the size of the sediment particles and the distance from the dredging location to the silt curtain. The amount of PCB contamination carried through the silt curtain depends on the factors and the concentrations of contaminants in the sediment. The area outside of the silt curtain is not free of contamination, with PCB concentrations in the sediment as high as 2.4 parts per million in some sample locations.

According to the dredging plan proposed by Ebasco in the Basis of Design Report (Ebasco 1992), the closest dredging to the silt curtain would be located approximately 20 feet away from the silt curtain, along the west side of the remediation area. However, the levels of contamination in this area are relatively low, and the potential for recontamination of sediment outside of the silt curtain is not considered to be significant. The locations with the highest known levels of PCB contamination are located no closer than 150 feet from the silt curtain. The likelihood that significant quantities of contaminants would be resuspended and carried at least 150 feet through the silt curtain before settling out is considered to be very low. Therefore, contamination of the Bay outside of the project area through the redistribution of PCBs is not considered to be a significant impact.

The second impact relates to the long-term stability of the NCF. Although the NCF is considered as a "permanent" solution to the contamination in Convair Lagoon, the design lifetime of structures such as this typically is in the order of several decades. The marine conditions and the nature of the contaminated sediment is expected to contribute to corrosion of the structure. As the structure deteriorates, the leakage of contaminant-bearing water into the Lagoon may occur. This is considered to be a significant long-term impact of the proposed project. Alternative construction techniques should be considered to prevent or mitigate these potential impacts.

5.1.2.2 No Action

The No Action alternative would result in continuing release of PCBs from the sediments to the water above the sediment, and ultimately into the rest of San Diego Bay. Sampling of the water in the Lagoon (see Table 5.1-1) has revealed the presence of PCBs at concentrations of 0.052 to 0.16 µg/L in the unfiltered water samples (52 to 160 parts per trillion), which are above the EPA's chronic criteria for marine water quality of 0.03 µg/L (30 parts per trillion). Therefore, the presence of PCBs may result in adverse effects on sensitive marine organisms through long-term exposure (refer to Section 5.2). Under the No Action alternative, these levels would most likely continue for the considerable future. Although the concentrations are low, they are above the levels that can result in chronic impacts on marine life.

5.1.2.3 Sand Capping – Preferred Alternative

As designed, the sand cap would isolate the contaminants in place with a minimum of disruption, and would prevent the migration of contaminants into the water column of Convair Lagoon. The only potential impacts that could occur under this alternative are associated with the potential for contaminants to migrate to the surface of the cap through chemical diffusion or bioturbation. A monitoring and repair program has been defined for this alternative that, if properly instituted and maintained, would prevent this from resulting in significant long-term impacts.

The primary water quality impact resulting from the Sand Capping alternative is the suspension of sediment during the capping operations. Since the contaminated sediment will remain in place with the capping material placed over it, the sediment that is suspended will consist primarily of the capping material, rather than the contaminated sediment. Prior to the installation of the cap, large debris would be removed from the area to be capped. Although this may lead to resuspension of contaminated sediment, the installation of a silt curtain would prevent the migration of sediment contamination outside of the remediation area.

The sand cap is expected to promote conditions that may enhance the natural anaerobic dechlorination of the PCBs (in which microorganisms biochemically degrade the PCB molecules in an environment that is free of oxygen). In comparison with the Proposed Project and the No Action alternative, implementation of the Sand Capping alternative would result in a net positive benefit in terms of water quality within both Convair Lagoon and San Diego Bay.

5.1.3 Mitigation Measures

5.1.3.1 Proposed Project – Nearshore Containment Facility

Implementation of the following mitigation measures would reduce impacts under the proposed project to below a level of significance:

- To minimize the impacts of recontamination of surface sediment following resuspension of contaminated sediments during the dredging operations, the dredging would begin in those areas of the Lagoon with the highest levels of contamination. The dredging would then move from cell to cell in order of the level of contamination. Finally, the entire surface of the sediment in the project area would be dredged to remove contaminated sediment that has settled in areas that originally did not require dredging.

- Extensive sampling would be conducted during the dredging operations to confirm that the PCB-contaminated sediment has been removed in accordance with the Cleanup and Abatement Order. Sampling would also be conducted to determine where final dredging should be performed to remove recontamination from settled sediments.

- Since the NCF cannot be designed and constructed as a truly permanent facility, measures must be included in the proposed project to identify leakage of contaminants out of the NCF. Ultimately, repairs will be necessary. A continual monitoring plan must be in place to verify that leakage of contaminants does not take place out of the NCF.

- The District will work with the Responsible Party(ies) to establish an adequate Annuity or other financial account to provide long-term monitoring and maintenance.

5.1.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.1.3.3 Sand Capping - Preferred Alternative

The Sand Capping alternative includes a post-capping monitoring plan that is designed to verify that contaminants are contained, and are not migrating to the surface through bioturbation or chemical diffusion. If contaminants are detected in the clean capping material, the placement of additional capping material or other repairs should return the cap to full integrity. With monitoring of the cap, and repair when conditions that could lead to potential breakthrough are detected, the impacts to water quality will be mitigated to below a level of significance.

5.2 MARINE RESOURCES

5.2.1 Existing Conditions

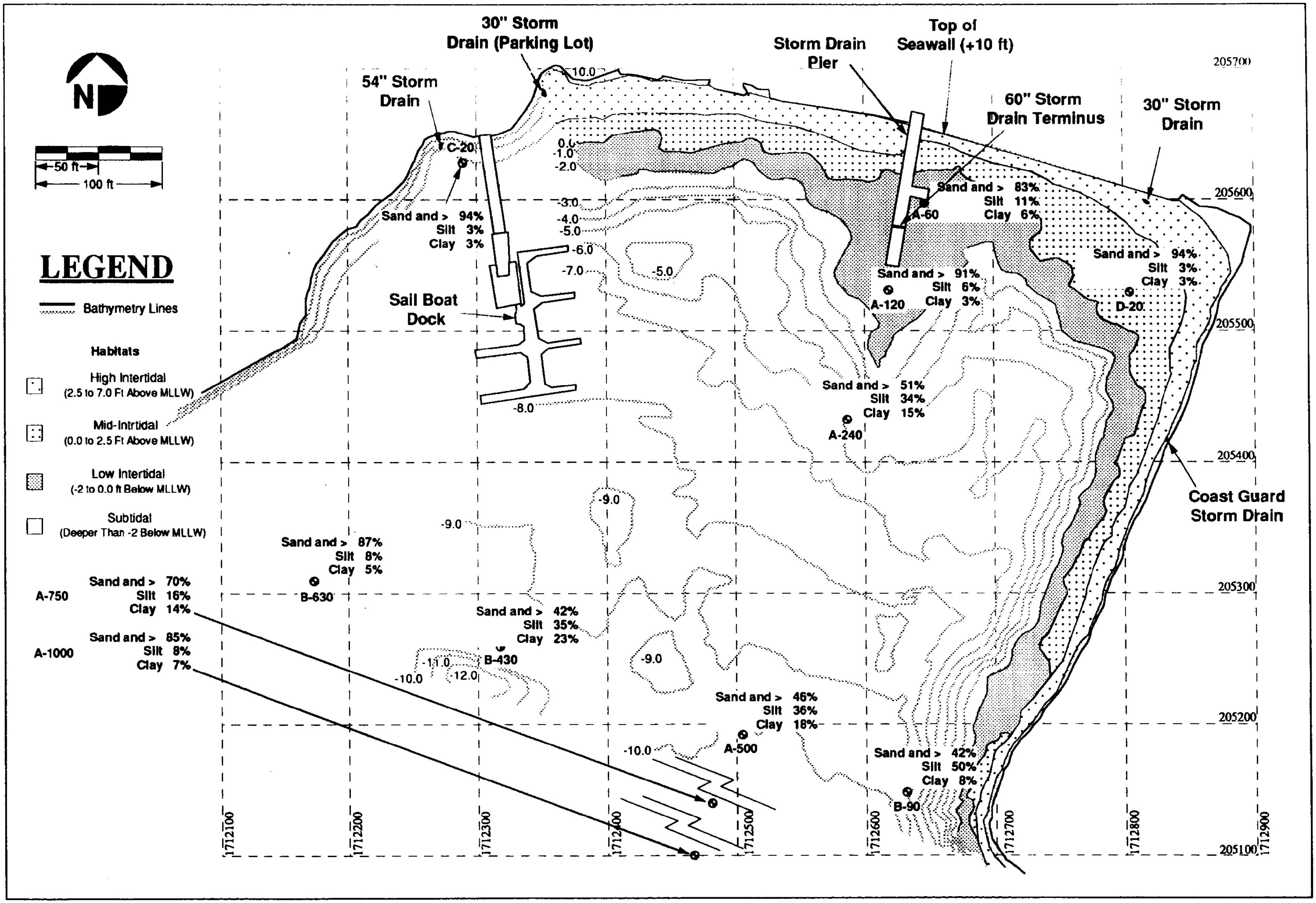
Convair Lagoon is a shallow embayment on the north shore of San Diego Bay (Figure 5.2-1). Its intertidal shoreline comprises a narrow beach abutting a seawall along the north shore paralleling Harbor Drive and a riprap revetment along the east shore adjacent to the U.S. Coast Guard Station. The narrow beach ranges from about 2.0 feet below mean lower low water [(MLLW), which equals 0.0 feet for most topographic maps and hydrographic charts)] to elevations ranging from approximately 3 to 7.5 feet above MLLW. The subtidal portion of the lagoon extends down to a depth of about 10 feet below MLLW. The project site, encompassing the proposed nearshore containment facility (NCF), the proposed dredge footprint, and a narrow area outside the proposed dredge footprint contained within the dredge silt curtain, is basically a rectangle measuring approximately 450 feet by 475 feet (approximately 4.8 acres).

The following description of existing marine environmental conditions is divided into sections on sediment quality, marine biology, and bioavailability (the availability of a chemical to be accumulated by an organism). The sediment quality section describes the chemical composition and grain size distribution of lagoon sediments. The marine biology section describes the marine invertebrate and fish assemblages inhabiting the intertidal and subtidal habitats of the lagoon and defines the distribution and density of eelgrass (*Zostera marina*) in the area. Because of their relevance to this project, an expanded discussion of burrowing organisms is included in this section. This group of organisms is addressed further under impact analysis. The bioavailability section summarizes data from reports describing concentrations of a variety of contaminants in lagoon biota.

Sediment Quality

Distribution of Sediment Types in Convair Lagoon

The natural sediments in Convair Lagoon are a mixture of sand and silt or mud. Sand predominates on a narrow beach that ranges from about MLLW to elevations ranging from approximately 3 to 7.5 feet above MLLW, where it meets either concrete or a rock revetment composed of a variety of sizes of rock and broken concrete. Most of the lower portion of the intertidal zone (the beach out to about 2 feet below MLLW) is fine sand



General Features of Convair Lagoon
Sand Grain Composition of Bottom Presented for Select Sites

FIGURE 5.2-1

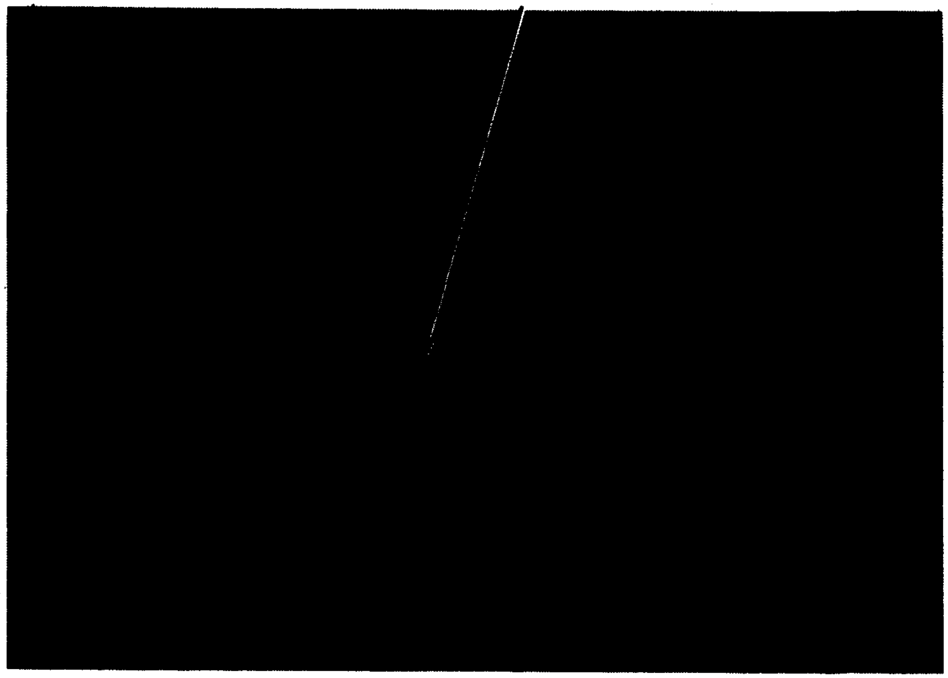
(Figure 5.2-1). Subtidally, the upper 1 foot of lagoon bottom is composed mainly of sandy silt with some clay. In both intertidal and subtidal areas surrounding the project area, sediments are predominantly sand. This pattern suggests that the project area is a depositional environment and that storm drains have contributed substantial quantities of fine-grain sediments to the lagoon.

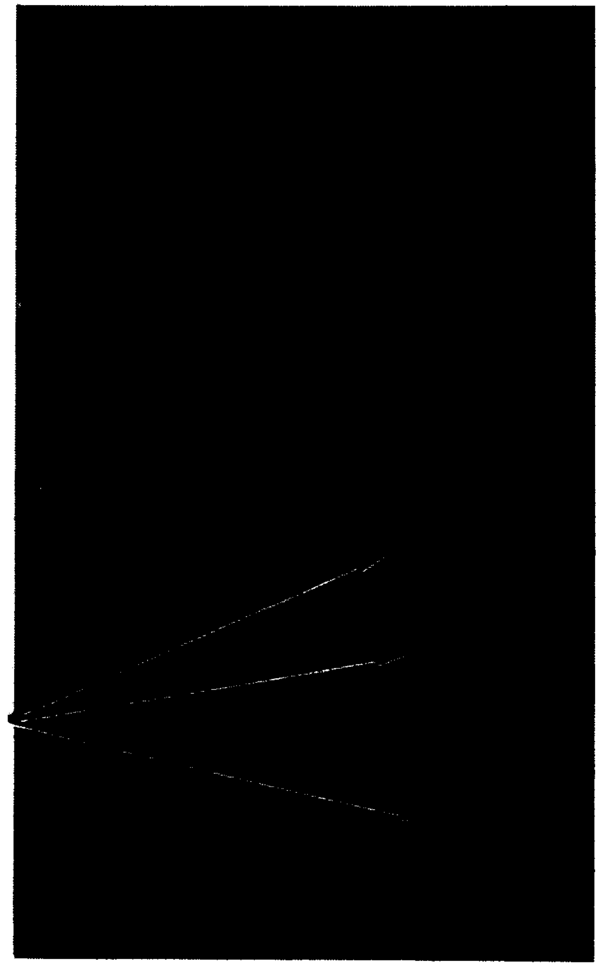
In terms of appearance, the most conspicuous visible feature of the subtidal seafloor in Convair Lagoon is the extensive network of burrows penetrating the surface of the sediments (Figure 5.2-2). Below its surface, the sediment is honeycombed with burrows constructed by several species of animals.

Concentrations and Distribution of PCBs and Trace Metals in Lagoon Sediments

Investigations of sediment quality in Convair Lagoon were initiated by the Regional Water Quality Control Board (RWQCB) in 1985 (RWQCB 1986) to describe the concentration of PCBs and trace metals in the lagoon sediments. In 1988, Teledyne Ryan Aeronautical (TRA) initiated studies to document the vertical and horizontal distribution of PCBs and trace metals in the lagoon (ERCE 1988). More comprehensive studies were conducted by TRA in 1989 to better define the distribution of PCBs (ERCE 1989). Finally, Ebasco Services collected additional data on PCB distributions to support the design of an NCF proposed for remediation of lagoon contamination (Ebasco undated). The 53 locations sampled in the three studies are identified in Figure 5.2-3. Figure 5.2-4 shows the estimated distribution of Total PCBs (the arithmetic total concentration of all seven PCB species detected) in the upper foot of sediment, based on combined data from all studies. The combined data sets for Total PCBs from all studies are summarized by sampling location and depth below the bay bottom in Appendix B-1. PCB values below the level of detection were assumed to be zero. The estimated location of the 10 ppm dry weight cleanup level is highlighted. All Total PCB concentrations exceeding 10 ppm are also highlighted in Appendix B-1.

Trace metals data from RWQCB (1986) and ERCE (1988) are summarized in Appendix B-2 and Appendix B-3, respectively, and compared with some regulatory guidelines often used to evaluate the potential for biological effects. The guidelines are discussed in Appendix B-4. While the highest values for trace metals fall within the area to be remediated, concentrations of several trace metals exceeding the more rigorous National Oceanic and Atmospheric Administration (NOAA) ER-L guideline (cadmium, chromium,





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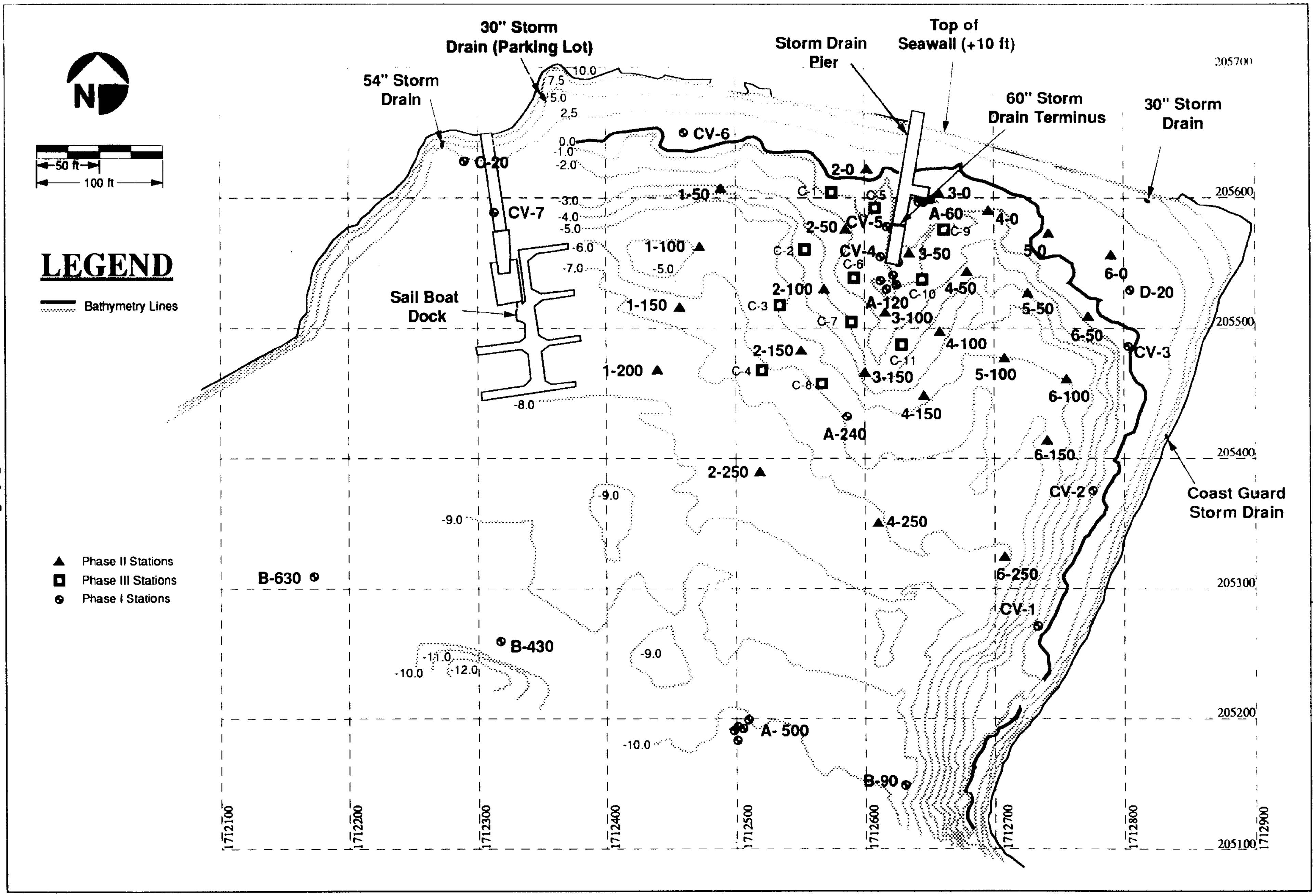
Appearance of Sea Floor in Convair Lagoon Demonstrating Entrances for Unidentified Burrow Systems

FIGURE **5.2-2**



Sediment Sampling Locations in Convair Lagoon

FIGURE 5.2-3

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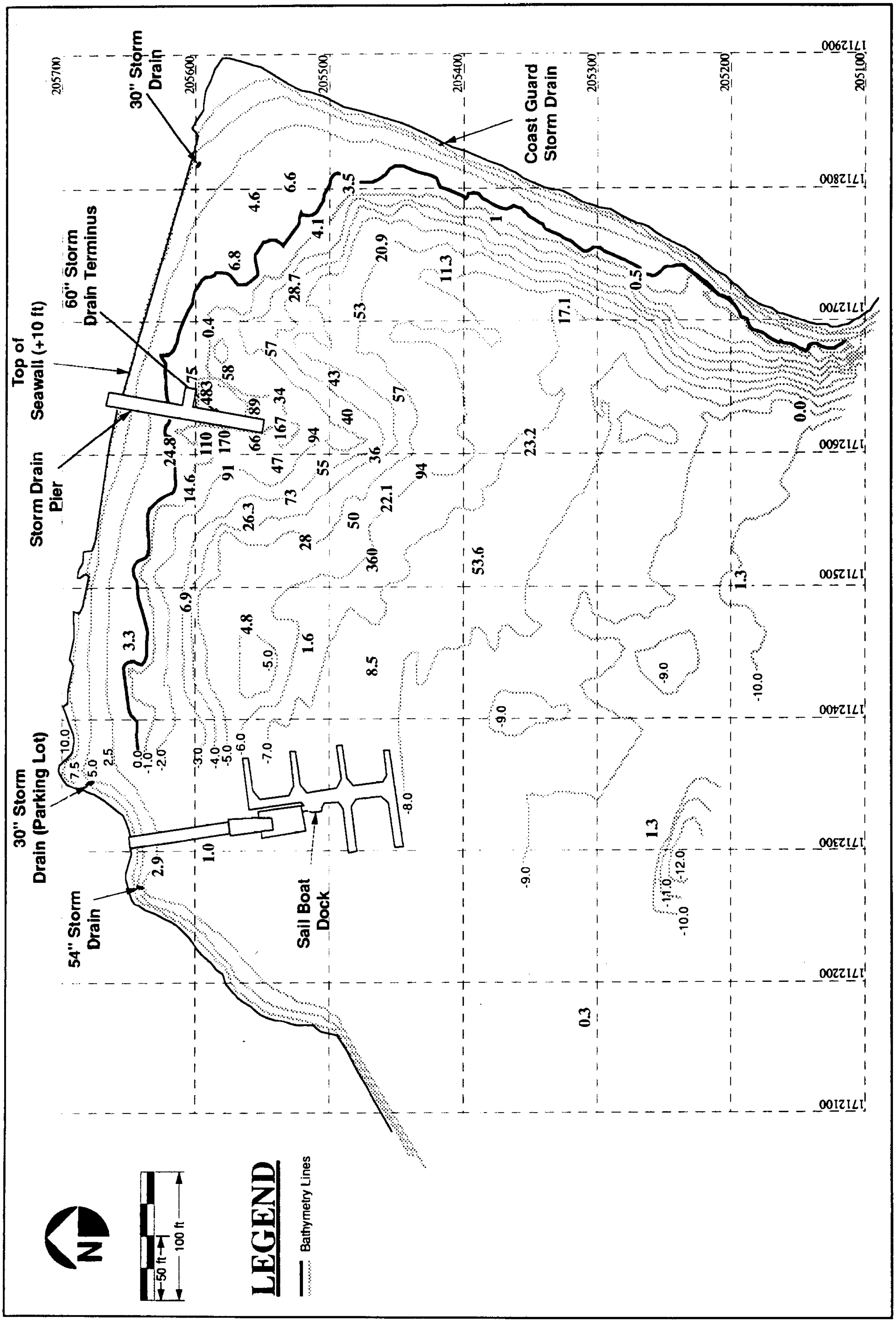

FIGURE 5.2-4

Distribution of Total PCBs (mg/kg dry weight) in the Upper Foot of Sediments in Convair Lagoon

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copper, lead, nickel, and zinc) are reported from sediments outside the remediation area (Figure 5.2-5). None of the metals concentrations exceed the NOAA ER-M Levels and only mercury exceeds the State of Washington Sediment Management Criteria. Copper or mercury concentrations do not exceed the cleanup levels established for Commercial Basin, San Diego Bay (copper - 530 mg/kg dry weight, mercury - 4.8 mg/kg dry weight; RWQCB 1990).

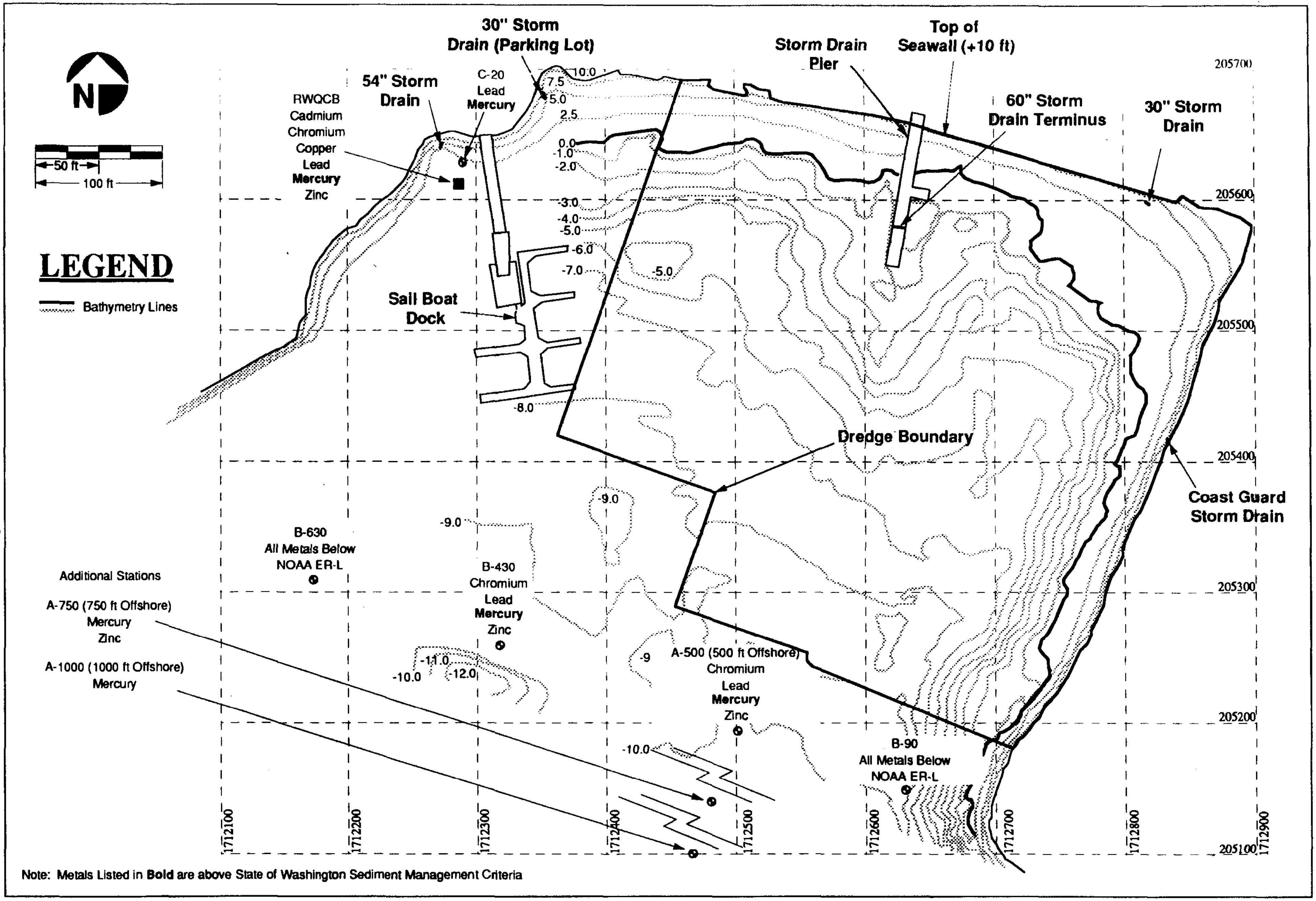
Although these regulatory guidelines have no status for San Diego Bay, they are used by many regulatory agencies to interpret sediment chemistry results. Values exceeding the guideline(s) have a statistical potential for association with adverse biological effect; however, the mere presence of a contaminant does not indicate biological effects. A large body of literature has developed in the last several years describing conditions that neutralize potential effects of trace metals (e.g., acid-volatile sulfides and organic carbons) (Ankley et al. 1993).

Marine Biology

Information from Previous Studies

The study of the biological resources in Convair Lagoon includes 1) a review of literature available from the vicinity of the project site, 2) a previous cursory site reconnaissance, and 3) results of field studies conducted in April 1993 as part of this EIR. Previous site-specific information on marine biological resources is limited to one, 1-day field reconnaissances from shore (Macdonald 1985) and ancillary observations recorded during the remediation design program for the Lagoon (Ebasco 1992). Information on fishes in the area is derived from studies done for the nearby Sunroad Marina on Harbor Island (approximately 1,000-2,000 feet west of the project area; Ford and Macdonald 1986).

Macdonald (1985) stated, "While site-specific biological data are lacking, the area does not appear to be prime habitat, nor have high biological productivity, nor to harbor rare, threatened, or endangered species." A subsequent intertidal field reconnaissance of the area conducted by Macdonald on March 4, 1985, seemed to support that statement. Findings showed that the limited hard substrate areas supported mussels and barnacles at higher elevations and a sparse biota of red algae, sea anemones, and tunicates below the water line. In the lower intertidal zone, burrows of infaunal organisms were evident in soft-bottom areas and mollusks including an introduced Japanese nestling mussel (*Musculista*



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Distribution of Trace Metals Exceeding NOAA ER-L Levels Outside the Project Area in Sediment in Convair Lagoon

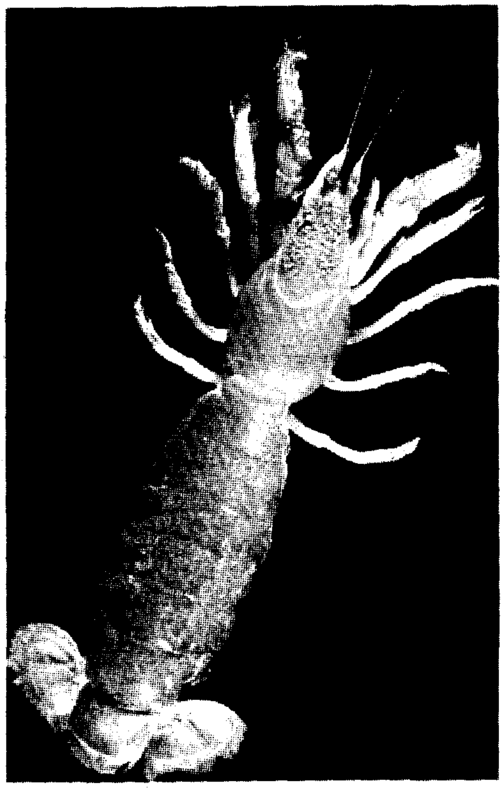
FIGURE 5.2-5

senhousia), bubble snails (*Bulla gouldiana* and *Haminoea* spp.), and a predatory sea slug (*Chelidonura inermis*) were present.

Fish and epifaunal invertebrate populations were assessed in the nearby East Harbor Island basin prior to construction of Sunroad Marina using trawls and beach seines (Ford and Macdonald 1986). Since these organisms are mobile and the opening to Convair Lagoon is contiguous with the mouth of East Harbor Island basin, it is reasonable to assume that this group of organisms at least visit the project site. The species found were typical of central and northern San Diego Bay, as well as other larger southern California embayments (Ford and Macdonald 1986). Abundance of small fish just below the water line of the basin was assessed with beach seines. The most abundant fish were the queenfish (*Seriphus politus*) and the topsmelt (*Atherinops affinis*). Cheekspot and arrow gobies (*Clevelandia ios*) were also fairly abundant. Fishes at greater depths and more distant from the shoreline were assessed using trawls. Round stingray (*Urolophus halleri*), California halibut (*Paralichthys californicus*), northern anchovy (*Engraulis mordax*), and queenfish were most common. Also common were barred sand bass (*Paralabrax nebulifer*), spotted sand bass (*Paralabrax maculatofasciatus*), and diamond turbot (*Hypsopsetta guttulata*). Common epifaunal invertebrates included the California bubble (*Bulla gouldiana*) and the mud snail. Invertebrates of commercial or recreational importance included ghost shrimp (*Callianassa affinis*), spiny lobster (*Panulirus interruptus*), and a shrimp (*Penaeus californiensis*) (Figure 5.2-6). The most abundant species of bivalves were the egg cockle (*Laevicardium substriatum*) and the introduced Japanese nestling mussel, both usually associated with the infauna. These species and others encountered in the East Harbor Island Basin would be expected in Convair Lagoon based on the proximity of the sites and similarity of habitat types in each.

<u>April 1993 Field Reconnaissance Surveys</u>

To augment the limited biological information for the lagoon described above, a three-day field survey of intertidal, subtidal, and eelgrass habitats was conducted as part of the EIR program. Intertidal and subtidal surveys to identify the macrofaunal organisms present in the lagoon and provide qualitative estimates of their abundance were conducted on April 9. The distribution and density of eelgrass in the lagoon were mapped on April 13. A subtidal survey was conducted on April 16 to identify macrofaunal organisms in the lagoon and provide quantitative estimates of the density of unidentified burrow systems.



Upogebia pugettensis (Dana). Blue Mud Shrimp. 95 mm long (overall, including appendages).

Callianassa californiensis Dana. Bay Ghost Shrimp. 100 mm long (overall).

SOURCE: Morris, Abbott, and Haderlie, Plate 166, 1980

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Photo of the Mud Shrimp and Ghost Shrimp

FIGURE **5.2-6**

The site-specific field study was designed to 1) map the density of eelgrass and the areal extent of eelgrass meadows; and 2) describe the benthic biota in the intertidal and shallow subtidal habitats of the project site (Figure 5.2-7). Eelgrass was mapped on the basis of density categories (i.e., low [<8 shoots/m^2], moderate [8 to 17 shoots/m^2], and high [>17 shoots/m^2]) along transects located on 30-foot centers and originating from either the sea wall or the riprap boundaries of the project area. Observations on benthic biota and fish were recorded along each transect and in other areas. Densities of burrows were sampled both in intertidal and subtidal areas.

Eelgrass. Total estimated eelgrass coverage on the 4.8-acre project site is 0.82 acres (Table 5.2-1). Eelgrass distribution and density within the project site are illustrated in Figure 5.2-8. Low-density growth covers approximately 25 percent of the eelgrass bed, moderate-density growth covers about 64 percent of the bed, and high-density growth covers about 11 percent of the bed.

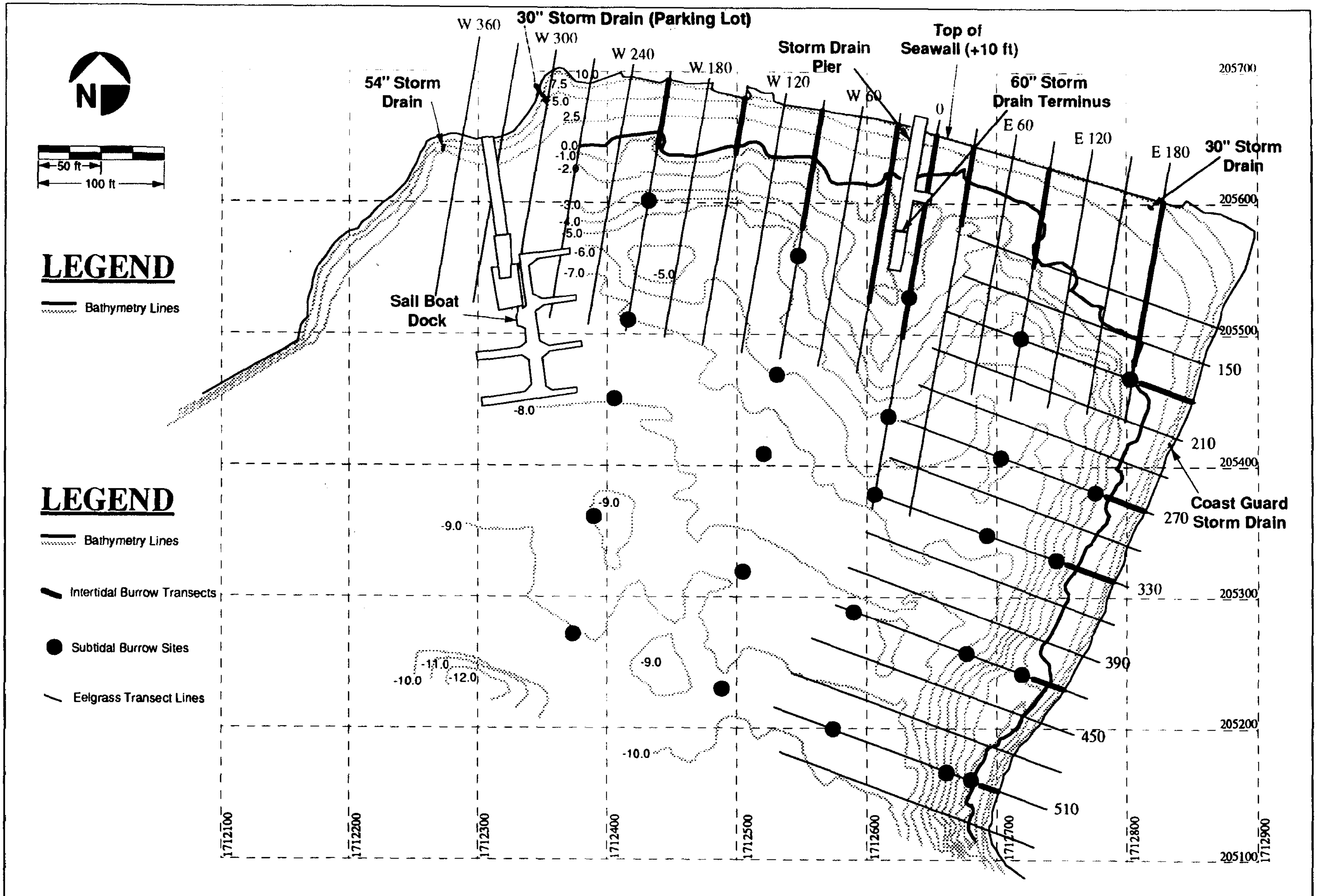
Table 5.2-1

ESTIMATED AREA OF EELGRASS MEADOWS IN CONVAIR LAGOON

	Low Density	Moderate Density	High Density	Total
Estimated Area in Sq Feet	8,940	22,860	3,950	35,750
Estimated Area in Acres	0.21	0.52	0.09	0.82
Percent of Eelgrass Meadow	25%	64%	11%	100%
Percent of Project Site	4.4%	10.8%	1.9%	17.1%

Generally, eelgrass was more abundant along the northern shore than along the eastern shore, adjacent to the Coast Guard facility. Except for an apparent gap in the bed in the vicinity of the 60-inch storm drain, the general distribution of eelgrass appears to reflect the bathymetry of the lagoon. The low-density areas were located mainly at the outer edge of the eelgrass meadows and probably indicate a response to reduced light levels. High-density patches occurred mainly at depths between -1 and -2 feet MLLW.

The gap in the eelgrass bed around the 60-inch storm drain was noted during this survey and the 1992 survey (Ebasco 1992).



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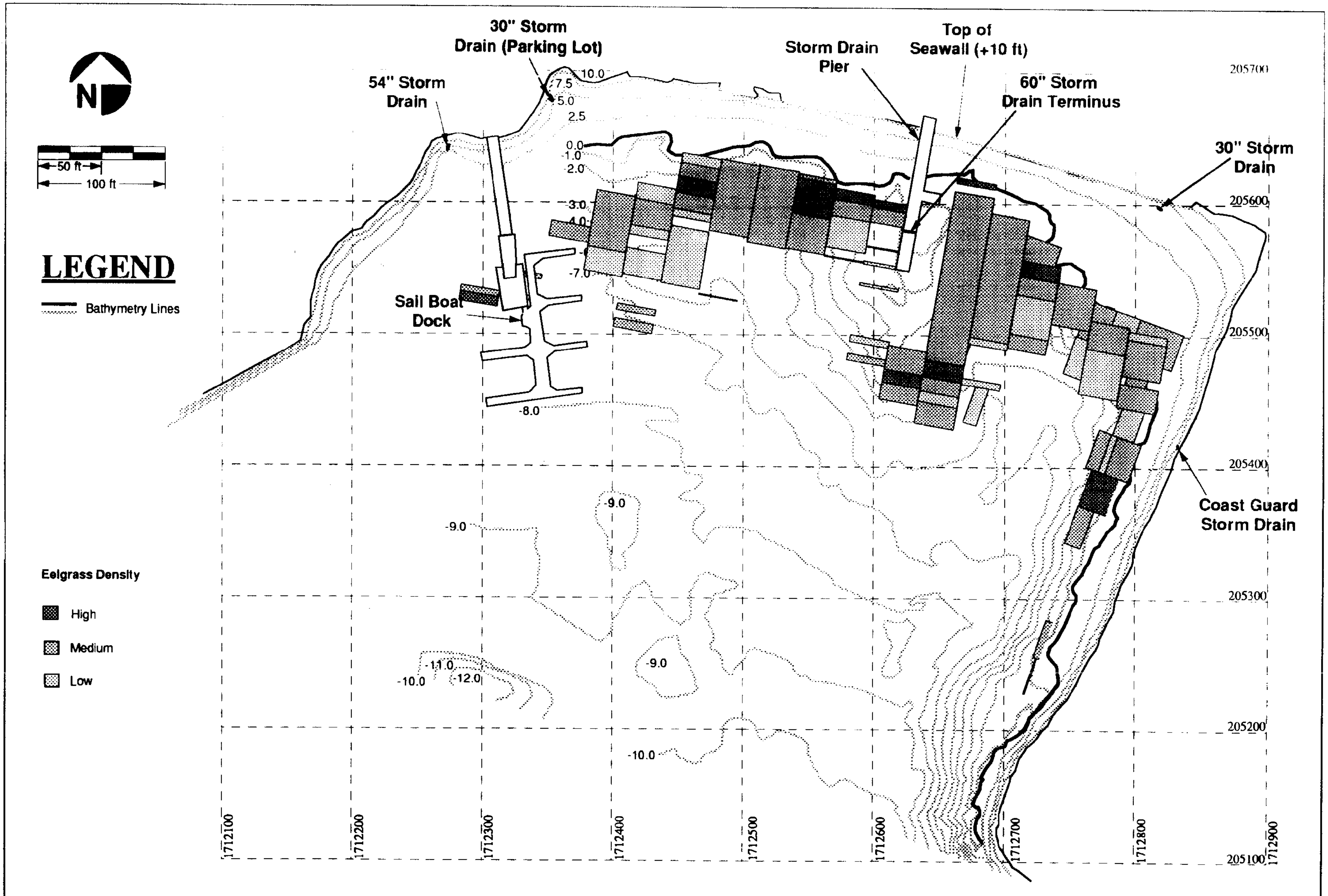
Approximate Areas Sampled During Intertidal, Subtidal, and Eelgrass Sampling in Convair Lagoon

FIGURE 5.2-7



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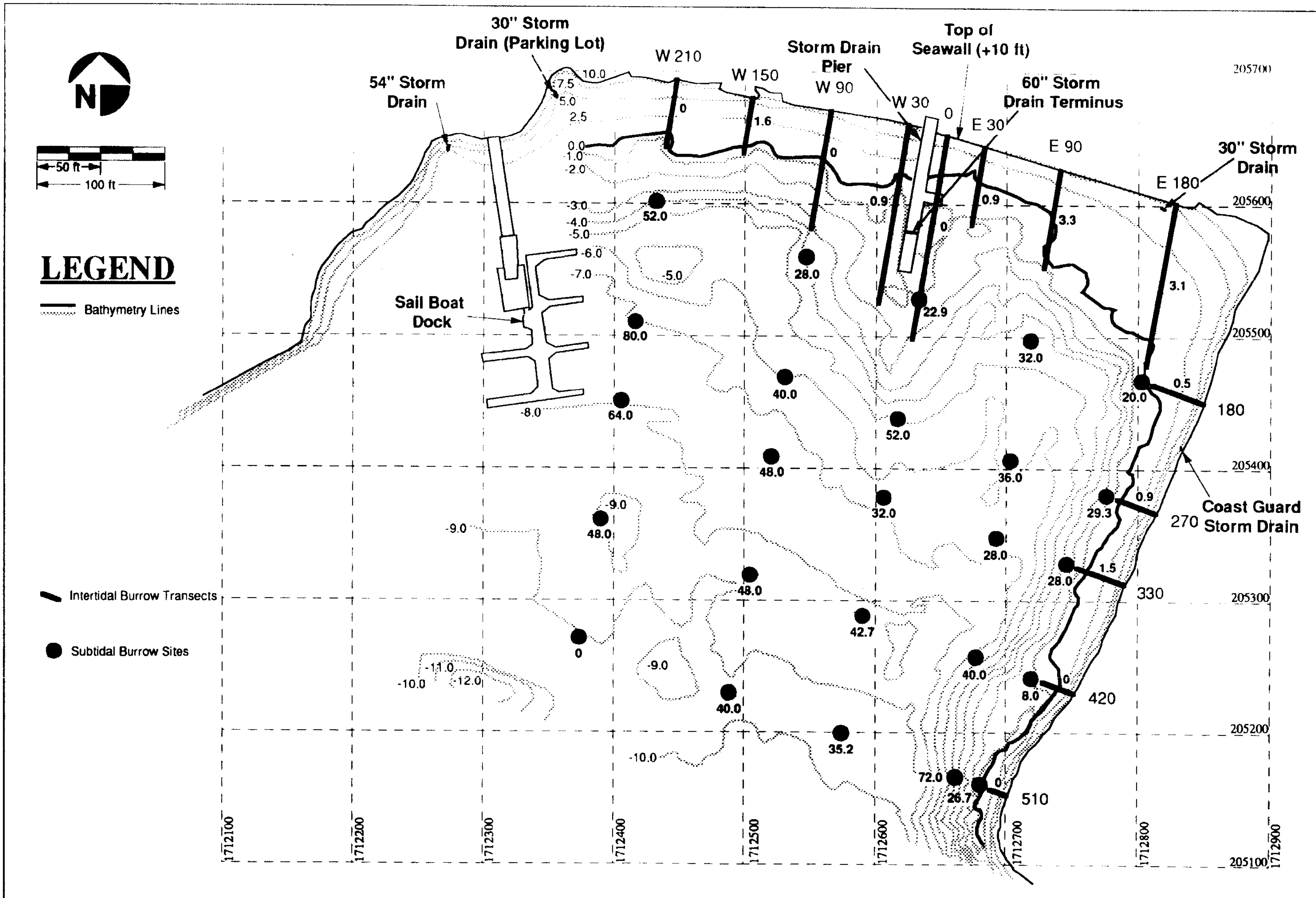
Distribution and General Density Patterns of Eelgrass in Convair Lagoon

FIGURE 5.2-8

Intertidal Invertebrates. Intertidal organisms observed included burrowing species such as ghost or mud shrimp (Figure 5.2-6), species living on or only partially buried in the sediment, and species associated with hard substrate (i.e., riprap and concrete pier of the 60-inch storm drain). Species associated with hard substrate included limpets (*Collisella scabra* and an unidentified limpet), barnacles (*Chthamalus dalli* and *Balanus* spp.), the lined shore crab (*Pachygrapsus crassipes*), a sedentary tubicolous snail (*Serpulorbis squamigerus*), a fleshy brown alga (*Colpomenia sinuosa*), and a branched brown alga (*Sargassum* sp.)

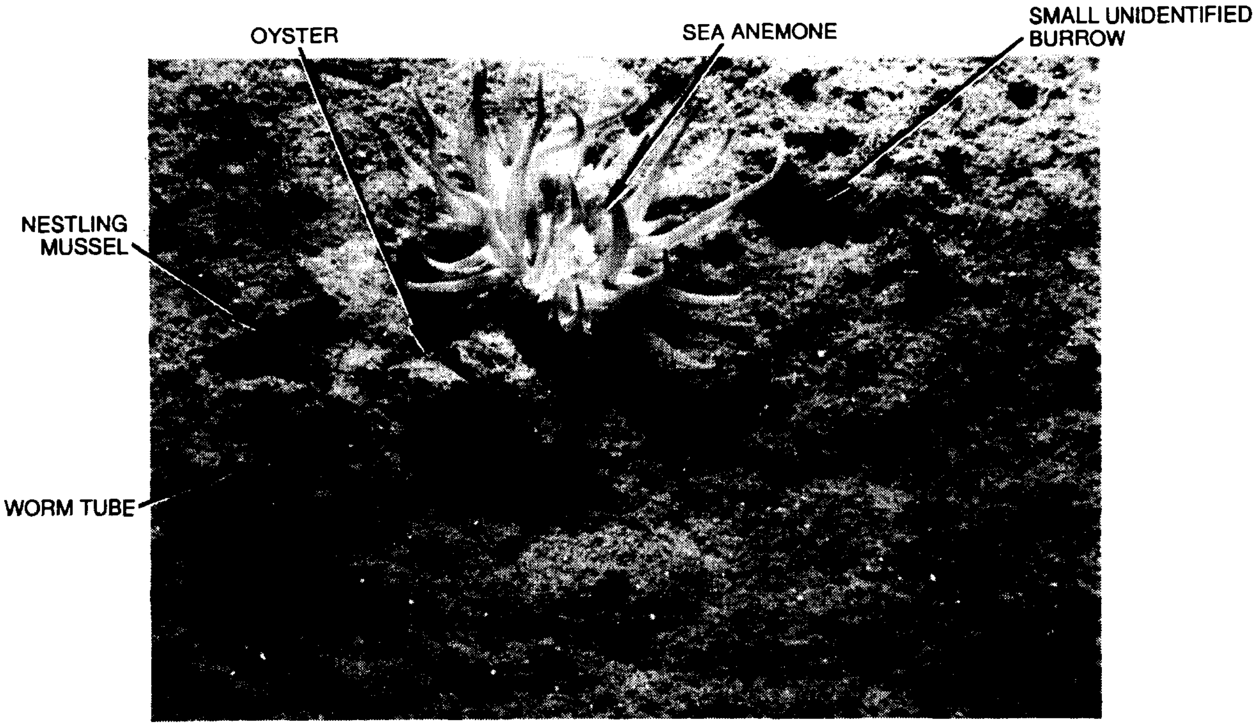
Burrow density in the intertidal areas differed among transects from the three main sampling areas: the west side of the 60-inch storm drain (WEST), the east side of the drain (EAST), and transects along the riprap adjacent to the Coast Guard facility. Highest mean densities of intertidal burrows were present along two transects east of the 60-inch storm drain with densities >3/m^2 (Figure 5.2-9). Mean densities were lower from 30 feet east to 210 feet west of the 60-inch storm drain. Mean densities were depressed in the area around the 60-inch storm drain as there were several areas with a higher elevation compared to the surrounding area (and to the EAST 180 feet transect). These elevated areas had few if any burrows, thus decreasing the mean density because of the elevation, different grain size, and different compaction of the sediment (these areas easily supported the weight of a person while much of the lower area did not). In general, densities of burrows were considerably lower than observed subtidally.

Subtidal Invertebrates and Fish. Descriptions of epibenthic macroinvertebrate and fish assemblages at the project site are based on qualitative observations and counts of burrows and organisms during the 1993 eelgrass and benthic surveys in the subtidal zones. The most abundant macroinvertebrate species in the soft-bottom habitat in the project area was probably a tubicolous polychaete (*Pseudopolydora paucibranchiata*). Small upright mud-impregnated tubes characteristic of this species were abundant from the mid-intertidal throughout the subtidal zone (Figures 5.2-10 and 5.2-11). An introduced nestling mussel was quite common in the area (Figure 5.2-10) and probably dominates the biota in terms of biomass (weight of organisms). This mussel is a common inhabitant of soft subtidal sediments offshore of eelgrass meadows throughout San Diego Bay. Densities in Convair Lagoon appear similar to those observed in other parts of the bay. Based on food habits of diving ducks and flatfish in other areas, different sizes of the mussel are probably



Distribution and Density of Intertidal and Subtidal Burrows in Sediments in Convair Lagoon

FIGURE 5.2-9



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Appearance of Tubicolous Polychaete Tubes, Nestling Mussel, Oyster, and Sea Anemone in Sediments in Convair Lagoon

FIGURE 5.2-10

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Appearance of Tubicolous Polychaete Tubes and Entrance to Unidentified Burrow System in Sediments in Convair Lagoon

FIGURE **5.2-11**

important components of the food web for several demersal fishes and diving ducks throughout the bay (Deleeuw et al. 1992).

Several other macroinvertebrate species occurred at moderate to high densities. The mud snail was common generally throughout the area. The bubble snail and its major predator, the large sea slug *Chelidonura inermis*, were most common in the vicinity of eelgrass but occurred throughout the project area.

Several types of burrowing organisms were common to abundant in various parts of the project area. Burrows of ghost shrimp were observed primarily between the mid-intertidal area and approximately -2 feet MLLW. Large and small extensively branched burrows of unidentified organisms were common throughout the subtidal area (Figure 5.2-11); based on the characteristic crackling sounds heard commonly during the dives in the area and observation of juveniles during the surveys, it is suspected that pistol shrimp (Alpheidae) are the animals building these burrow systems. Small gobies also occupy these burrows but do not appear to maintain them. A red alga (*Gracilaria verrucosa*), a brown alga (*Sargassum* spp.), a solitary hydroid (*Corymorpha* sp.), an unidentified sea anemone, a moon snail (*Polinices* sp.), an oyster (*Ostrea lurida*), the spiny lobster a polychaete (*Nephtys caecoides*), and solitary tunicates (*Styela clava, S. montereyensis, S. plicata*) were also encountered. These species are commonly found elsewhere in areas with similar depths and sediment types in San Diego Bay, particularly in the north part of the bay.

Burrowing organisms are generally common in soft substrates, including Convair Lagoon, and are structurally and functionally important ecologically. Nevertheless, they are not commonly observed directly, are difficult to sample, and their identity and abundance are frequently unaccounted for, primarily because of their extensive burrows. These organisms either construct burrows or tubes for residence and feeding, or move through the sediment. Experiments using pressurized water, rhodamine dye, and brine indicate that extensive burrow systems were common in the project area (Figure 5.2-11). In the process of movement, burrowing, tube construction, or feeding, sediment is displaced from one location to another. This phenomenon, called bioturbation, has been shown to have a major effect on the distribution of sediments (Bosworth and Thibodeaux 1990; De Vaugelas 1985; Myers 1979; Pemberton et al. 1976; Suchanek and Colin 1986; and Suchanek et al. 1986).

Burrowing organisms are important to the remediation of Convair Lagoon because they generally move considerable amounts of sediment both vertically and horizontally. Despite attempts to capture some of the burrowing organisms, only one small cheekspot goby was captured and several small alpheid shrimps were observed; thus, the organisms responsible for a large proportion of the subtidal burrows in the lagoon sediment were not identified during this survey. The density of burrows was measured at several intertidal and subtidal locations to provide a relative estimate of the abundance of burrowing organisms in different areas of the lagoon (Figure 5.2-9). Mean density of burrow openings for all areas counted was $38.1/m^2$. The transect nearest the Coast Guard Station (East 180) had the lowest mean density of burrows. The site with the lowest burrow density (none observed) was located at the farthest point from shore on the West 210 transect. Density of burrows at nearly all other sites was at least $20/m^2$, indicating the presence of large numbers of burrowing organisms throughout the lagoon. Based on observations from one transect, fewer burrows were present inside the eelgrass meadows than in areas without eelgrass. Diver observations using dilute dye and brine solutions or pressurized water showed that many of the burrow systems have multiple entrances, suggesting that the actual density of burrowing animals is probably somewhat lower.

Numerous fish were observed during all three surveys. Schools of unidentified juvenile fish were most abundant. They were present in the depression at the end of the 60-inch storm drain, in the eelgrass meadows, and in the depression at the end of the 54-inch storm drain. A school of juvenile opaleye (*Girella nigricans*) was observed near the mouth of the lagoon along the riprap revetment. Recreationally and commercially important fish species observed included California halibut, barred and spotted sand bass, and kelp bass (*Paralabrax. clathratus*). Also observed were round stingray, black perch (*Embiotoca jacksoni*), opaleye, rock wrasse (*Halichoeres semicinctus*), diamond turbot, and at least one unidentified species of goby. Most of these species were reported from the fish studies conducted in the adjacent East Harbor Island basin (PBR 1986).

Bioavailability

California State Mussel Watch Program

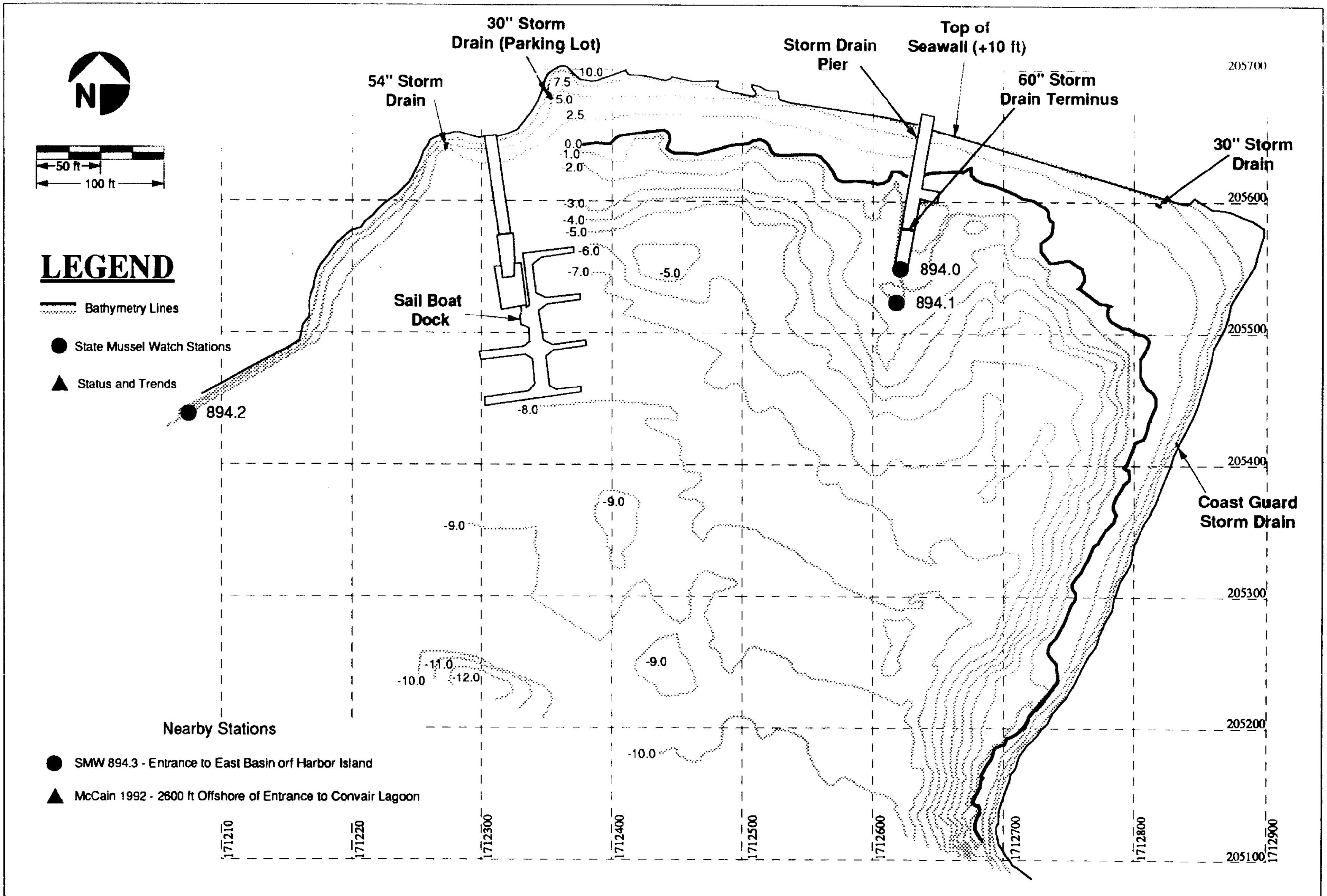
The California State Mussel Watch Program uses the California mussel (*Mytilus californianus*) as a tool to monitor the bioavailability of sediment-borne contaminants throughout the state. This is accomplished by transplanting uncontaminated mussels to various areas of interest, leaving the mussels in-place for 2 to 6 months, then measuring the concentration of contaminants in the mussels. A major assumption of this program is that the presence of contaminants indicates bioaccumulation in mussel tissue; however, transient sediment passing through the digestive tract of mussels could also be measured.

Between 1982 and 1991, the California State Mussel Watch Program sampled up to four locations in the vicinity of Convair Lagoon (Figure 5.2-12). Results of these studies are summarized in Appendices B-5 and B-6. Various PCB species (Aroclors) were found in almost all samples at all sample locations. Total PCB concentrations were recorded in mussel tissue during all sampling periods and exceeded State Mussel Watch Elevated Data Level (EDL_{95}) dry weight values for PCB at Station 894.0, the site nearest the 60-inch storm drain terminus for samples collected in 1988 and 1989. In 1988 the EDL_{95} was exceeded for Total PCB, PCB 1248, and PCB 1254 at Station 894.2 and 894.3 both near the entrance to east basin of Harbor Island. The EDL_{85} for Total PCB was exceeded at Station 894.1 in 1988. Thus, concentrations of PCBs at these stations equal or exceed 85 (EDL_{85}) or 95 percent (EDL_{95}) of all measurements of that analyte in similar samples at all other sites tested by the Mussel Watch Program (i.e., these samples fall into a group that represents the upper 15 or 5 percent of the samples throughout the state). Total PCB values in mussel tissue also exceed the Food and Drug Administration (FDA) action level for PCBs of 2 ppm wet weight in 1982, 1985, 1986, and 1988.

In 1989, when additional chemicals were measured, concentrations of gamma-HCH (Lindane), alpha chlordane, and chlorpyrifos also exceeded the EDL_{95} at Station 894 and O',P' DDE and P,P" DDMS exceeded the EDL_{85}. Cadmium, chromium, copper, lead, silver, and zinc exceeded the EDL_{85} or EDL_{95} in one or more of the nine samples collected. These elevated concentrations of chemicals in the mussels indicate the potential biological availability of trace metals and organics near the terminus of the 60-inch storm drain, the most contaminated area of Convair Lagoon.

National Status and Trends Program

NOAA assessed pollution in San Diego Bay as part of its National Benthic Surveillance Project, a component of the National Status and Trends Program. They sampled one site in the bay during 1984 and 1985. Because high concentrations of sediment and tissue contaminants were found, an additional site was added in 1986, and seven sites were sampled between 1987 and 1988. Fish and sediments from an East Harbor Island site



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Approximate Locations of State Mussel Watch Sample Sites and National Status and Trends Sediment and Fish Site (McCain 1992)

FIGURE 5.2-12

(approximately 2,000 feet offshore from the entrance to Convair Lagoon) were sampled at least once per year from 1986 to 1988 (Figure 5.2-12).

In summarizing these studies, McCain et. al. (1992) concluded that mean concentrations of selected PCBs, trace metals (e.g., copper and lead), and aromatic hydrocarbons in sediments from sites in central (East Harbor Island) and southern (28th Street) San Diego Bay were significantly higher than other bay sites and nearby non-urban sites.

Analysis of fish tissues indicated that concentrations of various aromatic hydrocarbons and PCBs were lower in non-urban areas than in the bay but concentrations in tissues from study sites within the bay generally were not significantly different from each other. Between-site differences inside the bay were found only for PCB concentrations in black croaker liver tissue from the East Harbor Island (highest) and Shelter Island sites. This study also noted that, while DDT concentrations were high in bay sediments, concentrations in fish tissue were lower in San Diego Bay than at the control station at Dana Point. Metal concentrations in fish samples from the bay and control sites were not significantly different.

5.2.2 Impacts

5.2.2.1 Proposed Project - Nearshore Containment Facility (NCF)

Beneficial Impacts

Successful implementation of the proposed project should result in significant improvement to the sediment and water quality in Convair Lagoon and the contiguous areas of San Diego Bay. Specifically the removal of contaminants will reduce the potential for 1) resuspension or remobilization of contaminants and redistribution to other areas of north San Diego Bay, and 2) bioaccumulation in resident biota and the potential transferred to higher levels in the food chain including man.

Four marine environmental areas in the project area where impacts may result from this alternative are 1) the footprint of the nearshore containment facility; 2) the area in which dredging will occur (the dredge footprint); 3) the area between the dredge footprint and the silt curtain; and 4) the area outside of and adjacent to the silt curtain (Figure 5.2-13). Biological assemblages in all these areas will be affected, especially the epibenthic forms living on riprap and the benthic invertebrates and burrowing fish inhabiting sediments in the project area. Types of impacts may include 1) direct mortality associated with removal of or burial by Lagoon sediments or 2) acute toxicity resulting from exposure to remobilized sediment-sorbed contaminants; 3) increased sublethal or chronic impacts associated with exposure to remobilized sediment-sorbed chemicals; 4) bioaccumulation; and/or 5) magnification of contaminants. These issues are discussed in more detail in the following sections.

Short-Term Construction-Related Impacts

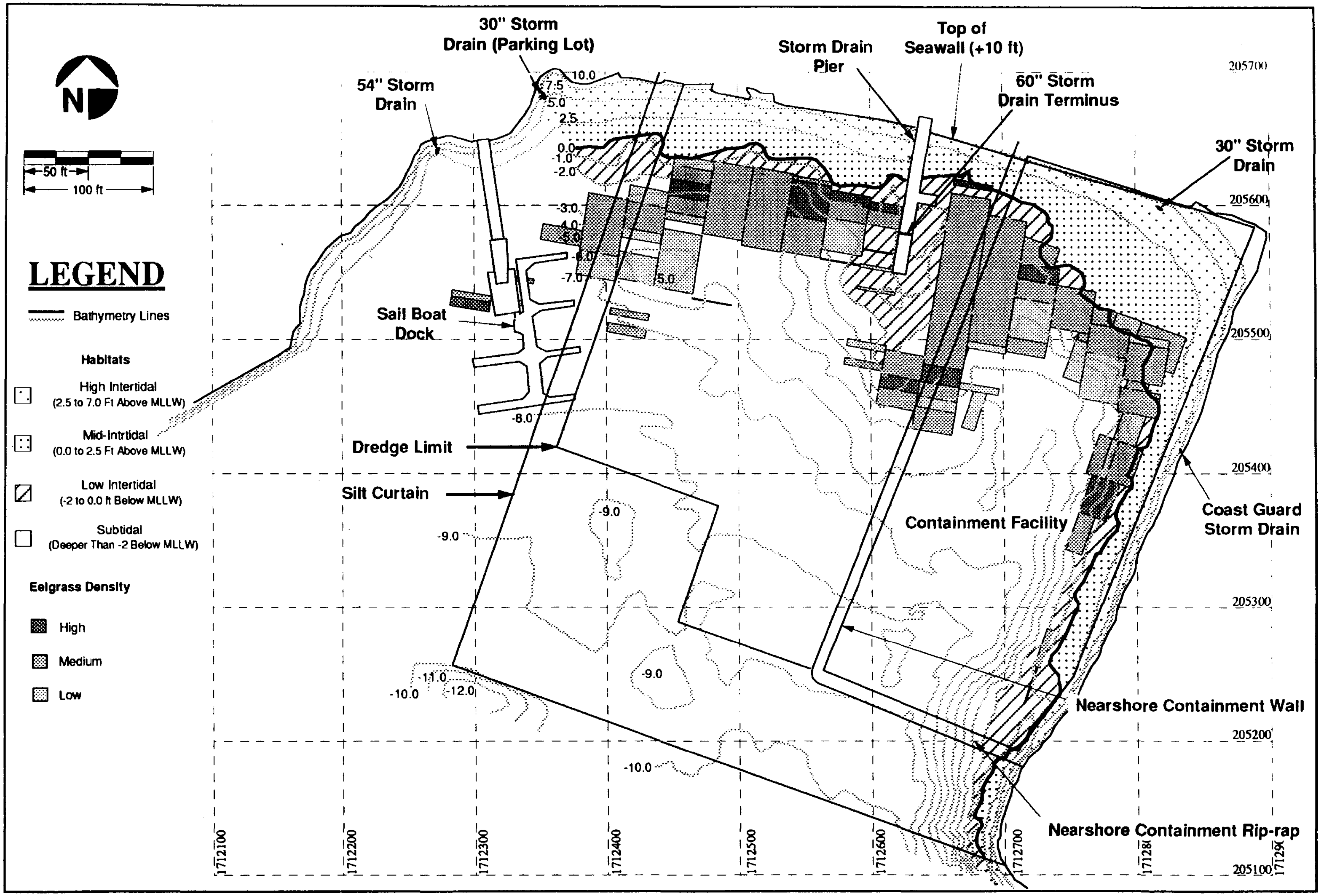
Nearshore Containment Facility Construction

Construction of the NCF would involve building a sheetpile wall and placing rip-rap adjacent to the wall (Figure 5.2-13). These activities would result in increased turbidity, noise, and above-average general human activity in the Lagoon. This is considered to be an insignificant impact assuming successful management of the construction operation.

Dredging to Relocate Contaminated Sediment Inside the Dredge Footprint Into the NCF

Project Footprint. The area within the dredge footprint would be enclosed within a silt curtain to improve containment of turbidity inside the project area. Lagoon sediments would then be hydraulically dredged and pumped into the NCF for dewatering and long-term containment. Dredging would result in 1) a considerable increase in turbidity above normal; 2) a somewhat unconfined turbidity plume of unknown size and shape; 3) substantial but largely contained remobilization of chemicals in the sediment; and 4) total eradication of eelgrass, macroinvertebrates living on and in the sediment, and burrowing fish within the dredge and NCF footprint. Mobile fish and some mobile macroinvertebrates may move to nearby suitable habitats when construction begins.

Dredging activities would eliminate approximately 0.39 acres of eelgrass in the combined dredge and silt curtain footprint (Figure 5.2-13). Benthic biota inhabiting the 1.42-acre dredge footprint would also be lost. Organisms inhabiting the 0.31 acres of intertidal habitat in the combined footprint would also be lost. The loss of intertidal habitat within the project area represents a small percentage of baywide totals; however, this is considered to be a significant cumulative impact.



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Habitats Impacted by Nearshore Containment Facility

FIGURE 5.2-13

Silt Curtain Footprint. The areas within the silt curtain but outside the dredge footprint would be affected by resuspension and potential remobilization of chemical contaminants, turbidity, and burial of benthic species, including eelgrass in the nearshore area. Benthic biota inhabiting the 1.24-acre silt curtain footprint would not be excavated but would probably be disturbed or buried by deposition of particulate material resuspended by dredging and retained within the silt curtain. These areas may also be physically disturbed (e.g., scouring and scarring of the bottom) by maneuvering of the dredge, deployment of anchors to position the dredge, and installation and maintenance of the silt curtain. This is considered to be an insignificant impact assuming successful management of the dredge operation.

Adjacent Area Outside Silt Curtain. Adjacent areas may be affected by resuspension and potential remobilization of chemical contaminants, turbidity, burial of benthic species, and physical disturbance from the dredge operations.

Resuspension and potential remobilization of chemical contaminants in the sediment into the water column and the redistribution of suspended particulate-sorbed contaminants to adjacent areas may result in short-term acute or chronic impacts to water column and benthic biota. Of particular concern are planktonic eggs and larvae of numerous invertebrate and fish species, especially during the spring when large numbers of species are spawning. Settlement of contaminants from the water column and incorporation into the sediments are discussed under long-term effects. Concentration of PCB 1248 in the elutriate tests (Ebasco 1992) designed to predict PCB levels in the dredge area water were 69 and 15 ug/l for unfiltered and filtered samples, respectively. Eisler (1986) conducted an extensive review of PCB hazards to fish and wildlife and reported that concentrations of PCBs from 0.1 to 10.0 ug/l were toxic to sensitive marine species. Consequently, containment of contaminants from the dredge operation is necessary to ensure that no significant impacts occur.

Turbidity resulting from the dredge operation may cause short-term sedimentation in the eelgrass meadows and shallow benthic habitat to the west and outside the dredge footprint. This sedimentation could affect the adjacent eelgrass meadows.

Adjacent areas may also be physically disturbed (e.g., scouring and scarring of the bottom) for a short time period by maneuvering of the dredge and deployment of anchors to position the dredge, and installation and maintenance of the silt curtain when working along the west and south boundaries of the project site. This is considered to be an insignificant impact.

Water Treatment Facility Discharge

Ebasco (1992) estimated that the hydraulic dredging operation would produce an approximately 10:1 water-sediment slurry. Consequently, the slurry entering the NCF would have to be dewatered. Ebasco evaluated the chemical composition of the untreated water generated by this operation using elutriate analysis. Both the filtered and unfiltered fractions of elutriate samples exceeded the National Ambient Water Quality Criteria (acute and chronic) and the California Bays and Estuaries Criteria for silver, copper, and PCB 1248 (Appendix Table B-6). Concentrations of PCB 1248 in elutriate analyses exceeded values reported by Eisler (1986) as toxic to sensitive marine species. Concentration of several other contaminants were below levels of detection that were high enough that an uncertainty of whether they exceeded one or more national or California water quality criteria remains. These contaminants include chromium, mercury, nickel, lead, and selenium. Consequently, this water may require additional treatment to obtain a permit for disposal into San Diego Bay. This is considered to be a significant impact.

Long-Term or Facility-Related Operational Impacts

Construction and Operation

Construction of the NCF would result in the loss of approximately 1.75 acres of tidally influenced habitat. This area comprises 0.21 acres of upper intertidal, 0.29 acres of middle intertidal, 0.24 acres of lower intertidal, and 1.0 acres of subtidal habitat, based on separation of the upper and middle intertidal at +2.5 feet MLLW, the middle and lower intertidal at 0.0 feet MLLW, and lower intertidal and subtidal at -2.0 feet MLLW. This includes approximately 0.39 acres of eelgrass meadows which is composed of 0.1 acre of low-, 0.25 acres of medium-, and 0.04 acres of high-density eelgrass. Approximately 1.75 acres of shallow open water habitat would also be lost. The loss of 1.75 acres of tidal habitat represents a small percentage of total tidal habitat of San Diego Bay; however, these habitat losses are considered cumulatively significant.

Modified Habitat. Construction of the riprap would result in the modification of approximately 0.13 acres of tidally influenced habitat. Based on the elevation criteria specified above, this area is composed of 0 acres of upper intertidal, 0.01 acres of middle intertidal, 0.02 acres of lower intertidal, and 0.10 acres of subtidal habitat. These habitats would be replaced with an equal amount of riprap habitat.

Deterioration of NCF. Long-term deterioration of the NCF may result in the release of contaminants into Convair Lagoon. This is considered to be an insignificant impact assuming successful management of the NCF.

Dredge Footprint. This area will be dredged and result in short-term losses previously described. Based on the condition that the dredged area is restored to existing bathymetry with clean sand after dredging and construction of the NCF are complete and the lost eelgrass meadow is revegetated, no long-term impacts are expected.

Silt Curtain Footprint. The area within this footprint could receive sufficient contaminants from suspended material from dredging to elevate the PCB and metals concentrations to levels of concern. This is considered to be an insignificant impact assuming successful management of the dredge operation.

Adjacent Area Outside the Silt Curtain. No long-term impacts are expected in this area if dredging operations meet regulatory criteria for controlling turbidity and chemical contaminants.

Residual PCBS. A substantial amount of PCBs would be removed from the lagoon and contained in the NCF after remediation is complete. Some residual sediment PCBs would remain in the lagoon. Ebasco (1991) estimated levels after remediation would be approximately 4.6 ppm for the dredge area and approximately 3.8 ppm for the total lagoon. Although both values are above the NOAA ER-M level (Appendix C-4) of 0.4 ppm, a concentration above which effects are frequently observed (NOAA 1990) and the California Action level of 1 ppm in soils, they are well below the cleanup level of 10 ppm ordered by the RWQCB.

Storm Drain Realignment

The operation of the 60-inch storm drain should not change following implementation of the project except the drain will carry runoff from the rerouted 30-inch storm drain. Because the contaminated sediments in the vicinity of the storm drain discharge would be removed under this alternative, there would be no disturbance and resuspension of contaminates expected. However, the catchment basins in the lower portion of the storm drain system should be routinely monitored to identify any new contaminants accumulating in the system. New contaminated sediment should be removed from the basins and appropriately disposed of before it recontaminates Convair Lagoon. No significant impacts are expected from storm drain modification.

5.2.2.2 No Action

The No-Action alternative would result in no remediation of Convair Lagoon. Consequently, chemical contaminants including PCBs and metals present in the sediment would continue to bioaccumulate in resident biota and potentially be transferred to higher levels in the food chain including man. Contaminants would also be resuspended by various physical factors (e.g., waves, currents, and the discharge of rainwater runoff), biological activity (e.g., bioturbation by the large number of burrowing organisms inhabiting the lagoon) and human activities (e.g., boating) where they could become biologically "available" to various marine organisms in the water column.

5.2.2.3 Sand Capping - Preferred Alternative

Beneficial Impacts

Successful implementation of this remediation alternative would result in significant improvement to the sediment and water quality in Convair Lagoon and the contiguous areas of San Diego Bay. Specifically the capping and containment of contaminants will reduce the potential for 1) resuspension or remobilization of contaminants and redistribution to other areas of north San Diego Bay, and 2) bioaccumulation in resident biota and the potential transferred to higher levels in the food chain including man.

Three marine environmental areas in the project area that may be impacted by this alternative are 1) the footprint of the sand cap; 2) the area between the sand cap footprint and the silt curtain; and 3) the area outside and adjacent to the silt curtain (Figure 5.2-14). Biological assemblages in all of these areas would be affected, especially the sessile epibenthic organisms living on riprap and the benthic invertebrates and burrowing fish inhabiting the project area. Impacts may involve direct mortality from burial or limited sublethal or chronic toxicity resulting from remobilization of sediment sorbed-chemicals and limited bioaccumulation and/or magnification of contaminants due to increased availability in the water column. These issues are discussed in more detail in the following sections.

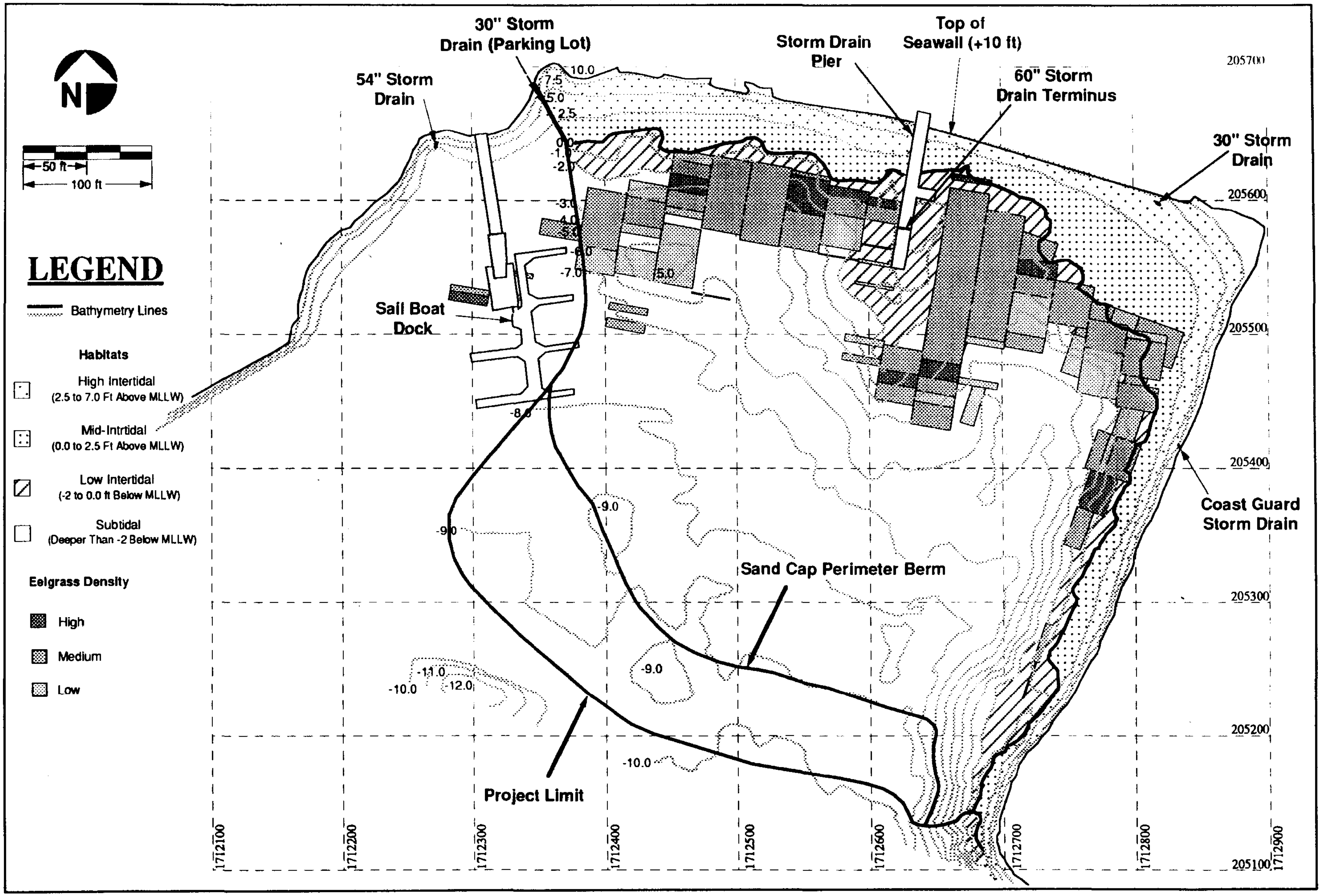
Short-Term Construction-Related Impacts

Sand Cap Construction

Construction of the sand cap would involve placement of a silt curtain to contain turbidity, the installation of various protective liners, a rock layer to inhibit bioturbation, riprap, and the sand cap (Figure 5.2-14). Since no sediment would be dredged, the deeper sediment layers containing the greatest concentrations of contaminants would not be disturbed. Sand capping activities would result in 1) an increase in turbidity above normal but substantially less than options employing dredging; 2) a turbidity plume of unknown size and shape; 3) slight but uncontained remobilization of chemicals in the surficial sediment; and 4) loss of eelgrass, macroinvertebrates living on and in the sediment, and burrowing fish within the sand cap footprint. Mobile fish and some mobile macroinvertebrates may move to nearby suitable habitats when construction begins. These short-term impacts are considered to be insignificant assuming careful management of the cap installation and successful operation of the silt curtain.

Adjacent Area Outside the Silt Curtain

Areas adjacent to and outside the silt curtain may be affected by resuspension and potential remobilization of chemical contaminants, turbidity, burial of benthic species, and physical disturbance from the capping operations. Most of the resuspended sediment will originate from clean materials used for capping but capping activities may cause a limited amount of resuspension and remobilization of contaminated sediments. Redistribution of suspended particulate-sorbed contaminants into adjacent areas may result in limited short-term acute or chronic impacts to biota in the water column and sediments. Of particular concern are planktonic eggs and larvae of numerous invertebrate and fish species, especially during the spring when large numbers of species are spawning. Settlement of contaminants from the water column and incorporation into the sediments are discussed under long-term effects.



Habitats Impacted by Sand Cap

FIGURE 5.2-14

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Turbidity resulting from the capping operation may cause short-term reduction in primary productivity in the adjacent eelgrass meadows. Resulting sedimentation could affect these eelgrass meadows and the shallow benthic habitat to the west and outside the cap footprint.

Adjacent areas may also be physically disturbed (e.g., scouring and scarring of the bottom) by maneuvering of vessels and barges employed in capping activities, deployment of anchors used to position the barges, and installation and maintenance of the silt curtain when working along the west and south boundaries of the project site.

These impacts are considered to be insignificant assuming careful management of the cap installation and successful operation of the silt curtain.

Storm Drain Extension

The storm drain would be extended approximately 80 feet farther offshore to provide a new discharge point. Construction would be conducted by placing extensions in line with the existing pipe. All construction would be conducted within the silt curtain perimeter and no dredging would be required. Consequently, construction impacts are considered to be insignificant.

Long-Term or Facility-Related Operational Impacts

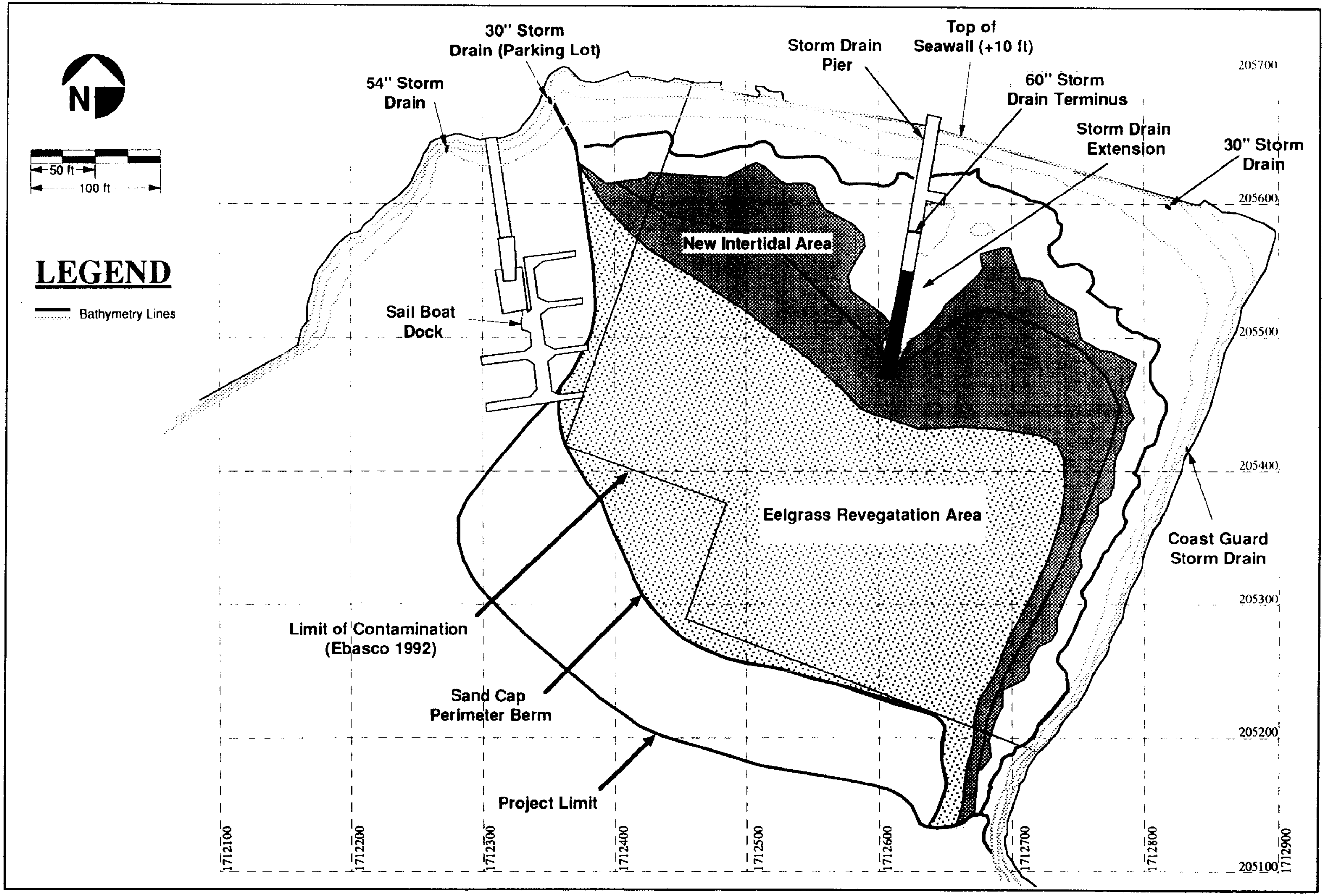
Operation

Lost Habitat. Construction of the cap would result in the modification of approximately 4.8 acres of tidally influenced habitat. This area is composed of 0.40 acres of upper intertidal, 0.47 acres of middle intertidal, 0.34 acres of lower intertidal, and 3.7 acres of subtidal habitat. This includes approximately 0.82 acres of eelgrass meadows. This meadow is composed of 0.21 acre of low-, 0.52 acres of medium-, and 0.09 acres of high-density eelgrass. The installation of a cap 3 feet thick would elevate the area presently at -3.0 feet MLLW to 0.0 feet MLLW or above. This action would result in the loss of approximately 0.98 acres of lower intertidal habitat based on the conceptual bathymetry presented in the capping plan. However, the area presently in the -3.0 to -5.0 feet MLLW range would be elevated 3 feet due to the cap and create approximately 0.98 acres of new lower intertidal habitat. This new intertidal habitat created by the cap would result in the loss of 0.98 acres of existing subtidal habitat. The increase in intertidal habitat is considered a beneficial impact since much of this habitat has been destroyed in San Diego Bay. It is anticipated that benthic and intertidal assemblages characterizing this area would rapidly recolonize within six to twelve months after cap completion. The conceptual capping plan includes the planting of eelgrass to provide cap stability and biological enhancement (Figure 5.2-15). Based on the conceptual capping plan approximately 2 acres of eelgrass would be planted. Root systems of eelgrass typically grow to depths of about 6 inches; consequently, they should not be influenced by the contaminants under the 3-foot thick cap. In addition, the perimeter berm would be constructed of large rock and smaller graded rock which will act as an artificial reef environment after construction of the cap is complete. As a result of the above biological enhancements in conjunction with containment of contaminants, habitat modifications are considered insignificant.

Long-term Deterioration of the Sand Cap. Long-term deterioration of the sand cap associated with normal erosion accompanying storms and boating activities or bioturbation may result in the release of contaminants to Convair Lagoon.

In view of moderate to high densities of burrowing organisms noted during field surveys and the proposed use of a sand cap to cover contaminated sediments in Convair Lagoon, the burrowing depth of organisms and the ability of local (or similar) species to redistribute buried sediments to the surface was investigated by review of published literature. This is one of the least understood, yet most likely, scenarios as populations of infaunal organisms (invertebrates that live and burrow in the sediment) develop in the new, clean sediments of a sand cap. These organisms either construct burrows or tubes for residence and feeding, or move through the sediment. In the process of movement, burrow or tube construction, or feeding, sediment is displaced from one location to another. This phenomenon, called bioturbation, has been shown to have a major effect on the distribution of sediments (Bosworth and Thibodeaux 1990; De Vaugelas 1985; Myers 1979; Pemberton et al. 1976; Suchanek and Colin 1986; and Suchanek et al. 1986).

Infaunal recruitment occurs rapidly in shallow subtidal sediments, particularly in protected areas of bays. Reish (1961) found that colonization of newly available sediments by infauna peaked within a year and stabilized within three years. A study on dredge-and-fill operations in north San Diego Bay showed that infaunal populations re-established within six months of disturbance (Elliott, unpublished data). As populations of burrowing organisms develop, the upper layer of sediment becomes increasingly disturbed by biological activity. MacGinitie (1934) estimated that a population of ghost shrimp



OGDEN

Habitat Enhancement for Conceptual Sand Cap

FIGURE 5.2-15

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(*Callianassa californiensis*) can completely recycle (turn over) the upper 30 inches of sediment (the approximate depth of their burrows) in about 240 days. Other studies demonstrating the ability of callianassid shrimps to move large amounts of sediment are reported by Murphy and Kremer (1992), Aller and Dodge (up to 12 $kg/m^2/day$; 1974), Suchanek (1983), Suchanek and Colin (1986), Branch and Pringle (1987), and Riddle (1988). These studies have documented that burrowing activities cause sediment destabilization and resuspension but also release nutrients and increase community productivity. Exclusion experiments (Branch and Pringle 1987) and measurement of bioturbation rates (Suchanek and Colin 1986) have shown that callianassids are the most important cause of bioturbation in certain areas. Suchanek and Colin (1986) noted that some of the highest contaminant levels were associated with extremely fine-grained sediments and callianassids tend to pump these back to the surface (Suchanek 1983; Tudhope and Scoffin 1984; Riddle 1988). The situation in Convair Lagoon may be similar as organic contaminants and metals are often associated with the smaller sediment grain sizes.

If a species such as the ghost shrimp penetrates into the contaminated sediments beneath a sand cap, their burrowing and feeding activities would bring contaminants to the sediment surface where their activities and the activities of the other species restricted to the upper layer would cause further redistribution. This raises the question of how thick a permanent sand cap needs to be to ensure that it will not be penetrated by biological activity. This is separate from the physical and oceanographic questions that also should be answered relative to the sand cap including the effect of wave and storm induced water energy on the sand cap, the possibility of upward migration of contaminated sediments into the sand cap through time due to internal sediment processes, and the possibility of outside activities penetrating the cap (e.g., boating activities such as anchoring, sailboat keels getting stuck in the sand, swimmers, etc.). To address the bioturbation concern, a list of burrowing organisms that may occur at this site (based on species found in Convair Lagoon and San Diego Bay, or those that could inhabit the bay based on their reported distribution) is shown in Table 5.2-2 along with pertinent information on habitat and burrow depth. Further information on the reported locations of species most likely to inhabit a sand cap in Convair Lagoon is presented in Table 5.2-3.

The penetration depth by organisms likely to be present in Convair Lagoon following remediation is difficult to determine as few studies have been done in the southern California area to determine these depths. An early study (MacGinitie 1934) suggested that the ghost shrimp burrows extend to a depth of approximately 30 inches in southern California. More recently Griffis and Chavez (1988) found that burrow diameter, depth, volume, and number of holes differed depending on substrate composition and species in Bahia de San Quintin, Mexico (approximately 175 miles south of San Diego). Burrows in sand were deeper (16 inches [45 cm]) with less horizontal extension than in mud. Burrows in mud had a larger volume, more openings, and larger diameters. An additional factor is tidal elevation as intertidal individuals burrow deeper apparently to remain in contact with water. This is significant as the highest PCB values are at depths between 4 and 5 feet in intertidal sediments around the 60-inch storm drain (TRA 1989). This is also the area that is exposed to more wave action that could accelerate redistribution of PCBs returned to the sediment surface. Ghost shrimp in other locations have been shown to burrow deeper (~6.5 feet [~200 cm] in very fine sand, Suchanek et al. 1986; >24 inches [>60 cm] in fine to medium grade sand, Tudhope and Scoffin 1984). Related species are reported to burrow as deep or deeper (*Upogebia pugettensis* [mud shrimp] to ~35 inches (90 cm); Dworschak 1983; MacGinitie 1930) and (*Axius serratus* to >10 feet (>3 m), Pemberton et al. 1976). Species related to both of these shrimp are present in the San Diego area. Ghost shrimp and mud shrimp have been reported throughout northern San Diego Bay. A deep burrowing and usually deep water species similar to *Axius* has been reported once from a location near the bay entrance (D. Cadien personal communication). A closely related species, *Axius serratus*, disrupted the normal stratification at a relatively shallow contaminated site in Nova Scotia (Pemberton, et al. 1978). Consequently, the potential for burrowing organisms to compromise the integrity of the cap is significant.

Adjacent Area Outside Silt Curtain. No long-term impacts are expected in this area if capping operations meet regulatory criteria for controlling turbidity and chemical contaminants.

Residual PCBs. A substantial of PCBs would be capped and isolated from the lagoon after remediation is complete. Some residual PCBs would remain in the lagoon sediment. Ebasco (1991) estimated levels after remediation using the NCF approach would be approximately 3.8 ppm for the total lagoon. Although the Ebasco value is above the NOAA ER-M Level (Appendix C-4) of 0.4 ppm, a concentration above which effects are frequently observed (NOAA 1990) and the California Action level of 1 ppm in soils, it is well below the cleanup level of 10 ppm ordered by the RWQCB. Because the cap and perimeter berm will cover a larger area then the NCF alternative even more PCB

Table 5.2-2

ORGANISMS THAT MAY OCCUR IN THE PROJECT AREA AND DISTURB THE SEDIMENT SURFACE

PHLYA *Species* (Common Name)	Bay Habitat Type	Burrow Depth	Probability of Occurrence	Habitat Zone
MOLLUSCA - BIVALVA				
Chione spp. (chione clams)	Sandy & sandy mud	Close to surface[1]	High	Low Int
Laevicardium substriatum (egg cockle)	Sand or mud	Near surface[1]	High	Low Int
Macoma nasuta (bent-nosed clam)	Gravel, sand, mud	~.4 ft (20 cm)	High	Int to 150 ft
Nuttallia nuttallii (purple clam)	Sand and gravel	12 to 16 in[1,2]	Low	Low Int
Panopea generosa (geoduck)	Sandy mud	~4.3 ft (1.3 m)[1]	Low	Low Int, Sub
Protothaca spp. (littleneck clam)	Sandy & gravel areas	16 in (40 cm)[2]	Moderate	Mid-Low Int
Saxidomus nuttallii	Sandy	1 ft or more[1]	Low	Low Int
Solen rosaceus (rosy razor clam)	Sandy	~1 ft (30 cm)[2]	Likely	Low Int, Sub
Solen sicarius (sickle razor clam)	Sandy (w/eelgrass)	~1.2 ft (35 cm)[2]	Likely	Low Int
Tagelus spp. (jackknife clam)	Sandy mudflats	4 to 20 in[1,2]	Likely	Low Int
Trachycardium quadragenarium (spiny cockle)	Sand flats	Close to surface[1]	Low	Low Int, Sub
Tresus nuttallii (gaper)	Sandy mud	3 ft+[1,2]	Low	Low Int
ARTHROPODA - CRUSTACEA				
Axius spp. typr (mud shrimp)		>10 ft (3 m)	Low	Subtidal
Callianassa spp. (ghost shrimp)	Mixed sand & mud	2.5 ft[2], 6.5 ft+[5]	High	Mid-Int
Hemisquilla ensigera californiensis (mantis shrimp)	Mud or sand-shell areas	3 to 6 ft (1 to 2 m)	High	Int to 90 ft
Upogebia macginitieorum (mud shrimp)	Mud or sandy mud flats	~3 ft (90 cm)	High	Low-InMud
ANNELIDA - POLYCHAETA				
Chaetopterus variopedatus (parchment-tube worm)	Sandy mud or mud	Near surface	Low	Int to Sub
Diopatra splendidissima	Sand & mud flats	3 ft (*D. cuprea*)[2]	Moderate	Int to 100 ft
Glycera americana (blood worm)	Muddy sand mud		High	Sub
Mesochaetopterus rickettsii[3]	Sand (w/eelgrass)	~4 ft (1.2 m)[2]	High[3]	Shal Sub
Nepthys caecoides	Sandy mud	Near surface	High	Int to Sub
Pista pacifica	Sand a & mud flats	Deep	Low	Low Int
SIPUNCULA				
Siphonosoma ingens	Sandy mud (w/eelgrass)		Moderate	Low Int
Themiste zostericola	Sand (w/eelgrass)	Near surface	High	Low Int
ECHIURA				
Urechis caupo	Sand & Sandy mud	4in to 1.5 ft (10-45 cm)	Low	Low Int, Sub
VERTEBRATA - FISHES				
Myliobatis californica	Sand & Sandy mud	to 2 ft	Moderate	Low Int, Sub
PLANTS - ANGIOSPERMS				
Zostera marina (eelgrass)	Sandy mud	6 in+ (15cm+)[4]	High	Low Int

Int - Intertidal -2.0 to + 7.0 ft.
Sub - Subtidal ≤-2.0 ft.
Source:
1 McLean 1969
2 Morris et. al 1980
3 The depth of penetration into the sediment is for *M. taylori*, a species reported only as far south as Dillon Beach, CA (Marin County)[2]. It is likely that the southern species demonstrates similar characteristics.
4 Short 1983
5 Suchanek et al. 1986

Table 5.2-3

ORGANISMS REPORTED OR OBSERVED IN THE VICINITY OF THE PROJECT AREA THAT MAY PENETRATE BENEATH THE SEDIMENT SURFACE

PHLYA Species (Common Name)	Convair Lagoon	East Harbor Island	North San Diego Bay	General
MOLLUSK - BIVALVE				
Chione spp.		+[1]	+	+
Laevicardium substriatum	+[3]	+	+	+
Macoma nasuta		+	+	+
Nuttallia nuttallii				+
Panopea generosa				+
Protothaca spp.		+[1]	+	+
Saxidomus nuttallii				+
Solen rosaceus		+	+	+
Solen sicarius				+
Tagelus spp.			+	+
Trachycardium quadragenarium				+
Tresus nuttallii				+
ARTHROPODS - CRUSTACEANS				
Callianassa spp.	+	+	+	+
Hemisquilla ensigera californiensis			+[2]	+
Upogebia spp.	+		+	+
ANNELIDS - POLYCHAETES				
Chaetopterus variopedatus	+[3]		+	+
Diopatra splendidissima			+	+
Glycera americana			+	+
Mesochaetopterus spp.				+
Nepthys caecoides		+	+	+
Pista pacifica				+
SIPUNCULA				
Siphonosoma ingens				+
Themiste zostericola				+
URECHIDA				
Urechis caupo				+
VERTEBRATA - FISHES				
Myliobatis californica		+	+	+
PLANTS - ANGIOSPERMS				
Zostera marina	+	+	+	+

1 Personal unpublished observations
2 U. S. Navy 1987
3 Observations from field studies in Convair Lagoon

U.S. Navy, 1987. Biological Reconaissance Survey at the Electromagnetic Roll Garden Pier, North San Diego Bay. Prepared as an appendix to an EIS for the pier.

contaminated sediment will be isolated from the lagoon, likely resulting in a still lower residual PCB level.

Storm Drain Modifications

The only change in operation of the 60-inch storm drain following implementation of this alternative is that the discharge point would be approximately 80 feet farther offshore but at the same elevation. The discharge would be positioned in a bed of large riprap to diffuse the force of the water as it exits the pipe. In combination with the cap, this design would reduce the potential for disturbance, resuspension, and redistribution of contaminants by storm water. The catchment basins in the lower portion of the storm drain system would be routinely monitored to identify any new contaminants accumulating in the system. New contaminated sediment would be removed from the catchment basins and appropriately disposed of before it recontaminates Convair Lagoon.

5.2.3 Mitigation

5.2.3.1 Proposed Project - Nearshore Containment Facility

Implementation of the recommended mitigation measures outlined below would reduce impacts to marine resources to below a level of significance.

- Impacts associated with turbidity and redistribution of particulates will be minimized by enclosing the construction area within a silt curtain. This action will minimize the dispersion of fine particulate material disturbed during construction activities. Success of this measure should be monitored using real-time turbidity and water column chemical monitoring at designated sampling locations outside the silt curtain. If turbidity and water chemistry criteria are not met, construction operations can be interrupted and modified to attain compliance.

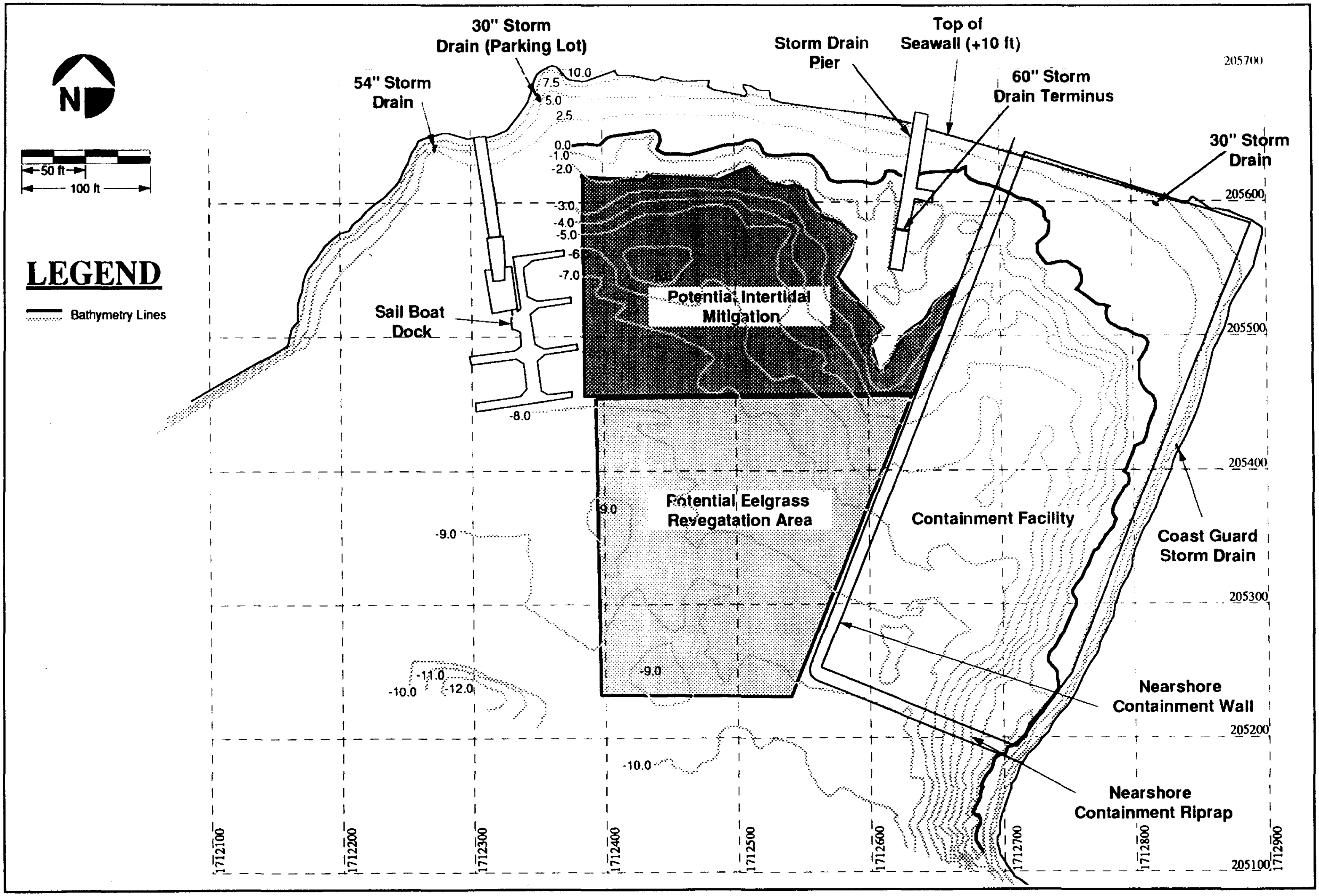
- Dredging impacts are likely to be significant within the dredge footprint but will be mitigated after dredging is complete, a situation not typical of usual dredge projects. Typical dredge project are undertaken to increase water depth. In this situation water depth does not need to be increased; consequently, the lagoon bottom can be returned to grade using clean sand after the contaminated material is removed. Benthic and intertidal assemblages characterizing this area are dominated by species that are usually able to rapidly recolonize areas following severe physical disruptions such as the proposed dredging within six to twelve months. Larger macroinvertebrates such as the ghost shrimp and other burrowers may require additional time to colonize the restored area. Consequently, it is expected that the area will recover from the dredge program naturally and within only a few years after restoration of the bottom to grade with biota typical of these habitats. Similar but more rapid recolonization of the silt curtain footprint is expected.

- Impacts in the area adjacent to but outside the silt curtain will be mitigated by careful operation of the silt curtain and dredge. The success of these mitigation measures can be monitored using real-time monitoring of turbidity and water chemistry in the water column. If turbidity and water chemistry criteria are not being met, dredge operations will be interrupted and modified to attain compliance.

- The potential toxicity of the discharge would be tested using appropriate EPA-approved bioassay tests. Moreover, the potential area influenced by the discharge plume would be estimated on the basis of physical oceanographic conditions and discharge water volume. These data and analyses will allow a better estimate of the impact of the proposed discharge.

- Potential mitigation for loss of 0.75 areas of intertidal habitat would involve construction of a new intertidal area of equal size west of riprap wall of the NCF (Figure 5.2-16) elevating the existing lagoon bottom to -0.2 feet MLLW. However, this action would result in the loss of an equal area of shallow subtidal habitat and the 0.39 acres of eelgrass from the dredge footprint. This loss of shallow subtidal habitat may be mitigated by filling a nearby deep water area (>18 feet MLLW) of the bay with clean sand to a depth of less than 18 feet to create new shallow subtidal habitat, thus using less valuable deep water habitat to create valuable shallow water habitat.

- The loss of eelgrass in the NCF and dredge footprints will be mitigated by implementation of a restoration program in the adjacent area west of the NCF in conjunction with the restoration of eelgrass for the dredge footprint



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Potential Mitigation for Nearshore Containment Facility

FIGURE 5.2-16

(Figure 5.2-16). This option will result in a planting of 0.94 acres of eelgrass to mitigate the loss of 0.78 acres of eelgrass and monitoring its development to document mitigation success.

- Long-term deterioration of the NCF would be monitored by implementation of a routine inspection and maintenance program for the life of the facility. This plan would include a biological and water quality monitoring program including a mussel watch station and tissue analysis of burrowing organisms to allow detection of bioaccumulation in resident biota that may indicate a breach in the integrity of the facility.

- After dredging is complete, redeposited contaminants in the silt curtain footprint will be evaluated by testing for surficial sediments to determine if contaminant levels require further remediation. If contaminant levels are elevated, the upper layer of sediment will be removed with the dredge and placed in the NCF. The area potentially affected will be minimized by placing the silt curtain as near the dredge footprint boundary as possible.

5.2.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.2.3.3 Sand Capping - Preferred Alternative

Implementation of the recommended mitigation measures outlined below would reduce impacts to marine resources to below a level of significance.

- Placement of a 1-foot layer of crushed rock on the existing lagoon bottom may act as a deterrent to deep-burrowing organisms such as ghost shrimp. Additional field studies shall be conducted to determine what species created the burrows in Convair Lagoon and estimate the depth of those systems. Finally, additional field and lab investigations shall be conducted to determine the effectiveness of the proposed rock layer as a deterrent to burrowing for the organisms identified as responsible for the burrow systems since these are likely to colonize the sand cap after construction.

- A long-term monitoring program will be designed to evaluate and monitor the effectiveness of the cap. This will involve sediment core samples to evaluate contaminant migration into the cap, biological samples to evaluate the significance of bioturbation and the transport of capped chemicals to surface sediments where they may be redistributed. Finally, a contingency plan will be prepared describing how significant damage to the cap will be repaired.

- The District will work with the Responsible Party(ies) to establish an adequate Annuity or other financial account to provide funds necessary for long-term monitoring and maintenance.

5.3 AVIAN RESOURCES

5.3.1 Existing Conditions

Introduction

In terms of bird diversity, southern California's brackish and saltwater bodies are utilized to the greatest extent in the non-breeding months from fall through early spring. However, several species with restricted and vulnerable nesting distributions use bays such as San Diego Bay for reproductive activities, further diversifying the avian use of the bay. The wide variety of bird species on San Diego Bay collectively make use of all elements of the bay system, from shorelines and man-made structures to open water and muddy bay bottoms. Convair Lagoon represents only a small percentage of the total bay area, but is important for its transitional nature between shore, sheltered cove, and open bay water. Calm waters such as these are frequently used for foraging as well as energy-conserving rest behavior.

Water-Associated Birds in the Vicinity of Convair Lagoon

Bird use of the Convair Lagoon is presented here in the context of the greater Harbor Island area, San Diego Bay, which includes a range of shore and water conditions. Table 5.3-1 lists confirmed and potential waterbird species of regular occurrence. Confirmed species are derived and modified from Copper's (1986c) surveys of the area. Those surveys did not include the late fall through early spring period of the year, so the list is supplemented with potential species, based on other published material (e.g., Cogswell 1977, Unitt 1984). For the purposes of this report, species are grouped into broad ecological foraging and seasonal categories. Weekly waterbird surveys of north San Diego Bay are currently being conducted by Ogden for the Navy. Thirty-eight bird species have been documented in the vicinity of Convair Lagoon and an additional 18 species are expected to use the Lagoon to varying degrees.

Sensitive Bird Species

The state of California recognizes several species as being of special concern. Many species without officially protected status are of concern for population declines, restricted and vulnerable habitat requirements, and limited distribution within the state. Others are

Table 5.3-1

CONFIRMED AND POTENTIAL WATER-ASSOCIATED BIRD SPECIES OCCURRING IN THE CONVAIR LAGOON AREA

Shore/waterline feeders

Great Blue Heron (r)*
Great Egret (n)
Snowy Egret (n)
Little Blue Heron (r)
Green-backed Heron (r)*
Black-crowned Night Heron (r)*
Mallard (r)*
Cinnamon Teal (n)*
Black-bellied Plover (n)*
Snowy Plover (r)*
Semipalmated Plover (n)
Killdeer (r)*
Willet (n)*
Spotted Sandpiper (n)
Whimbrel (n)*
Long-billed Curlew (n)*
Marbled Godwit (n)*
Ruddy Turnstone (n)*
Black Trunstone (n)*
Surfbird (n)*
Sanderling (n)*
Short-billed Dowitcher (n)*

Surface/water column feeders

Red-throated Loon (n)
Pacific Loon (n)
Common Loon (n)
Pied-billed Grebe (n)*
Horned Grebe (n)
Brandt's Cormorant (r)
Eared Grebe (n)*
Western Grebe (n)*

Surface/water column feeders (continued)

Clark's Grebe (n)*
Brown Pelican (n)*
Double-crested Cormorant (r)*
Bufflehead (n)
Red-breasted Merganser (n)
American Coot (n)
Bonaparte's Gull (n)*
Heermann's Gull (n)*
Ring-billed Gull (n)
California Gull (n)*
Herring Gull (n)
Western Gull (r)*
Glaucous-winged Gull (n)*
Caspian Tern (b)*
Elegant Tern (b)*
Forster's Tern (r)*
Least Tern (b)*
Black Skimmer (r)*
Belted Kingfisher (r)*

Benthic/bottom feeders

Greater Scaup (n)
Lesser Scaup (n)
Surf Scoter (n)*
Ruddy Duck (n)

Predators

Osprey (n)
Peregrine Falcon (r)*

For the purposes of this report, species are grouped into broad categories of foraging ecology and annotated as to seasonal occurrence. Seasonal codes: r = resident (year-round), n = non-breeding (fall through early spring), b = breeding (spring and summer). Asterisked species are of confirmed occurrence.

Source: Copper 1986c, Ogden unpublished data.

currently federal and/or state endangered or threatened species or are candidates for such status. Several species of state concern occur in the Convair Lagoon area.

California Least Tern

The California least tern is a state and federal endangered species and is the waterbird species most vulnerable to disturbance on San Diego Bay since it completes its entire nesting cycle within the bay environs. The birds nest in colonies on sandy beaches and forage for small schooling fish in relatively calm water, mostly within 2 miles of the colony (Atwood and Minsky 1983, Bailey 1984). Nesting colonies in proximity to Convair Lagoon are on the North Island Naval Air Station, Naval Training Center, and historically at the southeast corner of Lindbergh airfield (Copper 1986b). Foraging surveys by Copper (1986c, 1986d) showed that the Harbor Island area receives moderate to high foraging use by least terns. Foraging intensity was relatively moderate from Convair Lagoon eastward probably due to the proximity to the Lindbergh Field nesting colony that was active when the foraging surveys were conducted in 1986. Foraging activity in San Diego Bay is highest in May and June, declining afterward as nestlings fledge and birds disperse (Copper 1986c, 1986d). Least terns have usually departed by late September. Significant alterations to the Harbor Island east basin have occurred since Copper's work and subsequent focused foraging studies have not been conducted. The Lindbergh airfield colony has not been active since 1989. The current use of Convair Lagoon is likely to be less than that documented by Copper due to the greater distance from an active colony (about 2 miles from the North Island Colony).

A positive association with least tern foraging and the availability of eelgrass (*Zostera marina*) beds has been demonstrated (ERCE 1989), presumably due to higher fish densities associated with eelgrass. Seasonal shifts in foraging locations have been demonstrated within bay systems (Atwood 1983, Copper 1986a, 1986b, ERCE 1989). Fancher (1992) lists increased degradation of water quality in foraging areas as one of two major factors in the historical decline of the species in California. Although the statewide population has remained fairly stable in recent years, local nesting success and colony site fidelity can vary significantly between years, particularly with major changes in ocean surface conditions associated with *El Niño* weather patterns (Copper 1986b, Fancher 1992).

Snowy Plover

This federally threatened bird requires open, sandy beaches for nesting and foraging. They are likely of marginal occurrence in the vicinity of Convair Lagoon due to a lack of suitable foraging and nesting habitat.

Brown Pelican

This state and federally endangered species nests on islands on the Pacific and Gulf coasts of Baja and Southern California. San Diego Bay is utilized by brown pelicans throughout the year, with the most extensive use during the non-breeding season. Shoreline structures are commonly used for roosting and shallow bay waters are occasionally used for foraging.

Peregrine Falcon

A nesting pair of this federally endangered species has been maintained on a pylon of the Coronado Bridge since 1989 (Pavelka 1991). Peregrine falcons rely on a diet of waterbirds and pigeons. Foraging by adults and young appears to be concentrated on the southern half of San Diego Bay (Pavelka 1992). However, this falcon is wide-ranging and has been documented in the Harbor Island area (Copper 1986c). Foraging by peregrine falcons in the vicinity of Convair Lagoon is likely.

Great Blue Heron

This species is a California Department of Fish and Game (CDFG) species of special concern and nests in highly localized colonies within tree groves. These breeding colonies are vulnerable to disturbance and are of special concern to resource agencies. Several colonies occur on the bay shores of Point Loma and North Island Naval Air Station and foraging adults frequently utilize the shallow shoreline (Unitt 1984).

Black-crowned Night Heron

As with the great blue heron, this species' localized colonies are of concern in California. These birds also forage in shallow shore conditions, but do so nocturnally. Nest colonies are located in Point Loma and on North Island Naval Air Station (Unitt 1984).

5.3.2 Impacts

Successful implementation of either of the remediation alternatives would result in a potentially significant reduction in contaminant exposure to avian resources. Isolation of contaminants from the greater San Diego Bay ecosystem will reduce the potential for 1) resuspension or remobilization of contaminants and redistribution to other areas of San Diego Bay, and 2) bioaccumulation in resident biota and the potential transfer to levels in the food chain, including man.

5.3.2.1 Proposed Project – Nearshore Containment Facility

The proposed NCF would extend the northeastern shore of the Lagoon, reducing the open water surface and other marine habitats by 1.75 acres, or nearly 20% of the total Lagoon area. The nature of the new shoreline as proposed will present a much sharper profile at the water interface, thus limiting its usefulness to most waterbirds as foraging substrate particularly for surface/water column and benthic feeding species (e.g., least tern and brown pelican). The northeast corner of the Lagoon includes the majority of the intertidal habitat within the Lagoon which is the preferred foraging habitat for most shoreline feeding birds (i.e., herons and shorebirds; Table 5.3-1). The remainder of the Lagoon edge is primarily riprap which is utilized by a fewer number of waterbird species (e.g., turnstone spp.).

The loss of 1.75 acres of open water habitat represents a small percentage of the total surface of San Diego Bay; however, Convair Lagoon historically received moderate use by foraging California least terns (Copper 1986a), which still has many of the characteristics of preferred tern foraging habitat (ERCE 1989, Massey and Atwood 1982). Therefore, the loss of 1.75 acres of open water habitat is considered to be a cumulatively significant impact.

Any form of remediation, including the proposed NCF, may temporarily render the Lagoon unavailable to foraging least terns, brown pelican, and other waterbird species. The short-term loss of foraging habitat within the Lagoon due to dredging activity is not considered to be significant if the dredging activity occurs during the non-breeding season (late September through March).

The proposed dredging of contaminated sediments potentially poses a risk of resuspension and dispersion of contaminants, allowing for their introduction into the food chain (Eisler 1986, Ohlendorf 1993, Elliott and Noble 1993). This potential impact is not considered significant since standard methods using silt screen barriers will minimize the dispersion of sediment from the dredging area.

5.3.2.2 No Action

PCBs from a wide variety of industrial sources have historically been released into San Diego Bay. Areas where these outfalls converge are characteristic concentration points for the stable PCB compounds. The nearshore marine environment is the predominant location for bioaccumulation and transport of these contaminants (Borlakoglu and Haegele 1991). The primary route for entry of PCBs into marine food webs is through contaminated sediments and organic particulates in the water column. Laboratory tests have produced PCB concentrations of 100 to 1500 ppm in tissues of waterbirds (Borlakoglu and Haegele 1991), but levels in free-ranging birds are generally lower (Eisler 1986). Ohlendorf et al. (1985) documented PCB levels of 1.5 to 1.8 mg/kg (wet weight) in tern eggs from south San Diego Bay. PCBs have been linked to a number of pathological conditions in bottom-dwelling fish in San Diego Bay and are strongly implicated as carcinogens (McCain et al. 1992). Chronic effects of PCBs in birds include weight loss, immunotoxicity, reduced reproductive success, and various biochemical abnormalities (e.g., induction of liver and blood enzymes; Eisler 1986, Elliott and Noble 1993). The No Action alternative would continue to expose the marine environment to PCB-laden sediments with the continued potential for adverse environmental effects described above.

5.3.2.3 Sand Capping - Preferred Alternative

Implementation of the Sand Capping alternative would avoid the need for dredging. The approximately 3-foot thick sand cap, with a reconfigured shore profile would alter the benthic and other marine habitats within the Lagoon, resulting in a net loss of 0.98 acre of subtidal (open water) habitat and a net increase of 0.98 acre of intertidal mudflat habitats. Increased sand particle size, eelgrass enhancement, and a riprap fringe would minimize erosion of the sand cap. Established benthic biota on the coarser substrate may be less productive, diverse, or otherwise different from the current conditions, although recent preliminary studies of the effect of changing sand grain-size on infauna species composition is highly variable (PSBS 1992). Differential use of fine- and course-grained sand by foraging shorebirds has been demonstrated, with fine-grained sand preferred over course-grained sand (Quammen 1987, Ogden 1992). Portions of the sand cap covered with rock would be utilized by a fewer number of waterbird species. The loss of 0.98 acre of subtidal habitat is not considered to be a significant impact since there is a net gain in intertidal habitat, including eel grass, which is known to be preferred foraging habitat for least terns. This is considered to be a beneficial effect of this alternative.

The long-term integrity of the sand cap to erosion and burrowing invertebrates would be dependent on the strength and pattern of currents within the lagoon and on the thickness of the sand cap relative to the burrowing capability of the invertebrates. The potential failure of the sand cap is a potential risk of avian resources being exposed to contaminants and is considered to be a potentially significant impact of this alternative. Please refer to Section 5.2 for a detailed discussion of this issue.

5.3.3 Mitigation Measures

5.3.3.1 Proposed Project – Nearshore Containment Facility

To mitigate significant impacts to avian resources under the proposed project to below a level of significance, the following measures are recommended:

- Due to the presence of the endangered California least tern in the spring and summer months, remediation activities would be limited to the period from late September through early March, if feasible.

- Temporary barriers for the containment of suspended contaminated sediment from dredging would be in place to prevent further spread of contaminants into the bay during the operation.

- Net loss of open water on the bay edge from shoreline extension is not directly mitigable. Further, a definite acreage of ecologically valuable eelgrass bottom habitat will be lost permanently and all benthic habitats will be impacted on a temporary basis within the dredging footprint. Restoration of bottom habitats, specifically eelgrass beds, must be provided in the portion of the Lagoon not permanently lost to shoreline extension.

- Enhancement of degraded eelgrass beds in one other shallow portion of San Diego Bay at a 1.2:1 ratio would be done for areas of permanent loss of marine habitats within the Lagoon. This ratio will compensate for the permanent loss of open water.

5.3.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.3.3.3 Sand Capping - Preferred Alternative

No significant impacts have been identified; therefore, no mitigation measures are required.

5.4 UTILITIES

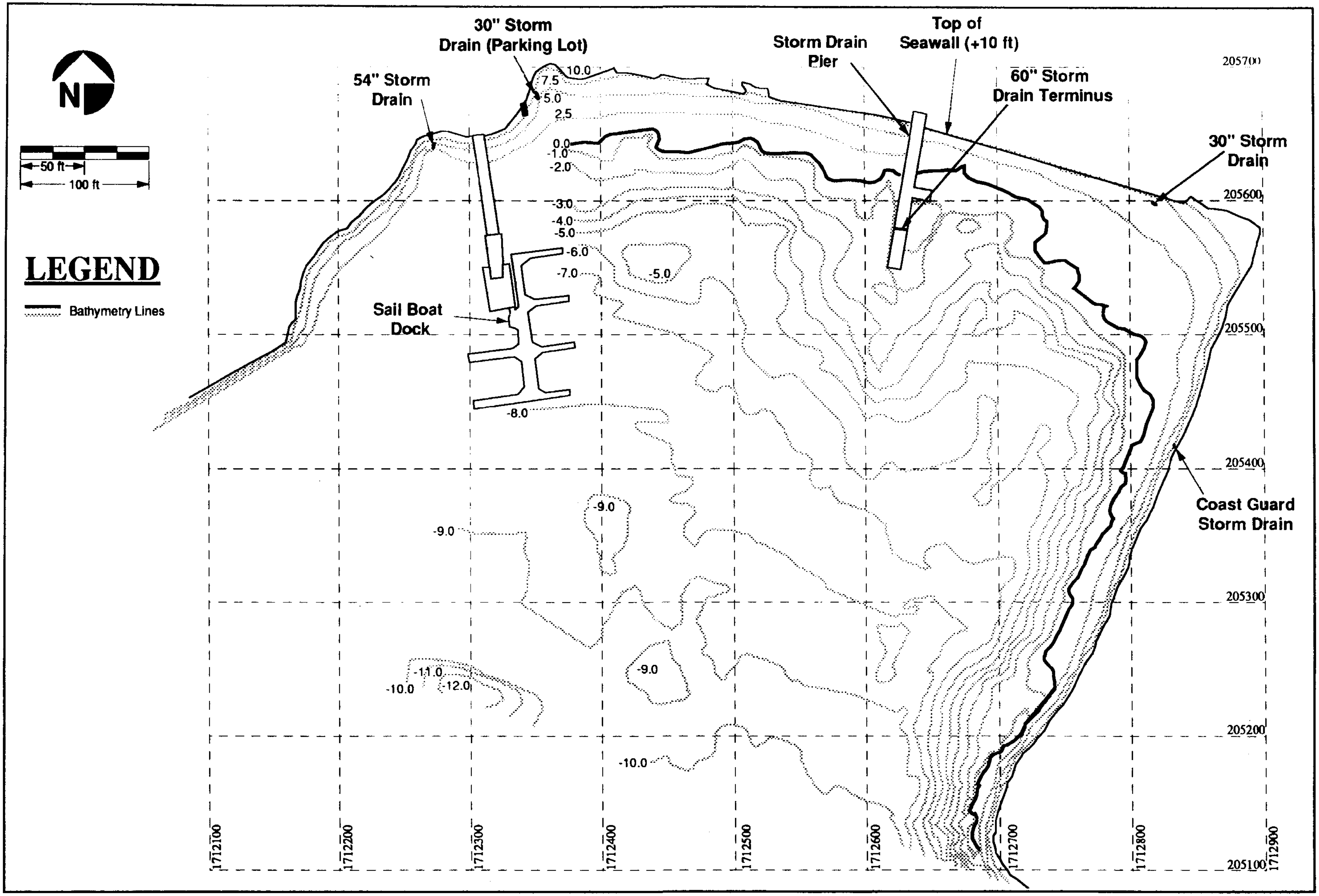
5.4.1 Existing Conditions

Four major storm drain systems discharge into Convair Lagoon from industrial areas to the north of Harbor Drive, along with several smaller drains from the Coast Guard property to the east.

Figure 5.4-1 shows the location of the four major storm drain outfalls into Convair Lagoon. In the northeast corner of the Lagoon, a 30-inch storm drain discharges storm water solely from the central portion of Teledyne Ryan Aeronautical's (TRA) leasehold. The 60-inch storm drain that discharges water under the pier in the northern central portion of the Lagoon drains a large area north of the Lagoon. This includes a central portion of TRA's leasehold (an area west of the 30-inch storm drain's drainage area), a portion of the eastern end of Lindbergh Field runways, the northern portion of General Dynamics Convair Division's facility on Pacific Highway, a portion of the Marine Corps Recruit Depot, an industrial area and railroad spur north of General Dynamics, and residential areas further north up into Mission Hills.

The 54-inch storm drain that discharges storm water west of the Convair Sailing Club dock drains a somewhat smaller area north of the Lagoon and west of the 60-inch drainage area. The 54-inch drainage area includes the western portion of TRA's facility, a central portion of the Lindbergh Field runways, and several hangars. A 30-inch storm drain outfall located between the 60-inch storm drain and the 54-inch storm drain discharges storm water from a TRA parking lot.

The contamination in the Lagoon most likely occurred from discharges into the storm drains. The storm drain pipe system associated with the 30-inch outfall into the northeast corner of the Lagoon was removed and replaced in 1989. This drainage system is expected to be largely free of contamination, although the final section of this drain into the Lagoon is the original pipe and has not been cleaned out. A limited amount of sampling reveals that the other storm drains discharging into Convair Lagoon contain PCB contamination in the sediment.



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Major Storm Drain Outfalls in Convair Lagoon

FIGURE 5.4-1

5.4.2 Impacts

5.4.2.1 Proposed Project - Nearshore Containment Facility

The location of the NCF would block the discharge of the 30-inch storm drain that drains a portion of Teledyne Ryan Aeronautical's leasehold, and discharges into the northeast section of the Lagoon. The design of the NCF (Ebasco 1992) includes several alternatives that will involve reinstallation of this storm drain around the NCF; therefore, no significant impacts would occur.

5.4.2.2 No Action

Under the No Action alternative, there are no impacts to the storm drain systems.

5.4.2.3 Sand Capping - Preferred Alternative

The placement of a sand cap would potentially impact stormwater discharges from the 60-inch storm drain. The plan for this alternative (described in Section 3.4.5) includes provisions for extending this storm drain with the intent of minimizing the disturbance of the contaminated sediment; therefore, no significant impacts would occur.

5.4.3 Mitigation Measures

5.4.3.1 Proposed Project - Nearshore Containment Facility

No significant impacts have been identified; therefore, no mitigation measures are required.

5.4.3.2 No Action

No mitigation is assumed under the No Action Alternative.

5.4.3.3 Sand Capping - Preferred Alternative

No significant impacts have been identified; therefore, no mitigation measures are required.

5.5 GEOTECHNICAL/SEISMICITY

5.5.1 Existing Conditions

Geologic and seismic data for the following section was obtained from a review of recently published geologic maps, stereopair aerial photographs, and current geologic literature.

Geologic Setting

The present-day configuration of the southern California coastline is said to have had its early beginning during Cretaceous time (120 to 85 million years ago) when the southern California Batholiths intruded existing Triassic and Jurassic-age strata, causing uplift to the east, and subsidence to the west where the deposition of marine sediments has continued through the last 60 to 80 million years.

The project site lies within the San Diego Embayment Graben, a structural block down-dropped between the Rose Canyon fault zone, located approximately 4,000 feet east of the site, and the Point Loma fault zone located approximately 12,000 to 13,000 feet west of the site. The formation of San Diego Bay is directly related to the relative downward displacement of the San Diego Embayment Graben.

Convair Lagoon is situated near the southerly edge of a large man-made hydraulic fill, placed in the Lindbergh Field area at the northerly end of San Diego Bay. The Lagoon, approximately 500 feet by 700 feet in lateral extent, with bottom elevations ranging from 8- to 10-feet below mean lower low water (MLLW), overlies the southerly end of the former San Diego River Delta. Prior to extensive dredging and filling, the site area was a marsh, known as "Dutch Flat." Historic records indicate that major storm events have periodically diverted the flow of the San Diego River, alternately to the north and south of the Loma Portal Rise, between Mission Bay (previously known as "False Bay") and San Diego Bay. By the early 1950s, the river levees and the Mission Bay jetties were completed, confining tidal flow to a new man-made river channel.

<u>Soils and Geologic Units</u>

The unpaved land area surrounding Convair Lagoon was created by hydraulic placement of approximately 10 to 15 feet of medium dense, gray, clayey to silty, fine to medium sands with shell fragments. These materials, dredged from the bottom of San Diego Bay, are typical of the fill soils used to construct Harbor Island and the Lindbergh Field fill area (Group Delta Consultants Inc. 1986, Ebasco Environmental 1992).

No site-specific geotechnical test borings have been drilled for Convair Lagoon; however, by extrapolating data from nearby sites, it is estimated that the above-described hydraulic fill and the bottom surface of Convair Lagoon are underlain by approximately 10 to 20 feet of geologically-recent to Holocene-age (0 to 11,000 years old) soft, dark gray organic silts, clays, and loose fine embayment sands. These "bay deposits" are in turn underlain by a sequence of interbedded Pleistocene-age fluvial and marine terrace deposits, likely on the order of 100 feet in thickness (Group Delta Consultants, Inc., 1986; and Kennedy, 1975).

Seismicity and Geologic Hazards

The southern California region is subject to significant hazards from moderate to large earthquakes. Rupture of the ground surface is a potential hazard at locations underlain by or near active faults. Tsunamis (earthquake-induced flooding) and liquefaction are all hazards in the San Diego Bay area.

The major San Diego and southern California fault systems form a northwest-southeast trending regional structural fabric, generally parallel to the San Andreas fault zone, which extends over land from the Gulf of California to Bodega Basin north of San Francisco Bay. Structural geologists relate movement during the past 5 million years along the San Andreas and associated fault zones to movement along the boundary between the North American and Pacific tectonic plates.

Table 5.5-1 presents data for significant regional fault systems. The active fault zones nearest the site include the Rose Canyon, Coronado Bank, and the Elsinore fault zones (Figure 5.5-1). These faults are discussed as follows.

Rose Canyon Fault Zone. The most significant fault zone in the vicinity of the project site (approximately 4,000 feet to the northeast) is the Rose Canyon fault zone, portions of which are currently classified as active by the California Division of Mines and Geology (CDMG). The Spanish Bight fault, inferred by some investigators to extend within approximately 1/4 mile to the west of Convair Lagoon, is part of the general structural fabric of the Rose Canyon fault zone within the San Diego Embayment Graben.

Table 5.5-1

EARTHQUAKE PARAMETERS FOR ACTIVE FAULTS WITHIN 62 MILES OF THE SITE AND SELECTED OTHER FAULTS

Active Fault or Fault Zone[1]	Slip Type	Fault Length[3,4] (miles)	Least Distance to Site[6] (miles)	Maximum Probable Earthquake			Maximum Credible Earthquake		
				Magnitude (M)	Peak Horizontal Acceleration	RHGA Horizontal Acceleration	Magnitude (M)	Peak Horizontal Acceleration	RHGA Horizontal Acceleration
Rose Canyon	Oblique?	66	1/2	6 1/4	0.50	0.33	7 1/2	0.60	0.39
Coronado Banks	Strike	110	11	6 1/4	0.22	0.15	7 1/2	0.26	0.17
Elsinore	Strike	255	42	6 3/4	0.03	0.03	7 1/2	0.05	0.05
San Clemente	Strike	100	41	6 1/2	0.02	0.02	7 1/2	0.05	0.05
San Jacinto	Strike	155	74	7 1/4	0.13	0.13	7 3/4	0.20	0.20
San Andreas	Strike	500+	90	7 3/4	0.10	0.10	8	0.18	0.18
Calabasas	Strike	18	44	6	0.01	0.01	6 1/2	0.03	0.03

1 Fault zones reported to have displaced Holocene-age (11,000 years old or younger) geologic units, with geologic evidence of high slip rate, the probable sources of recorded earthquakes of M_L 5.0 or greater, or classified by professional judgment of available information.

2 Fault zones of low slip rate that displace Quaternary-age (11,000 to 1.6 million years old) geologic units.

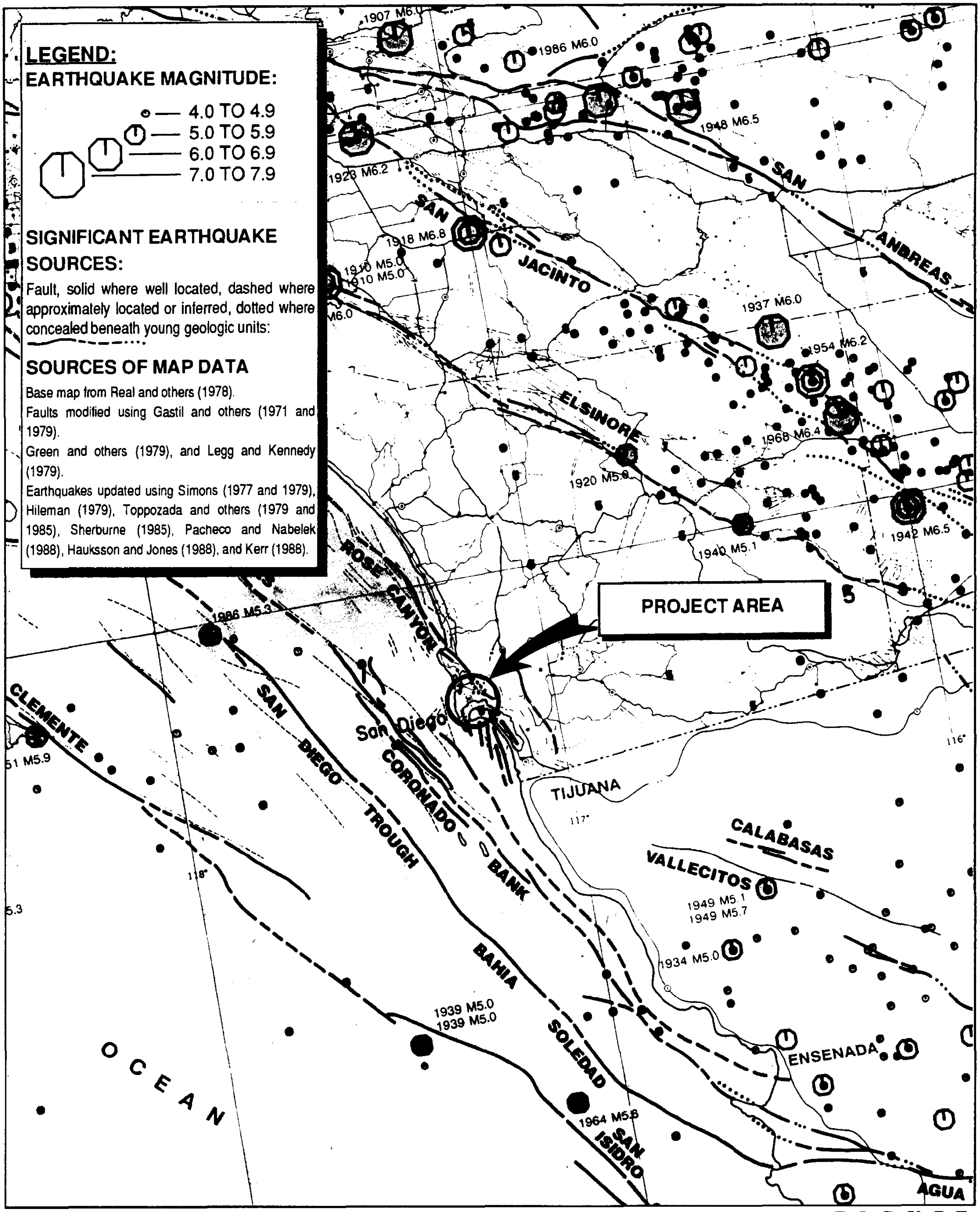
3 Total length of seismic zone, including all approximately aligned fault zones and segments.

4 Derived from regional segmentation model of Anderson and others (1989).

5 Measured from Active Fault and Epicenter Map (reproduced in this report).

6 Estimated to be the maximum earthquake capable of occurring. Derived from the maximum rupture length using length-magnitude relationship like Slemmons (1977, Fig. 27). Relationship used is for California earthquakes greater than or equal to M_L 6.0, plus one standard deviation.

7 Estimated from Schnabel and Seed (1973) for use as an index to prioritize earthquake sources. Acceleration value is for rock. Ground acceleration may be less for sites on significant thicknesses of sedimentary rock. Design accelerations usually vary.



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Regional Fault Map

FIGURE 5.5-1

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A cluster of small (Richter magnitude (magnitude) 3.5 to 4.5) earthquakes within the San Diego Embayment Graben over the past several years corroborates the CDMG "active" classification for the Rose Canyon fault zone. It is generally considered that the Rose Canyon fault zone may be subject to a maximum credible earthquake of magnitude 7, and that an magnitude 6.25 earthquake is likely to occur on this fault system during a typical 100-year period (Blake 1989).

Coronado Banks Fault Zone. The Coronado Bank fault zone is located offshore from San Diego, approximately 10 miles southwest of the project area. It appears to be part of a discontinuous zone of faulting which includes the Palos Verdes fault near Los Angeles, which extends southeastward beyond the Mexican border (Greene et. al., 1979; Legg and Kennedy 1979). The total length of this fault zone, which predominantly exhibits strike-slip movement, is estimated to be approximately 130 miles in length. Because of its mapped geologic displacements, one-half of total fault zone length was used as the length of surface rupture in order to estimate a maximum credible earthquake of magnitude 7. Offshore from San Diego, the Coronado Bank fault zone is near an area where the epicenters of numerous microearthquakes (magnitude 2.0 to 3.4) have been plotted. The Coronado Bank fault zone may be associated with an earthquake at magnitude 6.25 during a typical 100-year period (Blake 1989).

Elsinore Fault Zone. The Elsinore/Laguna Salada fault zone, which lies approximately 40 miles northeast of the project site, is generally characterized by strike-slip displacement. The total length of the fault zone is approximately 255 miles; however, geologic displacements are relatively discontinuous and sinuous compared to those of the other major active faults. Therefore, it appears likely that the Elsinore fault zone would rupture in shorter segments (as a proportion of total length) than the other major active faults in the region. The general tectonic environment and expression of geologic displacements along the Elsinore fault zone suggest that it may be subject to a maximum credible earthquake of magnitude 7.5, which would be associated with a length of surface rupture of approximately 80 miles. The epicenters of numerous small earthquakes of magnitude 3.0 to 5.0 are located near the fault, suggesting that a magnitude 7 earthquake is likely to occur on the Elsinore fault zone during a typical 100-year period (Blake 1989).

5.5.2 Impacts

5.5.2.1 Proposed Project - Nearshore Containment Facility

The geologic and soil conditions at the Convair Lagoon project site pose two potential constraints to construction of the proposed nearshore containment facility (NCF) at the Lagoon site. They include the following:

1. Ground settlement due to consolidation of the estuarine/fluvial deposits and the artificial fill soils on site; and

2. Seismic hazards, including ground shaking, surface displacement, liquefaction, and tsunamis.

Ground Settlement

Ground settlement is attributable to the presence of relatively shallow surficial deposits of soft, compressible estuarine and fluvial muds, as well as loose to medium dense hydraulic fill soils underlying and near the site. The sandy hydraulic fill soils would likely consolidate immediately when loaded into the NCF and its impounded sediment fill; however, the underlying estuarine "Bay" mud, and organic silty clay is highly compressible under load, and would likely take years to stabilize under the weight of the proposed NCF. The degree of risk and the significance of potential differential settlement impacts, including a relatively rigorous evaluation of both long- and short-term settlement potential for the NCF and ancillary structures, should be addressed after completion of a geotechnical investigation.

Seismic Hazards

Ground shaking. Ground shaking would likely occur during the anticipated life of the proposed project. Embayment deposits tend to magnify the effects of ground shaking by amplifying the intensity of movement caused by earthquakes. Ground surface accelerations and site periods will vary somewhat across the general site area due to lateral and vertical variations in material type and density. Although ground displacement could result from shaking anywhere throughout the proposed NCF structure, the perimeter walls, portions of which will encroach out onto the bay muds, have the highest risk of failure during earthquake shaking. The stability of these perimeter walls is entirely dependent upon the integrity of the proposed sheet-pile walls, which will tend to yield as a result of lateral loading.

Liquefaction. Liquefaction is a potential hazard in all areas underlain by saturated, sandy soils. In the general site vicinity, nearly all relatively clean sandy soils may be considered to be moderately to highly susceptible to liquefaction.

Tsunamis. Tsunamis are also potential hazards within the San Diego Bay area, and a sufficient length of water surface exists within the bay to cause earthquake-induced flooding within low-lying areas.

Ground Rupture. Differential vertical displacement by the vertical component of a fault trace across the site would directly affect the NCF, the degree of impact likely being directly proportional to the offset displacement. Because no faults are known to exist in the immediate site area, and because none have been mapped as trending toward the site, the potential for direct fault offset at the site is small. Furthermore, unless the offset were relatively large, measuring at least several feet, it is likely that the impact to the impoundment of hazardous materials would be insignificant.

5.5.2.2 No Action

Under the No Action alternative, the proposed remediation activities would not occur and the Lagoon would remain in its existing state. The existing contaminated sediment would continue to be subject to disturbance as a result of propwash erosion, anchor dragging, potential onsite vertical fault offset, and sand boils resulting from seismically-induced liquefaction.

5.5.2.3 Sand Capping - Preferred Alternative

Implementation of the Sand Capping alternative would involve the placement of approximately 3 feet of sand over the in-place contaminated soils within Convair Lagoon. The potential for the integrity of the cap to be disturbed and recontamination to occur as a result of erosion due to boat propwash is not considered to be significant based on the types of small recreational boats which normally enter into or pass near the Lagoon. Boat anchoring, however, could violate the integrity of the cap and result in a significant impact.

The potential for a large vertical fault offset to occur, which could cause vertical displacement of the contaminated sediment and disturb the integrity of the cap, is highly unlikely and is therefore not considered to be a potentially significant impact. Vertical fault displacement is discussed in more detail under Section 5.5.3.1.

5.5.3 Mitigation Measures

5.5.3.1 Proposed Project - Nearshore Containment Facility

The following measures are recommended to address potential and adverse impacts associated with the potential geologic hazards described above.

- The results of a site-specific geotechnical engineering investigation would be incorporated into the design and construction of the project. A site-specific geotechnical engineering investigation would be performed for each proposed separate structure as a condition of issuance of construction permits. Each investigation would contain adequate subsurface explorations and analyses to determine the potential for and degree of short- and long-term settlement, expected seismic ground acceleration values, and the potential for seismic ground failure (including liquefaction). Each investigation would contain detailed foundation recommendations, and would be subject to review by the appropriate regulatory agencies.

- The design of structures, embankments, and/or engineered fills encroaching onto existing compressible estuarine bay deposits may require site modification to improve the support capacity of those existing soils, and to reduce long-term post-construction settlement. Soil improvement could include partial or total removal of compressible soils and replacement with hydraulic fill soils, and/or the use of surcharged fills, to precompress the saturated bay deposits. A site-specific geotechnical study would specifically address post-construction settlement potential in these areas, and recommend methods to mitigate post-construction total and differential settlement to acceptable ranges, given the types of improvements at particular locations.

- To reduce the risk of structural damage caused by seismic shaking, geotechnical studies would specifically address seismic analysis based on site-specific subsurface data. As a minimum, seismic analyses would address seismically-induced slope failure, liquefaction, and ground surface accelerations.

- A cantilevered sheet-pile wall is being considered for the containment wall for the NCF. Three relatively practical and economic wall designs for the NCF are described below. Foundation soils for all three alternative structures are likely liquefiable in the event of a maximum credible earthquake. It should be observed that the trapezoidal section rock dike, with geogrid base and interlayers, is a flexible system that is, by far, the most accommodating to liquefaction-induced failure of the foundation soils.

Cantilevered Sheet-Pile Wall

The NCF impoundment wall can be designed to be unrestrained at the top; however, because of the potential for yielding due to lateral pressure from the backfill soils, it may be desirable to add toe protection in the form of 1/4-ton stone to reduce wall deflection and pile strength requirements.

Tied-Back Sheet-Pile Wall

A variation on the cantilevered sheet-pile wall, the tied-back sheet-pile wall consists of a series of ties and deadmen embedded in the backfill soils to restrain the wall at the top. Although this system of restraint permits lighter (and consequently less expensive) sheet piles, the cost of the tieback system considerably outweighs the savings by the use of lighter sheets.

Trapezoidal Rock Section

A berm or dike, constructed of 1/4-ton stone with slopes inclined at 1-1/2:1 (horizontal to vertical), a 70-foot-wide base, 10-foot-wide top, and 20-foot height would provide the most stable of the three alternatives suggested. Further seismic stability would be achieved if placed on a geogrid base with geogrid placed between rock layers during construction.

- An evaluation would be made to consider the stability of the embankment during expected seismic and hydraulic conditions.

- A site specific hydrology study would be performed for the site, addressing such issues as flooding during high-tide conditions and the effect of wind-driven waves generated from within San Diego Bay.

5.5.4.2 No Action

No mitigation is assumed under the No Action alternative.

5.5.4.3 Sand Capping - Preferred Alternative

To ensure that the integrity cap is not disturbed as a result of boat anchoring, the following measures are recommended:

- An ordinance prohibiting anchoring within Convair Lagoon will be adopted by the SDUPD.

- The SDUPD will, upon adoption of the ordinance, notify the San Diego Harbor Police and the U.S. Coast Guard of the anchoring restriction within Convair Lagoon.

- Signs will be posted within the water area along the mouth of Convair Lagoon notifying boaters of the anchoring restriction in the Lagoon area.

5.6 Human Health and Safety

5.6.1 Existing Conditions

Convair Lagoon has PCB-containing sediment at concentrations greater than regulatory standards. Human exposure to these sediments can occur directly through sediment contact and also indirectly through the consumption of contaminated marine organisms.

Direct exposure to PCB contaminated sediment is not likely for the general public as there are no readily available shoreside access points to Convair Lagoon. For those individuals who do access the Lagoon for recreational or occupational activities, direct exposure to PCB contaminated sediment is possible. Figure 5.2-4 (Marine Resources) presents contamination trends for PCBs based on sediment sample results from Ogden and Ebasco Environmental. The PCB concentrations identified in sediment are above the EPA residential lifetime health-based criteria for oral exposure to soil (0.09 ppm) by more than two orders of magnitude. Direct exposure to PCB-contaminated water can also occur if PCB-contaminated sediment is resuspended into the Lagoon water. Information on water sample analytical results from Ebasco Environmental show PCB concentrations exist in the part per trillion (ppt) level, a level evaluated by the EPA as being potentially conducive to human health effects based upon the EPA's carcinogenic health-based drinking water criteria (EPA 1989). This water, however, is not designated as drinking water and as such probably poses less of a human health hazard than the contaminated sediment.

Indirect exposure to PCBs potentially exists through the consumption of PCB-contaminated marine organisms. Elevated PCB levels in fish caught around the Lagoon have been associated with the elevated PCB levels in Lagoon sediment (McCain 1992, San Diego County Department of Health Services 1990). These results suggest the source of contamination is sediment. California State Mussel Watch data show that PCB concentrations in mussels exceed the Food and Drug Administration's accepted levels (Hayes and Philips 1987).

Marine organisms ingesting contaminated sediment and subsequently sequestering the contamination can biologically accumulate the PCBs. This can result in a biological concentration of PCBs through the direct consumption of contaminated media by the higher level organism. For example, if fish caught for human consumption were feeding on organisms contaminated with PCBs as a result of the PCB-contaminated Lagoon sediment, a biological concentration of PCBs could occur from one organism to the next organism in the trophic level. Bottom-feeding-type fish can also directly consume contaminated sediments. Biological accumulation could also occur via the gills where soluble uncomplexed fractions of PCBs in pore water can exist in equilibrium with sediment concentrations (Adams 1992). Organisms continuing to biologically concentrate PCBs could have internal PCB concentrations that pose a potential for chronic adverse human health effects for those individuals consuming the organisms.

5.6.2 Impacts

5.6.2.1 Proposed Project - Nearshore Containment Facility

The Nearshore Containment Facility (NCF) could potentially produce both direct short-term and indirect long-term human health effects. The direct short-term effect that could be encountered is based upon the likelihood of exposure. Dredging processes which take place would result in resuspension of PCB-containing sediments increasing the potential for exposure. Depending on the degree of PCB-containing resuspended sediment and its potential to spread beyond the project area, a potential short-term increase in direct exposures to PCBs could occur. Short-term exposure is also possible from the NCF due to the containment facility being left open while work is being completed. Human health effects could also potentially exist if the NCF's structural integrity is compromised to the extent that contaminated sediment becomes available to humans. However, the likelihood for indirect long-term exposure should be significantly lower than the existing condition.

No significant direct short-term or indirect long-term adverse human health impacts should occur as a result of the proposed project as long as exposure to PCB-containing sediment is minimized.

5.6.2.2 No Action

The No Action alternative would result in the likelihood of continued direct and indirect human exposure to PCB-containing sediment with the potential for adverse human health effects to occur. Any direct and indirect adverse human health effects which exist would remain.

5.6.2.3 Sand Capping - Preferred Alternative

As long as biological exposure to PCB contaminated sediments and water does not occur, human health would not continue to be impacted from the PCB-containing sediments under the Sand Capping alternative. The likelihood of exposure may be very slightly higher than the existing condition during the capping procedure due to resuspended sediments; however, compared to other alternatives, the likelihood of exposure from capping should decrease since no handling of the sediment would occur. The long-term likelihood of exposure should also be lower, provided that cap integrity is maintained.

Direct short-term exposure could be slightly higher than the existing condition. Indirect long-term exposure could be significant if cap integrity is not maintained.

5.6.3 Mitigation Measures

5.6.3.1 Proposed Project - Nearshore Containment Facility

If the NCF alternative is carried out, control measures will be implemented to insure minimization of exposure to PCB-containing sediment and water during dredging activities.

For onsite workers in the immediate vicinity of the dredging and the Nearshore Containment Facility, implementation of a health and safety plan which addresses the following will be prepared:

- appropriate use of personal protective equipment; and
- guidelines for containment procedures that minimize contamination migration from the site.

5.6.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.6.3.3 Sand Capping - Preferred Alternative

If the sand capping alternative is carried out, to verify cap integrity, appropriate monitoring plans will be prepared and implemented to determine whether short-term and/or long-term exposures to PCB-containing media are reintroduced.

5.7 LAND/WATER USE COMPATIBILITY

5.7.1 Existing Conditions

Existing Onsite and Surrounding Land Uses

The Convair Lagoon Remediation project site encompasses approximately five acres within the eastern portion of Convair Lagoon, northern San Diego Bay, in the City of San Diego. The project site is currently fenced from public access and contaminated water warning signs are posted around the Lagoon. A small pier approximately 45 feet in length extends into the water from the asphalt pavement along the northeast boundary of the Lagoon area. Historically, Convair Lagoon was used as a dumping ground and retrieval area for derelict vessels.

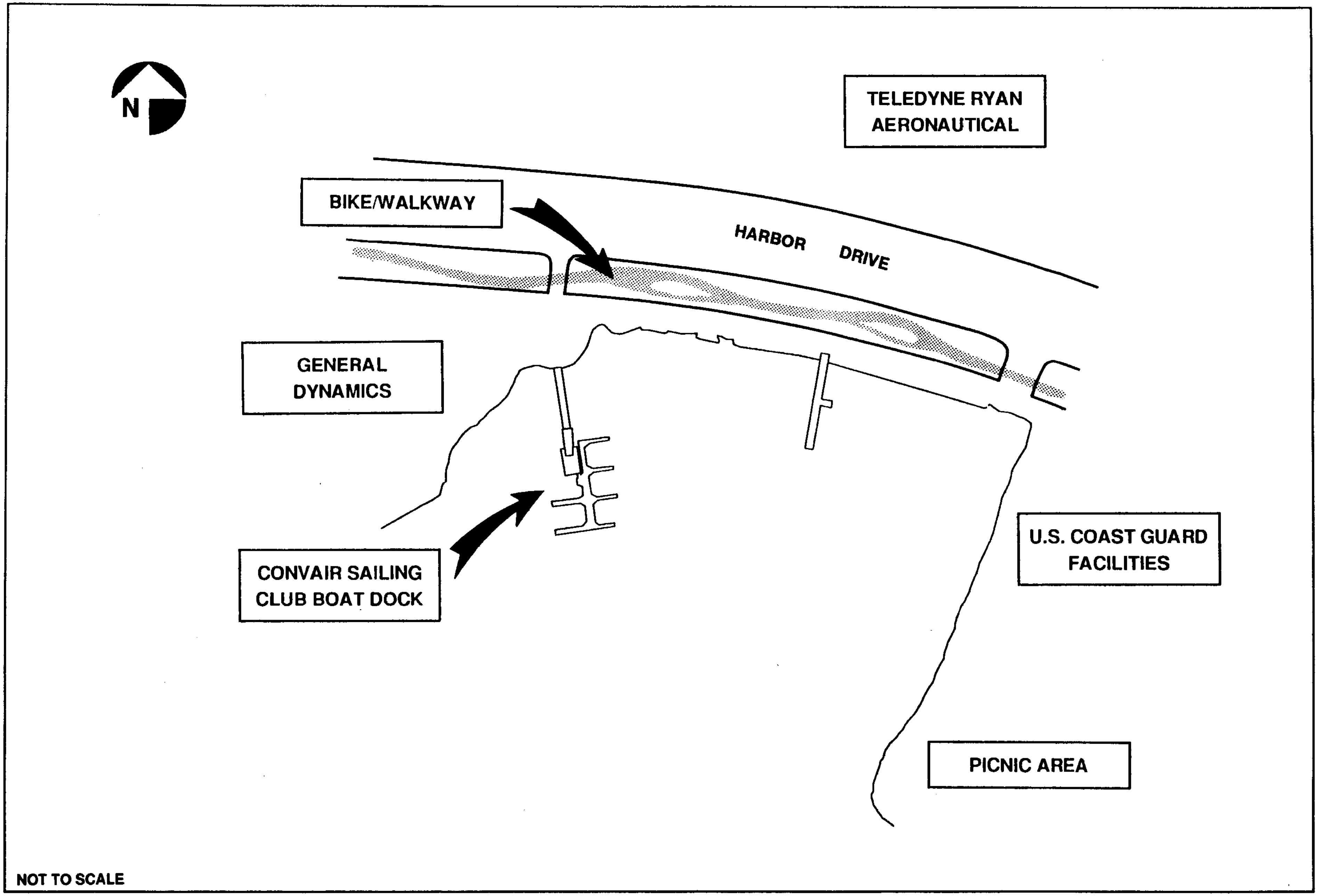
Surrounding land uses in the immediate project vicinity are primarily industrial and include Teledyne Ryan Aeronautical to the north, General Dynamics to the northwest, and the United States (U.S.) Coast Guard facility to the east. Harbor Drive, a six-lane thoroughfare, is located directly north of the project site. A 1.3-mile pedestrian walkway/bicycle path which follows the bayside alignment of Harbor Drive passes the project site to the north.

Within the Lagoon to the northwest of the project site, the Convair Sailing Club, which is associated with General Dynamics, maintains a pier and floating dock for small sailboats. Approximately 12 sailboats are currently docked at the pier. Harbor Island, a commercial recreation area which is developed with uses such as hotels, restaurants, marinas, and marine-related commercial businesses, is located to the southwest of the Lagoon. Onsite and surrounding land uses are illustrated in Figure 5.7-1.

Land Use Plans, Policies, and Regulations

<u>San Diego Unified Port District Master Plan</u>

The State Lands Commission has jurisdiction and authority over waterfront property along the bay; however, it has granted this land in trust to the San Diego Unified Port District (SDUPD). The Convair Lagoon project area is thus subject to the goals, objectives, and planned uses identified in the SDUPD Master Plan.



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Existing Onsite and Surrounding Land Uses

FIGURE 5.7-1

The SDUPD Master Plan was adopted in 1980 and last revised in October of 1992. Planning goals outlined in the Master Plan include administration of the tidelands to provide economic, social, and aesthetic benefits; to emphasize public, state-wide considerations over private considerations; to cooperate with adjacent communities; to enhance and maintain the biological and physical entity of the bay and tidelands; to ensure access to the water; and to maintain water quality.

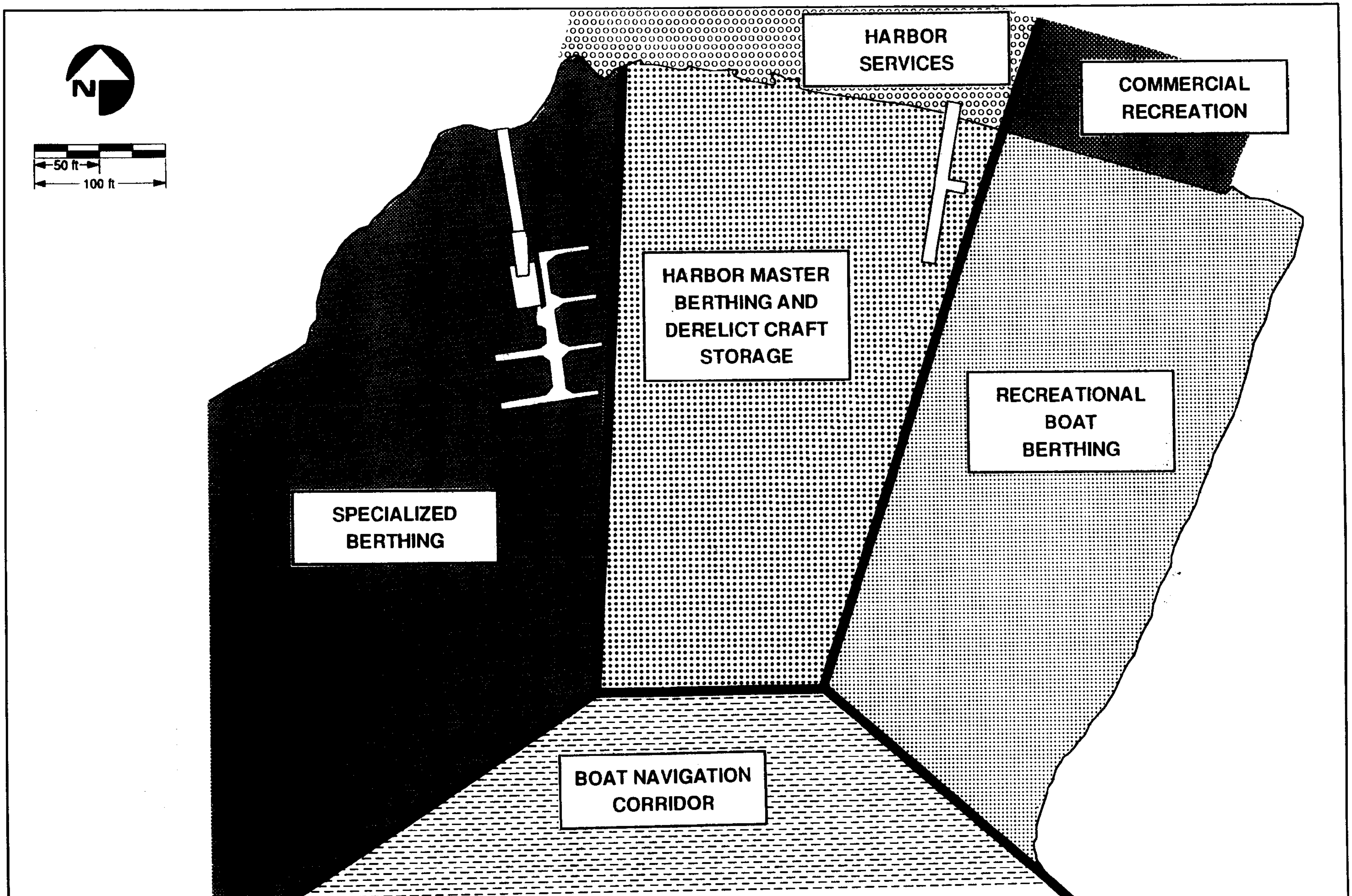
For planning purposes, the SDUPD Master Plan has divided the tidelands into nine separate Planning Districts to facilitate the preparation of Precise Plans for each of the districts. The Precise Plans are more detailed than the overall Master Plan; however, they are not intended to create an inflexible, static, unmanageable set of guidelines for development. Instead, the land use designations identified for the Planning Districts are intended to be flexible and to indicate compatible use groups. Specific uses that are currently not listed may be included in a use group if the use is determined to be similar in character and compatible (SDUPD 1992).

Convair Lagoon is located within the Harbor Island/Lindbergh Field Planning District. Permitted uses for the Harbor Island/Lindbergh Field Planning District are identified in terms of the land and water use designations defined within the Master Plan.

Commercial land and water use designations within the project area are Commercial Recreation (land) and Recreational Boat Berthing (water). Industrial land use designations include Specialized Berthing (water). Public Facility land use designations include Harbor Services (land), Boat Navigation Corridor (water), Derelict Craft Storage (water), and Harbor Master Berthing (water). These land and water use designations are illustrated in Figure 5.7-2 and described as follows:

Commercial Land Use Designations

Commercial Recreation. The Commercial Recreation land use designation is intended to promote land uses that will contribute to the economic base of the region with full time jobs, secondary employment for part-time help, and spin-off employment opportunities in construction, warehousing, trucking, custodial, and personal services. Specific uses include hotels, restaurants, recreational vehicle parks, specialty shopping, pleasure craft marinas, and sportfishing.



SOURCE: SDUPD 1992

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Existing Land and Water Use Designations

FIGURE 5.7-2

Recreational Boat Berthing. Recreational Boat Berthing is the water use category used to classify water sites located adjacent to land areas identified in the SDUPD Master Plan under Commercial Recreation. Typical associated land uses would be marinas, yacht clubs, hotels, and restaurants. Water uses could include boat berthing for tenants and patrons of the above uses, boat rental, boat charter, water sports, boating instruction, sailing clubs, fuel docks, boat sales and service, disposal facilities for waste oil and hazardous substances, live-aboards, dockside utilities, on-water boat outfitting and maintenance, boat storage, and security arrangements.

Industrial Land Use Designations

Specialized Berthing. Specialized berthing is the water use category used to classify water sites located adjacent to land areas identified in the SDUPD Master Plan as Marine Related Industry, Aviation Related Industry, and Industrial-Business Park. This close relationship of land and water uses is required because of the wide range of uses permitted in the industrial categories. Some of the activities which would be permitted are ship building and repair facilities, ship and boat berthing, drydocks, marine rails and lifts, graving docks, cargo piers, equipment and material testing facilities, vessel maintenance and storage, tugboat services, marine contractors, kelp processing, water transportation docks, and the transshipment of goods and materials to and from the landside development.

Public Facility Land Use Designations

Harbor Services. The Harbor Service land use designation identifies areas devoted to maritime services and harbor regulatory activities of the Port District.

Boat Navigation Corridor. Boat navigation corridors are those water areas delineated by navigational channel markers or by conventional waterborne traffic movements. Boat corridors are designated by their predominant traffic and their general physical characteristics (these channels are usually too shallow and too narrow to accommodate larger ships). These corridors are required to serve marina development; maintenance dredging and improvements to existing channels, as required, are to be conducted.

Harbor Master Berthing. Harbor Master Berthing identifies water areas located offshore of land areas classified in the SDUPD Master Plan as Harbor Services. Typical associated land uses would include Harbor Police, and other governmental functions. Water uses could include berthing for the above law enforcement and governmental vessels, transient boat berthing, temporary storage of disabled and abandoned vessels, temporary storage of confiscated vessels, berthing for customs and pilot boats, and activities associated with conducting the designated services.

California Coastal Act

The project area is also within the coastal zone as designated by the California Coastal Act. The California Coastal Act requires that each non-federal jurisdiction located along the coastline prepare a Local Coastal Program (LCP) that provides guidelines, policies, and ordinances for the development of properties within the coastal zone. The California Coastal Commission (CCC), established in 1972, was granted the authority to approve LCPs and regulate development and land use within the coastal zone. The SDUPD Master Plan, which serves as the SDUPD's LCP, was certified by the CCC in 1981 with the most recent amendment certified in 1992. Upon certification of the SDUPD Master Plan coastal development permit authority was transferred to the Board of Port Commissioners. Appeals of Board of Port Commission decisions regarding specific types of development, including the proposed project, are appealable to the CCC (Chapter 8, Article 3, Section 30715.(2)4 of the Coastal Act). Appeals may be based upon the project's consistency with the SDUPD Master Plan. If the project is appealed, it is forwarded to the State Coastal Commission, which retains final discretionary authority over approval of Coastal Development Permits pursuant to Section 30625(b)(3).

The California Coastal Act of 1976 established basic goals for the coastal area. These goals include (CCC 1976):

- Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and manmade resources.

- Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.

- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners.

- Assure priority for coastal-dependent development over other development on the coast.

- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

5.7.2 Impacts

5.7.2.1 Proposed Project - Nearshore Containment Facility

Compatibility with Existing Land Uses

The proposed remediation project for Convair Lagoon consists of a combination of dredging and containment to isolate PCBs from the environment. Approximately 13,300 cubic yards (cy) of sediment would be dredged from the Lagoon and pumped into a Nearshore Containment Facility (NCF), which would permanently occupy an area approximately 430 feet x 177 along the north side of the U.S. Coast Guard facility. Additional fill material would eventually be placed on top of the dredged material to bring the facility to an elevation level with shoreside topography. The project would thus permanently convert a portion of Convair Lagoon to upland area. The future land use of the proposed upland area has not yet been determined and will therefore require subsequent environmental review with respect to land/water use compatibility; however, the creation of the upland area itself would not conflict with existing or surrounding land uses. The project's compatibility with water related uses is discussed in the Recreational Boating/Navigational Safety section of this report (refer to Section 5.10).

Settling of the dredged material would generate water which would require treatment in a water treatment facility. A temporary water treatment facility (WTF) has been proposed to be located along the westernmost portion of the NCF within the northernmost area of the U.S. Coast Guard facility property. This temporary facility would require further federal environmental review, a permit from the U.S. Coast Guard, and concurrence therein by the California Coastal Commission. The WTF would be removed once the dewatering process is complete (approximately 1.5 years). The industrial nature of the WTF would be compatible with the surrounding industrial land uses; however, because the U.S. Coast

Guard facility is currently not fenced off from Convair Lagoon potential security impacts could occur temporarily during the remediation process. Refer to Section 5.9, Coast Guard Operations and Security, for additional discussion of this issue.

Consistency with Land Use Plans, Policies and Regulations

San Diego Unified Port District Master Plan

The proposed remediation project is consistent with the overall goals of the SDUPD Master Plan to enhance and maintain the biological and physical entity of the bay and to maintain water quality. The project would clean up the contaminated Lagoon, thereby enhancing both the long-term biological and physical entity of the bay and greatly improving water quality.

The NCF is proposed to be located primarily in an area designated in the Port Master Plan as Recreational Boat Berthing; margins of the NCF may extend into areas designated as Boat Navigation Corridor, Harbor Master Berthing, and Derelict Craft Storage. Because the Recreational Boat Berthing area allows disposal facilities for waste oil and hazardous substances, the proposed use is consistent with the Port Master Plan. However, the landfill necessary to create the NCF is not consistent with the policies of the Port Master Plan and an amendment would be required. The loss of water area within the lagoon is not considered to be significant by the SDUPD (Trull 1993). Because there is currently such a small land area surrounding the Lagoon that could support water related uses under the Recreational Boat Berthing designation, the conversion of a portion of the Lagoon area to upland could allow for these uses to be developed in the future and result in an overall beneficial land use impact, depending on the proposed use of the site. As mentioned above, subsequent environmental review would be required.

Land use related impacts with respect to coastal access, Coast Guard operations and security, and recreational boating and navigational safety are discussed in their respective sections of this report.

California Coastal Act

The proposed project is consistent with both the general and port-specific conservation development policies of the coastal act.

5.7.2.2 No Action

Under the No Action alternative, the proposed remediation project would not occur and the Convair Lagoon would remain contaminated. Although this alternative would result in no land/water use changes and would therefore be compatible with the existing onsite and surrounding land uses, it would conflict with the goal of the SDUPD Master Plan to enhance and maintain the biological and physical entity of the bay and to maintain water quality.

5.7.2.3 Sand Capping - Preferred Alternative

The Sand Capping alternative would not result in any land/water use change from existing conditions and would therefore not conflict with the existing or surrounding land uses. Because no land or water use changes would occur, this alternative would also be consistent with the existing land/water use designations. No adverse impacts would occur.

5.7.3 Mitigation Measures

5.7.3.1 Proposed Project - Nearshore Containment Facility

No significant impacts have been identified; therefore, no mitigation measures would be required.

5.7.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.7.3.3 Sand Capping - Preferred Alternative

No significant impacts have been identified; therefore, no mitigation measures would be required.

5.8 COASTAL ACCESS

5.8.1 Existing Conditions

The project area is currently fenced off and there are no readily available shore side access points to Convair Lagoon, thus public shore use is limited in order to protect the public from the contamination. Controlled access is presently available to General Dynamics employees through the Convair Sailing Club that maintains a pier and floating dock in the southwestern portion of the Lagoon.

The SDUPD Master Plan makes provision for differing degrees of physical and visual access to the shoreline in a manner that is consistent with the activities being conducted on the land and water areas involved, and the proprietary interests of the private land owners, lessees, and public rights and needs. Maximum access to the shoreline is encouraged except where security or public safety factors would negate. The location and size of public access ways are guided by considerations for the availability of other recreational areas and support facilities, the proximity to users, the size and physical characteristics of the site and the potential impact the access way has on the nature, intensity, and ownership of existing and planned uses both onsite and in adjacent developments. The Master Plan has established access categories (Class I-IV) to pursue the development of access ways (SDUPD 1992).

The Convair Lagoon falls under Access Class IV which applies to non-recreational areas developed with public or private funds to accommodate industrial activities, military bases, and sea or air transportation facilities. General public access is prohibited in Class IV areas due to security and public safety reasons, although, when possible, visual access is encouraged.

5.8.2 Impacts

5.8.2.1 Proposed Project - Nearshore Containment Facility

With the exception of the creation of upland area and the water treatment facility, the proposed remediation project does not propose any specific land or water uses. The existing fence along Harbor Drive would remain and access to the site may be restricted. Future land access to Convair Lagoon is dependent upon the final use of the proposed cover, which has not yet been determined. Planned uses would provide for public access and boating use of the site at which time the site would be Access Class III.

The proposed project would require the temporary removal of the Convair Sailing Club pier and floating dock during construction. This is considered to be an adverse impact of the proposed project; however, it is not considered to be significant due to the temporary nature of the impact.

5.8.2.2 No Action

Under the No Action alternative, the fence along Harbor Drive would remain and coastal access would continue to be limited to General Dynamics employees through the Convair Sailing Club.

5.8.2.3 Sand Capping - Preferred Alternative

The implementation of the Sand Capping alternative would not result in any coastal access changes from existing conditions. Similar to the proposed project, the fence along Harbor Drive would remain and access would continue to be limited to General Dynamics employees through the use of the Convair Sailing Club.

This alternative would not require the temporary removal of the Convair Sailing Club pier and floating dock. No coastal access impacts would occur.

5.8.3 Mitigation Measures

5.8.3.1 Proposed Project - Nearshore Containment Facility

No significant impacts have been identified; therefore, no mitigation measures would be required.

5.8.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.8.3.3 Sand Capping - Preferred Alternative

No significant impacts have been identified; therefore, no mitigation measures would be required.

5.9 COAST GUARD OPERATIONS/SECURITY

5.9.1 Existing Conditions

Three United States (U.S.) Coast Guard offices are located to the south of Convair Lagoon and west of Harbor Drive, and perform different functions in the Port. Primary responsibilities of the Coast Guard Group/Air Station include search and rescue, enforcement of laws and treaties, and aid to navigation. Also in the immediate project vicinity, the Coast Guard maintains employee recreation facilities which include a tennis court, a volleyball court, and an open barbeque/picnic area. The Coast Guard property is currently not fenced-off from the Convair Lagoon.

5.9.2 Impacts

5.9.2.1 Proposed Project - Nearshore Containment Facility

No specific land or water uses are proposed as a component of this project; therefore, with the exception of the nearshore containment facility (NCF) and the temporary water treatment facility (WTF) proposed on Coast Guard property, the site would be returned to its existing state post-remediation (approximately 1.5 years). Use of Coast Guard property for the proposed WTF would require further federal environmental review and a special permit. Any specific land or water use proposals for the upland area would require subsequent environmental review. No long-term impacts to the Coast Guard facilities would occur as a result of the proposed remediation project.

5.9.2.2 No Action

Under the No Action alternative, the proposed remediation project would not occur and the Convair Lagoon would remain in its existing state. Access to the Lagoon area for remediation activities would not be necessary and there would be no potential for impacts to Coast Guard operations and security.

5.9.2.3 Sand Capping - Preferred Alternative

After the remediation process has been completed the Lagoon would be returned to its existing state. Therefore, no long-term impacts to Coast Guard operations and security would occur.

5.9.3 Mitigation Measures

5.9.3.1 Proposed Project - Nearshore Containment Facility

To mitigate short-term security impacts during the dredging/construction phase of the proposed project, a fence would be installed by the SDUPD between the Coast Guard property and the Convair Lagoon project site, and around the temporary water treatment facility. The fence would be permanent if determined by the Coast Guard to be necessary to ensure long-term security.

5.9.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.9.3.3 Sand Capping - Preferred Alternative

No significant impacts have been identified; therefore, no mitigation measures are required.

5.10 RECREATIONAL BOATING/NAVIGATIONAL SAFETY

5.10.1 Existing Conditions

Convair Lagoon currently supports an extremely limited amount of small craft recreational boating traffic, primarily on the weekends. Limited recreational boating opportunities are currently available to General Dynamics employees through the Convair Sailing Club, which maintains a pier and floating dock in the southwestern portion of the Lagoon on land and water area leased to General Dynamics by the SDUPD.

Due to its location, the Lagoon is fairly isolated from the higher use water areas within San Diego Bay; therefore, the majority of the existing boating activity occurs within the southwestern-most portion of the Lagoon area and increases out toward the Bay. The Lagoon and Bay are regulated by general navigational standards enforced by the San Diego Harbor Police. The San Diego Harbor Police is responsible for ensuring that all local boating requirements, such as delinquent and illegal anchoring and safe boating practices, are complied with. The Bay and Lagoon are also regulated by the U.S. Coast Guard navigational standards. These federal standards include safe boating practices and pollution control. To ensure navigational safety in waters regulated by the Coast Guard, a standard has been adopted which requires all projects within Coast Guard waters to submit a request for "Notice to Mariners" with the dates and times of operations. This information is then broadcast by radio and published in the local Notice to Mariners by the Coast Guard to alert all boat operators in the area of potential navigational hazards. Projects are also required to comply with the International Rules of the Road for lighting and day markers which outline specific lighting and marker requirements for operations within the water.

According to the U.S. Coast Guard, there have been no reported accidents involving dredging vessels in San Diego Bay within the last ten years (U.S. Navy 1992).

5.10.2 Impacts

5.10.2.1 Proposed Project - Nearshore Containment Facility

The creation of approximately 76,110 square feet (1.75 acres) of upland area within Convair Lagoon would result in a decrease of water area available for recreational boating activities. As discussed under Section 5.10.1, Existing Conditions, the Lagoon area is fairly isolated and is currently a low use area with respect to recreational boating activity. However, the project has the potential to optimize use of the lagoon for recreational boating activities by correcting the inadequacies of the size of the land side support. The reduction of water area available for recreational boating activity is therefore not considered to be significant.

Within the Lagoon area, construction of the proposed project would require dredging activities. To minimize the extent of disturbance around the proposed dredging area, a silt curtain would be temporarily installed. This silt curtain as well as other associated construction activities would require that the Lagoon area be temporarily blocked from boating access. After the construction phase of the project is completed, the water area of the project site would return to its former state. As discussed above, the Lagoon is not currently a high traffic area for recreational boating and the access restriction would be temporary. In addition, the proposed project would be required to comply with Coast Guard standards and the International Rules of the Road with respect to lighting and day shapes. Therefore, the proposed project is not expected to interfere with vessel traffic and no significant impacts with respect to recreational boating/navigational safety would occur.

The proposed project would require the temporary removal of the General Dynamics Convair Sailing Club pier and floating dock during construction. The pier and dock removal would affect recreational boating opportunities associated with the sailing club in the short-term and is considered to be an adverse impact of the proposed project. However, the impact is not considered to be significant due to its temporary, short-term nature.

5.10.2.2 No Action

Under the No Action alternative, recreational boating opportunities and navigational safety would not experience any change from existing conditions; the area would continue to be restricted to boating access due to contamination.

5.10.2.3 Sand Capping - Preferred Alternative

Implementation of the Sand Capping alternative would involve the "sprinkling" of approximately 3 feet of rock and sand along the bottom of the Lagoon area which would reduce the amount of navigable area for boating activities. Because the Lagoon area is fairly isolated and is currently a low use area with respect to recreational boating activity, the reduction of water area available for recreational boating activity is not considered to be a significant impact.

The anchoring of boats within the Lagoon could disturb the cap area and recontaminate the sediment. Therefore, boats would have to be restricted from the Lagoon if appropriate mitigation measures are not adopted. The restriction of boats from the Lagoon is considered a significant impact.

Temporary impacts to adjacent recreational boating activities and navigational safety under the Sand Capping alternative are primarily associated with the capping phase of the project and are similar to the dredging/construction phase of the proposed project (refer to Section 5.10.3.1). These impacts are not considered to be significant.

5.10.3 Mitigation Measures

5.10.3.1 Proposed Project - Nearshore Containment Facility

No significant impacts have been identified; therefore, no mitigation measures are required.

5.10.3.2 No Action

No mitigation is assumed under the No Action alternative.

5.10.3.3 Sand Capping - Preferred Alternative

To ensure that anchoring within the Lagoon area does not disturb the sand cap and recontaminate the sediment, the following mitigation measures are recommended:

- An ordinance prohibiting anchoring within Convair Lagoon would be adopted by the SDUPD.

- The SDUPD would, upon adoption of the ordinance, notify the San Diego Harbor Police and the U.S. Coast Guard of the anchoring restriction within Convair Lagoon.

- Signs should be posted within the water area along the mouth of the Lagoon notifying boaters of the anchoring restriction within Convair Lagoon.

5.11 SHORT-TERM VS. LONG-TERM PRODUCTIVITY

5.11.1 Proposed Project - Nearshore Containment Facility

Implementation of the proposed project would involve certain short-term and long-term effects on the Lagoon and surrounding area. The short-term physical effects of implementing the proposed project includes dredging and construction-related impacts on noise and security to the adjacent U.S. Coast Guard facility, and temporary closure of the Convair Sailing Club. During the short-term dredging/construction phase of the project, these effects would be unavoidable as construction activities proceed.

Notwithstanding these short-term effects, implementation of the proposed project would create gains in the long-term productivity of the Lagoon area. Implementation of the proposed project would result in an overall improvement in water and sediment quality in Convair Lagoon and thus reduce significant bioaccumulations of PCBs in fish and shellfish. Further, these long-term benefits would result in a decreased health and safety risk to the human population. The creation of a developable waterfrontage as a result of the proposed fill activities could also allow for future long-term socioeconomic benefits as well as the potential for the development of future commercial recreation land uses in accordance with the existing SDUPD Master Plan designation for the Lagoon area. Any specific land use proposal would be subject to subsequent environmental review.

5.11.2 No Action

Under the No Action alternative, the short-term construction-related impacts would not occur; however, the Lagoon would remain contaminated which would reduce the long-term productivity of the project area.

5.11.3 Sand Capping - Preferred Alternative

Implementation of the Sand Capping alternative would involve certain short-term and long-term effects on the Lagoon and surrounding area. The short-term physical effects of implementing the preferrred alternative includes capping-related impacts on noise and security to the adjacent U.S. Coast Guard facility. During the short-term remediation phase of the project, these effects would be unavoidable as remediation activities proceed.

Notwithstanding these short-term effects, implementation of the Sand Capping alternative would create gains in the long-term productivity of the Lagoon area provided the integrity of the cap is maintained. Implementation of this alternative would result in an overall improvement in water and sediment quality in Convair Lagoon and thus reduce significant bioaccumulations of PCBs in fish and shellfish. Further, these long-term benefits would result in a decreased health and safety risk to the human population.

5.12 CUMULATIVE IMPACTS

Cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts (Section 15355 of the State CEQA Guidelines). Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. The CEQA guidelines state that cumulative impacts shall be discussed when they are significant (Section 15130a).

Section 3 of this EIR addresses two remediation alternatives for the clean-up of Convair Lagoon. The first alternative, which is analyzed as the proposed project, consists of a combination of dredging and containment to isolate PCBs from the environment. The second alternative, sand capping, involves covering the contaminated sediment in Convair Lagoon with a layer of uncontaminated "clean" material to isolate the PCBs. Because all significant impacts are mitigated, there are no cumulative adverse impacts. Therefore, no cumulatively significant impacts are associated with the following issue areas: water quality, marine resources, avian resources, utilities, geotechnical/seismicity, land/water use, coastal access, coast guard operations/security, and recreational boating/navigational safety.

Implementation of the proposed remediation project in conjunction with the removal of copper contaminated sediment at the Paco Terminal would result in a cumulative improvement in both water and sediment quality in the Bay as contaminated sediments are removed and isolated or contained beneath fill. The cumulative improvement in water quality would also cumulatively improve conditions for certain marine and avian resources which have continued to show significant bioaccumulation of contaminants. Cumulative beneficial impacts to human health and safety would also occur, as the exposure to PCBs and heavy metals through direct exposure to contaminated sediments and the ingestion of contaminated shellfish would be reduced.

5.13 GROWTH INDUCING IMPACTS

Section 15126(g) of the California Environmental Quality Act (CEQA) Guidelines requires a discussion of the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly. Induced growth is distinguished from the direct employment, population, or housing growth of a project. A project could induce growth by lowering or removing barriers to growth or by creating or allowing an amenity such as an industrial facility that attracts new population or economic activity.

5.13.1 Proposed Project - Nearshore Containment Facility

In the case of the proposed project, the potential exists for the future development of the upland area created to accommodate the nearshore containment facility (NCF). Any future utilization of the NCF area will be consistent with the certified Port Master Plan. At this time, there are no specific development proposals for the upland area and any future proposals would be subject to subsequent environmental review. Therefore, the proposed project is not considered to be growth inducing.

5.13.2 No Action

Under the No Action alternative, the project site would remain in its existing state. Because no changes from existing conditions are proposed under the No Action alternative, there is no potential for growth inducing impacts to occur.

5.13.3 Sand Capping - Preferred Alternative

Under the Sand Capping alternative, the project site would be returned to its existing state post-remediation. Because no changes from existing conditions are proposed under this alternative, there is no potential for growth inducing impacts to occur.

5.14 Unavoidable and Irreversible Significant Environmental Effects

The proposed nearshore containment facility project would result in the incremental loss of water area within San Diego Bay. No additional unavoidable and/or irreversible significant environmental effects would occur.

6.0 EFFECTS FOUND NOT TO BE SIGNIFICANT

The Port District prepared an Initial Study that determined that various possible significant effects of the proposed project were found not be significant, and, therefore, are not discussed in detail in the EIR. The Initial Study is attached as Appendix E.

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The above references are available for public inspection during normal business hours at:

Ogden Environmental and Energy Services Company, Inc.
5510 Morehouse Drive
San Diego, California 92121
(619) 458-9044

8.0 AGENCIES/ORGANIZATION/PERSONS CONTACTED

California Department of Fish and Game

California State Coastal Commission

City of San Diego, Planning Department
  Development and Environmental Planning Division
    Rob Rundle

County of San Diego, Department of Health Services

National Oceanic and Atmospheric Administration
  National Marine Fisheries Service
    Bob Hoffman

Regional Water Quality Control Board

San Diego Unified Port District
  Environmental Management
    Ralph T. Hicks, Environmental Management Coordinator
    Ken Andrecht, Assistant Environmental Management Coordinator
    Melissa Mailander, Associate Environmental Management Analyst

  Planning
    Fred Trull, Planning Director

State Lands Commission

U.S. Army Corps of Engineers

U.S. Coast Guard

U.S. Fish and Wildlife Service

9.0 PREPARERS OF EIR AND CERTIFICATION

This report was prepared by Ogden Environmental and Energy Services Company (Ogden), located at 5510 Morehouse Drive, San Diego, California 92121. The following professional staff of Ogden and its subconsultants participated in the preparation of this document:

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I hereby affirm that to the best of our knowledge and belief, the statements and information herein contained are in all respects true and correct and that all known information concerning the potentially significant environmental effects of the project has been included and fully evaluated in this EIR.

David A. Potter, AICP
Project Manager

10.0 PUBLIC REVIEW

10.1 INITIAL DISTRIBUTION

The initial distribution of the Draft EIR was to the following public agencies which may have jurisdiction by law and/or to organizations and individuals with special environmental interests.

U.S. Army Corps of Engineers
  Los Angeles
    Regulatory Function Branch (Chief)
  San Diego (David Zoutendyk)

U.S. Coast Guard
  San Diego
    Marine Safety Office (Commander)
  Alameda
    Civil Engineering Division (Chief)

U.S. Department of Commerce
  National Marine Fisheries Service
    Southwest Regional Director

U.S. Fish and Wildlife Service
  Division of Ecological Services, Carlsbad

Environmental Protection Agency
  Regional Administrator, San Francisco

Office of Planning and Research, Sacramento
  State Clearinghouse (10 copies)

California Coastal Commission
  Executive Director, San Francisco
  Port Coordinator, San Francisco

Department of Fish and Game
  Environmental Services Division, Long Beach

California Department of Parks and Recreation

California Department of Boating and Waterways

California Department of Transportation
  District 11

State Lands Commission, Sacramento

SANDAG
  Areawide Clearinghouse

SD Air Pollution Control District, Exec. Officer

San Diego County
Environmental Health Services

City of San Diego
City Manager
Development and Environmental Planning Division, Deputy Director

City of Chula Vista
City Manager

City of Coronado
City Manager

City of Imperial Beach
City Manager

City of National City
City Manager

Teledyne Ryan Aeronautical

San Diego Bay Committee

I Love A Clean San Diego

Save Our Bay, Inc. (Forming)

Environmental Health Coalition

San Diego Aududon Society

Sierra Club, San Diego Chapter

Citizens Coordinate for Century III

Nathan Slater

San Diego Public Library
Documents Librarian

City of Chula Vista Public Library

City of Coronado Public Library

City of Imperial Beach Public Library

San Diego County Library
Documents Librarian
Governmental Reference Library

San Diego State University
Main Library
Institute of Public & Urban Affairs
General Reference Library

UCSD
Governmental Public Library

San Diego Chamber of Commerce
San Diego Unified Port District
Port Planning

Chula Vista Chamber of Commerce

10.2 COMMENTS RECEIVED AND RESPONSES

The 45-day public review period for the "Convair Lagoon Remediation EIR/RAP" (UPD #83356-EIR-225; SCH #92091011) began June 25, 1993 and officially ended on August 9, 1993. The EIR/RAP assessed impacts resulting from the Nearshore Containment Facility and Sand Cap remediation alternatives.

Comments were received from several agencies, organization and individuals. This report prepared by the San Diego Unified Port District identifies those agencies, organizations, and individuals, stating their comments and responses to these comments.

National Marine Fisheries Service
Gary Matlock, Acting Regional Director

U.S. Fish and Wildlife Service
Peter Stine, Acting Field Supervisor

U.S. Coast Guard - San Diego
C. F. Fitzgerald, Captain

Environmental Health Coalition
Laura Hunter, Director

San Diego Port Tenants Association
Robert Bush, Chairman - Environmental Action Committee

San Diego Audubon Society
Norma Sullivan, Conservation Chair

Governor's Office of Planning and Research
Christine Kinne, Deputy Director

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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RECEIVED
AUG 0 2 1993
PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

July 30, 1993 F/SWO21:RSH

Mr. Ralph T. Hicks
Environmental Management Coordinator
Port of San Diego
P.O. Box 488
San Diego, California 92112

Dear Mr. Hicks:

Thank you for the opportunity to comment on the draft Environmental Impact Report (DEIR) for the Convair Lagoon Remediation.

Two alternatives are described in the DEIR. I believe the sand capping concept is preferable to the construction of a nearshore containment facility alternative. While each alternative will require mitigation to offset impacts to marine resources, the magnitude of impacts associated with the sand capping alternative are considerable less than those for the nearshore containment facility.

Specific Comments

I-1 Section 3.4. Alternative Forms of Remediation. A new technique developed by Battelle's Pacific Northwest Laboratories utilizes sodium bicarbonate to replace the chlorine molecule in PCB's with hydrogen. This process can produce soils with less than two parts per million of PCB's at one-fourth the cost of incineration. The feasibility of this particular treatment process for treating contaminated sediments in Convair Lagoon should be investigated.

I-2 Section 3.4.5.2, page 3-24. The conversion of subtidal habitat to intertidal is characterized as a beneficial impact. The biological basis for this statement should be provided.

I-3 Section 3.4.5.3, page 3-25. A detailed cross section of the proposed high-energy cap is not provided in Figure 3-8. However, if the project, as illustrated in Figure 3-7, is correct, the width of that cap appears to vary between 50 and 100 feet depending on shoreline location. Since this cap will act in part as a fill, mitigation to offset this loss of habitat will be necessary. Quantification of the area of impact and proposed mitigation should be included in the final EIR.

10.2 Comments Received and Responses

I National Oceanic and Atmospheric Administration

I-1 The chemical dechlorination process developed by Batelle's Pacific Northwest Laboratories is similar in nature to the chemical fixation alternative in terms of technical feasibility and costs. This process may be more desirable than fixation in that it destroys the PCBs rather than simply isolating them through fixation. However, the costs associated with dredging up the sediment, processing the sediment, and placing the sediment back into the site (if possible) would make this alternative very expensive compared to the NCF or capping. If the treated sediment were determined to be hazardous, then the costs would be even greater.

I-2 The sentence has been deleted. In fact, the principal cause of beneficial effects is the improved quality of the beach material rather than the increased area. Much of the increased area is at an elevation that is too high to be productive or produce appreciable beneficial effects.

I-3 The location and configuration of the high-energy cap was shown in the conceptual capping plan (Figure 3-7). The need for this type of cap needs to be demonstrated in the design stages by more detailed information on the hydrodynamics of Convair Lagoon. Presently, the concrete seawall will provide more than adequate wave protection with riprap only at the toe. However, given the present shoreline configuration and the riprap slope at the Coast Guard, continuing this slope configuration would provide uniformity and some aesthetic benefits in addition to wave protection. The area of impact is estimated at one to two acres, however this is based on the conceptual cap design, which may vary as the final design parameters are set.

I-4 Page 3-31. The DEIR states that a layer of coarse rock should isolate the contaminated sediments from deep burrowers but that field and laboratory experiments should be performed to demonstrate the effectiveness of this technique. It is imperative that these experiments be completed to ensure that bioturbation into the contaminated sediments is not possible.

I-5 Page 3-33. It is not clear from the text of the document what the width of the perimeter berm will be or the size of rock to be used in its construction. A berm with varying sized rock and height of construction would provide more enhancement opportunities than a uniform structure.

I-6 Section 5.2.3, page 5.2-41. Excavation of 0.75 acres of uplands would be acceptable mitigation to offset the expected loss of 0.75 acres of intertidal habitat associated with construction of the nearshore containment facility. The concept of converting a similar amount of deep subtidal habitat to intertidal habitat is not acceptable.

I-7 Page 5.2-42. Mitigation to offset the expected impacts to existing eelgrass resources should be included in this section. That mitigation should be consistent with the enclosed Southern California Eelgrass Mitigation Policy.

Should you have any questions, please contact Mr. Robert Hoffman at (310) 980-4043.

Sincerely,

Rodney R McInnis

for Gary Matlock, Ph.D.
Acting Regional Director

Enclosure

cc:
USFWS - Carlsbad (M. Kenney)
CDFG - Long Beach (R. Nitsos)

I-4 Some reported research provides indications that rock discourages burrowing. However, the effectiveness of crushed rock has not been demonstrated for any of the species potentially occurring in the area. The text has been revised to clarify that the field and laboratory experiments will be conducted. If the studies indicate that a rock layer will not provide an adequate barrier, another form of liner will be used.

I-5 The perimeter berm will vary in its width and material configuration. Conceptually, at the north-east side of the sailboat dock, the perimeter berm width will be minimized to limit encroachment into the sailboat dock. At the southern end of the site, the width and material characteristics can be varied to provide habitat enhancement and an "artificial reef" effect.

I-6 It is our understanding that the conversion of deep subtidal habitat to intertidal habitat is being implemented by the Navy at an undisclosed site in San Diego Bay and that this approach was acceptable to the National Marine Fisheries Service. A mitigation ratio has not been suggested, but 1.2:1 is probably adequate. In contrast, excavation of highly valuable upland habitat around San Diego Bay in order to produce intertidal or subtidal habitat is not feasible. Much of the presently undeveloped land around the bay is wetlands, a highly desirable category of land.

I-7 The eelgrass mitigation will comply with the Southern California Eelgrass Mitigation Policy (revised 8/25/92) which has been included as Appendix F to the EIR/RAP.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
Carlsbad Field Office
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Carlsbad, California 92008

RECEIVED
AUG 11 1993
PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

August 9, 1993

Mr. Ralph T. Hicks, Environmental Management Coordinator
Port of San Diego
P.O. Box 488
San Diego, California 92112

Re: "Convair Lagoon Remediation" (SCH #92091011; UPD #83356-EIR-225)

Dear Mr. Hicks:

The Fish and Wildlife Service (Service) has reviewed your Draft Environmental Impact Report / Draft Remedial Action Plan (Document) dated June 17, 1993, and received by the Service June 24, 1993, for the Convair Lagoon PCB Remediation Project. Your June 17 letter indicated the review period ends August 9, 1993.

II-1 In our pre-Document comments to Ms. Mailander (Associate Environmental Management Analyst, Port of San Diego) in a letter dated December 18, 1992, regarding sand capping (copy attached), the Service recommended "the most highly contaminated areas of Convair Lagoon, greater than 1 mg/kg (dry weight) PCBs be dredged from the Bay and this dredge material be disposed of in an appropriate upland site." The Service understands the costs and hazards for removal of the highly contaminated areas appears to be prohibitive at this time. However, due to the longevity and potential hazards of PCBs, we believe other solutions presented in the Document, such as the Nearshore Containment Facility (NCF) and sand capping, are temporary and therefore less effective. The deterioration of the sand cap or facility would result in a containment breach exposing the environment to PCBs. Monitoring and maintenance of the site would need to be implemented and continued until the PCBs deteriorate, are removed or destroyed.

Benefits of these temporary measures would be that technological advances are likely to devise a safer, more cost effective means to destroy or render the PCBs permanently harmless. If these temporary measures are to be used, a deadline for permanent destruction of the PCBs should be set to insure long term maintenance and monitoring costs do not become too cumbersome. Plans must also be made to ensure funds are available to permanently resolve the contamination problem when the deadline is reached.

II-2 The NCF is not considered to be a permanent solution by the Service. The NCF will not only be removing a portion of the Bay from productivity, but hazards and costs associated with construction, maintenance, and monitoring do not appear to outweigh benefits. Design of the NCF also appears to be

II USFWS

II-1 The District concurs that if either the NCF or sand capping alternative are implemented that "monitoring and maintenance of the site would need to be implemented and continued until the PCBs deteriorate, are removed or destroyed." The District also concurs that future "technological advances are likely to devise a safer, more cost effective means to destroy or render the PCBs permanently harmless." However, until the appropriate technology has been developed, it is not possible to establish a deadline for permanent destruction of the PCBs. The District will work with the Responsible Party(ies) to establish an adequate Annuity or other financial account to provide funds necessary for long-term NCF or sand cap monitoring and maintenance.

II-2 Both the NCF and the capping alternatives are permanent alternatives. However, it is important to recognize that these alternatives may have maintenance requirements that are greater than any alternative that destroys the PCBs or removes them from the Lagoon.

The Fish and Wildlife Service is concerned that the NCF is built over roughly half of the contamination, and that it will not effectively contain it. The design of the NCF fully accounts for this material and will provide adequate containment. The walls of the NCF penetrate to a depth that is expected to provide lateral containment. Vertical movement of contaminants is not expected to be significant, and does not present a path for contaminants leaving the NCF.

flawed. Construction plans indicate isolation of approximately half of the contaminated sediment (13,300 cy) within the NCF. The remainder of the contaminated sediments will be located underneath the facility and will remain uncontained. This type of construction may allow seepage of this uncontained portion to occur.

II-3 The Sand Capping - Preferred Alternative must also be considered to be temporary. Examples of sand capping, as cited in the Document, have not been monitored for a significant period of time in relation to the life span of PCBs. Sand capping in Convair Lagoon should be used only to isolate contaminants while a permanent solution is devised and implemented. If used, levels of PCBs affecting biota and the environment need to be detected immediately and kept below harmful levels. Bioturbation and erosion are likely to be the major forces impacting the caps life span. The depth of Convair Lagoon limits the thickness of a sand cap and the document has cited literature which indicates bioturbation of ghost shrimp could go as deep as 6.5 feet. This indicates a barrier is needed to prevent bioturbation of contaminated sediment. Of the options provided, concrete slabs may be preferable over rock because there are fewer cracks and therefore less area for bioturbation to occur. To be effective, monitoring plans must be designed to detect any breach of the cap including bioturbation, erosion, and seepage that may occur. Other concerns of the Service are found in the December 18,1992 letter (copy attached).

If you have any questions concerning this letter, please contact Martin Kenney at (619) 431-9440. Specific questions on contaminant issues should be directed to Leonard LeCaptain at the same number. We appreciate the opportunity to provide comments at this time.

Sincerely,

for Peter A. Stine
Acting Field Supervisor

cc: CDFG, SD (Attn: T. Dillingham); Long Beach, CA (Attn: D. Nitsos)
NMFS, Long Beach, CA (Attn: B. Hoffman)
EPA, San Francisco, CA (Attn: B. Ross)
RWQCB, San Diego, CA (Attn: B. Kelly)
COE, San Diego, CA (Attn: D. Zoutendyk)

II-3 If properly maintained, sand capping can be a permanent solution. Historically, sand capping has been implemented on at least 15 sites since the late 1960s. Monitoring of capping projects has occurred since the late 1970s.

The sand cap has been designed to protect from bioturbation and erosion. Please see pages 3-36 to 3-38 for a discussion on long-term monitoring.

"Concrete slabs" are less cost effective than rock. While limiting bioturbation, the slabs may also limit the natural release of gases from organic degradation. Sufficient dredging and displacement may also occur from settlement. Articulated sections would most likely be required to allow for displacement and settlement.

The following letter from Mr. Jeffrey D. Opdycke of the U.S. Fish and Wildlife Servcies dated December 18, 1992 in response to the Notice of Preparation addressed a number of issues that were incorporated into the EIR.

United States Department of the Interior

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

TAKE PRIDE IN AMERICA

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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

December 18, 1992

Ms. Melissa Mailander, Assoc Env Mgmt Analyst
Port of San Diego
P.O. Box 488
San Diego, CA 92112

Re: Convair Lagoon Remediation Sand Capping Alternative, San Diego Bay, California

Dear Ms. Mailander:

The Fish and Wildlife Service (Service) has reviewed your letter dated November 24, 1992, and received by the Service on November 30, 1992, concerning the potential to use a sand cap for the Convair Lagoon, PCB Remediation Project. Your November 24 letter requested comments from the Service that could be considered by the Port of San Diego (Port) in the preparation of an environmental impact report (EIR) for the project. You asked to receive comments from the Service by December 10, 1992. Due to workload constraints and the short time period the Service had to respond to the letter, we requested approximately one additional week to prepare a written response. You indicated to Mr. Kenney of my staff by phone that the additional time needed to prepare a response was acceptable.

Capping contaminated soil on terrestrial sites has been used often, especially on EPA "superfund" hazardous waste sites. The main advantage is that an impervious cap prevents surface water from penetrating through the hazardous material and polluting groundwater.

There is much less experience with underwater capping as it presents much more difficult design and construction problems. Obviously, the goal of any remediation project is to eliminate the environmental risk and hazard of toxic contaminants like PCBs in Convair Lagoon. Ideally, the Service would like to see all PCBs removed from San Diego Bay (Bay). However, this approach may not be realistic in economic terms. We believe a reasonable compromise would be the removal of the most hazardous levels of PCBs. Therefore, we recommend that the most highly contaminated areas of Convair Lagoon, greater than 1 mg/kg (dry weight) PCBs be dredged from the Bay and this dredge material be disposed of in an appropriate upland site.

The remaining portion of the site could then be capped with clean sediment. The design of a cap should prevent any contaminated sediment from being suspended in the water column during a large storm event (i.e. 50 year storm). The cap also needs to be thick enough to prevent benthic invertebrates from burrowing into this cap and coming in contact with the PCB sediments. The depth at which benthic invertebrates burrow into sandy shallow intertidal/subtidal waters within San Diego Bay should be investigated. The information should be included in the EIR prepared for the project.

We suspect that an appropriate cap thickness may be 3 to 5 feet. However, thickness of the cap will be dependent upon the grain size of the fill material and the ability of this material to be stable during strong wave and current conditions encountered during local storm events. The EIR should describe other bays within the United States where capping has been successfully accomplished, the thickness of the cap used and any problem encountered. The thickness of the cap in relationship to local storm events should also be discussed in order to reduce the risk of cap failures and subsequent resuspension of contaminated sediments. The EIR should discuss a long-term monitoring program to ensure cap is effective in isolating PCB sediments from biological organisms found in the Bay. Even at low concentration levels PCBs can biomagnify in the food chain and cause detrimental effects to fish and wildlife organisms.

Stability of the sand cap may be more easily achieved if the surface elevation of the cap were at a depth conducive to the growth of eelgrass plants. Eelgrass plantings could be incorporated into the project design and could be planted shortly after the cap was put in place. The Service strongly endorses the planting of eelgrass on top of a sand cap if practicable.

A final concern is a capping alternative that creates of uplands or "fast land" by the filling of Bay waters within Convair Lagoon. The south San Diego Bay Enhancement Plan prepared by Michael Brandman Associates, Inc. for the Port and the California State Coastal Conservancy identified that 31 percent of the tidal area of the Bay has been lost as a result of past filling activities. The Service is opposed to additional losses of Bay habitat. If any portion of Convair Lagoon would be consider in an alternative to create uplands, the Service would recommend to the Corps of Engineers, Regulatory Branch that the appropriateness of this approach be evaluated under Section 404(b)(1) of the Clean Water Act. The guidelines for Section 404(b)(1) identify discharges to created fast land are <u>not</u> allowed if there is a practicable alternative which would have less adverse impact on the aquatic ecosystem and all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem have not been taken.

This represents our preliminary comments on your proposed capping project. If you have any questions concerning this letter, please contact Martin Kenney at (619) 431-9440. Specific questions on contaminant issues should be directed to Mick Rivera at the same number. We appreciate the opportunity to provide comments at this time.

Sincerely,

Jeffrey D. Opdycke
Field Supervisor

cc: CDFG, SD (Attn: T. Dillingham); Long Beach, CA (Attn: D. Nitsos)
NMFS, Long Beach, CA (Attn: B. Hoffman)
EPA, San Francisco, CA (Attn: B. Ross)
RWQCB, San Diego, CA (Attn: B. Kelly)
COE, San Diego, CA (Attn: D. Zoutendyk)

U.S. Department of Transportation
United States Coast Guard

Commander
U.S. Coast Guard
Group

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9 Aug 93

RECEIVED
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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

San Diego Unified Port District
Environmental Management Department
Attn: Ms. Melissa Mailander
Post Office Box 488
San Diego, CA 92112

Subj: REVIEW OF DRAFT EIR

Ref: (a) Draft Environmental Impact Report/Remedial Action Plan dated June 1993

(b) My letter 3750 of 26 March 1993

III-1 1. Reference (a) was developed by your office as required by the California Environmental Quality Act. The Commander, U.S. Coast Guard Maintenance and Logistics Command Pacific (MLCPAC), whose offices are located in Alameda, California, is authorized to address real property issues affecting U.S. Coast Guard installations within California. The draft EIR has been reviewed by my staff in conjunction with the Environmental Law Branch of MLCPAC. This review has found the draft EIR to be defective in that it fails to address significant adverse environmental impacts. The actions involved in any of the remediation alternatives described in the draft EIR have the potential to severely impact the operations, security, and habitability of Group/Air Station San Diego in the short-term. The Group/Air Station also has long-term waterfront interests remaining unaddressed in the draft EIR.

III-2 2. Reference (b) was my input to the notice of preparation of the draft EIR. It highlighted both short-term and long-term concerns. These concerns were not adequately addressed in the draft EIR. The concerns described in reference (b), as well as those I am including in enclosure (1), are provided to facilitate resolution of our concerns prior to publication of the final EIR.

III-3 3. The remediation alternatives are projected to be accomplished within a minimum eighteen month construction lifespan. The draft EIR states in conclusory fashion, without reasoned analysis, that the effects of this construction will have "no impact" on Coast Guard operations/security. There are incomplete analyses of the remediation alternatives and the potential impacts of these on the missions of the Group/Air Station. The final EIR must address these short-term concerns as well as the long-term interests of the Group/Air Station as reiterated in reference (b).

III U.S. Coast Guard

The following cover letter gives a brief summary of more detailed U.S. Coast Guard comments provided as Enclosures (1) + (2).

Responses to comments on this cover letter refer to later detailed responses.

III-1 Please see following responses.

III-2 Please see responses III-29 through III-50.

III-3 Please see following responses.

4. Enclosure (1) contains the results of a page-by-page review of the draft EIR. Significant concerns include:

III-4 a. Failure to address with any specificity those Coast Guard environmental and real property concerns noted in reference (b).

III-5 b. Failure to adequately address the short-term impacts on the Group/Air Station and the potential negative impact of the eighteen-month-long Nearshore Containment Facility (NCF) construction period on day-to-day operations.

III-6 c. Continuing to propose the NCF when the Coast Guard has given no permission for construction on its property. The final EIR must more precisely describe the NCF project.

III-7 d. The discussion of the human health and safety impacts of -the NCF is seriously deficient. The Group/Air Station is both a working operational unit and a residential facility. The human health and safety impacts of construction of the proposed NCF project (or any of its alternatives) could be significant.

III-8 e. The No-Action alternative discussion does not effectively address the potential benefits of inaction.

III-9 f. Failure to address mitigation of short-term construction impacts to human health and safety. Lack of analysis of the environmental impact (noise, traffic, security, fuel spills, air pollution, hazardous waste) of the construction process.

III-10 g. Failure to effectively address the mission and operations of the Group/Air Station.

5. In conclusion, the draft EIR is considered deficient because it does not effectively address the Coast Guard's short-term construction-related concerns and long-term land use interests. I am committed to fully participate in efforts to improve the environment and quality of life in the City of San Diego and

III-4 Please see response III-11.

III-5 Please see response III-13.

III-6 The EIR clearly recognizes that use of Coast Guard property for the proposed WTF would require further federal environmental review and permission by the U.S. Coast Guard.

See Appendix A for a more detailed description of the NCF.

III-7 Please see response III-17.

III-8 Please see response III-18.

III-9 Please see response III-17.

III-10 Please see Section 5.9.1 of the EIR/RAP.

Southern California. Please accept my comments and concerns in that vein. Should you require additional information, my point of contact is LCDR John Campbell, tel: (619) 557-5896.

C. C. FITZGERALD
Captain, U.S. Coast Guard
Commanding Officer

Encl: (1) Detailed Comments on Draft EIR
(2) Copy of my letter 3750 dtd 26MAR93 (Ref.(b))

Copy: MLCP(lg)
MLCP(sp)

DETAILED COMMENTS ON DRAFT EIR

A page-by-page review of the draft EIR resulted in the following comments and concerns.

III-11 1-2: The general description of the Nearshore Containment Facility (NCF) proposed project fails to address with any specificity Coast Guard environmental and real property concerns noted in reference (b).

III-12 1-3: The general description of the sand capping alternative fails to address with any specificity Coast Guard environmental and real property concerns noted in reference (b).

III-13 1-11: The short-term vs. long-term productivity discussion completely fails to assess the short-term impacts on the Group/Air Station. The analysis does not examine with useful precision the day-to-day operation of the Group/Air Station and the potential negative impact of the eighteen-month-long NCF construction period on those operations. The final EIR must address these concerns in the long-term vs. short-term productivity discussion.

III-14 2-3: The description of responses to the notice of preparation fails to identify concerns identified in reference (b). In fact, the Group/Air Station, an adjacent landowner, was omitted from the mailing list of the draft EIR as well. The official interest of the Group/Air Station has been demonstrated both in meetings and correspondence with the Port District. The final EIR must reflect this degree of interest by placing Coast Guard Group/Air Station both on the mailing list and on the list of named responding parties, as well substantively responding to Coast Guard concerns.

III-15 3-5: The NCF project description indicates that it would be built adjacent to the Group/Air Station. A major element of the NCF project is a temporary water treatment facility (WTF) to be constructed on Group/Air Station property. There is no discussion of the precise location, nature, extent, or effect of that construction on the Air Station. The final EIR must more precisely describe the NCF project. Moreover, the Coast Guard has given no permission for construction on its property so consideration of this alternative is premature.

III-16 3-34: Figure 3-10 contemplates the shoreside placement of sandpiles and loading equipment needed for the sand capping alternative. There is no discussion anywhere in the draft EIR of where or how these will be situated, or what effect on the existing environment these staged items will have. There is no pre-staging plan diagram for the sand-capping alternative illustrating the square-feet required or the

Enclosure (1)

III-11 Potential impacts to the Coast Guard facilities resulting from implementation of the NCF were addressed in Section 5.9 (Coast Guard Operations/Security).

III-12 Potential impacts to the Coast Guard facility resulting from implementation of the sand capping alternative were addressed in Section 5.9 (Coast Guard Operations/Security).

III-13 A more detailed discussion of the Short-Term vs. Long-Term Productivity was addressed in Section 5.11. The EIR indicates that "the short-term physical effects of implementing the proposed project includes dredging and construction-related impacts on noise and security to the adjacent U.S. Coast Guard facility..." The EIR also indicates that "the short-term physical effects of implementing the preferred alternative (sand capping) includes capping-related impacts on noise and security to the adjacent U.S. Coast Guard facility." No significant long-term impacts to the U.S. Coast Guard facility were identified.

III-14 The March 26, 1993, letter from the Commanding Officer was received substantially after the 30-day deadline for responding to the Notice of Preparation. Nevertheless, the issues listed in the letter were taken into consideration in analyzing the impacts of the NCF and alternatives.

Section 10.1 indicates that the Draft EIR was sent to the Commander of the Marine Safety Office in San Diego as well as the Chief of the Civil Engineering Division in Alameda. The Final EIR will be distributed to the commentor and to these offices.

III-15 The District clearly recognizes that the Coast Guard has not given permission for construction of the WTF on its property. If the Board of Port Commissioners wishes to pursue the NCF, NEPA environmental review will be required to thoroughly address the precise location, nature, and effect of the WBF's construction and operation on the Air Station.

III-16 The construction approach and methods will be the option of the contractor selected. However, access to the site will be a key consideration, that will require careful coordination with the District and the Coast Guard. Although the plan is conceptual at this point, it does recognize that some onshore access and construction staging area would be required. Where feasible, Port District tidelands will be used for staging during construction. In general, as much offshore placement will be encouraged in that is more efficient and requires less construction staging and access.

points of access to the staging areas. The final EIR must provide more thorough, site-specific diagrams of the sand capping process for meaningful review of this alternative's environmental impacts.

III-17 5.6-2: The discussion of the human health and safety impact of the NCF is seriously deficient. The draft EIR makes the conclusory statement that there will be no significant direct impacts on human health and safety during the NCF project. There is no discussion of construction safety, altered congestion and traffic patterns, construction waste, or noise and air pollution from the construction process. The Group/Air Station is both a working operational unit and a residential facility. The impact on human health and safety of the construction of the proposed project or any of its alternatives could be significant. While the draft EIR described the impact to marine resources with great detail, a meaningful discussion of impacts to human health and safety is entirely absent. For example, in the discussion of the impact of the NCF on marine resources at 5.2-26, the WTF is described as having a significant impact on the environment due to the potential risk to marine life of the disposal of toxins into San Diego Bay. This discussion of risks of water treatment should be extended to include potential risks of effluent toxins and hazardous waste from the treatment process to the human population in the vicinity of the WTF. The discussion of the impact of the NCF on human health and safety must, at a minimum, be expanded to address the same factors analyzed in the marine resources impact discussion. The final EIR must address in factual detail all the practical elements of the NCF, the WTF and dredging processes, and their potential impacts on human health and safety.

III-18 5.6-2: The No-Action alternative discussion does not effectively address the benefits of inaction. For example, the No-Action alternative should examine the potential phenomenon of "natural" remediation. There is no analysis of the possibility that the PCB contaminants on the floor of the Lagoon might be covered in time by layers of shifting sand and sediment. There is also no assessment of current and future risks of continued direct and indirect human exposure to PCB-containing sediment. The final EIR should address this potential for "natural" remediation as well as the risk to human health and safety from PCB-containing sediment should no action be taken.

III-19 5.6-3: The human health and safety impact of the construction process involved in sandcapping is simply not addressed. The final EIR must factually analyze this short-term impact.

III-20 5.6-3: The discussion of mitigation of the human health and safety effects of the NCF fails to address steps to be taken

III-17 Health and safety requirements during construction must comply with California Code of Regulations (CCR) Title 8 and OSHA (29 Code of Federal Regulations) which include a site-specific health and safety plan in compliance with 8 CCR Section 5192. A Hazardous Waste programmatic site-specific health and safety plan would also be prepared. Compliance with these regulations would ensure that no significant impacts to human health and safety would occur.

Hazards with PCBs result from direct skin contact or ingestion. Inhalation does not represent a hazard, unless the PCBs are adhering to fine dust particles. This will not be a problem with the project which is dealing with wet sediment. As such, any hazards during construction would be limited to onsite workers. These workers will be protected by measures specifically aimed at limiting or fully eliminating the chance for exposure as required by the above regulations.

III-18 Comments noted. However, "Natural" remediation is not considered to be a viable option in view of the cleanup and abatement order by the Regional Water Quality Control Board (RWQCB).

III-19 Please see response III-17.

III-20 Please see response III-17.

to mitigate short-term construction impacts. There is no factual analysis of the environmental impact (noise, traffic, security, air pollution, fuel spills, hazardous waste) of the construction process. The final EIR must adequately address these impacts and propose mitigating measures for human health and safety impacts.

III-21 5.7-1: The land/water use compatibility impact discussion should address the impacts of the proposed project or its alternatives on Coast Guard Group San Diego's long range plans for the area immediately adjacent to the NCF. The Air Station's input to the draft EIR, reference (b), highlighted issues of importance. The draft EIR failed to address these issues. The final EIR must discuss the land/use compatibility impact on Group San Diego's long range plans.

III-22 5.7-7: The discussion of the land/water use compatibility impact of the NCF is deficient. Though this section does provide a factual description of the NCF project, it fails to analyze the environmental regulatory framework thoroughly. Should the Coast Guard allow the Port District to construct a temporary WTF on the Group/Air Station as part of the NCF project, that act could be considered a major federal action implicating the public review processes of the National Environmental Policy Act and the Coastal Zone Management Act. The creation of new upland waterfrontage from dredge spoils adjacent to the Group/Air Station may also involve the wetlands permitting process of section 404 of the Clean Water Act. The draft EIR makes the conclusory statement that the NCF would require "further federal environmental review" without addressing these specific federal law requirements or their relationship with parallel state laws. The final EIR must thoroughly discuss the potential federal and state regulatory implications and how they will be practically dealt with by the Port District.

III-23 5.8-1: The coastal access impact discussion fails to address the impacts of the proposed project or its alternatives on the proposed main entrance relocation as discussed in reference (b). The final EIR will be deficient without a thorough examination of the issue of main entrance relocation.

III-24 5.9-1: The draft EIR is defective as it fails to effectively address the mission and operations of the Group/Air Station. The discussion of existing Coast Guard activities should be amplified to more clearly recite the number of onboard personnel, both residents and commuters, the specific activities and equipment, and the societal importance of the Group/Air Station. The final EIR must thoroughly assess the existing conditions at the Group/Air Station and effectively address the potential short-term and long-term impacts of the proposed project or its alternatives to those activities.

3

III-21 Please see responses III-29 through III-50 for a detailed discussion regarding land/water use compatibility.

III-22 NEPA typically requires that environmental documentation determine compliance with applicable laws and regulations. No such requirement exists for CEQA. The EIR has identified that further federal environmental review would be required for the NCF and its temporary WTF.

III-23 The entrance gate and water area of Convair Lagoon are within the District's jurisdiction. Whether the NCF or sand cap is constructed, use of this gate for a main entrance for USCG will require authorization from the District.

III-24 The mission and operations of the Coast Guard are discussed further in the Port Master Plan which is hereby incorporated by reference. Refer to response III-13 *for discussion regarding short- and long-term impacts.*

	Comment		Response
III-25	5.11-1: The discussion of the short-term physical effects of the NCF is deficient. The final EIR should more fully address dredging and construction-related impacts. The statement that these effects are unavoidable is conclusory and ignores the role of mitigation. The final EIR must not only describe these impacts but also address any overriding considerations used to justify them.	III-25	Construction impacts include restricted access during construction, noise pollution, and construction equipment on surface streets. These impacts have been discussed in greater detail in the appropriate EIR sections.
III-26	5.11-1: The discussion of the NCF's creation of developable waterfrontage must address the Preliminary Master Plan. The Group/Air Station has a significant interest in the creation of waterfront acreage adjacent to the Group/Air Station. The final EIR will be deficient without a thorough examination of enclosure (2).	III-26	Please see response III-40.
III-27	5.11-1: The discussion of the short-term physical effects of the sand capping alternative is deficient for it fails to adequately describe capping-related impacts on noise, security, and human health and safety on the Group/Air Station. The final EIR should more fully address capping-related impacts. The statement that these effects are unavoidable is conclusory and ignores the role of mitigation. The final EIR must not only describe these impacts but also address any overriding considerations used to justify them.	III-27	Construction impacts include restricted access during construction, noise pollution, and construction equipment on surface streets. The actual duration of construction is anticipated to be less than 3 months with the majority of the construction occurring in a one month period.
III-28	5.14-1: The discussion of irreversible significant environmental effects is deficient. The statement that no unavoidable and/or irreversible environmental effects other than incremental loss of water area within San Diego Bay is conclusory. The final EIR must address the potential for irreversible impacts on the human health, safety and Group/Air Station operations that could result from the NCF.	III-28	There are no irreversible significant impacts on the human health, safety, and Group/Air Station operations that could result from the NCF.

U.S. Department of Transportation
United States Coast Guard

Commanding Officer
U. S. Coast Guard
Air Station

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(619) 557-5890

3750
MAR 26 1993

San Diego Unified Port District
Environmental Management Department
Attn: Ms. Melissa Mailander
Post Office Box 488
San Diego, CA 92112

Subj: COAST GUARD INPUT FOR ENVIRONMENTAL IMPACT REPORT

Coast Guard Air Station San Diego has several concerns to be addressed in the proposed remediation of Polychlorinated Biphenyls in Convair Lagoon by Teledyne Ryan Aeronautical. The three options presented by Mr. Donald Wilkins of Teledyne Ryan were: (1) Installation of a Nearshore Containment Facility; (2) Sand Capping; and (3) Dredge and Dispose.

Environmental concerns for each option:

1. Nearshore Containment Facility:

III-29 A. Contamination Migration: Will our property be contaminated by the migration of PCBs in any media?

III-30 B. Construction Impact: What effect will the dredging and landfill process have on the Air Station's ability to regularly operate and maintain security, especially in regards to the dust, noise, emissions, and congestion caused by the extended presence of construction workers and their equipment?

III-31 C. Water Treatment Facility: Planned for installation on Air Station property. Who will be responsible for the effluent and hazardous waste produced by the temporary water treatment facility?

2. Sand Capping:

III-32 A. Contamination Migration?

III-33 B. Construction Impact?

3. Dredge and Remove:

III-34 A. Contamination Migration?

III-35 B. Transportation Impact: The likelihood of an accident or

Enclosure (2)

III-29 The NCF includes a bentonite liner to prevent the migration of PCBs.

III-30 Health and safety requirements during construction must comply with California Code of Regulations (CCR) Title 8 and OSHA (29 Code of Federal Regulations) which include a site-specific health and safety plan in compliance with 8 CCR Section 5192. A Hazardous Waste programmatic site-specific health and safety plan would also be prepared. Compliance with these regulations would ensure that no significant impacts to the Coast Guard Station would occur.

III-31 TRA will be responsible for the effluent and hazardous waste produced by the temporary water treatment facility.

III-32 Pathways for migration were identified in the EIR to consist of physical and biological pathways. Chemical diffusion and physical disturbance of the cap, as well as bioturbation, were discussed in Section 3.4.5.2 and Section 5.2 of the EIR.

III-33 Please see response III-27.

III-34 The alternatives which involve dredging and removal of PCB contaminated sediments were not considered viable, and therefore, no further analysis was conducted.

III-35 Please see response III-34.

Subj: COAST GUARD INPUT FOR ENVIRONMENTAL IMPACT REPORT

B. Transportation Impact (cont.):

spill of hazardous waste increases with the amount of truck traffic. Can the Coast Guard be insulated from liability and assured of rapid clean up?

Real Property concerns for each option:

1. Nearshore Containment Facility:

III-36 A. Water treatment facility impact: Does the construction of the water treatment facility effect the Air Station's use and enjoyment of the property? How have facility worker access and security concerns been addressed? Will the facility be on the Air Station or not? How long will it be there? How long will it be in operation?

III-37 B. Use of Coast Guard Property: What formal steps, if any, have been taken with regard to the use of Coast Guard property as part of remediation project?

III-38 C. Construction Impact: What effect will the construction process (staging/access) have on the Air Station's security and regular operations?

III-39 D. The New Landfill: How and by whom will the new land be used? What consideration has been given to Coast Guard interests in using the property?

III-40 E. Master Plan Impact: The Coast Guard San Diego Master Plan design objectives address contemplated recreational development of the shoreline area adjacent to the lagoon and roadway extension. It also proposes relocation of the Air Station entrance to the gate located adjacent to convair lagoon. How will these long term plans be effected?

III-41 F. Permanent Monitoring: Will there be other permanent monitoring devices that would impact operations and Master Plan development at the Air Station?

III-42 G. Construction Accident Liability: How has liability for both personal and environmental mishaps been addressed in the remediation planning process?

2. Sand Capping:

III-43 A. Use of Coast Guard Property?

III-36 Should the NCF remediation option be chosen, TRA and the District will work with the Coast Guard to address the location of the WTC and to ensure that the WTF does not significantly effect the Air Station's use. It is anticipated that the WTF will be in operation for 6 months. As noted in the EIR, further federal environmental review would be required to address these issues.

III-37 No formal steps have been taken with regard to the use of Coast Guard property as part of the remediation project.

III-38 Please see response III-16.

III-39 No specific land use has been proposed for upland area that would be created as a result of the NCF. Subsequent environmental review would be required prior to adopting a use designation for the newly created upland area.

III-40 The entrance gate and water area of Convair Lagoon are within the jurisdiction of the District. Impacts on the Coast Guard's contemplated recreational development of the shoreline area adjacent to the Lagoon would depend upon the type of recreational activity proposed and compliance with the Port Master Plan. Relocation of the Air Station entrance to the gate located adjacent to Convair Lagoon would not be precluded by implementation of the NCF; however, the Coast Guard would have to negotiate with the District for use of the access.

III-41 There are no proposed monitoring devices that would impact operations and Master Plan development at the Air Station.

III-42 TRA will be responsible for liability, mitigation/monitoring, and integrity of the NCF. The Port will require a financial instrument in the form of a bond, letter, trust fund, or other appropriate enforceable means.

III-43 Please see response III-16.

3750
MAR 26 1993

Subj: COAST GUARD INPUT FOR ENVIRONMENTAL IMPACT REPORT

III-44 B. Construction Impact?

III-45 C. Master Plan Impact?

III-46 D. Construction Accident Liability?

3. Dredge and Remove:

III-47 A. Use of Coast Guard Property?

III-48 B. Construction Impact?

III-49 C. Transportation Impact: Will the trucking of dredge material effect the regular operations of the Air Station?

III-50 D. Construction Accident Liability?

Upon receipt of answers to the above questions, I look forward to providing the U.S. Coast Guard's final position on the remediation alternatives.

My point of contact for this project is the Public Works Officer, LCDR John Campbell. He may be reached at (619) 557-5896 or 5895. The alternate point of contact is the Ground Safety Officer, ENS Mitchell Morrison, and he can be reached at 557-7227.

Sincerely,

C. C. FITZGERALD
Captain, U.S. Coast Guard
Commanding Officer

Copy: Mr. Donald Wilkins, Teledyne Ryan Aeronautical

III-44 See Response III-27.

III-45 There are no anticipated impacts that would impact the Air Station Master Plan. The water area within Convair Lagoon is within the District's jurisdiction.

III-46 The contractor is responsible for worker safety and job safety at the site. However, the contractor will probably require shared liability in the case of potential sediment suspension and mobilization due to his construction practices - as long as these practices are in accordance with the construction contract.

III-47 See response to comment III-34.

III-48 See response to comment III-34.

III-49 See response to comment III-34.

III-50 See response to comment III-34.

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SAN DIEGO
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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

OFFICE OF
PLANNING
DEPARTMENT
236-6460

August 6, 1993

Mr. Ralph T. Hicks
Environmental Management Coordinator
Port of San Diego
P.O. Box 488
San Diego, CA 92112-0488

Dear Mr. Hicks:

SUBJECT: DRAFT EIR FOR CONVAIR LAGOON REMEDIATION,
SCH NO. 92091011

Thank you for the opportunity to review and comment on the above-referenced Draft EIR. Upon review of the EIR, the City Planning Department recommends implementation of the environmentally-preferred alternative (sand capping) to remediate the contamination of Convair Lagoon. The Draft EIR adequately addresses issues raised in our response to the NOP (dated August 25, 1992) and we have no further comments. We would request a copy of the Final EIR for our files.

Please feel free to contact Doug McHenry, Environmental Analyst, at (619) 236-7785 should you have any questions.

Sincerely,

Mary Ladiana
for Ann B. Hix, Principal Planner
City Planning Department

ABH:vbc

cc: Mary Ladiana, Senior Planner

IV City of San Diego

No response required.

ENVIRONMENTAL HEALTH COALITION
1717 Kettner Boulevard, Suite 100 • San Diego, California 92101 • (619) 235-0281 Fax (619) 232-3670

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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

August 9, 1993

Mr. Ralph Hicks
P.O. Box 488
San Diego, CA 92122

RE: Comments on the Draft Environmental Impact Report (EIR) for Convair Lagoon Remediation

Dear Mr. Hicks:

Environmental Health Coalition (EHC) has been participating in efforts to remediate the state of pollution in Convair Lagoon for which Teledyne Ryan Aeronautical has been named the responsible party. Please find below our suggestions for changes and additions that our analysis reveals should be made to the document prior to finalization of Environmental Impact Report (EIR) for Convair Lagoon Remediation.

<u>Major areas of concern</u>

CHARACTERIZATION OF PREFERRED ALTERNATIVE SHOULD BE MORE CLEARLY DEFINED

V-1 A final EIR is intended to be the description of the project should it be carried out. In this case certain aspects of the alternatives project, most notably mitigation measures for the sand cap, must be committed to as part of the project. The frequent qualification of actions by the word "should" and "may" must be eliminated. Either the project includes a biological monitoring or it doesn't. "Should" is not acceptable and does not describe an aspect of the project that can be expected to occur. Project proponents must either commit to these aspects of the project or leave them out. Also, greater specificity is
V-2 needed. The long-term monitoring program must have a length of time, parameters, and an identified funding source to carry it out listed in the project description if that is to be
V-3 one of the mitigating measures. Also, it is not clear if the geotextile material will be placed under the sand cap or not. This should be clarified in the text.

V-4 The following changes are recommended: Page 3-35--"Short term monitoring will be conducted during the construction process..."; page 3-36 should be rewritten to read "The health and safety of workers <u>will</u> be assured..." and "The workers that may come in

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V Environmental Health Coalition

V-1 Please see pages 3.35 through 3.38 and 5.2-38 through 5.2-42 for the revised text.

V-2 The long-term monitoring program is defined on page 3-38.

TRA will be responsibility for mitigation, monitoring and integrity of the cap. The District will work with the Responsible Party(ies) to establish an adequate Annuity or other financial account to provide funds necessary for long-term sand cap monitoring and maintenance.

V-3 A geotextile liner is proposed at the 60" storm drain and pier per Figures 3.7 and 3.9. The liner's purpose is to limit sediment suspension during the construction of the storm drain extension.

V-4 See Response V-1.

contact with the contaminated sediment will be required to participate in proper training prior...."; page 5.2-41-- "This plan will include a biological and water quality monitoring program..."; and page 5.2-42-- "A long-term monitoring program will be designed to evaluate and monitor the effectiveness of the cap. This will involve core samples....Finally, a contingency plan will be prepared..." Please make the commitment to these items and the many other instances throughout the EIR where this occurs as parts of the project description or delete them.

V-5 The project description for both alternatives should include a commitment on the part of the project proponent to establish a reserve fund for repair, replacement, and monitoring of the site.

POTENTIAL BREECH OF CAP NEVER RESOLVED OR MITIGATED

EHC is committed, as we believe all parties involved are, to permanent isolation of PCBs from the environment and the food chain as quickly as possible. The sand cap concept certainly has strong potential and the EIR does a good job outlining the issues surrounding the cap including the possible breech of it by burrowing organisms.

V-6 However, having successfully posed the question, it does not satisfactorily answer how the breech will be avoided given the strong possibility that it could occur. This also raises the question of how, with a significant outstanding issue, this became the preferred alternative.

V-7 Once again a commitment must be made in the project description to provide necessary funds for repair, monitoring, and replacement in the future. Since PCBs are not expected to break down for 250 years, we need a long-term solution to this problem.

THE DOCUMENT NEEDS TO BE BALANCED AND OBJECTIVE.

The function of an EIR is not to serve as a "consensus document" but rather to be a factual analysis of the environmental impacts of a proposed project. We all realize that as a result of this spill, the environment has been forever compromised. EHC recognizes that complete cleanup is not possible. However, the role of this document is very important as it is supposed to provide an objective analysis of the options which then can lead the Responsible Parties to the best possible solution. As such, it should be balanced

V-8 and objective. EHC was eagerly looking forward to a document that dispassionately examined the proposed confined disposal facility and the sand capping option. This EIR shows a strong bias toward sand capping even though neither of the discussed capping methods has a lengthy track record. While the EIR often cites the impermanence of the Nearshore Containment Facility (NCF), no different claims can be made for a sand cap. The longevity of both caps are in question and this should, in an objective manner, be indicated in the EIR. Some examples of imbalance that should be removed are as follows:

V-5 Incorporated by reference is a requirement that the project proponent will be required to establish an appropriate financial instrument for repair, replacement, and monitoring of the site. Refer back to response V-2.

V-6 There is not a strong possibility of a breach in the cap. Although bioturbation may be a cause of movement of contaminated material up through the cap, a bioprotection layer has been proposed to inhibit biological access to the contaminated sediment. Page 3-38 addresses contingency plans for other events that may result in the loss of capping material.

V-7 See Response V-2.

V-8 According to Section 15362 of the State CEQA Guidelines, an EIR is "a detailed statement prepared under CEQA describing and analyzing the significant environmental effects of a project and discussing ways to mitigate or avoid the effects." The Convair Lagoon Remediation EIR/RAP clearly is consistent with this definition. By virtue of the fact that the project must be acceptable to both the District and the RWQCB, "consensus" is essential. It was determined that reaching agreement or consensus on an approach could best be accomplished by analyzing viable alternatives (in this case, the NCF and sand capping) in equal level of detail as opposed to the minimal requirement of CEQA to analyze only the proposed project in detail. This EIR not only complies with CEQA, but exceeds the legal requirement.

The analysis of impacts of the NCF, sand capping, and the no project alternative is impartial and without bias. The District selected sand capping as the preferred alternative based on several considerations including impacts, cost, construction time, and relative ease of implementation.

Historically, sand capping has been conducted since the late 1960s. There are more proven projects implemented involving capping (approximately 15) as opposed to NCF (approximately 6) in the last 20 years. The longevity of either alternative is dependent on the engineered design life and the ability to predict impacts at the site.

V-9 The second paragraph on page 5.2-7 verges on editorializing and should be removed or expanded to include other findings such as studies showing sublethal effects from contaminants that do not demonstrate acute toxicity.

V-10 Another example is found in the description of the same impact under both projects. For the NCF it is called "total eradication of eel grass, macroinvertebrates living on or in the sediment" and for the sand cap it is stated (Page 5.2-29) "loss of eel grass, macroinvertebrates living on and in the sediment".

V-11 The place for judging which is the best solution should take place after the objective analysis is completed, not as part of the EIR process.

EHC COMMENTS ON THE NOTICE OF PREPARATION WERE NOT ADDRESSED

V-12 Several EHC comments to the NOP were not considered or responded to in this document. In particular, we requested that the EIR: specify length and funding source of long-term monitoring; examine in depth several innovative technologies from EPAs program; include the possibility of a bulkhead to isolate the lagoon from the rest of the Bay during dredging to prevent recontamination of the Bay; and include as mitigation for the NCF, a Least Tern nesting area on the NCF and restoration of some of the area as salt marsh. EHC then, raises these issues again and requests a response to them all as required under CEQA.

EIR SHOULD CLARIFY HOW THE PREFERRED ALTERNATIVE MEETS REQUIREMENTS FOR CLEANUP IN RWQCB ORDER 86-92

V-13 Teledyne Ryan is under order to "reduce the sediment PCB concentration in the Convair Lagoon portion of San Diego Bay to a PCB action level of 10 mg/kg dry weight." The EIR should specifically state how the preferred alternative satisfies this directive.

V-14 The sand capping option was not extensively discussed by the EBASCO engineering studies as it was not considered to achieve the action level for PCBs required by the Regional Board. How this issue will be resolved must be part of the discussion surrounding the sand cap analysis.

Specific Comments

Below are some questions and suggestions for clarification in the EIR. We have also included some requests for additional information to be added.

Table 1.2-1

V-9 While providing a valuable perspective on recent developments in contaminant toxicology, the paragraph does not contribute to the description of Existing Conditions and has been deleted.

V-10 This phrasing represents an attempt to avoid redundancy rather than intentional bias. The ultimate meaning of both phrases is the same, i.e., both cases indicate that the option would destroy the resources.

V-11 Section 15126 (d) (1) of the State CEQA Guidelines allows the designation of a "preferred alternative."

V-12 Long-term monitoring will be required until such time as the NCF is removed or the PCBs are rendered harmless or permanently destroyed. The District will require that TRA fund the monitoring. Refer back to response V-2.

The technologies referenced by EPA have not been proven effective for a marine sediment environment.

A bulkhead is impractical in that it does not consider the flow and tidal flux into the site. A bulkhead may also be environmentally unsound due to the biological disruption and sediment resuspension resulting from its installation and removal. Fixed-U-Barge silt curtains have been used to minimize sediment resuspension at the point of dredging (IHC Technologies, personal communication, May, 1990). Other mechanisms to reduce sediment resuspension are available beyond construction of a temporary sheet pile structure.

Foraging areas for the California least tern will be mitigated by the restoration of eelgrass beds elsewhere in the Lagoon, and there are no nesting areas within the project area. Therefore, no additional mitigation is required in the form of a nesting area on the NCF and/or development of a salt marsh within the Lagoon.

V-13 The sand capping alternative exceeds the purpose and intent of the RWQCB's Cleanup and Abatement Order No. 86-92 by totally isolating the sediment-containing PCBs as opposed to removing only the sediment which exceeds 10 ppm (dry weight) PCBs. The RWQCB is a responsible agency which has discretionary approval power over the project and must ultimately decide whether or not sand capping is in compliance with the cleanup and abatement order.

V-14 The EBASCO study did not consider sand capping as presented in the EIR. Also see the above response V-13.

V-15 The EIR describes the potential for a breech in the sand cap as having significant impacts on marine resources yet the Table describes it as mitigated. It is not clear how the possibility of breech is removed and mitigated anywhere in the document. This must be done before impacts to marine resources can be considered mitigated.

Sand capping alternative (Page 1-12)

V-16 There is no improvement to sediment quality with the sand cap. In fact, there is no change at all. This is a separate issue from isolation of the contaminants from the food chain that the cap would provide.

Page 3-5

V-17 The three treatment processes mentioned in the second paragraph should be identified. Is this the same treatment three times or three different treatments?

3.4 Alternative Forms of Remediation

V-18 The EIR states that all viable alternatives are examined at the same level of specificity. This is not the case. The preferred alternative receives over 27 pages of analysis and the other receive two pages at most.

V-19 If anaerobic dechlorination of PCBs is being tacitly promised with the sand cap then at least one anaerobic dechlorination treatment process (other than subsurface bioremediation) should be analyzed for its appropriateness for cleanup.

3.4.2 Incineration

V-20 The negative health effects of incineration should be included in this analysis. We have enclosed information regarding the problems and health effects of incineration of PCBs.

V-21 A clarification is needed in the amount of contaminated sediment that needs remediation. Page 1-2 and the Basis of Design Report list the amount at 13,000 cubic yards. Here, the EIR lists 22,000 cubic yards. The cost for remediation of 13,000 cubic yards should be included in the analysis.

3.4.4 Chemical Fixation

V-22 The EIR correctly assumes that a municipal landfill would not accept this material. However, a hazardous waste landfill would and a landfill in Imperial County has excess capacity. This option should be explored.

3-17 Cap Thickness and Chemical Diffusion

V-23 The *Wang et al* study was done to determine the "break through" time for four types of capping material. What were the results? The summary statement in the EIR does not

V-15 The term "breach" implies major interruptions in the integrity of the sand cap and/or the bioprotection layer. This type of disturbance to the seafloor is extremely uncommon anywhere except in areas where very large vessels engage their propellers while fixed in a single position or are deploying large anchors, around log storage dumps, or where ice bergs cause large-scale gouging of the seafloor. It is possible that a major earthquake could cause fractures in the seafloor, but because the cap materials are unconsolidated, it is quite likely they would collapse into a fracture and reseal it. Far more likely is the small-scale loss of integrity caused by burrowing organisms such as ghost or pistol shrimp.

V-16 While this is literally true for both the NCF and sand cap options, the end result is nearly the same.

V-17 The three process *steps* in the wastewater treatment *process* are, in order, dissolved air flotation, granular media filtration, and activated carbon adsorption.

V-18 Of the alternative forms of remediation considered, only sand capping was considered viable. Section 5 analyzes the NCF, the sand capping alternative, and the required "no project" alternative at the same level of specificity. The more than "27 pages of analysis" which the reader refers to is the description of the sand capping alternative and not the analysis. The detailed description of the sand capping alternative is also necessary for the document to serve as a Remedial Action Plan (RAP) pursuant to Health and Safety Code Section 25356.1. The detailed design studies for the NCF were provided as Appendix A to the EIR.

V-19 Anaerobic dechlorination is not tacitly promised. Data collected from Convair Lagoon suggest that this may result in the eventual destruction of PCBs, but it is not guaranteed. An *ex situ* anaerobic dechlorination process would suffer the same questions about potential high costs and lack of demonstrated commercial feasibility.

V-20 The EIR concluded that incineration was not a viable alternative; therefore, there was no analysis of impacts. If incineration had been analyzed, it is questionable whether or not the negative health effects cited in the newsletter attached to the EHC letter would be considered applicable. Air emissions data from PCB incineration generally indicate that PCBs would not create an air emission problem. The articles attached to the EHC letter deal with variations on the incineration process that are not relevant to this case.

V-21 The alternatives must consider 22,000 cubic yards to fully remediate the contamination problem. The NCF is able to get by with only 13,000 cubic yards of dredging because the NCF will be built over an area of the Lagoon that contains approximately 9,000 cubic yards of contaminated sediment. Therefore, the cost for incineration must be based on 22,000 cubic yards.

V-22 The chemical fixation alternative was dismissed as uneconomical and technically questionable. The uneconomical nature of this alternative becomes even worse if the fixed sediment must be hauled to a hazardous waste landfill, rather than returning it to the Lagoon. It is highly debatable whether a hazardous waste landfill that isn't licensed to accept PCB-contaminated soil would accept chemically fixed Convair Lagoon sediment.

V-23 The *Wang et al.* study was conducted to determine net-flux through the capping material in a laboratory setting. The intent was to measure movement through the capping material and to determine what characteristics (total organic carbon, density, grain size distribution) result in greater flux through the cap.

inform the reader of length of time that the caps maintained chemical isolation.

Short-term vs Long-term Productivity

V-24 Developable water frontage as a result of the proposed fill activities could allow for future long-term economic benefits indicates a growth inducing activity around the Bay. Another option that we asked be evaluated in our comments on the NOP would be to use the site as a least tern nesting site to mitigate loss of the Airport Triangle nesting area. This should be added to the EIR as an option.

3-28 Modification of 60-in storm drain

V-25 This evidence shows that it is clearly time to redesign and up-grade this storm drain. This should be added to the plan.

Materials (3.32)

V-26 **Any dredge material used to cap this site MUST undergo sublethal effects testing. To attempt a habitat enhancement with material that may meet an acute toxicity standard but not a chronic or sublethal effects test results in net loss to the Bay living resources. This is critically important.**

Long-term (Post Implementation) monitoring

V-27 The "long" in long-term should be defined on a 5, 10, 50, or 100 year scale. In addition, the source of funding for this long-term monitoring should be identified.

Biological Monitoring

V-28 We have some serious concerns about this paragraph. The phrase, "and if they are biologically detrimental" should be stricken. The phrase implies that some escape of PCBs into the environment is acceptable. It is not. This document needs to bind the responsible parties to a level of protection because future laws may not. The last sentence states that monitoring "could" include measurements of PCBs....The project proponents should state whether it will or not.

V-29 The proposed sampling schedule on page 3-38 is horribly inadequate. The cap will be unmonitored for 5 years at a time in the very near future. The frequency must be increased if monitoring is to be considered a mitigating measure.

Impacts

V-30 The solubility of PCBs and other contaminants in the sediments in water is very important to any discussion of remediation at the site. Silt screens, screen only silt. Should contaminants be dissolved in water, they will pass through the silt screen to be dispersed throughout the Bay. An estimate of Bay contamination by this phenomenon must be discussed and mitigated in this section.

V-24 The District has not yet determined the appropriate land use for the upland area that would be created if the NCF were to be implemented.

V-25 Modification of the 60" storm drain is essential to the sand cap. However, the upgrade of the system is not required for successful implementation as long as the capacity is not reduced.

V-26 The dredge material used to cap this site will undergo sublethal effects testing. The dredge material toxicity test program includes a bioaccumulation test for two species and acute short and long-term response for the remaining species. Other tests which can be conducted include several chronic tests in sediments, e.g., amphipod reburial, sea urchin sperm fertilization, or bivalve larval development tests.

V-27 Please see page 3-38. The EIR specifies 30 years. Please refer back to response V-2 regarding funding for maintenance and monitoring of the sand cap.

V-28 Please see the revised text on page 3-37.

V-29 The proposed monitoring schedule reflects the schedule required at several CERCLA remediation sites. A tiered or phased monitoring approach is recommended. Physical monitoring could occur annually. The monitoring program indicates that for 10 years chemical and biological monitoring should be conducted only if conditions warrant so.

V-30 Even with silt curtains the spread of PCBs attached to suspended solids is a much greater concern than dissolved PCBs in the water.

5.1.1 Existing Conditions

V-31 The State Mussel Watch Program did find that mussels suspended in the water column in Convair Lagoon had elevated levels of PCBs. This impact to the water column should be noted in existing conditions.

Table 5.1-1

V-32 Table 5.1-1 shows that sample A10 had expired. This makes the sample invalid and it should be redone.

5.2-3 Concentration and Distribution of PCBs and Trace Metals

V-33 PCB values below the level of detection should not be assumed to be zero. The toxicity and the mutagenicity of some chemicals is so high that there can be biological impacts where their presence is not detectable with current laboratory processes. This is why some measure of sublethal effects testing should be done in the areas remaining after the remediation.

5.2-14 Intertidal Invertebrates

V-34 This section is difficult to understand. The meaning of the conclusions is not evident. Please add text that will explain any conclusions drawn as a result of this examination.

Table 5.2-9 Distribution and Density of Intertidal and Subtidal Burrows in sediments in Convair Lagoon

V-35 Our reading of this map would convince us that the most burrows occur in the shallower water in areas that support eel grass vegetation. Could this conclusion be extrapolated to mean that the sand cap could expect high densities of burrowing organisms since the water would be shallower than it is currently and would have established eel grass beds? Please comment.

5.2-25 Silt Curtain

V-36 Areas that are inside the silt curtain but not inside the dredge footprint will very likely be the recipient of some PCB contaminated sediment that has been resuspended through the dredging process. This is potentially a very significant impact since PCBs in very low levels have negative impacts on living organisms. This area should be reevaluated after settling of sediment has occurred and may, also, have to be dredged depending on the amount of resuspension that occurred. This same precaution should be taken outside the silt curtain as well.

V-31 The EIR/RAP does address the impact to the water column. It should be noted that the mussel watch data are based on undepurated samples, which means that the concentrations could represent contaminated particles passing through the digestive tract rather than contaminants incorporated in the tissue, i.e., true body burden.

V-32 That fact that this sample was analyzed after its holding time expired means that it can no longer be accepted legally for the purposes of establishing the need (or lack of) for an enforcement action. That was not the purpose for including the data in the EIR. The purpose was to identify that PCBs are found in the water column. The fact that the sample was analyzed after the holding time expired does not alter the conclusion. In reality, given the persistence of PCBs, it is very unlikely that the relative short amount of time beyond the allowable holding time had any effect on the concentration of PCBs. PCB concentrations in a sample do not precipitously drop once the holding time has passed.

V-33 This is a point of discussion in all in-depth analyses of chemical data with low concentrations. This is the most conservative of several conventions which are employed routinely. The point is probably moot given that the RWQCB has written off PCBs below 10 ppm whereas the lowest concentration shown in the table and figure is 0.055 ppm, nearly 200 times lower. The O value for non-detects has no impact on any of the analyses in the report and does not influence the figure at all. This can be confirmed by an examination of the data in Appendix C-1.

V-34 This section has been revised.

V-35 In fact, the map shows just the opposite, i.e., that the density of burrows increases strongly with increasing depth; statistically, this a very significant relationship. If one were to try to use these data to predict how the biota would be affected by the cap, an appropriate interpretation of the data would be that existing patterns of burrow density would be displaced offshore by the distance that an isobath is offset by the construction of a sand cap. It is anticipated that, over time, with all other factors remaining equal, the relationship between burrow density and depth would not be altered by the sand cap itself.

However, it must be recognized that these data only describe existing conditions and that sediment conditions will be considerably different after construction of the cap. First, the sand cap will be constructed of a coarser material than presently exists in the subtidal portions of Convair Lagoon; this may discourage the re-establishment of the "pistol shrimp" assemblage, which appears to prefer finer sediments. It is possible this change in grain size will result in an expansion in the area dominated by ghost shrimp, which appear to prefer coarser material. Moreover, the new sediments will probably have a far lower organic carbon content than the existing sediments. Thus, the ecological ramifications of the change in grain size and the associated changes in biological assemblages cannot be predicted at this point because too little is known about the assemblages involved.

V-36 Comment acknowledged.

5.2-32 Long-term Deterioration of the Sand Cap

V-37 Here is the crux of the matter. In the long-term, the cap can be expected to deteriorate due to erosion, storms, scouring, tidal action, bioturbation. Steps to insure that resources are available to address this eventuality must be incorporated as specific and distinct measures of the project plan.

Containment of Contaminants

V-38 The additional protection against dispersion provided by two sets of silt curtains should be evaluated in the EIR. Siltation of adjacent eel grass meadows predicted on page 5.2-26 must be mitigated. EHC also requests that the bulkhead we discussed in our comments to the NOP be evaluated here as a means to satisfactorily contain contaminants during dredging.

5.2-39 Third and Fourth Bullet

V-39 Please state whether or not toxicity of the discharge will be tested and if .75 acres of intertidal habitat will be created.

5.2.3.3 Mitigation for Preferred Alternative

V-40 These mitigation measures need to be more concrete and specific in the final EIR as discussed above.

5.3 Avian Resources

V-41 To allow boating and swimming in the area undermines the environmental benefit to waterfowl that might be created by the habitat area. Boating and swimming should not be allowed in the Lagoon during seasons when it is functioning as a feeding and resting area for waterfowl.

5.4 Utilities

V-42 The effects of scouring from storm drain discharge during heavy storms should be discussed in detail especially as it related to the sand capping proposal and possible impacts to the NCF. The velocity of the discharge from the storm drain could have an important role in weakening either the sand cap or the NCF.

5.6 Human Health and Safety

V-43 The fact that health advisory signs are posted in Convair Lagoon and around the Bay should be described in this section.

V-37 The cap is not anticipated to deteriorate or erode over time. Convair Lagoon appears to be a depositional environment exposed to little erosion. A contingency plan for storm events in excess of the design storm is proposed on page 3-38.

V-38 Silt curtains can be effectively used in quiescent conditions with limited boat traffic and currents less than 1 ft/sec. Dual silt curtains could be used as a redundant control measure of dredging; however, water quality monitoring will provide adequate feedback on the protection of the construction process.

V-39 Toxicity of the discharge will be tested as a permitted discharge, much like any NPDES discharge.

0.75 acres of intertidal habitat would be created from shallow subtidal habitat to mitigate for the loss of the 0.75 acres of intertidal habitat lost under the NCF. Additionally, an unspecified area of deep subtidal habitat would be filled to shallow subtidal depth to mitigate for the lost shallow subtidal habitat.

V-40 Revisions specified above have been included in the EIR/RAP.

V-41 Boating is currently an activity allowed within the Lagoon; the project does not propose any changes in the planned land or water uses within the project site or vicinity.

V-42 Page 3-28 discusses the proposed storm drain extension. The velocity of the discharge of the storm drain will be controlled by energy dissipators at the discharge and rock on either side of the open channel. Since the capacity of the discharge has not changed, and it is apparent that sediment has accumulated at the point of discharge instead of being scoured, the rock is an additional protective measure not really required.

V-43 The presence of health advisory signs are hereby noted.

5.12 Cumulative Impacts

V-44 **This section is inadequate and belies a lack of understanding of what cumulative impacts are and how they should be evaluated. A picture of a map showing the extent to which San Diego Bay has been filled in will reveal immediately the cumulative impact of filling more of the Bay in.**

REQUESTED ADDITIONS TO THE EIR

V-45 **Offsite or other mitigation for the contamination of this site are not discussed and should be. Off-site habitat enhancements and commitments to fund fisheries projects are immediate candidates.**

V-46 **One advantage to the NCF is that it results in the concentration of contaminants in one place where they are more easily accessible should a clean treatment process be developed in the future. We request that this be added to the evaluation of the NCF.**

V-47 **The conclusions drawn on the efficacy and reliability of Confined Disposal Facilities by Ebasco's analysis were considerably different than those represented in this EIR. In fact, the confined disposal facility was the remediation of choice in New Bedford Harbor, an area having some of the highest PCB levels in the world. In the spirit of having full knowledge upon which to make this very important decision, we request that Ebasco be requested to respond to the characterization of the NCF given in this EIR.**

We would like to reserve our right to submit additional comments and questions regarding sand capping until after the Technical Advisory Meeting on August 18. This letter is meant to raise issues that should be adequately addressed in the EIR so that the full impacts to the environment will be known. Thank you for the opportunity to comment on the EIR.

Sincerely,

Laura Hunter, Director
Clean Bay Campaign

V-44 The Port Master Plan FEIR (1980) discusses the history of fill in San Diego Bay; Figure 5 shows major fill areas between 1914 and 1979. The history of fill is incorporated by reference.

V-45 No impacts were identified that required off-site mitigation.

V-46 The EHC is correct in stating that "one advantage to the NCF is that it results in the concentration of contaminants in one place where they are more easily accessible should a clean treatment process be development in the future." The statement is incorporated by reference.

V-47 The Basis of Design Report is included as an appendix to the EIR; thus, allowing the public and the decision makers the opportunity to fully evaluate the presentation of the NCF in the EIR. The record of decision was that incineration was the selected remediation.

The "Rachel's Hazardous Waste News" enclosures provided by EHC includes additional information regarding incineration. No response is necessary.

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RACHEL'S HAZARDOUS WASTE NEWS #131

Providing news and resources to the Movement for Environmental Justice - May 30, 1989; revised 6/6/89

NOTICE OF REVISION

This is a revised version of RHWN #131, which contained errors. Please destroy any copies of the original #131; if you sent #131 to friends, please send them this revision. We regret the errors.

FINE PARTICLES--PART 1
THE DANGERS OF INCINERATION

Incineration of anything, including garbage and hazardous chemical wastes, produces a kind of pollution that is uniquely dangerous to humans: fine particles.

In this series, we will first discuss the characteristics of fine particles, and later we will discuss health studies showing the consequences of breathing fine particles.

The process of incineration turns solids and liquids partly into gases and partly into tiny particles of soot or ash. As the gases rise in the smoke stack, they cool and some of the gas molecules come together to form additional fine particles. The resulting particles are exceedingly small when they are emitted into the environment. Scientists who study particles make a distinction between coarse (large) particles and fine (small) particles. Fine particles behave entirely differently from coarse particles and, as we will see, are much more dangerous to humans. Fine particles are also much more difficult and expensive to control. They are also invisible, so when they are not controlled, there is no way to know it except by monitoring with the proper instruments.

Coarse particles are those with a diameter larger than 2 micrometers (um); fine particles are those with a diameter less than 2 micrometers. A micrometer (um) is a millionth of a meter and a meter is about a yard. (An older term for micrometer is micron.)

Incinerators emit large numbers of particles, despite the best available control technology. Half of all the particles emitted will have a diameter less that 2 um, and the majority of these will have a diameter of 0.3 um.

It is difficult to imagine how small these particles are. To help understand what we're talking about, look at the dot over the letter i in this newsletter; that dot measures about 400 micrometers in diameter. You can fit 40,000 particles with a diameter of 2 um on the dot. When the particles have a diameter of 0.3 um, you can fit 1.7 million particles on the dot over the i.

Unfortunately, U.S. EPA [Environmental Protection Agency] regulations do not take into consideration the sizes of the particles emitted by an incinerator. For regulatory purposes, coarse particles are considered to be the same as fine particles, as if they were all equivalent. The regulations issued as part of the Resource Conservation and Recovery Act (RCRA) allow the emission of 0.08 grains per dry standard cubic foot of stack gas (or 180 milligrams per dry standard cubic meter). There are 437.5 grains in an ounce. Measurements show that half these particles will have diameters ranging from 2.5 down to 0.1 micrometers; of that half, a majority will have a diameter of 0.3 micrometers. If we assume that 25% are 2 um, 25% are 1 um, 35% are 0.3 um and 15% are 0.1 um in diameter, we can generalize about the fine particle emissions from an incinerator.

Each pound of fine particles emitted from an incinerator will consist of 140 quadrillion (1.4×10^{17}) individual particles. A quadrillion is 1000 trillion. Over a year's time, an incinerator meeting the federal standards will legally emit anywhere from 10 to 1000 tons of fine particles, depending upon the size of the incinerator.

Breaking things into fine particles has the effect of vastly increasing their surface area. A single lump of waste weighing a pound (and having the same density as water) would have a surface area of about 44 square inches (a square 6.5" on a side), about the size of a large post card. But when that same pound is broken into fine particles, its combined surface area grows to 9900 square yards (approximately two football fields).

HAZARDOUS WASTE NEWS #92

From RACHEL: Weekly news and resources for citizens fighting toxics -- August 29, 1988

NEW STUDY SHOWS INCINERATOR ASH MORE DANGEROUS THAN WE REALIZED

A new study by a team of engineers at Rutgers, the state university of New Jersey, shows that municipal incinerator ash is more dangerous than previously realized.

When household garbage burns, the resulting ash has two parts: fly ash, most of which is captured from the smoke stack by an air pollution control system, and the heavier "bottom ash" which falls through the grate of the combustion chamber into an ash pit; both types of ash must be carted away. Both types of ash contain toxic heavy metals (chromium, cadmium, lead, arsenic, zinc, and other metals) as well as organic compounds (PCBs, dioxins, benzene, and other cancer-causing organics). Here we will discuss only the metals.

When the ash is thrown away, the metals in the ash become available to the environment. Currently, such ash is typically heaped on the ground somewhere, or is dumped in a municipal landfill. Then rainwater seeps into the ash and begins to dissolve the metals and carry them into the general environment.

Chemical engineers at Rutgers have released a new study showing that toxic metals in municipal incinerator ash are more abundant and more soluble, and therefore more dangerous, than previously thought.

The Rutgers team took samples of household solid waste from three locales (Pennsauken, NJ, Magnolia, NJ, and Somerset County, NJ) and burned them in a small (50 ton per day) solid waste incinerator. They captured the fly ash and the bottom ash. The solid waste samples did not include substantial quantities of industrial trash but were restricted to household wastes.

The actual composition of the ash is shown in Table 1. There were, of course, other elements and compounds in the ash, but the Rutgers team did not measure these because they are not regulated under federal law. As is obvious from these numbers (which are all given as parts per million, or ppm) there are large quantities of metals in the ash.

Table 2 shows how many pounds of metal are found in each ton of ash, using the "average" values given at the bottom of Table 1. (We, not the Rutgers group, did the averaging in Table 1.)

The numbers are quite astonishing. Take lead, for example. If a 2000 ton-per-day incinerator produces 500 tons of ash

TABLE 1--Metals in ash resulting from combustion of household wastes

Waste Source	Metal	Fly ash (ppm)	Bottom ash (ppm)
Pennsauken	Chromium	30	40
	Cadmium	490	100
	Lead	4990	6970
	Arsenic	47	118
	Zinc	4700	4400
Magnolia	Chromium	50	73
	Cadmium	130	5
	Lead	2838	650
	Arsenic	80	71
Somerset	Chromium	52	35
	Cadmium	227	8
	Lead	3993	852
	Arsenic	87	112
Average	Chromium	44	49
	Cadmium	282	37
	Lead	3940	2824
	Arsenic	71	100

per day, and if 10% is fly ash and 90% is bottom ash, the total daily ash will contain 2935 pounds of lead. That's a ton and a half of lead per day. The same arithmetic tells us that one day's ash will contain 48 pounds of chromium, 61 pounds of cadmium, and 97 pounds of arsenic. In a year's time (operating 5 days a week, 52 weeks a year), such an incinerator will put out 12,610 pounds of chromium, 15,990 pounds of cadmium, 25,246 pounds of arsenic, and three quarters of a million pounds of lead (763,256, actually). These are all metals that are toxic in microgram quantities (there are 454 million micrograms in one

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RACHEL'S HAZARDOUS WASTE NEWS #105

From Rachel: Weekly news and resources for citizens fighting toxics -- November 28, 1988

HAZARDOUS WASTE INCINERATORS

Across the country, citizen groups are fighting the introduction of hazardous waste incinerators into their neighborhoods. Are there good reasons to oppose such an incinerator near your home? Review of available literature reveals the following problems with these incinerators:

1. Monitoring of smokestack emissions is very crude. Hazardous chemicals coming from the smokestack are not monitored. Instead, benign chemicals (such as oxygen and carbon dioxide) are monitored, and based on these readings, estimates of toxic emissions are developed. When the oxygen or carbon dioxide levels show something is wrong, it is guaranteed that toxic emissions are occurring, but there is no reliable way to estimate the quantity of toxic chemicals being released into the local air.

The emission of particulate matter (ash, soot) is especially difficult to control, is especially hazardous to human health, and is subject only to the crudest of regulations. We will discuss this subject at length in a future newsletter.

2. A single trial burn provides the basis for establishing that the machine emits tolerable quantities of toxic pollutants, and on the basis of the single trial burn, the machine is licensed to operate for up to 10 years. Unfortunately, the wastes burned during the trial burn are very likely not the wastes that will be burned during the active life of the machine, and the carefully-controlled conditions during the trial burn are unlikely to mimic the real-life conditions under which the machine will operate day after day, so the information gathered during the trial burn may be irrelevant and misleading.

Since the chemicals used by industry change frequently, it is impossible to predict today what will be contained in tomorrow's wastes. This means the operators of hazardous waste incinerators are often out on a frontier, dealing to some extent with the unknown. Furthermore, the wastes coming into an incinerator are usually not carefully sampled to see what they contain. For example, a drum may be opened and visually inspected, or a sample may be drawn from the top of the drum, but heavier chemicals may have settled into the bottom of the drum and may not be sampled at all.

3. All incinerators undergo frequent periods of "upset" during which the machine is not operating under ideal (or even tolerable) conditions. During upsets, the emission of toxic chemicals can reach very high levels. Puffs of heavily contaminated smoke are emitted into the neighborhood. Upsets may occur many times each day.

4. Products of incomplete combustion (PICs) are chemical compounds created inside the combustion chamber where different wastes mix together in the presence of high heat. If conditions in the combustion chamber are not ideal for destroying the chemicals, new chemical compounds--some of them more toxic than the hazardous wastes from which they are derived--are created and then released from the smokestack. PICs may be formed during upsets, they may be formed when the incinerator is started up or shut down, and they may be formed when a new type of waste is introduced into the combustion chamber. Many different malfunctions of the machine may also give rise to PICs from time to time.

5. Fugitive emissions. These are unplanned and unintentional releases that occur through spills, leaky valves, cracks, damaged drums, and so forth. Fugitive emissions may exceed the amount of toxic chemicals released intentionally from the smoke stack each year.

6. Explosions. It does not happen often, but hazardous waste incinerators can explode, spewing chemicals into the local environment. Naturally, it is impossible to accurately monitor emissions from an explosion.

7. Federal regulations require the destruction of 99.99% ("four nines") of the waste entering an incinerator. However, a typical incinerator will process more than 36 million pounds of hazardous wastes each year. With no unexpected releases, no upsets, no fugitive emissions, and no

RACHEL'S HAZARDOUS WASTE NEWS #198

Providing news and resources to the Movement for Environmental Justice -- September 12, 1990

SCIENTISTS SUSPECT POISONING OF FISH BY MERCURY EMISSIONS FROM INCINERATORS

Incineration of municipal solid waste (msw) is releasing massive amounts of the potent neurotoxin, mercury, into the air, according to a study published last week by scientists Robert Collins and Henry S. Cole of Clean Water Action's Research and Technical Center in Washington, DC. Garbage burners now operating in 40 states are releasing an estimated total of 74,356 pounds of mercury into the air each year, according to Collins and Cole; garbage burners on the drawing boards would release an additional 52,339 pounds into the air annually when they start operating, for a total of 126,695 pounds per year. This makes garbage burning the second largest source of mercury entering the atmosphere, after coal-burning power plants, which put an estimated 162,000 pounds per year into the air.

Even at very low exposures, mercury can damage the human central nervous system, impair mental development, and damage kidneys.

Mercury--the familiar "quicksilver" metal used in many thermometers--is contained in many household products, including batteries, paints, dyes, electric and electronic devices (silent light switches, for example), fluorescent lights, plastics, pharmaceuticals, pesticides, pastes, glues, adhesives and other items. When these items are landfilled, their mercury escapes slowly into the soil and groundwater, contaminating the local environment. However, burning any of these items turns their mercury into a gaseous vapor which escapes from the smoke stack and thus contaminates an area extending many miles from the incinerator stack. As the airborne mercury cools off, it turns back into a solid form and settles to earth where it begins to interact with living organisms. Some of the mercury is held for a time in the soil, but eventually it moves with rainwater toward the nearest stream, river, or lake. Once in an aquatic environment, the mercury moves into the food chain or food web, concentrating as it goes. It starts by entering plankton--the smallest, floating plants--and ends up contaminating the largest fish, which often become so toxic that they are dangerous for humans to eat. The U.S. Food and Drug Administration has set one part per million (1 ppm) as the "action level" for mercury in fish. Fish containing 1 ppm or more of mercury can be banned from interstate commerce and people are warned against eating any of it. Many states issue warnings not to eat fish containing more than 0.5 ppm.

At least 20 states currently have one or more bodies of water in which excessive mercury has been identified and where warnings have been issued to restrict or avoid fish consumption because of a human health hazard from mercury contamination of the fish. Collins and Cole surveyed states with fish advisories and found a suspicious pattern: of the 16 states burning the largest amounts of garbage, 12 have fish advisories for mercury. The sixteen biggest garbage burning states [with their incinerator mercury emissions in pounds listed inside parentheses, and an asterisk indicating those that have issued fish advisories for mercury contamination] are: *Massachusetts (10,606); *New York (9,696); *Florida (8,203); *Ohio (6,132); Maryland (4,433); *Connecticut (3,956); *Michigan (3,831); *Virginia (3,449); Maine (2,466); Indiana (1,771); *Tennessee (1,699); *Minnesota (1,694); Pennsylvania (1,429); *Wisconsin (1,360); *California (1,324); *Oklahoma (1,139).

Fifteen to 20 years ago, industry (chemicals and allied products; petroleum refining; copper and lead smelters; and instrument and electronics manufacture) were much larger sources of mercury air emissions than either incinerators or coal-burning power plants, with total air emissions of 262,298 pounds in 1973. In the past two decades, these industries have evidently reduced their mercury emissions substantially (according to data industry reported to EPA in 1988 under the federal Community Right to Know law) while power plant emissions have increased 60% since 1980. However, the fastest-growing source of mercury emissions in the past decade has been garbage burners, which increased their mercury air emissions 122% between 1979 and 1989.

The air pollution control devices used on most U.S. garbage incinerators (called electrostatic precipitators) do not capture mercury at all; mercury slips right by them and out the stack. More modern pollution control equipment for garbage burners combines dry lime scrubbers (which spray crushed lime into the exhaust gas to neutralize hydrochloric acid) followed by a fabric (baghouse) filter (essentially a huge vacuum cleaner bag). EPA (U.S. Environmental Prot[illegible]n Agency) has evaluated the ability of these modern systems to control mercury emissions and has found inconsistent results. EPA's proposed regulations of garbage burners contain the following statement:

"Available data indicate wide variation in mercury collection efficiency and emission rates, even for MWC [municipal waste combustors] with GCP [good combustion practices] and SD/FF [spray dry scrubber/fabric filter (baghouse)] controls. The reasons for this variability and the mechanisms affecting mercury emissions and collection are not well understood. Therefore, an emission limit cannot be specified at this time."

In short, the designers, operators and regulators of garbage burners do not understand the behavior of the machines they design, operate and regulate, at least so far as mercury emissions are concerned. It is interesting to recall that Dr. Barry Commoner *recently reviewed the history of dioxin emissions* from garbage burners and showed that the incinerator industry spent a decade denying that their machines create dioxin in the combustion process. After a decade of keeping their heads in the sand like ostriches, they had to admit that their original understanding *of their machines was simply wrong*. Commoner concluded, "Clearly, trash-burning incinerators have serious environmental problems. But they reveal a failing that is even worse: the incinerator industry has been building these devices without fully understanding how they operate, at least with respect to their impact *on the environment*." (Commoner, *Making Peace With the Planet* [NY: Pantheon Books, 1990], pg. 120.) In sum, both the mercury and the dioxin situations indicate that the people who design, operate, and regulate garbage burners have been conducting a massive experiment without fully understanding the conditions of the *experiment or its consequences*, exposing large segments of the American public to toxic effluents, claiming all the while to know precisely what they are doing. It is a stark lesson worth remembering the next time a "state of the art" facility (of any kind) is proposed for your community. Lois Gibbs of the Citizens' Clearinghouse for Hazardous Waste has said, "State of the art really just means industry's latest experiment." The recent history of the garbage burning industry seems to confirm Ms. Gibbs's maxim.

Air pollution control devices that capture mercury exist; they are simply not used in the U.S. because government has not *required* garbage burners to use them. (It is worth noting that the National Resource Recovery Association, which promotes incineration, is a subsidiary of the U.S. Conference of Mayors, so the relationship of this industry to government is cosier than most.) Recently, all 11 solid waste incinerators *in the Netherlands have been required to install* activated carbon filters on their smoke stacks, to capture mercury effectively.

Of course capturing mercury from the smoke stack simply puts it into the ash, which must be landfilled somewhere. The mercury will then make its way into the local *environment around the landfill*, sooner or later. Ultimately, the only real solution to the problem of mercury emissions from incinerators is to stop using incinerators for solid waste management, or to stop manufacturers from putting toxic mercury into household products, or both.

Get: Robert Collins and Henry S. Cole, *Mercury Rising: Government Ignores the Threat of Mercury From Municipal Waste Incinerators* (Washington, DC: Clean Water Action Research and Technical Center [1320 18th St., NW, Washington, DC 20036; phone (202) 457-1286, ext. 128], September, 1990. 44 pgs. *$7.50 for citizen activists; $50.00 for for-profit groups.*

Rachel's Hazardous Waste News is published weekly by Environmental Research Foundation, P.O. Box 3541, Princeton, NJ 08543. Editor: Peter Montague, Ph.D.; Associate Editor: Maria B. Pellerano; Assistant Editor: Annette Eubank; subscriptions: Faith R. Corman, Office Manager. Subscription rates: $40 per year for individuals and citizen groups, $80 for government agencies, $15 for students and seniors, $400 for businesses and professionals. In Canada and Mexico, add $4.00; in all other countries, add $11.00. All payments in U.S. funds.
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[redacted]

Mr. Ralph Hicks
Environmental Coordinator
San Diego Unified Port District
P.O.Box 488
San Diego, CA 92112

RE: Comments on NOP for Convair Lagoon Remediation EIR

Dear Ralph:

We have received your Notice of Preparation for the Convair Lagoon Remediation EIR and have the following comments.

Since the Regional Water Quality Control Board has ordered a cleanup level of 10 ppm, any alternative examined should achieve that level of cleanup. It is also significant to note that a lawsuit has been settled with the cleanup level of 10 ppm PCB as its basis.

Environmental Health Coalition's concerns center around:

1. V-48 The permanence of the proposed structure--structure should be considered temporary until such a time as there is an acceptable treatment for PCBs that does not merely change the environmental medium of contamination (such as incineration causes by moving PCBs from sediment pollution to air pollution)
2. V-49 Impacts due to the structure's presence near an active fault line
3. V-50 Resuspension of PCBs and other contaminants from dredging
4. V-51 Re-contamination of the Bay from reactivated PCBs
5. V-52 Possibility of volatilization of PCBs when exposed to air
6. V-53 Length of monitoring by responsible party after the project is completed
7. Restoration of the dredge site
8. V-54 Review and addition of other innovative technologies as alternatives to dredging (List

V-48 Comment noted.

V-49 Please see pages 5.5-2 to 5.5-6 of the EIR/RAP.

V-50 Please see response V-38.

V-51 Please see Section 5.1 Water Quality and Section 5.6 Human Health/Safety of the EIR/RAP

V-52 Please see response III-17 and V-20.

V-53 The long-term monitoring program is defined on page 3-38 of the EIR/RAP.

V-54 Please see response V-12.

attached)

V-55 9. Possibility of bulkhead isolating the lagoon from the rest of the Bay during dredging to prevent recontamination of the Bay during dredging.

EHC REQUESTS THAT THE FOLLOWING MITIGATION BE ADOPTED:

V-56 The EIR should include, as a mitigation for the PCB tainted fish ingested and thereby reduced breeding success by least terns, that the capped site be reclaimed as a least tern nesting area. Containment structure should be fitted with a sand cap and should be maintained as an additional site for least tern nesting until such a time as the cap is removed for treatment of the sediments below. **This additional nesting site should be mitigation for damage done to least tern populations by the PCB spill and not for other efforts that may arise to reduce least tern nesting areas.** Remaining area should be restored as a salt marsh and eel grass beds to encourage fish propagation.

Thank you for the opportunity to comment on this NOP.

Sincerely,

Laura Hunter, Director
Clean Bay Campaign

V-55 Please see response V-12.

V-56 Please see response V-12.

INDUSTRIAL ENVIRONMENTAL ASSOCIATION

Leaders of Environmental Responsibility

cc DW 225

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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

July 26, 1993

San Diego Unified Port District
P.O. Box 488
San Diego, CA 92112

RE: DEIR for remediation of Convair Lagoon

Dear Sir:

The Industrial Environmental Association supports the Draft Environmental Impact Report's recommended alternative for remediation of Convair Lagoon by Teledyne Ryan Aeronautical. Sand Capping is an effective, economical solution which protects human health and safety, as well as the marine biota, while enhancing the biological habitat. Practical, innovative remediation approaches such as this are in the best interest of the public, the environment and businesses in the San Diego Bay area.

Sand capping provides an effective barrier to contain contaminated sediment to protect human health and safety with minimal biological disturbance and at a more feasible cost. In fact, a sand cap would maintain or improve the present biological environment by increasing the intertidal area, an important habitat which has been significantly reduced throughout San Diego Bay.

Sincerely,

Paul Downey
Executive Director

VI Industrial Environmental Association

No response required.

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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

San Diego Port Tenants Association

August 9, 1993

Mr. Ralph T. Hicks
Environmental Management Coordinator
Port of San Diego
P.O. Box 488
San Diego, CA 92112

Re: Draft Environmental Impact Report/Remedial Action Plan (EIP/RAP)
For The Convair Lagoon Remediation Project

Dear Mr. Hicks:

The San Diego Port Tenants Association Environmental Action Committee has reviewed the above referenced document. Based upon our review, the committee supports the preferred alternative of a sand cap and commends the Port's thorough analysis of the project. Sand capping is an effective, economical solution to remediation of Convair Lagoon which protects human health and safety as well as the marine biota, while enhancing the biological habitat. Practical, innovative remediation approaches such as this are in the best interest of the public, the environment and businesses in the San Diego area.

Since we support the preferred alternative as the most environmentally beneficial solution, we suggest one modification to the document which strengthens the justification for its selection. Section 1.2.4 provides an analysis of the project and the viable alternatives to determine significant impacts to the environment. It is our opinion that erosion should also be discussed as a separate impact. Currently, the existing erosion conditions are not discussed until page 3-25. Placing this erosion/hydraulic
VII-1 discussion under a section entitled "Physical and Biological Constraintsto Capping in Convair Lagoon" buries this essential information where it is easily missed. We suggest that erosion conditions also be mentioned in

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VII San Diego Port Tenants Association

VII-1 Convair Lagoon appears to be a dispositional and not erosional environment. This is evidenced by the presence and accumulation of fine-grained material throughout the site. However, prior to any design, additional hydrodynamics of the site should be collected.

Sections 1.2.3., 2.4.5, 3.4.5.1, 4.0 and 5.10 because it provides important technical support for the recommended sand cap alternative.

We hope our support will assist in moving the project forward. If you should have any questions, do not hesitate to contact me at 544-5191.

Sincerely,

Robert D. Bush

Robert D. Bush
Chairman, Environmental Action Committee

cc: W. Longley Cook, Rohr Industries
P. Litrenta, San Diego Port Tenants Association
San Diego Bay Technical Advisory Committee

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PORT OF SAN DIEGO
ENVIRONMENTAL MANAGEMENT

August 6, 1993

Ralph Hicks, Port of San Diego
PO Box 488
San Diego, CA 92112

Subject: Draft EIR/Action Plan for the Convair Lagoon Remediation

VIII-1 We are concerned about the waterfowl uses of the lagoon, one of the few remaining resting areas left in the northern portion of the Bay, where diving ducks and other waterfowl can rest and feed, on their long migratory journeys. The Bay is the key resting place in 900 miles on the Pacific Flyway, as documented in your study, "The South Bay Enhancement Plan." This lagoon is now relatively safe for ducks, relatively free of boating activity and other intrusions. We request that, whatever alternative is selected, this fact be recognized, that mitigation be added to the project to enhance this area for the benefit of waterfowl, resident and migrant.

VIII-2 We also request that the top of the near shore containment facility be developed as a least tern habitat nesting area.

We have other specific comments:

VIII-3 Please explain how a loss of .98 acres of lower intertidal habitat and creation of .98 acres of new intertidal habitat is a net gain for intertidal habitat. This simply doesn't add up. Creation of habitat is new, very problematical, and, as yet, unproved. We request at least 5:1 mitigation, with monitoring, to ensure what is promised in the EIR: a net gain of intertidal habitat. Perhaps charts, and more data, would justify your conclusion that there will be a net gain. As of the EIR, we find this hard to believe.

VIII-4 The description of the use of the area by the endangered species, the California least tern, is inconsistent and confusing. First, on page 5.3-7, the EIR asserts that the trade of subtidal (open water) for intertidal is a net benefit, since intertidal is known to be preferred foraging habitat for least terns. We question this. Least terns need and use both, subtidal and intertidal.

VIII San Diego Audubon Society

VIII-1 The current land use of Convair Lagoon includes recreational boating, primarily as a short-term anchorage area. Field data does not suggest that the lagoon is used disproportionately by wildlife in comparison to other anchorage areas. No additional mitigation is required.

VIII-2 Foraging areas for the California least tern will be mitigated by the restoration of eelgrass beds elsewhere in the Lagoon, and there are no nesting areas within the project area. Therefore, no additional mitigation is required in the form of a nesting area on the NCF. A use for the area has yet to be determined.

VIII-3 While there may be a 0.98 acre net gain of intertidal habitat under the sand cap alternative (p. 5.3-6), not all of it is productive intertidal habitat. Thus, after the existing productive mid intertidal is capped, its new elevation is too high to support a productive assemblage. The increased intertidal area will result from a reduction in the gradient (flattening) of the area. This will produce increased area in all three intertidal zones (upper, mid, and lower) at the expense of a reduction in shallow subtidal habitat. The program will increase the area of unproductive upper intertidal sand and riprap. However, the increased area of mid and lower intertidal has the potential of increasing the productivity of the area by supporting larger populations of eelgrass and ghost shrimp.

VIII-4 The EIR provides citations of studies that demonstrate that the terns tend to forage primarily in the shallow intertidal areas, particularly within eelgrass habitat.

VIII-5 The EIR also states that Convair Lagoon is likely to be used less by least terns because the terns have not used the airport breeding colony since 1989 (5.3-3). We also know that airport activities have rendered the triangle area virtually useless for terns, and the Port has not, to our knowledge, made clear how they will mitigate this loss. And so a least tern breeding area must be created, on the near shore containment facility. If it is not, then where will the terns come from, to benefit from this additional foraging area? We recommend that this area be developed as a large, protected least tern nesting area. Then, and only then, will the mitigation for this project will make sense..

VIII-6 We are also concerned with other species who require deep water habitat, not intertidal. What about them?

VIII-7 A loss of one habitat type must not be mitagated by protection of another type. The result may well be destruction of both.

VIII-8 Another problem: the EIR indicates that dredging and other work will not be done during the breeding season of the least tern. All well and good. However, another endangered species, the CA brown pelican, uses the Bay most heavily during this non-breeding season. (EIR, 5.3-4) How will you mitigate the impacts on this endangered species?

VIII-9 The EIR proposes boating and other recreational activities. We find this counterproductive to mitigation efforts. We recommend that no boating activity be allowed in this area, in order to protect waterfowl, including endangered species, as required by law, and in order to protect other waterfowl species, in order to help to keep them OFF the endangered species list.

VIII-10 In short, we recommend a small wildlife refuge in this area, fully respected and protected, in order to obey the law, in order to protect biodiversity and waterfowl dependent on the Bay, in order to ensure the quality of life of our grandchildren, who will look upon this miracle, San Diego Bay, and find wild creatures thriving and well, for the benefit of us all.

Thank you for your consideration.

Norma Sullivan

Norma Sullivan, Conservation Chair
5858 Scripps St.
San Diego, CA 92122

VIII-5 The existing conditions for the Lagoon are in regard to the availability and accessibility of potential foraging habitat to least terns. Least terns tend to concentrate their foraging activity within two miles of the breeding colony. The Lagoon would likely be used extensively if a breeding colony were active within two miles of the Lagoon. This has not been the case since 1989.

VIII-6 There are no species of concern that are obligate users of deep water habitats. Diving ducks do use moderately deep water (<20 feet in depth); however, they still tend to congregate in relatively shallow waters which are relatively abundant in middle and lower San Diego Bay. Deep water habitats within San Diego Bay are primarily manmade and are associated with the necessary dredging required to maintain boat channels and large ship docking facilities.

VIII-7 Comment noted.

VIII-8 The Lagoon is not used extensively by the brown pelican. Considering the relatively small area involved and the brief nature of the proposed activity, potential impacts to pelicans were not considered significant.

VIII-9 Boating with the Lagoon is an existing use permitted by the Port Master Plan. A change in land/water use is not included in the proposed project. Impacts to waterfowl were not identified; therefore, mitigation measures are not required.

VIII-10 No significant impacts have been identified; therefore, no mitigation measures are required for the least tern nesting area. Development of a wildlife refuge is not within the scope of the proposed project and would require a change in the land/water use designation of the Port Master Plan.