OCEAN BEACH-GREAT HIGHWAY STORM DAMAGE PROTECTION PROJECT

Final Report

Prepared for:
San Francisco Department of Public Works
U.S. Army Corps of Engineers

May 31, 2005

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1.1 Introduction

In order to adequately articulate the purpose, need, and objectives for the proposed project, it is important to understand the historic and current context of the Ocean Beach area stretching south from Sloat Boulevard to Fort Funston (Figures 1-1 and 1-2). Relevant background information on impacts to both natural resources and public infrastructure is provided below, followed by a description of the multi-agency partnership that is currently developing long-term solutions to beach and bluff erosion problems on park and city property along the Great Highway.

Project History

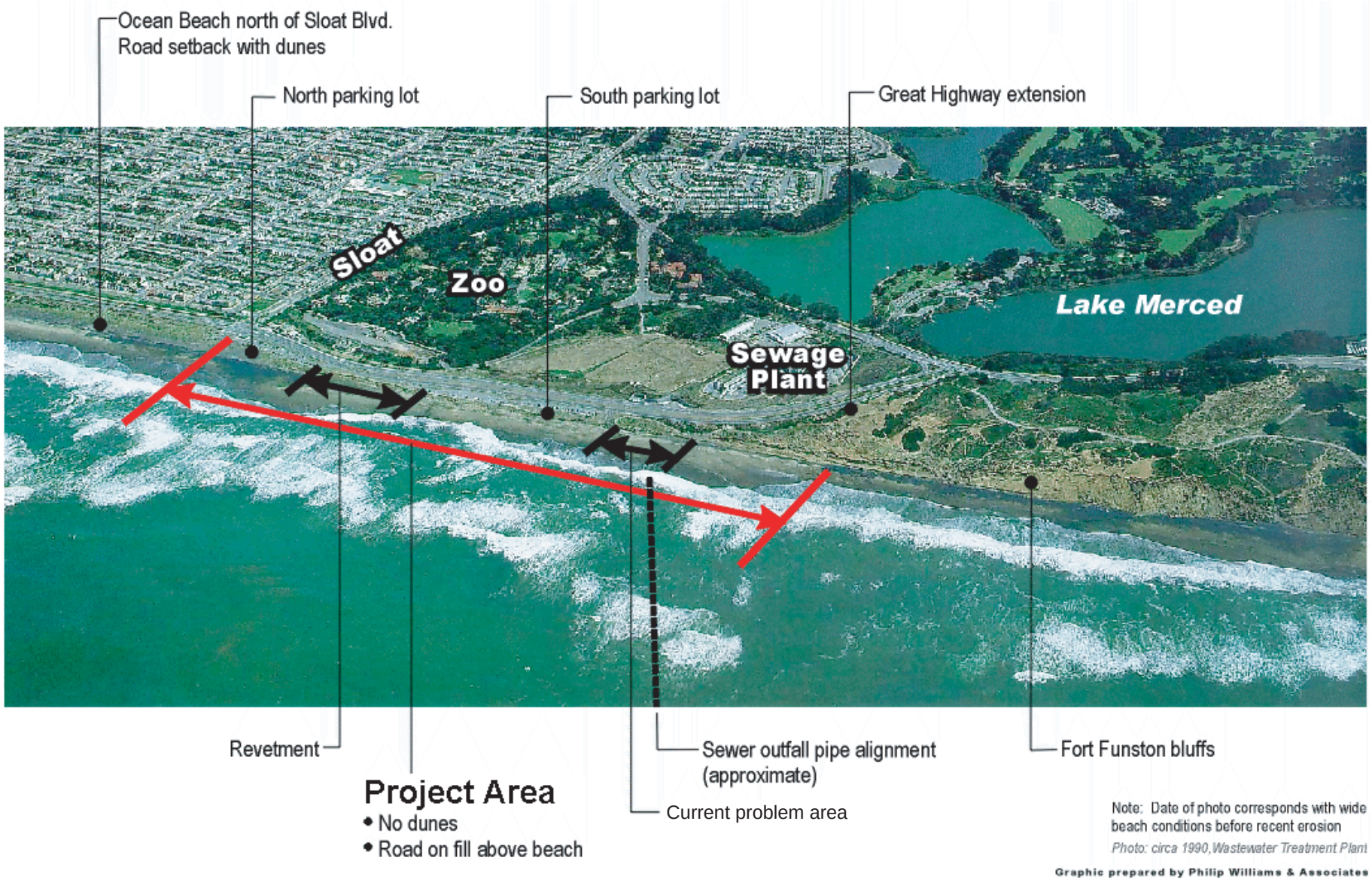
Historically, the Ocean Beach shoreline north of the Lake Merced outlet was situated several hundred feet landward of its current location. Development in the 1800s and early 1900s moved the shoreline seaward. Since then, a combination of winter storms, modifications to dredging and disposal practices, and sand mining have eroded significant portions of the shoreline. From the Cliff House south, there are a number of seawalls and constructed dunes that limit storm-generated impacts to public facilities, but the approximately 3,000-foot section of Ocean Beach that stretches from Sloat Boulevard to Fort Funston is relatively unprotected and has been subject to increased erosion. This 3,000-foot reach is the subject of the present study.

Ocean Beach was transferred to the Golden Gate National Recreation Area (GGNRA, a unit of the National Park Service) in the 1970s. Prior to 1995, the two parking lots (Sloat Lot and South Lot) had a sufficient buffer of bluff material between the Great Highway and the ocean so that erosion was not perceived as a problem. Some of this bluff material came from the excavation of the Lake Merced Transport Tunnel in the early 1990s, when 400,000+ yards of Colma formation sand was deposited on the beach. This sand provided an outward berm from Sloat Boulevard to Fort Funston. Since 1995, however, winter storms have eroded away the excavated sand and large areas of the pre-existing man-made bluffs (Figure 1-3). This has resulted in the loss of parking spaces within the GGNRA, as well as potential threats to the Great Highway and to a lesser extent the City-owned wastewater facilities in the area. The severity of the damage occurring in the past few years may be related to seasonal beach elevation fluctuations combined with winter and spring high tides and storm surges, which have eroded the aforementioned buffer.

SOURCE: Environmental Science Associates

SFDPW Great Hwy-Ocean Beach Erosion / 202262 ■

Figure 1-1
Project Location



SOURCE: Philip Williams & Associates

SFDPW Great Hwy-Ocean Beach Erosion / 202262 ■

Figure 1-2
Oblique Photo of Project Area

South Parking Lot Erosion, 2000

South Parking Lot Erosion, 2005

Bluff Condition, 2000

Riprap Stabilizing Bluff at Same Location, 2005

Beach Nourishment Area, 2000

Eroded Beach Conditions, 2005

SFDPW Great Hwy-Ocean Beach Erosion / 202262 ■

SOURCE: Environmental Science Associates

Figure 1-3
Environmental Setting Changes at Ocean Beach

The City and County of San Francisco (CCSF), U.S. Army Corps of Engineers (USACE), GGNRA, and the United States Geological Services (USGS) have been evaluating the coastal processes on Ocean Beach for many years.[1] In the late 1970s, a number of special studies were commissioned in connection with the City's construction of the Westside Sewage Transport Box, the Southwest Ocean Outfall (SWOO), and the Oceanside Water Pollution Control Plant adjacent to the San Francisco Zoo. In 1992, USACE prepared a reconnaissance report addressing Ocean Beach shoreline protection, followed by a draft feasibility report in 1996. The report focused on shoreline structures that would protect the bluff line from future storm damage. The report's recommendations were not implemented, however, due to concerns raised about the location and types of improvements proposed, as well as local sponsor funding issues. Since 1997, CCSF has funded several temporary/emergency projects to protect City infrastructure. In response to concerns raised by the public and GGNRA that "hard structure" alternatives (such as the placement of large quarry rocks to protect the bluff) would be harmful to the beach and its users, the Board of Supervisors directed CCSF's Department of Public Works (DPW) to use "softer" and more temporary measures (such as placement of large quantities of sand along the bluff) until a long-term plan could be developed. Over a three-year period, the City spent $1,300,000 for sand placement and monitoring, in addition to constructing an emergency detour lane that could be available to carry traffic in the event of damage to the Great Highway.

In 2000, the Mayor's Office created the Ocean Beach Task Force to bring the public and the many governmental stakeholders together to discuss issues concerning Ocean Beach. Task Force members include representatives of San Francisco's Department of the Environment, Recreation and Parks Department, DPW, Public Utilities Commission, California Coastal Commission, GGNRA and USACE, as well as representatives of a number of environmental and community interest groups, such as the Friends of Ocean Beach, the Surfrider Foundation, and the Golden Gate Audubon Society. The Task Force received monitoring reports, commented on erosion issues, prepared several issue papers and developed a list of recommendations on alternatives to be evaluated as part of the long-term planning process for Ocean Beach.

In 2002, the San Francisco Commission on the Environment passed a resolution pertaining to a number of issues at Ocean Beach. The Commission encouraged DPW and the other cooperating agencies to continue monitoring the beach and bluffs south of Sloat Boulevard and to relocate traffic away from the Great Highway if necessary to reduce the risk of road closure resulting from further coastal erosion. The Commission also encouraged continued public involvement through the alternatives evaluation process.

Current Process

Currently DPW and USACE are partnering to develop a long-term solution to beach and bluff erosion issues at Ocean Beach. DPW recently received grant funding from the California Department of Boating and Waterways and the California Resources Agency to explore a solution that is compatible with National Park Service management policies and other related agency mandates. To enhance this collaborative endeavor, USACE has been contributing its

[1] Updated information on coastal processes is reviewed in Chapter 3.

technical expertise. There are five phases of the storm damage reduction project: reconnaissance, feasibility, design, construction and operations and maintenance (O&M). The reconnaissance phase consisted of reviewing and evaluating previously prepared reports, identifying alternatives not previously studied, developing a Project Management Plan and finalizing a Federal Cost Share Agreement.

The second, and current, phase of the project is the feasibility study. This phase consists of scoping the project objectives, further developing and reviewing alternatives, preparing environmental documents, and selecting a preferred alternative. The feasibility phase has an active community outreach component, and it will bring stakeholders together to work with the study management team on various aspects of the project. This phase will take an estimated two to three years to complete, with funding shared on a 50% Federal and 50% local basis.

Depending on the complexity of the preferred project, the next two phases (design and construction) could take 3 to 5 years. O&M would continue indefinitely after project construction is completed.

The San Francisco Department of the Environment (SF Environment) and DPW took special measures in the Fall of 2004 to reach out and inform and involve the public early in the Ocean Beach project process. Outreach materials that were drafted for project use can be found in Appendix 1A.

1.2 Planning Objectives

An extensive body of work has been developed over the years at Ocean Beach by USACE, SF Environment, DPW, USGS, and the Ocean Beach Task Force. In light of this updated information and the current partnership between DPW and USACE, the following land and water resource issues have been translated into specific planning objectives. These objectives provide focus for the formulation of alternatives, and represent desired positive changes in the conditions of the project area and affected users. The planning objectives are as follows:

1) To provide long-term solutions to storm erosion & damage problems of coastal features, including natural features and existing infrastructure, such that they minimize storm damage and associated maintenance costs

2) To stabilize the shoreline along the southern portion of Ocean Beach

3) To protect the natural resource values of Ocean Beach

4) To develop consensus among interested parties, including agencies with jurisdictional responsibilities and the public

5) To restore continuity of public access and recreation at Ocean Beach

6) To enhance public safety

7) To protect transportation network and access needs of adjacent properties.

8) To protect wastewater facilities.

9) To maintain a modified natural beach in an urban environment.

10) To examine the potential beneficial reuse of dredged material

1.3 Planning Constraints

Planning constraints represent policies, site issues or other limitations that could affect the feasibility of proposed solutions. The initial planning constraints identified in this report are as follows:

1) Physical constraints on the project area:

    a. Pre-existing facilities adjacent to the project area, including SFPUC Oceanside Water Pollution Control Plant and SWOO.

    b. Geologic formations

    c. Hydrology and drainage patterns

    d. Sediment transport

2) Environmental constraints on the project area:

    a. Special status species including the State-listed bank swallow and the Federally-endangered western snowy plover.

    b. Cultural resources

    c. Geographic limitations

3) Traffic constraints

    a. Entrance requirements for SFPUC wastewater treatment plant

    b. Current and anticipated traffic volume for San Francisco Zoo

    c. Emergency right-of-way for local fire, police, and ambulance vehicles

    d. Ability of Great Highway to continue to operate at current levels.

4) Compliance with local, State, and Federal agency plans, policies and regulations:

    a. United States Army Corps of Engineers (USACE)

        i. Federal Clean Water Act

        ii. Environmental Operating Principles

b. Golden Gate National Recreation Area (GGNRA)

   i. GGNRA and Point Reyes National Seashore General Management Plan

   ii. GGNRA Natural Resource Management Plan

   iii. National Historic Preservation Act of 1966

c. National Oceanic Atmospheric Administration's National Marine Fisheries Service (NMFS)

   i. Magnuson-Stevens Act

   ii. Fisheries Management Plan

   iii. Federal Endangered Species Act

d. United States Environmental Protection Agency (USEPA)

   i. Federal Clean Water Act

e. United States Fish and Wildlife Service (USFWS)

   i. Federal Endangered Species Act

f. California Department of Boating and Waterways (CDBW)

   i. California Boating Law

g. California Department of Fish and Game

   i. California Endangered Species Act

h. California Coastal Commission (CCC)

   i. Coastal Zone Management Act (CZMA)

   ii. California Coastal Management Program (CCMP)

i. California State Lands Commission

   i. Leasing authority of tidal and submerged lands

j. San Francisco Environment (SFE)

   i. San Francisco Local Coastal Plan

k. San Francisco Regional Water Quality Control Board (SFRWQCB)

   i. Clean Water Act

   ii. Porter Cologne Act

5) Applicable Executive Orders, Statutes and Regulations

6) Function of the proposed alternative.

7) Public values including, but not limited to, aesthetics, recreation, access, and safety.

8) Cost effectiveness

9) Prioritization and Implementation of Construction Activities

10) Budget availability

1.4 Project Alternatives to Be Evaluated

The following information provides a general description of alternatives that have been identified for consideration in the feasibility phase. These alternatives have been generated from the 2002 resolution passed by the San Francisco Commission on the Environment, pertaining to a number of issues at Ocean Beach; information collected at Ocean Beach by USACE, CCC, CCSF, and the Ocean Beach Task Force; and the current collaborative effort by DPW and USACE.

No Action Alternative

The "No Action" alternative assumes that no project would be implemented to achieve the planning objectives. The No Action alternative forms the baseline from which all other alternative plans will be measured in future planning efforts. The No Action Alternative includes responding to erosion events as they occur on an emergency basis and continuing ad hoc maintenance activities, such as the placement of sand in the south end of the project area, north of Fort Funston. This alternative translates to a continuation of existing measures without the benefit of a coordinated effort to change conditions on site.

Hard Structures (Armoring) Alternative

A hard structure alternative could incorporate seawalls or revetments. *Seawalls* are typically large concrete structures that protect coastal upland areas from wave action, and prevent inland flooding from major storm events. A seawall alternative could provide protection needed to minimize storm damage and protect infrastructure. Future seawall designs could be adapted from those which are already present at Ocean Beach, such as the O'Shaughnessy or Taraval seawalls located north of the affected area.

Similar to seawalls, *revetments* could also minimize wave impacts and provide protection to infrastructure. Revetments are a cover or facing of erosion resistant material placed directly on an existing slope or embankment to protect the area from waves and strong currents. They are typically built to preserve the existing uses of the shoreline and for slope protection. A project alternative featuring a revetment design could be either watertight, covering the slope completely, or porous, to allow water to filter through after the wave energy has been dissipated (CHL, 2005).

These structures could be placed at the current shoreline or further inland on GGNRA or City property. A hard structure alternative placed further inland could be constructed in a variety of ways. One inland alternative could involve building a seawall, revetment, or other engineering measure (such as soil-cemented, drilled caissons) further inland and abandoning maintenance of the current shoreline. A second inland alternative under consideration involves building a seawall, revetment, or other engineering measures (such as soil-cemented, drilled caissons) further inland and removing the rubble and emergency revetment in the mid-section of the project area.

Soft Structure (Beach/Dune Nourishment) Alternative

A soft structure alternative would emphasize beach or dune nourishment. Beach nourishment is the creation and maintenance (replenishment) of artificial beaches which functions to both stabilize a receding shoreline, and maintain a recreational and protective sandy beach (Clayton, 1991). Beach nourishment serves to protect upland structures and infrastructure from the effects of storms by acting as a buffer. A beach nourishment project typically involves constructing a wider beach and/or more substantial dune to reduce storm damage that would have resulted without the project. Soft structures can be constructed at the current shoreline, or further inland on GGNRA or City property.

Different types of structures can be used in conjunction with beach fill projects to retard fill erosion and thereby reduce periodic nourishment costs. Possible structures include breakwaters (see next section), dune stabilization using fences or vegetation, and the construction of crossover structures, which deter pedestrians from damaging the stabilized dune area.

Breakwater or Artificial Reef Alternative

This alternative would focus on in-water structures, that are either buried or above surface water level, such as breakwaters or artificial reefs. The function of a breakwater or an artificial reef is to slow erosional processes by reducing wave energy and thus reducing the impacts to the beach and bluffs. These structures are placed offshore to dissipate the energy of incoming waves. The dissipation of wave energy allows drift material to be deposited behind the breakwater. The accretion of material protects the shore and may also extend the beach. The amount of deposition depends on the site characteristics and the design of the alternative. Breakwaters may be either fixed or floating: the choice depends on normal water depth and tidal range. Artificial reefs serve the same function as a breakwater, but can also be designed to provide reef habitat for aquatic species depending on the design and material type.

Facilitated Retreat Alternative

This facilitated retreat alternative would be a phased adaptively managed process, designed to be implemented over time as natural processes continue to erode the bluff and beach. The current bluff material, fill material from historic development, is exposed for most of the 3,000 foot section of the Ocean Beach project area. As defined in this Alternative, facilitated retreat is a process whereby there would be periodic removal of exposed historic fill materials from the bluff face. Through the actions of winter storms the beach would widen as the bluff retreated. This

alternative would involve erosion monitoring and maintenance measures, as well as identification of thresholds that might trigger specific actions. For example, the southbound lanes of the Great Highway and Ocean Beach parking lots could eventually be closed as they may become part of the beach and new bluff zone. A structure such as a seawall, revetment, or dune in combination with this restoration alternative could be required to protect public infrastructure, given that there is a large diameter storage and transport tunnel under the southbound lanes of the Great Highway that acts as the eastern boundary of the retreated area.

Dredged Material Reuse Alternative

This alternative would combine Ocean Beach's coastal erosion issues with existing San Francisco channel maintenance needs. USACE currently dredges up to 500,000 cubic yards annually from the SF Main Ship Channel and disposes this material in an authorized location on the offshore bar. From this disposal site, some of the sand is hypothesized to disperse back into the littoral sand transport system. Currently sand transport to Ocean Beach has been insufficient to protect the area and a new disposal location closer to shore is being considered. Due to its closer proximity to shore, some of the disposed sand may help to nourish the eroded beach south of Sloat Boulevard, and potentially reduce the threat to infrastructure in the area from storm events over the long-term. Sediment transport analysis (discussed in Chapter 3) may identify more optimum locations for disposing the sand which will feed the project area.

References

Journal Articles

Clayton, T.D. 1991. Beach Replenishment Activities on U.S. Continental Pacific Coast. *Journal of Coastal Research*, 7(4), 1195-1210, Fort Lauderdale (Florida). ISSN 0749-0208.

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CHAPTER 2
Management Guidelines, Environmental Policies and Operating Principles Synopsis

2.1 Introduction

The following is a summary of the applicable management guidelines, environmental policies, and programs of public agencies affected by the implementation and outcomes of a long-term solution to storm damage at Ocean Beach. The resource management or regulatory missions, followed by relevant policies, regulations, and guidelines of the following agencies are described in this chapter.

Covered Agencies

- United States Army Corps of Engineers (USACE)
- United States National Park Service (NPS)
- Golden Gate National Recreation Area (GGNRA)
- National Oceanic Atmospheric Administration's National Marine Fisheries Service (NMFS)
- United States Fish and Wildlife Service (USFWS)
- California Department of Boating and Waterways (Cal Boating)
- Regional Water Quality Control Board – San Francisco Region 2
- California Department of Fish and Game (CDFG)
- California Coastal Commission (CCC)
- California State Lands Commission (SLC)
- San Francisco Department of the Environment (SF Environment)
- San Francisco Recreation and Parks Department (RPD)
- San Francisco Department of Public Works (DPW)
- San Francisco Department of Parking and Traffic (DPT)
- San Francisco Public Utilities Commission (SFPUC)
- San Francisco Zoo (SF Zoo)

2.2 Federal Agencies

United States Army Corps of Engineers (USACE)

Purpose and Authority

Federal interest in water resources development is established by law. Within the larger Federal interest in water resource development, the U.S. Army Corps of Engineers (USACE) is authorized to carry out projects in seven mission areas: navigation, flood damage reduction,

TABLE 2-1

STAKEHOLDER AGENCIES' AUTHORITY AND JURISDICTION

Stakeholder Agency	Authority Relating to Ocean Beach Storm Damage Protection Project	Jurisdictional Boundary within Project Area
USACE	Section 404 (Clean Water Act); Section 10 (Rivers and Harbors Act) permitting; CAP partner for Storm Damage Reduction and/or Beneficial Reuse of Dredged Materials; Consultation on federal permits; Project co-convener	Navigable Waters of the United States
National Park Service (GGNRA)	Management authority for GGNRA lands	All of the beach at Ocean Beach, as well as lands to the north and south, are within the GGNRA administrative boundary. The eastern boundary of GGNRA's jurisdiction is 55 feet west of the Great Highway. Through a State Lands lease, GGNRA's land jurisdiction extends 1,000 feet waterward of ordinary high water mark.
NMFS	Consultation on federal permits; Magnusen-Stevens Act	Essential Fish Habitat (EFH), upland activities that impact EFH
USFWS	Endangered Species Act; Incidental take permitting; Consultation on federal permits	Listed T & E species and related habitat
CCC	California Coastal Act of 1976; Coastal Zone Management Act (CZMA) authority which provides regulatory control (federal consistency review authority) over all federal activities and federally licensed, permitted or assisted activities, wherever they may occur (i.e., landward or seaward of the respective coastal zone boundaries fixed under state law) if the activity affects coastal resources.	Direct permitting authority over any structures located on the beach or base of the bluff (tidelands) Appeal jurisdiction over any project located between the sea and the first public road; or 300 feet of the inland extent of any beach, whichever is greater. Also applies to projects within 300 feet of the top of any seaward face of any coastal bluff
Cal Boating	Funding and Advisory Capacity Administers the Coastal Beach Erosion Control Grant Program Authority granted by Rivers and Harbors Act of 1962, as amended; Chapter 2, Article 2.5 (Beach Erosion Control) and 2.8 (Public Beach Restoration Act);	California coastal shoreline, including SF Bay
CDFG	California Endangered Species Act; Incidental take permitting; Consultation on State permits	Listed T & E species and related Habitat

Stakeholder Agency	Authority Relating to Ocean Beach Storm Damage Protection Project	Jurisdictional Boundary within Project Area
CSLC	CSLC has authority over submerged land adjacent to Ocean Beach. CSLC has granted permission to USACE to dispose of dredged material within the proposed project area, as part of USACE ongoing SF Main Channel maintenance activities.	Three mile-wide section of tidal and submerged land adjacent to the coast and offshore islands, including bays, estuaries, and lagoons
DPT	ARTICLE 11: Regulation of Obstructions to Traffic, Sections 190 through 196	City limits of City of San Francisco
DPW	Project Co-Convener and Grant Manager; Recipient of Cal Boating Beach Erosion Control Grant	Responsible for maintenance of public right-of-way
RPD	Management guidelines from planning documents including: • Recreation and Open Space Element of the General Plan • Zoological Gardens Master Plan Draft Golden Gate Master Plan • Draft Significant Natural Areas Resources Plan • Lake Merced Comprehensive Management Plan Recreational Use Program.	Entirety of Great Highway, including median, from Point Lobos Ave to the southern edge at Skyline Boulevard; San Francisco Zoo, which is bounded by The Great Highway, Sloat Boulevard, Herbst Road and Skyline Boulevard.
SFPUC	Neighboring Entity	The San Francisco PUC operates the Lake Merced Transport, the Oceanside Water Pollution Control Plant and the Southwest Ocean Outfall (SWOO) for the discharge of treated wastewater into the Pacific Ocean offshore of San Francisco. – The 14 foot diameter Lake Merced Transport runs roughly under the Westside edge of Great Highway median strip. The top of the pipe is roughly at zero City Datum. – The entrance to the Oceanside WPCP is from the north bound lane of the Great Highway. – The Southwest Ocean Outfall runs under the Great Highway and goes offshore roughly 4 miles (it is 4.5 miles long but angles offshore). It is deep. The junction structure is east of the north bound lane.
SF Zoological Society	Neighboring Entity	Maintenance and operation of SF Zoo

[a] Although the Zoo is under the RPD jurisdiction, the Zoological Society is responsible for the maintenance and operations of the zoo.

SOURCE: City of San Francisco, 2005; Golden Gate NRA, 2005; ESA, 2005

*Boundaries are approximate and for graphical display only.

Figure 2-1

Ownership and Lease Boundaries for the Ocean Beach-Great Highway Storm Damage Protection Project Area

ecosystem restoration, hurricane and storm damage reduction, water supply, hydroelectric power generation and recreation. Navigation projects include both inland and deepwater projects. Ecosystem restoration projects serve to improve ecosystem structure and function. Wherever possible, and subject to budgetary policy, USACE projects combine these purposes to formulate multiple purpose projects. Such projects may include congressionally authorized projects, continuing authorities projects (CAP), planning assistance to states, flood plain management services, and emergency authorities **(Engineering Regulation 1105-2-100, Chapter 3, Paragraph 3.1)**.

The U.S. Army Corps of Engineers is the steward of the lands and waters at USACE water resources projects. USACE's current Natural Resource Management Mission (**ER 1130-2-550**, **Chapter 2, Paragraph 2-2.a(1)**) is:

- To manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations.

- Promote awareness of environmental values and adhere to sound environmental stewardship, protection, compliance, and restoration practices in all aspects of natural and cultural resources management.

- Manage for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.

- Integrate the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities.[1]

Regulatory Authority

Wetlands and other waters, e.g., rivers, streams and natural ponds, are a subset of "waters of the U.S." and receive protection under Section 404 of the Clean Water Act. USACE has primary Federal responsibility for administering regulations that concern waters of the U.S. In this regard, USACE acts under two statutory authorities, the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the Clean Water Act (Section 404), which governs specified activities in "waters of the United States," including wetlands. However, it should be noted that when USACE implements its own Civil Works projects they are responsible for implementing the requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act into their project review, but separate internal permits are not required by law**.**

Navigable waters of the United States are defined as those waters that are a subject to the ebb and flow of the tide or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. EPA has the ultimate authority for designating dredge and fill material disposal sites and can veto USACE's issuance of a permit to fill jurisdictional

1 See Appendix 2A for USACE' Environmental Operating Principles, adopted in 2002.

waters of the U.S. USACE requires applicant obtain a Section 10 permit if a project proposes certain activities placing structures within navigable waters. The Ocean Beach project would require a Section 10 permit for placement of a breakwater or artificial reef, and beach fill and dredging if activities are below the mean high watermark.

The term "waters of the U.S." [2] as defined in Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]) includes: (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) All impoundments of waters otherwise defined as waters of the United States under the definition; (5) Tributaries of waters identified in sections (1) through (4); (6) Territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in sections (1) through (6).

USACE requires applicant obtain a Section 404 nationwide or individual permit for activities within waters of the United States. The Ocean Beach project would require either a nationwide permit(s) or an individual permit for placement of a breakwater or artificial reef, beach fill (including soft structures) and bank stabilization activities, including hard structures, within the mean high water mark.

Nationwide Permits

Projects that meet certain conditions may be authorized by USACE under the Nationwide General Permit Program (NWP), a permitting process for specific activities. Examples of activities proposed for the Ocean Beach project that may be covered by a Nationwide permit include NWP 13 (Bank Stabilization), which applies to stabilization activities necessary for erosion prevention provided the activity meets all of the following criteria:

- No material is placed in excess of the minimum needed for erosion protection;
- The bank stabilization activity is less than 500 feet in length;
- The activity will not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line;

[2] Based on the Supreme Court ruling (SWANCC) concerning the Clean Water Act jurisdiction over isolated waters (January 9, 2001), non-navigable, isolated, intrastate waters based solely on the use of such waters by migratory birds are no longer defined as waters of the United States. Jurisdiction of non-navigable, isolated, intrastate waters may be possible if their use, degradation, or destruction could affect other waters of the United States, or interstate or foreign commerce. Jurisdiction over such other waters should be analyzed on a case-by-case basis. Impoundments of waters, tributaries of waters, and wetlands adjacent to waters should be analyzed on analyzed on a case-by-case basis.

- No material is placed in any special aquatic site, including wetlands;
- No material is of the type, or is placed in any location, or in any manner, to impair surface water flow into or out of any wetland area;
- No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas); and,
- The activity is part of a single and complete project.

Bank stabilization activities in excess of 500 feet in length or greater than an average of one cubic yard per running foot may be authorized if USACE is notified in accordance with the "*Notification*" General Condition 13 and the District Engineer determines the activity complies with the other terms and conditions of the NWP and the adverse environmental effects are minimal both individually and cumulatively. The notification must include a compensatory mitigation proposal to offset permanent losses of waters of the U.S. and measures to minimize temporary effects and wetland delineation.

Individual Permits

An Individual Permit would be required for the Ocean Beach project if the project does not meet the conditions of a NWP. Additional regional requirements for maintaining upland buffer areas between authorized projects and open waters may be conditions for granting any USACE permit. Activities authorized under an Individual Permit require compliance with Section 404 of the Clean Water Act regulations, EPA Section 404(b)(1) Guidelines, National Environmental Policy Act, the federal Endangered Species Act, Section 106 of the National Historic Preservation Act, and Section 401 of the Clean Water Act (water quality certification).

Prior to application for a permit, USACE must verify the wetland delineation. This consists of a field visit by USACE staff to check mapping and dimensions of jurisdictional areas, followed by a letter that either requests changes be made or confirms that the map is satisfactory. The delineation then becomes a "Jurisdictional Determination," which will be used to calculate impacts for the permit application.

Individual permits require the submission of an individual application and compliance with USACE's formal review process. This process provides opportunities for public notice and comment, requires the preparation of an alternatives analysis pursuant to EPA Section 404 (b)(1) and requires compliance with the National Environmental Policy Act environmental review process.

Applicable Shore Protection Guidelines

For the past 60 years, Congress has authorized Federal participation in the cost of restoring and protecting the shores of the United States, its territories and possessions. Federal participation in shore protection projects is based on shoreline ownership, shore use, and type and incidence of benefits. The intent of this legislation is to prevent or control shore erosion in order to reduce

damage to upland developments caused by wind- and tidal-generated waves and currents along the Nation's coasts and shores, and lakes, estuaries, and bays directly connected therewith.[3] Shore or beach erosion damages include losses to upland development, land and structures. Planning guidance on Federal participation in shoreline protection is found with **Engineering Regulations 1165-2-130** and **1105-2-100**.

Continuing Authorities Program

USACE can take an active role in shoreline protection through a process known as the Continuing Authorities Program (CAP). CAP allows USACE's to respond to water resource problems without the need to obtain specific Congressional authorization for each project. This decreases the amount of time required to budget, develop, and approve a potential project for construction. As favorable studies progress towards more detailed design and construction, certain project costs must be shared with the local sponsor including any and all costs in excess of Federal project limits. Section 204 of the Water Resources Development Act and Section 103 are two sources of Federal authority that pertain to CAP eligibility for planning, designing, and implementing storm damage reduction measures at Ocean Beach. (See Appendix 2B: Continuing Authorities Program (CAP) possibilities for Ocean Beach; and Appendix 2C: Operations and Maintenance (O&M) of SF Bar Main Ship Channel Possibilities for Ocean Beach Erosion Protection for detailed information on the purpose, base plan, and cost-sharing structures for beneficial uses of dredged materials; protecting public and private properties against damages caused by storm-driven waves and currents; and Federal participation in beach nourishment projects.)

Design Guidance

Under Federal law there is, generally, no meaningful distinction between maintenance, repair, replacement, and rehabilitation. A beach fill project is designed to provide a certain level of erosion and storm surge protection to landward facilities through the sacrifice of project fill material. The protection provided depends on the crown elevation and the amount and characteristics of sacrificial sand maintained within the project design section. The project function depends on maintenance of the horizontal and vertical dimensions of the project design section. Preservation of this design section can be achieved through a combination of the following activities which generally describe the non-Federal sponsor responsibility for maintenance, repair, replacement, and rehabilitation under the terms of the project cooperation agreement (PCA):

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3 An Act of Congress approved August 13th, 1946 (*Public Law 727, 79th Congress*) established a policy of Federal aid in construction costs where projects protected publicly owned shores. An Act approved July 28th, 1956 (*Public Law 826, 84th Congress*) amended that basic beach erosion legislation to authorize Federal participation in the protection of private property if such protection was incidental to the protection of publicly owned shores, or if such protection would result in public benefits. The amendment also substituted the term "restoration" for "improvement," so that the basis for Federal concern became "restoration and protection" as opposed to creation of new lands (*House Report No. 2544 and Senate Report No. 2691, 84th Congress*). Accordingly, Federal participation in restoration is limited to the historic shoreline. It does not provide for Federal cost sharing in extending a beach beyond its historic shoreline unless required for protection of upland areas. The River and Harbor Act of 1962 *(Public Law 87-874),* as amended, increased the proportion of construction costs borne by the Federal Government and made the total cost of studies a Federal responsibility.

(1) Grading and shaping the beach and dune using sand within the project design section.
(2) Maintenance of dune vegetation, sand fencing and dune crossovers.
(3) Continuing project construction (periodic nourishment).

The following activities may be classified as continuing project construction and may be shared as periodic nourishment under the terms of the PCA:

(1) Placement of additional sand fill to restore an advanced nourishment berm.
(2) Placement of additional sand fill on the project to restore the design section.

National Park Service

Purpose and Authority

The National Park Service (NPS) was established by 1916 NPS Organic Act (39 Stat. 535; 16 U.S.C. l 2 3, and 4). The NPS preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The NPS cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world. Extensive management guidelines provide authority and direction for the National Park Service's programs and policies.

Applicable Objectives and Management Guidelines

Based on the 1916 Organic Act, strategic planning, and applicable laws, the NPS' long-range objectives are as follows:

- Natural and cultural resources and associated values are protected, restored, and maintained in good condition and managed within their broader ecosystem and cultural context.

- The National Park Service contributes to knowledge about natural and cultural resources and their associated values. Management decisions about resources and visitors are based on adequate scholarly and scientific information.

- Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities. Park visitors and the general public understand and appreciate the preservation of parks and their resources for this and future generations.

- Natural and cultural resources are conserved through formal partnership programs with other Federal, State, and local agencies and nonprofit organizations to provide educational, recreational, and conservation benefits for the American people and to ensure continued access for public recreational use.

- The NPS uses current management practices, systems, and technologies to accomplish its mission and improves its managerial capabilities through initiatives and support from other agencies, organizations, and individuals.

With respect to internal guidance on management issues, there are three tiers of guidance documents. NPS Management Policies (2001) is the highest of three levels of internal guidance

documents used by park managers. The second level of NPS guidance documents is the Directors Orders (DOs). Directors Orders serve as a vehicle to clarify or supplement *Management Policies* to meet the needs of NPS managers. The third tier of guidance documents is the NPS Handbooks and Reference Manuals. These documents provide NPS field employees with a compilation of legal references, operating policies, standards, procedures, general information, recommendations and examples to assist them in carrying out *Management Policies* and Directors Orders. NPS' management of Ocean Beach requires plans be consistent with above mentioned internal guidance as well as the Park's General Management Plan (1980) and the 1975 Transfer Deed Agreement with CCSF that transferred lands to the National Park Service.

The 2001 Management Policies outline general guidance on impairment of park resources and values, and specific guidance that applies the project area. The following policies have been included in this chapter: §4.8.1. Protection of Geologic Processes; §4.8.1.1 Shorelines and Barrier Islands; §9.1.1 Siting of facilities; §9.1.1.6) Siting of Facilities to Avoid Natural Hazards; and §9.1.3.3 Borrow Pits and Spoil Areas. General guidance (§1.4.4, 1.4.5, 1.4.6, 1.4.7, 4.1) and Specific Director's Orders that pertain to the project area have been placed in Appendix 2D for reference purposes.

Management Policies §4.8.1: Protection of Geologic Processes

The NPS will allow natural geologic processes to proceed unimpeded. Geologic processes are the natural physical and chemical forces that act within natural systems, as well as upon human developments, across a broad spectrum of space and time. Such processes include, but are not limited to, exfoliation, erosion and sedimentation, glaciation, karst processes, shoreline processes, and seismic and volcanic activity. Geologic processes will be addressed during planning and other management activities in an effort to reduce hazards that can threaten the safety of park visitors and staff and the long-term viability of the park infrastructure. Intervention in natural geologic processes will be permitted only when:

- Directed by Congress;
- Necessary in emergencies that threaten human life and property;
- There is no other feasible way to protect natural resources, park facilities, or historic properties; or
- Intervention is necessary to restore impacted conditions and processes, such as restoring habitat for threatened or endangered species.

Management Policies §4.8.1.1: Shorelines and Barrier Islands (relevant to Ocean Beach Project)

- Natural shoreline processes (such as erosion, deposition, dune formation, overwash, inlet formation, and shoreline migration) will be allowed to continue without interference.
- Where human activities or structures have altered the nature or rate of natural shoreline processes, the Service will, in consultation with appropriate state and federal agencies, investigate alternatives for mitigating the effects of such activities or structures and for

restoring natural conditions. The Service will comply with the provisions of Executive Order 11988 (Floodplain Management) and state coastal zone management plans prepared under the Coastal Zone Management Act of 1972.

- Where erosion control is required by law, or where present developments must be protected in the short run to achieve park management objectives, including high-density visitor use, the Service will use the most effective and natural-appearing method feasible, while minimizing impacts outside the target area.

Management Policies §9.1.1 Facility Planning and Design

The protection of each park's resources and values will be the primary consideration in facility development decisions. Facilities for visitor use and park management will be consistent with each park's authorizing legislation, and with approved general management plans, development concept plans, and associated planning documents. The planning and design of park facilities will be accomplished by interdisciplinary teams constituted to meet the resource stewardship, programmatic, and technical requirements of the project. Public input will be sought at the earliest stage of planning and design, particularly in those cases where controversy is likely.

The Park Service will meet its facility development needs in a cost- effective manner, ensuring that value is returned for every decision made. Only development projects that are shown to be an appropriate use of funds, and economically feasible, will be approved. Value- analysis and value-engineering techniques, such as functional analysis and cost evaluation, will be applied to achieve the lowest life- cycle cost, consistent with required environmental and energy performance, reliability, quality, safety, and resource protection. Construction and operational cost estimates will be continually reviewed throughout the planning and development processes to avoid excessive, unwarranted, or unnecessary costs. Development projects will also be continually reviewed for opportunities to add value and benefits that will help achieve the NPS mission.

Designs for park facilities, regardless of their origin (NPS, contractor, concessionaire, or other), will be harmonious with and integrated into the park environment. They will also be subject, throughout all phases of design and construction, to the same code compliance; the same high standards of sustainable design, "universal design," and functionality; and the same review and approval processes. Park Service requirements for sustainable design and functionality include protection of the natural and cultural environments, resource conservation, energy conservation, pollution prevention, defensible space for fire safety, and fostering education about sustainable design and practices.

The Service will issue, and update as necessary, guiding principles for sustainable design to be applied throughout the national park system, consistent with federal regulations such as Executive Order 13123 (Greening the Government through Efficient Energy Management) and Executive Order 13101 (Greening the Government through Waste Prevention, Recycling and Federal Acquisition).

Management Policies §9.1.1.6: Siting Facilities to Avoid Natural Hazards

The Service will strive to site facilities where they will not be damaged or destroyed by natural physical processes. Natural hazard areas include sites with unstable soils and geologic conditions, fault zones, thermal areas, floodplains, flash-flood zones, fire-prone vegetation, and coastal high-hazard areas. Park development that is damaged or destroyed by a destructive, hazardous, or catastrophic natural event will be thoroughly evaluated for relocation or replacement by new construction at a different location. If a decision is made to relocate or replace a severely damaged or destroyed facility, it will be placed, if practicable, in an area that is believed to be free from natural hazards. In areas where dynamic natural processes cannot be avoided, such as seashores, developed facilities should be sustainably designed (e.g., removable in advance of hazardous storms or other conditions). When it has been determined that facilities must be located in such areas, their design and siting will be based on:

- A thorough understanding of the nature of the physical processes; and
- Avoiding or mitigating (1) the risks to human life and property, and (2) the effect of the facility on natural physical processes and the ecosystem.

Requirements for development in floodplains and wetlands are contained in Executive Order 11988 (Floodplain Management); Executive Order 11990 (Protection of Wetlands); Director's Orders #77-1 and #77-10; and other NPS guidance documents.

Management Policies §9.1.3.3: Borrow Pits and Spoil Areas

Materials from borrow pits, quarries, and other clay, stone, gravel, or sand sources on NPS lands, including submerged lands, will be extracted and used only:

- By the NPS or its agents or contractors;
- For in- park administrative uses;
- After compliance with NEPA, including written findings that extraction and use of in-park borrow materials does not, or will not, impair park resources or values, and is the park's most reasonable alternative based on economic, environmental, or ecological considerations; and
- After compliance with other applicable federal, state, and local requirements.

Parks should use existing pits, quarries, or sources, or create new pits, quarries, or sources in the park only after developing and implementing a park- wide borrow management plan that addresses the cumulative effects of borrow site extraction, restoration, and importation. NPS guidance documents, as well as natural and cultural resources and facilities management staff, should be consulted during plan development and the review of specific proposals…

Spoil may be used for beach nourishment or another resource management activity only if the superintendent first finds that the proposed nourishment or activity will not impair park resources and values, and is consistent with park planning documents.

National Historic Preservation Act Compliance

Projects involving federal lands with historic resources must comply with the National Historic Preservation Act (NHPA) of 1966. NHPA established laws for historic resources to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, advisory councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs. Section 106 of the NHPA requires all federal agencies to consult the Advisory Council before continuing any activity affecting a property listed on or eligible for listing on The National Register. The Advisory Council has developed regulations for Section 106, to encourage coordination of agency cultural resource compliance requirements under Executive Order 11593 and NEPA with those of Section 106.

Golden Gate National Recreation Area (a National Park Service unit)

Purpose and Authority

The Golden Gate National Recreation Area (GGNRA) is one of the largest urban national parks in the world. Established in 1972, as part of a trend to make national park resources more accessible to urban populations and bring “parks to the people”, GGNRA’s 75,398 acres of land and water extend north of the Golden Gate Bridge to Tomales Bay in Marin County and south to San Mateo County, encompassing 59 miles of bay and ocean shoreline, including the length of Ocean Beach. These lands represent one of the nation’s largest coastal preserves and attract 16 million visitors each year, making GGNRA one of the NPS’ most highly visited units.

In 1980, the Golden Gate National Recreational Area and Point Reyes National Seashore General Management Plan (GMP) was adopted, focusing on objectives, rationale for decision making and a strategy for approaching the future of the recreational area. Due to the system’s varied resources, the GMP made an effort to define the park’s land by use. Ocean Beach was categorized as a Natural Appearance Subzone of the Natural Resources Zone. Subsequently, focusing on the divisions created in the GMP, a Natural Resource Management Plan (NRMP) was drafted in 1981 and adopted in 1987 describing objectives and management goals. The specific goals for Natural Appearance Subzones focused on accommodating relatively high use levels with a commitment to intensive maintenance in order to retain the appearance of a natural landscape. Specific recommendations for Ocean Beach were primarily focused on collecting additional data to facilitate future planning. GGNRA Management policies are currently under revision.

NOAA’s National Marine Fisheries Service (NMFS)

Purpose and Authority

NOAA’s National Marine Fisheries Service (NMFS) is responsible for the management, conservation and protection of living marine resources within the United States Exclusive Economic Zone. NMFS also plays a supportive and advisory role in the management of living marine resources in coastal areas under state jurisdiction, provides scientific and policy leadership

in the international arena and implements international conservation and management measures as appropriate.

NMFS is dedicated to the stewardship of living marine resources through science-based conservation and management, and the promotion of healthy ecosystems. As a steward, NMFS conserves, protects, and manages living marine resources in a way that ensures their continuation as functioning components of marine ecosystems, affords economic opportunities, and enhances the quality of life for the American public. This requires a balancing of multiple public needs and interests in the sustainable benefits and use of living marine resources, without compromising the long-term biological integrity of coastal and marine ecosystems.

Applicable Management Authority

NMFS is responsible for carrying out the Magnuson-Stevens Fishery Conservation and Management Act (*Public Law 94-265 as amended)* which provides for the conservation and management of fishery resources within the U.S. Exclusive Economic Zone (EEZ). It also provides for fishery management authority over continental shelf resources and anadromous species beyond the EEZ. The following FMPs are applicable to Ocean Beach-Great Highway Storm Damage Protection Project area:

- Coastal Pelagic Species
- West Coast Groundfish
- Pacific Salmon

The Magnuson-Stevens Act requires Councils to identify in FMPs any fishing activities that may adversely affect Essential Fish Habitat (EFH). The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." To clarify this definition, the following interpretations are made: "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means "the habitat required to support a sustainable fishery and the managed species" contribution to a healthy ecosystem;" and "spawning, breeding, feeding, or growth to maturity" covers the full life cycle of a species. The definition of EFH may include habitat for an individual species or an assemblage of species, whichever is appropriate to the Fisheries Management Plan (FMP) (See Appendix 2E for detailed EFH requirements of Coastal Pelagic Species, West Coast Groundfish, and Pacific Salmon). The Magnuson-Stevens Act also requires that, where fishing-related adverse impacts to EFH are identified, FMPs must include management measures that minimize those adverse effects from fishing, to the extent practicable.

Federal agencies are required to consult with NMFS on all activities, and proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. NMFS must provide recommendations to conserve EFH to federal agencies on such activities. NMFS must also provide recommendations to conserve EFH to state agencies if it receives information on their actions. A Regional Fishery Management Council may provide EFH recommendations on

actions that may affect habitat, including EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency.

In addition to the Magnuson Stevens Fishery Conservation and Management Act, NMFS receives its ocean stewardship responsibilities under many federal laws. Most important are the Federal Endangered Species Act, which protects species determined to be threatened or endangered; the Marine Mammal Protection Act, which regulates interactions with marine mammals; the Lacey Act, which prohibits fish or wildlife transactions and activities that violate state, federal, native American tribal, or foreign laws; and the Fish and Wildlife Coordination Act, which authorizes NMFS to collect fisheries data on environmental decisions which affect living marine resources. Many other statutes, international conventions, and treaties also guide NMFS activities.

FESA, Section 7 Consultation involves projects with a federal connection or requirement; typically these are projects where a federal lead agency is sponsoring or permitting the project. For example, a permit from USACE may be required if a project will result in wetland impacts. In these instances, the federal lead agency (e.g., USACE or GGNRA) initiates and coordinates the following steps: informal consultation with USFWS to establish a list of target species; preparation of biological assessment evaluating potential for the project to adversely affect listed species; coordination between state and federal biological resource agencies to assess impacts/proposed mitigation; and development of appropriate mitigation for all significant impacts on federally listed species. The NMFS ultimately issues a final Biological Opinion on whether the project will affect the federally listed species, including listed salmonid species, which may migrate through the waters of the Pacific Ocean.

U.S. Fish and Wildlife Service

Purpose and Authority

The mission of the U.S. Fish and Wildlife Service (USFWS) is to conserve, protect, and enhance fish and wildlife, and their habitats for the continuing benefit of the American people. The four principal mission goals, which drive the Fish and Wildlife Service's Strategic Plan, address:

- Sustainability of Fish & Wildlife Populations:
  - Conserve, protect, restore, and enhance fish, wildlife, and plant populations entrusted to our care.

- Habitat Conservation
  - Conserve an ecologically diverse network of lands and waters — of various ownerships — providing habitats for fish, wildlife, and plant resources.

- Public Use & Enjoyment:
  - Provide opportunities to the public to enjoy, understand, and participate in the use and conservation of fish and wildlife resources.

- Partnerships in Natural Resources:
  - Support and strengthen partnerships with tribal, state, and local governments and others in their efforts to conserve and enjoy fish, wildlife, plants and their habitats.

Applicable Regulatory Authority

USFWS activities include, but are not limited to: enforcing the federal Endangered Species Act (ESA); acquiring wetlands, fishery habitats, and other lands for restoration and preservation; insuring compliance with the National Environmental Policy Act; managing National Wildlife Refuges and National Fish Hatcheries; and reviewing and commenting on all water resource projects.

The USFWS will oversee federal ESA issues in the project area. The 1973 Endangered Species Act (16 U.S.C. 1531-1544) (FESA) as amended provides for the conservation of ecosystems (both through federal action and by encouraging the establishment of state programs) upon which threatened and endangered species of fish, wildlife, and plants depend. The FESA is enforced by the USFWS for endangered plants and wildlife (with the exception of salmon and other anadromous fish that are regulated by NMFS).

Procedures for addressing federal-listed species follow two principal pathways, both of which require consultation with the USFWS, which administers the FESA for all terrestrial species. The Section 10(a) Incidental Take Permit of the FESA is set up for situations where a non-federal government entity (or where no federal nexus exists) must resolve potential adverse impacts to species protected under FESA. A Section 10(a) Endangered Species Incidental Take Permit may be necessary when the "taking" or harming of a species is incidental to the lawful operation of a project. Under Section 10(a)(1)(B), such authorizations are granted through the issuance of incidental take permits. Applicants for such permits must submit plans that specify:

- The impact(s) that will likely result from the taking
- The measures the permittee will take to minimize and mitigate those impacts
- The source of funding available to implement the measures
- Alternatives to the taking and the reason the alternatives were not chosen
- Any other measures considered by the USFWS as necessary or appropriate for minimizing or mitigating the impacts of the taking

The second pathway (FESA, Section 7 Consultation) involves projects with a federal connection or requirement; typically these are projects where a federal lead agency is sponsoring or permitting the project. For example, a permit from USACE may be required if a project will result in wetland impacts. In these instances, the federal lead agency (e.g., USACE or GGNRA) initiates and coordinates the following steps: informal consultation with USFWS to establish a list of target species; preparation of biological assessment evaluating potential for the project to adversely affect listed species; coordination between state and federal biological resource

agencies to assess impacts/proposed mitigation; and development of appropriate mitigation for all significant impacts on federally listed species. The USFWS ultimately issues a final Biological Opinion on whether the project will affect the federally listed species, including western snowy plover, which winters on Ocean Beach.

2.3 State Agencies

California Department of Boating and Waterways

Purpose and Authority

The California Department of Boating and Waterways, also known as Cal Boating, serves to provide safe and convenient public access to California's waterways and leadership in promoting the public's right to safe, enjoyable, and environmentally sound recreational boating. Cal Boating also administers the Coastal Beach Erosion Control Grant Program. The basic objectives of this program are to preserve and protect the California shoreline, minimize economic losses caused by beach erosion and maintain urgently needed recreational beach areas. Cal Boating accomplishes this by co-sponsoring the construction of beach erosion control projects with local and federal agencies; improving present knowledge of oceanic forces, beach erosion and shoreline conditions; and using this knowledge to prevent future erosion.

Cal Boating has been involved with the Ocean Beach Long Term Beach Restoration and Erosion Control Project Plan since 2001, when the State executed a Boating and Waterways $1.0 million grant with DPW, under the Beach Restoration Program. Cal Boating supported DPW's request for funding and technical assistance from USACE, which resulted in the reconnaissance phase of USACE 5 Phase Project Development Project. In 2003, DPW sent a letter to Cal Boating requesting an extension of time on the Public Beach Restoration Grant to complete the planning phase. A 4-year time extension was granted to DPW.

Applicable Statutes

The beach erosion control statutes, Sections 65 through 69.9 of the Harbors and Navigation Code (California State Law), authorize the Department to study erosion problems; act as shore protection advisor to all agencies of government; and plan, design and construct protective works when funds are provided by the Legislature. The Rivers and Harbors Act of 1962, as amended, allows Cal Boating to participate in beach erosion control projects undertaken by the U.S. Army Corps of Engineers.

The following sections of the Harbors and Navigation Code, General Provisions, Division 1, Chapter 2, Article 2.5 (Beach Erosion Control) and Article 2.8 (Public Beach Restoration Act) ***are*** applicable to the Ocean Beach Storm Damage Protection Project:

- Section 65. The Department, either independently or in cooperation with any person or any County, State, Federal, or other agency, to the extent that funds are available therefore, shall study and report upon problems of beach erosion and means for the stabilization of beaches and shoreline areas.

- Section 65.1. To the extent that funds are available therefore, the Department shall cooperate with all agencies of government, Federal, State, and local, for the purposes of beach erosion control and stabilization of beaches and shoreline areas, and shall act in an advisory capacity on beach erosion control and stabilization of beaches and shoreline areas when requested by any public agency of the State or by any agency of the Federal Government.

- Section 65.2. The Department shall prepare plans for and construct such works as its studies and investigations indicate to be necessary for beach erosion control and stabilization of beaches and shoreline areas, to the extent that funds are available therefore. In the preparation of such plans and construction of works therefore the Department may cooperate by contract or otherwise with the Beach Erosion Board of the United States or with any other Federal, State, County, or Municipal agency, or with any or all such agencies, upon such terms and conditions and in such manner as will be for the best interests of the State.

- Section 65.3. When State funds are made available on a matching basis to be expended in connection with any Federal project for beach erosion control or stabilization of beaches and shoreline areas, the Department, subject to approval of the Director of Finance, shall administer such funds.

- Section 65.4. Any plans for construction of beach erosion control works, which may in any way affect recreational beaches under the ownership or control of the Department of Parks and Recreation shall be subject to approval by the Department of Parks and Recreation.

- Section 65.5. Whenever a beach erosion control project has been authorized by Congress for Federal financial participation in accordance with Public Law 727, 79th Congress, 2nd Session, as amended by Public Law 826, 84th Congress, 2nd Session, or as it may hereafter be amended, or any other act of Congress relating to beach erosion control in which local participation is required, it shall be the policy of the State to bear one-half the costs of local participation required by the authorizing Federal legislation, including construction costs and costs of lands, easements, and rights-of-way; provided, any affected City, County, or other public agency furnishes assurances satisfactory to the Department that it will provide all other local cooperation required by the authorizing Federal legislation, will hold and save the State free from damages for all time due to the construction, operation, and maintenance of the project, and will maintain and operate the project during its useful life, as may be required to serve its intended purpose, subject to such regulations as may be prescribed therefore by the Department.

- Section 65.6. Notwithstanding the provisions of Section 65.5, appropriations may be made by the State, from time to time by law, to pay for the costs of sharing in such participation in beach erosion control projects following State authorization of a specific project, but such participation shall apply only to costs incurred for the project as finally authorized by the Congress and the State, and appropriations for such costs shall not be expended by the State until after the appropriation of construction funds by the Congress.

- Section 65.7. Small beach erosion control projects not specifically authorized by Congress and undertaken by the United States Army Corps of Engineers pursuant to Section 103 of the River and Harbor Act of 1962, Title I of Public Law 87-874, 76 Stat. 1173, and Section 310(b) of the River and Harbor Act of 1965, Title III of Public Law 89-298, 79 Stat. 1073 (33 U.S.C. 426(f) and 426(g)), are authorized for State participation pursuant to Section

65.5 without further specific authorization by the Legislature, at such costs as may be appropriated by the Legislature upon the recommendation and advice of the Department. Such State participation shall not take precedence over other pending projects of higher priority.

- Section 66. The Department, with the approval of the Director of Finance, and on terms satisfactory to the Department may advance moneys appropriated for this purpose in the amount required to meet the Federal share of any project described in Section 65.5 in order to carry out construction of the project. Reimbursement from the Federal Government shall be reimbursed to the fund from which the advance was made.

- Section 66.1. Where the Department is the construction agency, the City, County or other public agency acting in cooperation with the Department in the construction of any federally authorized beach erosion control project shall transmit funds representing its share of the costs to the Department for deposit in the State Treasury in advance of commencement of construction work.

Article 2.8

- Section 69.5. This chapter shall be known, and may be cited, as the California Public Beach Restoration Act.

- Section 69.6. (a) The California Public Beach Restoration Program is hereby established, to be administered by the department for all of the following purposes:

    (1) The restoration, enhancement, and nourishment of public beaches, as determined to be necessary by the department, through the cost-effective engineered placement of sand on the beach or in the nearshore environment.

    (2) The planning, design, and permitting of the beach restoration, nourishment, or enhancement projects specified in paragraph (1), which shall not exceed 15 percent of the total project cost.

    (3) The preparation of studies to inventory, characterize, and assess the physical and biological resources of the ocean, and nearshore, shoreline, and inland areas that are determined by the department to be necessary to construct the projects specified in paragraph (1) that are environmentally and economically sound. The cost of the studies shall not exceed 5 percent of the annual program funding.

    (4) The funding of 100 percent of the nonfederal project construction cost for restoration, nourishment, or enhancement of coastal state parks and state beaches with placement of sand on the beach or in the nearshore.

    (5) The funding of 85 percent of the nonfederal project cost for restoration, nourishment, or enhancement of non-state public beaches with placement of sand on the beach or in the nearshore, with a 15 percent match from the local sponsors, provided as funds or in-kind services.

    (6) The active pursuit and promotion of federal and local partnerships to cost-share beach restoration, nourishment, or enhancement projects specified in paragraph (1) that have significant state benefits.

- (b) Prior to funding any project under this section, the department shall develop guidelines that include application requirements and criteria for evaluating a project. The guidelines shall be consistent with the Resources Agency's policies for shoreline erosion protection. Only beaches that are in public ownership and that are open and accessible to the public are eligible for funding under this section.

- Section 69.9. (a) The Public Beach Restoration Fund is hereby created in the State Treasury. The moneys in the fund shall be available for expenditure by the department only for the purposes of the California Public Beach Restoration Program established pursuant to this article.

- (b) Of the moneys in the fund, 60 percent shall be available for allocation by the department to projects south of the point at which the Pacific Ocean meets the border between the County of San Luis Obispo and the County of Monterey and 40 percent shall be available for allocation to projects located north of that point.

Regional Water Quality Control Board – San Francisco Region 2

The Regional Water Quality Control Board (RWQCB) regulates waters of the state under the Porter-Cologne Act. Under Section 401 of the Clean Water Act, the RWQCB has review authority of Section 404 permits. The RWQCB has a policy of no-net-loss of wetlands in effect and typically requires mitigation for all impacts to wetlands before it will issue a water quality certification. Dredging, filling, or excavation of isolated waters not protected under Section 404 of the Clean Water may constitute a discharge of waste to waters of the State, and prospective dischargers are required to submit a report of waste discharge to the RWQCB and comply with other requirements of Porter-Cologne. The Ocean Beach project would require a Section 401 water certification for activities involving artificial reefs, breakwater, beach fill, and any hard and soft structures within USACE and/or RWQCB jurisdictional area.

California Department of Fish and Game

Purpose and Authority

The Department of Fish and Game (DFG) maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to people. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The DFG is also responsible for the diversified use of fish and wildlife including recreational, commercial, scientific and educational uses. The mission of DFG is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

Applicable Regulatory Authority

Under Sections 1600 – 1616 of the California Fish and Game Code, DFG regulates activities that would substantially divert, obstruct the natural flow, or substantially change of rivers, streams and lakes. The limits of DFG jurisdiction are defined in Section 1602 of the California Fish and Game Code as, "bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris,

waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake…." The DFG requires a Streambed Alteration Agreement for activities with its jurisdictional area. However, the project does not support any rivers, streams, or lakes. Thus, no Streambed Alteration Agreement would be required for the project.

The California Legislature directs the State (Fish and Game Code Section 2052) to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat.

In accordance with this directive, the DFG has jurisdiction over the California Endangered Species Act (CESA), which states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved. DFG maintains a list of threatened and endangered species (California Fish and Game Code 2070). DFG works with all interested persons, agencies and organizations to protect and preserve such sensitive resources and their habitats. Section 2080 of the California Fish and Game Code prohibits the taking of plants and animals listed under the authority of the California Endangered Species Act of 1984 (CESA). Section 2081 of CESA allows for taking of any endangered species, threatened species or candidate species for scientific, educational, or management purposes. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats. The Ocean Beach project would require a Section 2081 permit for bank swallow under alternatives involving "take" of this species along the cliff bank.

The CDFG also maintains lists of "species of special concern" which serve as "watch lists." Pursuant to the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species.

California Coastal Commission

Purpose and Authority

The California Coastal Commission was established by voter initiative in 1972 (Proposition 20) and later made permanent by the Legislature through adoption of the California Coastal Act of 1976. The mission of the Coastal Commission is to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations.

The Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Implementation of Coastal Act policies is accomplished primarily through the preparation of local coastal plans (LCPs) which include a land use plan that prescribes land use classifications, types and densities of allowable development, and goals and policies concerning development; and zoning and other ordinances and administrative procedures

needed to implement the plan. The Coastal Commission certified the City and County of San Francisco's LCP in 1986, exemplifying a state-local partnership in the stewardship of the Pacific coastline. The City and County of San Francisco Planning Department has been delegated permitting authority for development activities including building construction, land division, and activities that change the intensity of use of land or public access to coastal waters. However, the Coastal Commission retains appeal authority over certain local government permit decisions, as well as original permit jurisdiction over tidelines, submerged lands, and public trust lands development.

Applicable Guidelines

The 1997 Strategic Plan provides a strategic vision and guidelines for coastal projects. Key elements articulate a future in which both environmental and human-based resources of the California coast and ocean are protected, conserved, restored, and enhanced for environmentally sustainable and prudent use by current and future generations. The vision statements emphasize the coastal economy, access and recreation, hazards, community character, and partnerships.

- Coastal and ocean natural resources are effectively protected in a way that promotes and maintains a strong coastal zone economy.
- Access ways for the public to get to the shoreline and State waters are attractive, inexpensive, well signed, readily accessible to visitors, and plentiful.
- Shoreline protective works such as seawalls are avoided on the open coast or on beaches, and non-structural alternatives are utilized.
- The natural beauty of the coastal zone and the special character of historic, scenic, and unique coastal communities and places are preserved for the benefit of future generations.
- Significant public views of the ocean and scenic coastal resources are preserved.
- The Coastal Commission works effectively and efficiently in partnership with other local, State, and Federal agencies to carry out the state coastal management program, as well as determine its consistency, on a case-by-case basis, with the federal Coastal Zone Management Act.
- Public support and participation remains a fundamental part of California's coastal management program.

Specific goals from the Strategic Plan include:

- Improve the protection of coastal and ocean resources;
- Improve assessment and management of impacts of development in the coastal zone;
- Improve shoreline access opportunities for the public;
- Enhance the Coastal Commission's leadership role in coastal zone management and in the provision of information regarding coastal and ocean resources;

- Strive to make the Commission's regulatory and planning processes more effective, efficient, and user-friendly; and

- Develop innovative approaches to carrying out the Commission's programs, including inter-agency, inter-disciplinary, and volunteer approaches.

Applicable Management Authority

The California Coastal Act of 1976 includes specific policies (see Division 20 of the Public Resources Code) that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the Commission and by local governments, pursuant to the Coastal Act.

The California Coastal Act is applicable throughout an area designated as the Coastal Zone. The Coastal Zone extends from three miles offshore (all state waters) to anywhere from approximately 1,000 yards to around five miles inland of the shoreline depending on location and based on jurisdictional boundary maps adopted by the state legislature. In areas with certified local coastal programs (like San Francisco) coastal development permitting authority is delegated to the local government, but the Commission retains appeal jurisdiction over certain local government actions on coastal development permits and has direct permitting authority for developments located on tidelands, submerged lands, and public trust lands. With respect to the Ocean Beach project, the Commission would have direct permitting authority over any structures (hard or soft) that are located on the beach or base of the bluff (tidelands) and appeal jurisdiction over any project located between the sea and the first public road (in this case, the Great Highway), or within 300 feet of the inland extent of any beach, whichever is the greater distance. In addition, developments approved by local government located on tidelands, submerged lands, public trust lands, within 100 feet of any wetland, estuary or stream, or within 300 feet of the top of any seaward face of any coastal bluff are also under the Commission's California Coastal Act appeal jurisdiction.[4]

Along with the Bay Conservation and Development Commission (BCDC), the Coastal Commission is one of California's two designated coastal management agencies for the purpose of administering the federal Coastal Zone Management Act (CZMA) in California. The most significant provisions of the federal CZMA give state coastal management agencies regulatory control (federal consistency review authority) over all federal activities and federally licensed, permitted or assisted activities, wherever they may occur (i.e., landward or seaward of the respective coastal zone boundaries fixed under state law) if the activity affects coastal resources.

The Coastal Zone Management Act's (CZMA) federal consistency provision is a cornerstone of the CZMA program and a primary incentive for states' participation. Federal consistency is the

[4] Section 30603. Coastal Act. Appeal of actions taken after certification of local program; types of developments; grounds; finality of actions; notification to Commission

CZMA requirement that *federal actions* that have reasonably foreseeable *effects* on any *land or water use* or *natural resource* of the coastal zone (also referred to as coastal uses or resources, or coastal effects) must be consistent with the *enforceable policies* of a coastal state's federally approved CMP. In this instance, the federal action is "activities and development projects performed by a Federal agency, or a contractor for the benefit of a Federal agency" e.g. a U.S. Army Corps of Engineers breakwater or beach renourishment project.

State Lands Commission

Purpose and Authority

The California State Lands Commission was created by the California Legislature in 1938 as an independent body, composed of three members- the Lieutenant Governor and State Controller, both statewide elected officials, and the Director of Finance, an appointee of the Governor. The mission of the CSLC is to serve the people of California by providing stewardship of the lands, waterways, and resources entrusted to its care through economic development, protection, preservation, and restoration. The CSLC was given the authority and responsibility to manage and protect the important natural and cultural resources on certain public lands including: a three mile-wide section of tidal and submerged land adjacent to the coast and offshore islands, including bays, estuaries, and lagoons; the waters and underlying beds of more than 120 rivers, lakes, streams, and sloughs; and 585,000 acres of school lands granted to the state by the federal government to support public education. Public and private entities may apply to Commission for leases or permits on state lands for many purposes including marinas, industrial wharves, dredging, sand mining, tanker anchorages, bank protection, recreational uses, etc. CSLC has authority over submerged land adjacent to Ocean Beach. The City and County of San Francisco (CCSF) currently have a lease with CSLC for a 150+ acre parcel of land off the Ocean Beach shoreline that allows for offshore dumping of sand. This lease expires in 2027. Additionally, CSLC have been in discussions with USACE regarding the lease of an alternative dredged materials disposal site that lies within the proposed project area, as part of USACE's ongoing San Francisco channel maintenance activities. This site is approximately 1.5 miles offshore. Once the preferred alternative is identified in future NEPA/CEQA processes, CSLC will need to complete a full title and boundary review to determine if the proposed project falls within an area that is currently leased, or if a new lease is required.

2.4 Local Agencies

San Francisco Department of the Environment (SF Environment)

Purpose and Authority

SF Environment's mission is to improve, enhance, and preserve the environment and to promote San Francisco's long-term environmental well being. SF Environment is involved with promoting sustainable solutions for environmental issues in the City. It provides public education and outreach to the community, reviews and makes recommendations on proposed City legislation to

include long-term environmental goals, and coordinates SF's environmental services. SF Environment also serves as an active member of the Ocean Beach Task Force.

Management Guidance

The SF Commission on the Environment sets policy for SF Environment, and advises the Mayor and Board of Supervisors on environmental matters.[5] Suggestions from the Commission usually take the form of Resolutions, which when adopted, are directed to the Board of Supervisors. Many of these resolutions have informed legislation adopted by the City & County of San Francisco. In 2002, SF Commission on the Environment passed a resolution on Ocean Beach Management Issues (Appendix 2F).

Applicable Guidance

On August 4, 2004, the City and County of San Francisco adopted the Precautionary Principle- a new policy framework widely used in western and northern European countries for developing laws that protect health and the environment by refocusing decision-making on reducing harm, rather than focusing on how much harm will be done. The Precautionary Principle, as adopted, is below.

Sec. 101. The San Francisco Precautionary Principle.

> The following shall constitute the City and County of San Francisco's Precautionary Principle policy. All officers, boards, commissions, and departments of the City and County shall implement the Precautionary Principle in conducting the City and County's affairs:
>
> The Precautionary Principle requires a thorough exploration and a careful analysis of a wide range of alternatives. Based on the best available science, the Precautionary Principle requires the selection of the alternative that presents the least potential threat to human health and the City's natural systems. Public participation and an open and transparent decision making process are critical to finding and selecting alternatives.
>
> Where threats of serious or irreversible damage to people or nature exist, lack of full scientific certainty about cause and effect shall not be viewed as sufficient reason for the City to postpone cost effective measures to prevent the degradation of the environment or protect the health of its citizens. Any gaps in scientific data uncovered by the examination of alternatives will provide a guidepost for future research, but will not prevent the City from taking protective action. As new scientific data become available, the City will review its decisions and make adjustments when warranted.
>
> Where there are reasonable grounds for concern, the precautionary approach to decision-making is meant to help reduce harm by triggering a process to select the least potential

5 The Commission has the authority to review and make recommendations on *any policy* proposed for adoption by any City agency regarding conformity with the long-term plans for environmental sustainability, except for those regarding building and land use; and the authority to investigate and make recommendations to all City agencies related to operations and functions, such as solid waste management, recycling, energy conservation, natural resource conservation, environmental inspections, toxics, urban forestry and natural resources, habitat restoration and hazardous materials.

threat. The key elements of the Precautionary Principle approach to decision-making include:

1. Anticipatory Action: There is a duty to take anticipatory action to prevent harm. Government, business, and community groups, as well as the general public, share this responsibility.

2. Right to Know: The community has a right to know complete and accurate information on potential human health and environmental impacts associated with the selection of products, services, operations or plans. The burden to supply this information lies with the proponent, not with the general public.

3. Alternatives Assessment: An obligation exists to examine a full range of alternatives and select the alternative with the least potential impact on human health and the environment including the alternative of doing nothing.

4. Full Cost Accounting: When evaluating potential alternatives, there is a duty to consider all the reasonably foreseeable costs, including raw materials, manufacturing, transportation, use, cleanup, eventual disposal, and health costs even if such costs are not reflected in the initial price. Short-and long-term benefits and time thresholds should be considered when making decisions.

5. Participatory Decision Process: Decisions applying the Precautionary Principle must be transparent, participatory, and informed by the best available science and other relevant information.

San Francisco Recreation and Parks Department

Purpose and Authority

The mission of the San Francisco Recreation and Park Department is "To provide enriching recreational activities, maintain beautiful parks, and preserve the environment for the well-being of our diverse community." This City Department is the owner of the Great Highway, as well as adjoining recreation resources such as Golden Gate Park and Lake Merced.

Applicable Policy Guidance

In December 2002, a Strategic Plan was adopted by the San Francisco Recreation and Parks Department, which proposed seven objectives with strategies and tactics for park, facility and recreation enhancement. These include objectives that emphasize building partnerships to maximize resources, managing for environmental sustainability, community participation in planning, design and advocacy, and providing high levels of community and customer service.

In addition to the Strategic Plan, there are five planning documents containing policies relevant to the Ocean Beach Storm Damage Protection Project: the Recreation and Open Space Element of the General Plan, the Zoological Gardens Master Plan, the Draft Golden Gate Master Plan, the Draft Significant Natural Areas Resources Plan, and the Lake Merced Comprehensive Management Plan Recreational Use Program. The relevance of each plan's policies depends on the scope of the improvements for the Great Highway Project.

1) Recreation and Open Space Element of the General Plan

- Policy 3: Create a trail around the perimeter of the City with links open space along the shoreline and provides for maximum waterfront access.

- Policy 5: Western Shoreline (Great Highway): This policy addresses traffic, design of seawall, protection of the sand dune ecosystem, and safe pedestrian access to the beach.

2) San Francisco Zoological Gardens Master Plan

- Recommendation 9: Access

  A. Develop a primary automobile entry from The Great Highway.

  E. Provide egress from the parking lot to The Great Highway and Sloat Boulevard.

3) Draft Golden Gate Master Plan (GGMP)

- The Draft GGMP (page 13-4) outlines improvements to the western edge of the park to increase pedestrian activities in the area. The improvements include new pedestrian trails, landscaping, irrigation, and windmill renovations.

4) Draft Significant Natural Areas Resources Program

- Section 6.1, Table ES-4 of the Draft Significant Natural Areas Program is the relevant policy that outlines the issues and Recommendations pertaining to Lake Merced.

5) Lake Merced CMP Recreational Use Program

- Goal 1: Enhance Biodiversity of Aquatic and Terrestrial Ecosystem
  - NRE-1.2: Protect and Restore Native Plants and Animals.
  - NRE- 1.5: Develop a Marsh Enhancement Plan
- Goal 2: Minimize Human Impacts on Natural Resources
  - NRE 2.1: Control Erosion
  - NRE 2.2: Determine Appropriate Human Use in Sensitive Natural Resources Areas
  - NRE 2.4: Investigate Prevention of Road Kills around the Lake
  - NRE 2.7: Maintain Areas around Lake Merced as Open Space

San Francisco Department of Public Works

Purpose and Authority

The mission of the Department of Public Works is to provide for safe & clean streets and a well maintained roadway; to plan, design, construct and maintain City-owned facilities; and to enforce streets and sidewalk codes.

Under City Charter, City departments (with the exception of SFIA, Port, MTA, SFPUC, and SFUSD) are required to utilize DPW's engineering and architectural staff to receive planning, design, and construction management assistance. Additionally, the Department will coordinate the facilitation of the project process as well as manage the grant for this project in a partnership with the U.S. Army Corps of Engineers.

San Francisco Department of Parking and Traffic

Purpose and Authority

The Department of Parking and Traffic is an agency dedicated to enhancing the quality of life for the residents of San Francisco by encouraging the efficient movement of people and goods throughout the City. It is a customer-service organization working to improve traffic safety, management and awareness while supporting public transit and offering parking opportunities in our neighborhoods.

Applicable Regulations

ARTICLE 11 – Regulation of Obstructions to Traffic - Sections 190 through 196 may be specifically relevant to this Project. Relevant portions of this Article are reproduced below:

SEC. 190. Definitions

As used in this Article, the following words and phrases shall have the following meanings:

a) Traffic. See Section 3.5 of this Code.

b) Director of Parking and Traffic. The Director of Parking and Traffic, City and County of San Francisco, also referred to as the Director.

c) Obstruction to Traffic. Any of the following when located in a street: Opening; ditch; excavation; fence delineating work area; temporary sidewalk, mobile hoist and boom; materials truck; materials, supplies and equipment; temporary or portable office, building or structure; and any vehicle or object which cannot be towed away by tow truck; provided, however, that an opening created by the removal of a manhole cover or an opening made to effect a lateral connection by conduit or pipe from a sewer or utility distribution facility in a street to the premises of an abutting owner is an obstruction to traffic during the following time periods: (1) between the hours of 6:00 a.m. and 10:00 p.m., every day of the week, if located in any portion of a street designated as a Street of Major Importance pursuant to Section 191 of this Code that lies within the Metropolitan Traffic District as defined in Section 3-a of this Code;

and (2) between the hours of 7:00 a.m. and 9:00 a.m. and the hours of 4:00 p.m. and 6:00 p.m., Monday through Friday, if located in any other portion of the City.

d) Street. The area of a public street between curblines intended for the movement of traffic exclusive of traffic islands.

e) Street of Major Traffic Importance. A street so designated by the Director pursuant to Section 191.

f) Department Order. An order of the Department of Parking and Traffic issued in writing by the Director after a public hearing.

g) Public Hearing. A hearing held by the Director, open to the public, notice of the time and place of which shall have been published once in the official newspaper of the City and County of San Francisco at least 10 days before the date of such hearing.

h) Traffic Lane. An area of a street not less than 10 feet wide delineated by painted or marked lines, curbs, traffic cones or barricades, and intended for the passage of vehicles in single file, including the curb lanes where all or any portion thereof is forbidden to be used for parking or stopping purposes.

i) Person. A natural person, corporation, partnership, municipal department or other governmental agency. (Amended by Ord. 70-73, App. 2/23/73; Ord. 128-92, App. 5/18/92)

SEC. 191. Director Authorized to Designate Streets of Major Traffic Importance and to Prohibit Obstructions Thereon.

Subject to the provisions of Section 192 the Director, after a public hearing, is authorized by Department order, to designate streets within the City and County of San Francisco which are Streets of Major Traffic Importance and to regulate or prohibit obstructions thereon or therein. In determining whether to designate a street as one of major traffic importance, and in determining the scope of the regulation or prohibition of the obstruction of traffic thereon which he shall order, the Director shall be guided by the volume of traffic upon the street, its importance as a traffic artery, the number of traffic lanes on the street, the effect upon traffic of obstructing it or of partially obstructing it, the availability of other streets for the accommodation of traffic if traffic is obstructed thereon, and the desirability from the point of view of the public interest of keeping it free from obstruction. (Added by Ord. 320-64, App. 11/30/74)

Article 19 – Commercial Parking Program; Sections 600 through 605 may be specifically relevant to this Project. Relevant portions of this Article are reproduced below.

SEC. 600. Legislative Purpose.

This Article is enacted in response to the continuing adverse effects caused to certain commercial and residential-commercial combined neighborhoods of the City and County by motor vehicle congestion. In order to protect and promote the commercial viability of these neighborhoods, it is necessary to provide a mechanism whereby

commercial proprietors in these neighborhoods may increase the availability of parking near their business establishments. (Added by Ord. 143-86, App. 4/25/86)

SEC. 601. Definitions.

a) "Commercial area" or **"**residential-commercial combined area**"** shall mean a contiguous or nearly contiguous area within the City and County containing public streets and highways or parts thereof which is classified by these same terms under the Planning Code.

b) "Director" shall mean the Director of the Department of Parking and Traffic.

c) "Motor vehicle" shall include an automobile, truck, motorcycle or other motor-driven form of transportation not in excess of 6,000 pounds gross weight. (Added by Ord. 143-86, App. 4/25/86; amended by Ord. 128-92, App. 5/18/92)

SEC. 602. Designation of Commercial Parking Areas.

The Director of Parking and Traffic shall consider for designation as parking areas those areas meeting the criteria established in this Article. The Director may designate such areas for parking only if such designation would not interfere with public safety or access to such areas, or with preexisting traffic patterns, as applicable.

In determining whether to make such designation, the Director shall also take into account factors which include but are not limited to the following:

a) The extent of the desire and need of the commercial proprietors of the area for such parking;

b) The extent to which legal on-street parking spaces in the area are presently occupied by motor vehicles; and

c) The extent to which sidewalks may be narrowed and underground utilities relocated in order to expand the area available for on-street parking. (Added by Ord. 143-86, App. 4/25/86; amended by Ord. 128-92, App. 5/18/92)

San Francisco Public Utilities Commission

Purpose and Authority

The San Francisco Public Utilities Commission (SFPUC) is a department of the City and County of San Francisco that provides water, wastewater, and municipal power services to San Francisco. Under contractual agreement with 29 wholesale water agencies, the SFPUC also supplies water to 1.6 million additional customers within three Bay Area counties. The SFPUC system provides four distinct services: Regional Water, Local Water, Clean Water (wastewater collection, treatment and disposal), and Power.

The SFPUC operates the Oceanside Water Pollution Control Plant and the southwest ocean outfall (SWOO) for the discharge of treated wastewater into the Pacific Ocean offshore of San Francisco. These facilities are located within the project area.

San Francisco Zoo

The San Francisco Zoo represents a partnership between the City of San Francisco and the San Francisco Zoological Society, a nonprofit membership organization dedicated to the support of the San Francisco Zoo. A single management structure integrates all areas of animal care, operations, education and public services. The Zoo is governed under the Recreation and Park Commission and a 60-member Board of Directors governs the Society. A Joint Zoo Committee is made up of three members of the Recreation and Park Commission and three members of the Board, which oversees policy and provides a public forum.

The mission of the San Francisco Zoo is to connect people with wildlife, inspire caring for nature and advance conservation action. The Zoological Society's long range plan sets forth four major goals for the Zoo: development of the New Zoo, fostering the Zoo's role in animal conservation and research, improvement of the Zoo's capacity for educating the public about wildlife conservation, and enhancement of the Zoo as a recreational facility.

As a neighbor adjacent to the project area, the SF Zoo would likely be concerned with visitor access and noise issues. The segment of the Great Highway south of Sloat Boulevard provides a through connection to State Route 35 (Skyline Boulevard) near the northern end of Lake Merced. That same segment provides local access for the San Francisco Zoo. Minimizing ambient noise levels from construction equipment by using feasible noise controls will be of particular significance to animals located in the Children's Petting Zoo, African Savanna (including zebras and gorillas), and Avian Conservation Center. Zoo exhibits are located as close as approximately 400 feet from the Great Highway centerline.

CHAPTER 3
Sediment Transport Processes Update

3.1 Introduction

Background

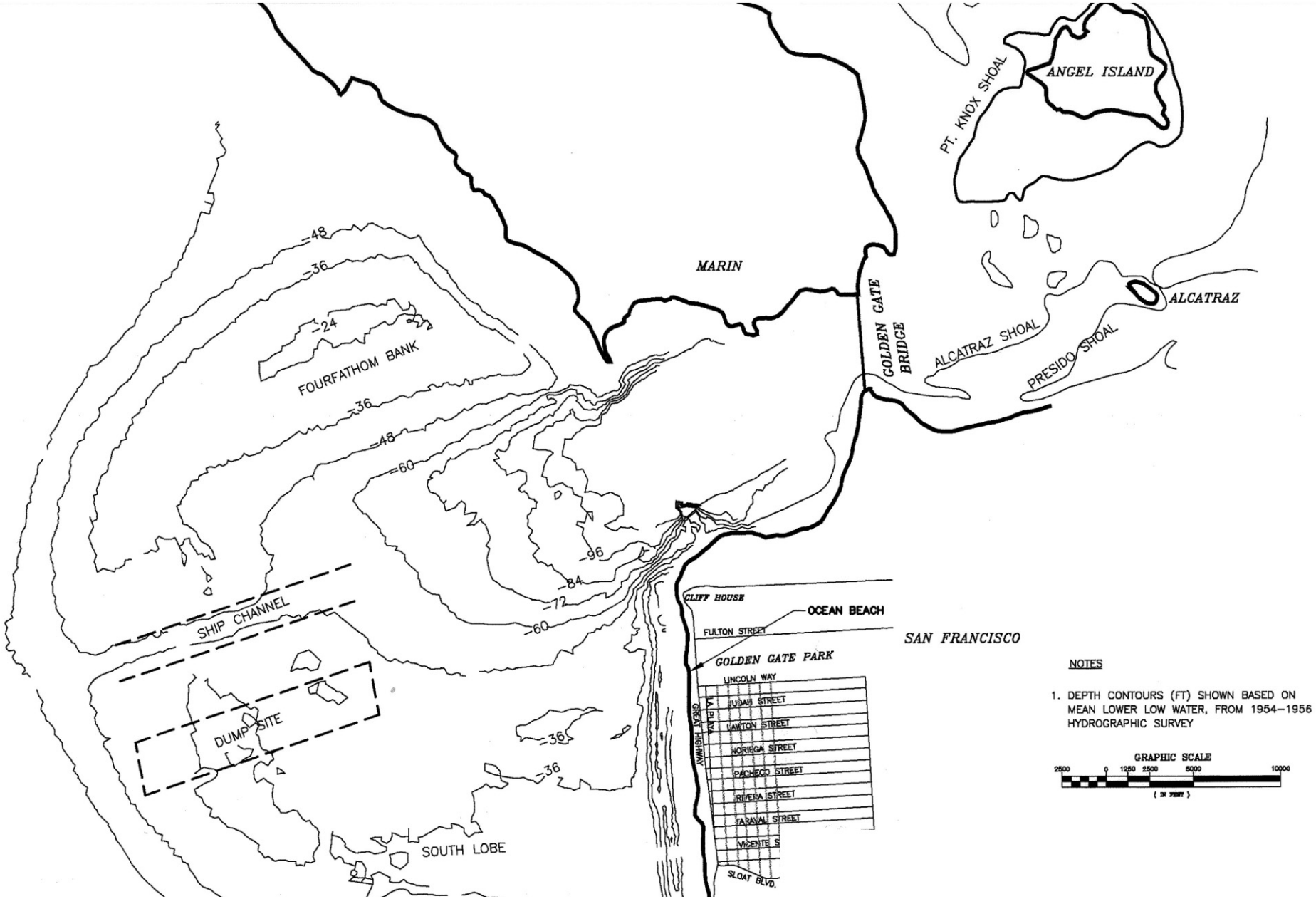
This chapter is a technical update of sediment transport processes for the reach of shoreline between Sloat Blvd and the south end of the South Lot near the Fort Funston bluffs, based on recent events and monitoring data. This reach of shoreline has experienced ongoing erosion and is threatening public infrastructure including 2 parking lots, the Great Highway, and the Merced Transport Box running under the southbound lanes of the Highway. A location map is presented in Figure 3-1, and a vicinity map in Figure 3-2. Figure 3-2 also includes the reaches which are referred to several times in this report. These reaches have already been described in prior studies (M&N 1995, Sand 1995) and are being used for reference purposes in this report.

The purpose of this chapter is to update the database of knowledge that exists for the study area, and to investigate the feasibility of different erosion control measures from a regulatory perspective. The intent is to develop a subset of alternatives that would be acceptable to regulatory agencies from a management policy perspective. Technical analysis is limited to updating relevant data, and determining if the new dataset results in conclusions that are substantially different from those presented in prior studies.

Scope of Work

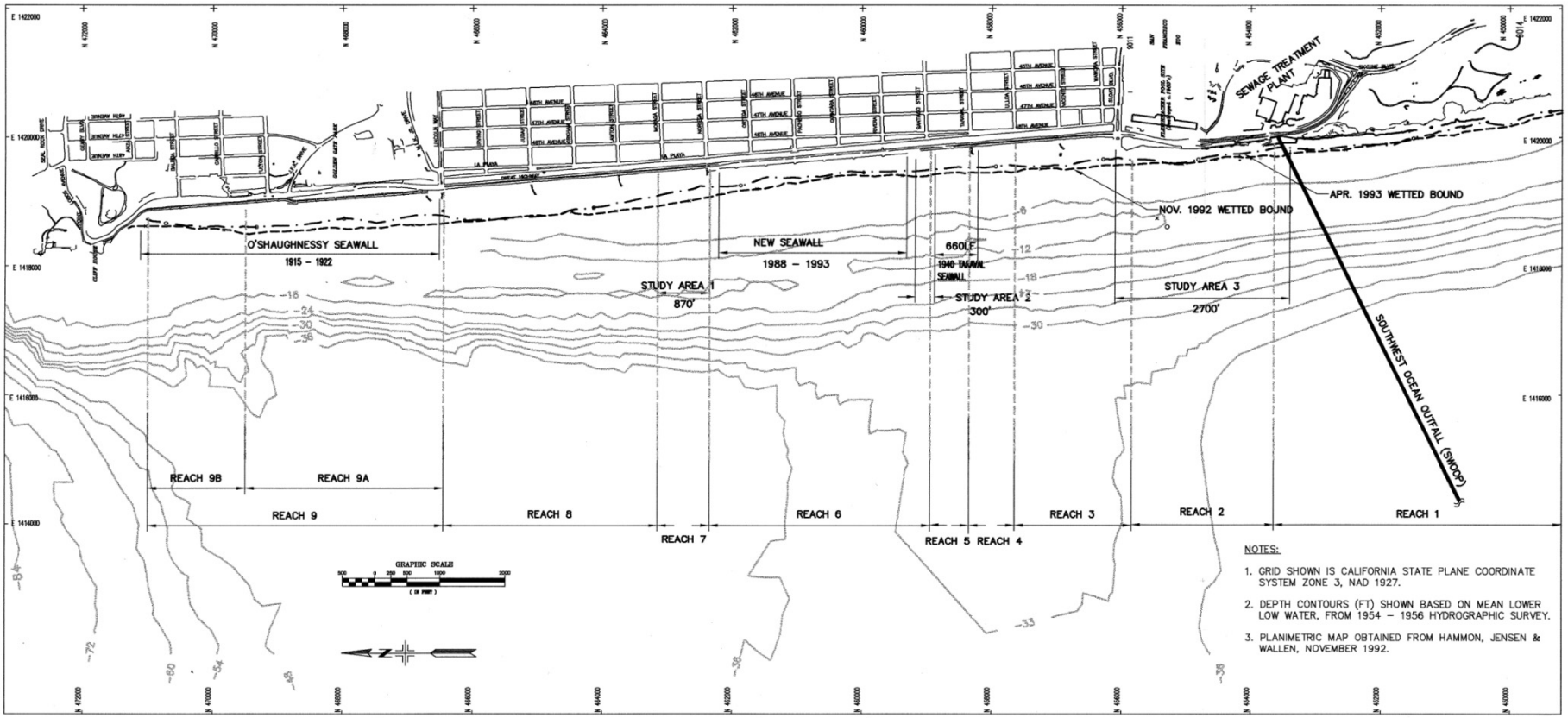
The existing technical data set regarding physical conditions and coastal processes in and around Ocean Beach was updated, using the earlier Moffatt & Nichol study (Moffatt & Nichol, 1995) conducted for the U.S. Army Corps of Engineers (USACE) as the starting point. The following data were reviewed and are summarized in this report:

- Recent beach monitoring and survey reports prepared by CH2M Hill for the CCCSF;
- Recent hydrographic surveys and dredging records pertaining to the SF Bar Channel from USACE;
- Reports of Great Highway sand drift removal and Ocean Beach nourishment operations conducted by DPW;
- Recent USGS survey data for the Bar and for Ocean Beach;



SOURCE: Moffatt and Nichol Engineers

Figure 3-1
Location Map



SOURCE: Moffatt and Nichol Engineers, 1995

Figure 3-2
Vicinity Map

- Sediment transport modeling studies conducted by M&N for the study area, related to the San Francisco International Airport project

An updated bibliography (since 1995) of all reports and technical studies pertaining to sediment transport processes around Ocean Beach is also included.

3.2 Recent History and Events

Erosion-Related Impacts/Observations

This section is primarily from reports completed by CH2M Hill for the City and County of San Francisco (CCSF) as part of monitoring of reaches where erosion control measures were implemented, mostly in response to recent storm events. Specific locations and recent construction activities are shown on Figure 3-3, and the intensity of recent storm events (large waves + high tides) is shown on Figure 3-4.

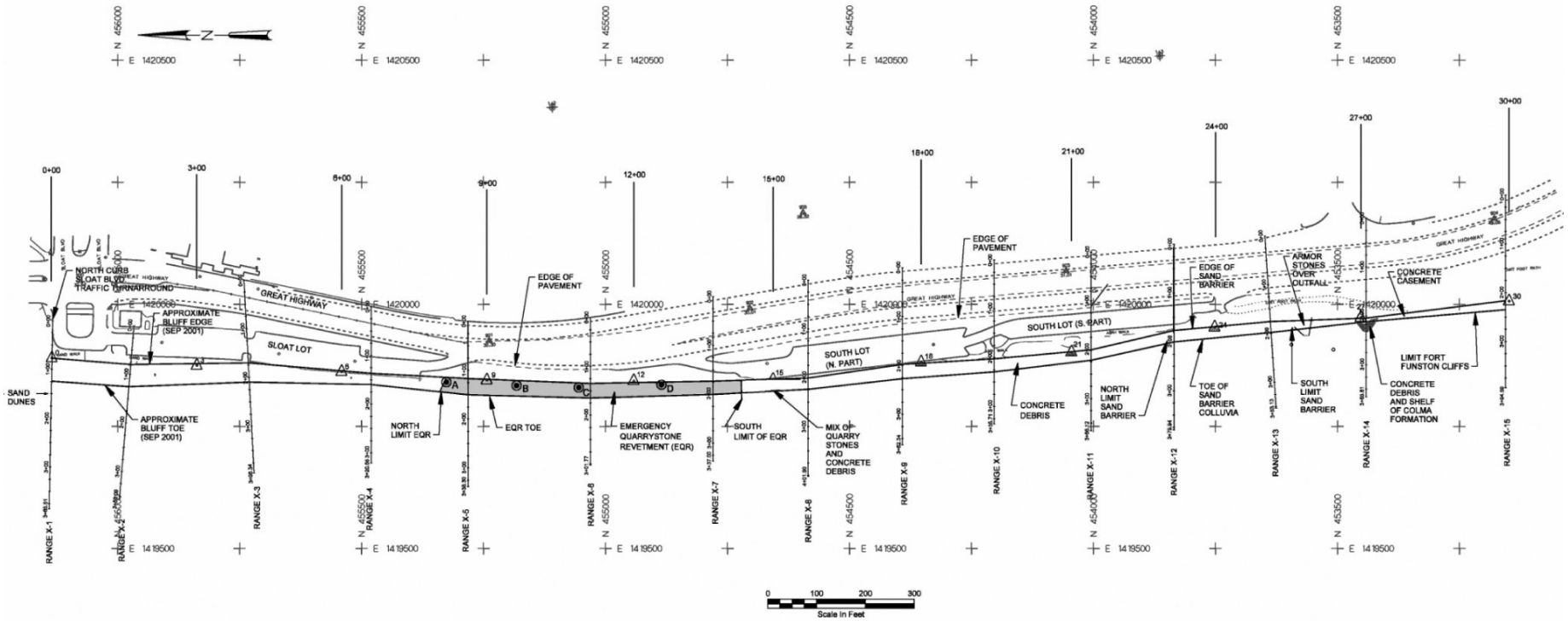
Initial Placement of Toe Protection (1997)

Severe erosion from high tides and waves in the winter of 1994/1995 caused 30 to 40 feet of bluff edge retreat between the two parking lots. In response, CCSF installed two rows of armor stones at the toe of the bluff between the two parking lots in the fall of 1997. This structure was intended to be a very minimal and temporary structure that would provide limited protection from scour at the toe of the bluff for the 1997/1998 storm season.

Emergency Placement of Quarrystone (1997/1998)

During the El Niño storm season of 1997/1998, unusually high waves and tides eroded a large mass of sand from the beach in front of the bluffs and minimal revetment described above. The erosion uncovered concrete debris that had been buried for years beneath the beach and in the fill that had been deposited over the years to form the bluffs. The erosion has also damaged part of the northernmost parking lot (the Sloat Lot). As a result of this erosion and the threat of more storms, CCSF placed additional armor stones, under emergency conditions, directly on top of the minimal revetment and sand along this 600-foot-long section of the bluff.

This temporary revetment—the Emergency Quarrystone Revetment (EQR)—remained intact through the rest of the storm season and has been effective in preventing catastrophic erosion in the area between the two parking lots. However, some erosion has continued due to wave runup on the unprotected bluffs adjacent to the revetment and from surface water runoff from the top of the bluffs. There is also evidence of erosion above the revetment from wave runup and wind-blown spray. The revetment has settled due to displacement of stones along the toe of the structure. The revetment will continue to shift and slump, further reducing its effectiveness for protecting the bluff in future storms.



LEGEND

0+00, 3+00, ...30+00 = DISTANCES MEASURED IN FEET NORTH TO SOUTH ALONG BLUFF OR EAST TO WEST ALONG RANGES

△3 TEMPORARY STATION MARKER, 0,3,6...30 ARE DISTANCES IN 100'S OF FEET FROM 0+00

●1-4 CAMERA LOCATION AND PHOTO I.D. NUMBER

◉A BRASS DISK SET IN TOP OF QUARRYSTONES AT CREST OF EQR

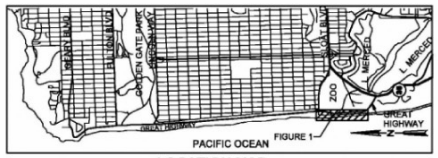
QUARRYSTONE SURVEY MARKERS

I.D.	N	E	EL (SEP 2001)
A	455327.4584	1419840.3132	26.42
B	455182.3222	1419833.5130	23.25
C	455055.3118	1419830.1313	25.06
D	454885.3490	1419835.9562	24.59

TIDAL DATUMS IN FEET MEAN LOWER LOW WATER (MLLW)

HIGHEST RECORDED (BASED ON GOLDEN GATE 1/27/1985)	9.0 FT
MEAN HIGHER HIGH WATER	6.0 FT
MEAN HIGH WATER	5.3 FT
MEAN TIDE LEVEL	3.2 FT
MEAN LOW WATER	1.1 FT
MEAN LOWER LOW WATER	0.0 FT
LOWEST RECORDED TIDE (GOLDEN GATE)	-2.7 FT

OTHER DATUMS:
0.0 NGVD29 = 3.04 FT MLLW
0.0 CITY DATUM = 11.66 FT. MLLW



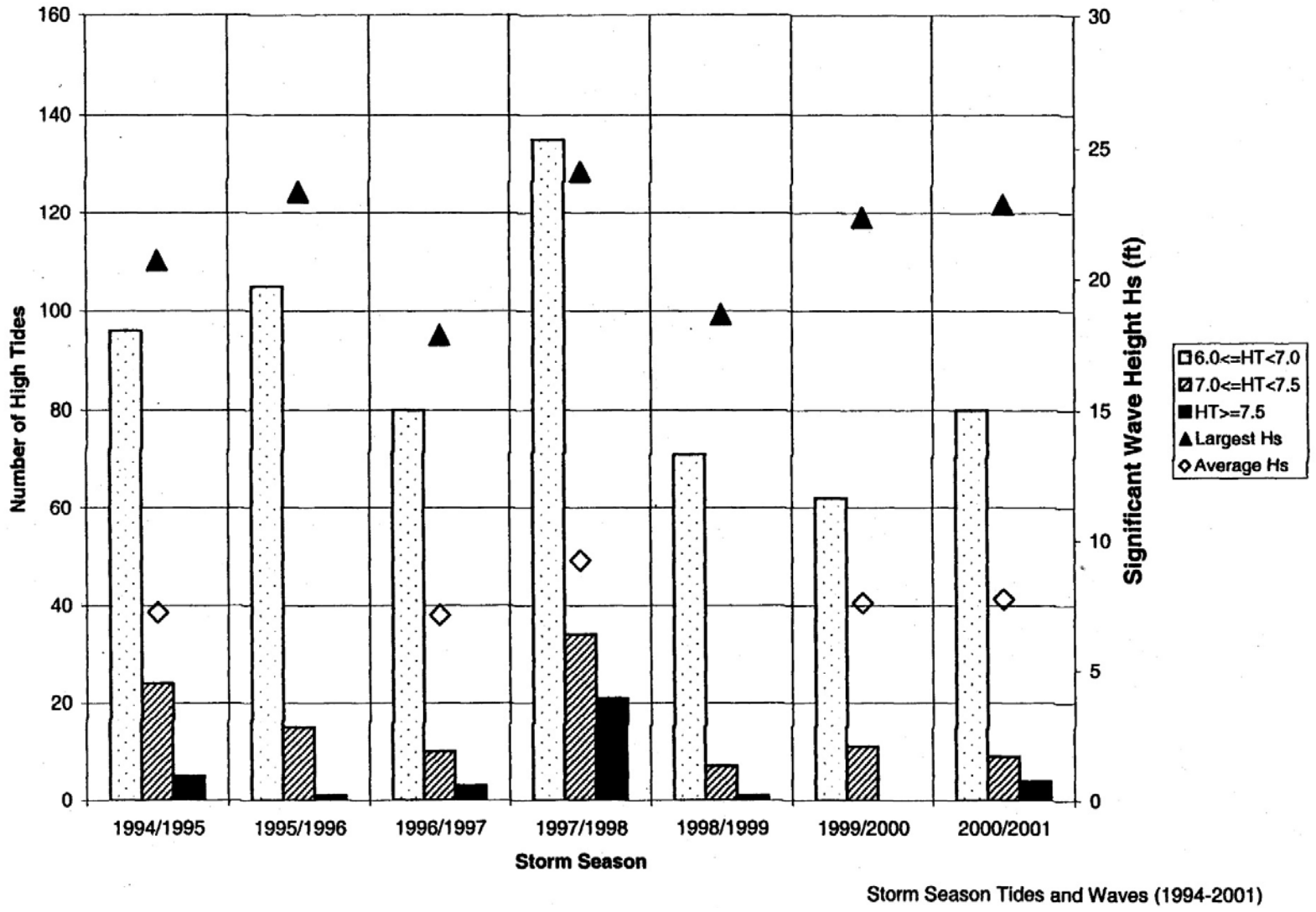
LOCATION MAP
APPROX SCALE 0 FT 4000

GRID COORDINATES ARE BASED ON CALIFORNIA COORDINATE SYSTEM, ZONE 3 NAD 27.

ELEVATIONS IN FEET - MLLW

SOURCE: CH2M Hill, 2001

Figure 3-3
Study Area/Recent Construction



SOURCE: CH2M Hill, 2001

Figure 3-4

Recent Water Level and Wave Climate Data

Because placement of the additional stone was under emergency conditions and access to the beach was impossible, the *existing revetment does not meet coastal engineering design standards*. The revetment will experience a faster rate of degradation than an engineered structure and will require maintenance, as dictated by changing conditions at the site.

In response to continuing recession of the bluff top with increasing potential for the Great Highway to be affected, CCSF constructed new southbound lanes in the center median in the reach south of the South Lot. Traffic has not yet been diverted.

TABLE 3-1

TIMELINE OF RECENT EVENTS

1994/1995 Storm Season	The bluff edge retreated 30 to 40 feet between the two parking lots, and somewhat less elsewhere in the reach south of Sloat Blvd.
1996/1997 Storm Season	Precipitation runoff and wave action formed numerous erosion gullies in the bluff face. In March 1997, one storm formed a gully extending to the beach that eroded the bluff to within 15 feet of the highway in the area between the two parking lots
Fall 1997	Toe protection (quarrystone) placed between the 2 parking lots as an interim measure to protect the bluff against storms.
1997/1998 Storm Season	Loss of sand from the beach south of Sloat Blvd. resulted in extensive erosion of the bluffs. In some areas, beach elevations were lowered 10-15 feet compared to their summer/early fall elevations. The bluff edge retreated up to 30 feet in the unprotected areas at the south end of Sloat Lot. Emergency Quarrystone Revetment placed in February 1998 between the 2 parking lots in response to the large storms. The bluff edge protected by the EQR retreated only 2-6 feet in localized areas between the two parking lots. Along the South Lot, bluff edges retreated 0-16 feet and there was an overall over-steepening of the bluff slope, making it likely that future wave undercutting would result in more extensive bluff erosion.
1998/1999 Storm Season	The bluff edge retreated approximately 50 feet in places along the section of beach from the south end of South Lot to Funston Cliffs. Bluff slopes have been over-steepened along the entire reach and are more susceptible to slope failure and wave undercutting. Bluff slopes above the toe are 40 to 70 degrees or more. The slope of the face of the bluff south of South Lot was nearly vertical in places following the erosion in early 1999
October 1999	Approximately 20,000 cubic yards of sand placed along a 370-foot-long reach of the bluffs south of South Lot to form a temporary sand barrier
January 2001	12,000 CY of sand placed at the sand barrier again, in response to a loss of almost half of the sand between Oct '99 and Apr '00
2000/2001 Storm Season	All of the sand placed in Jan 2001, plus about 17 feet of the original sand barrier eroded away. The bluff south of the barrier eroded back by 7 to 13 feet.

Continuing Damage to Parking Lots

Erosion in front of the two parking lots has continued, resulting in undercutting of the pavement, loss of parking spaces along the western edge of the lots, and will eventually result in closure of

both lots. Erosion of the lots has resulted in the deposition of asphalt and concrete debris onto the beach, both from the parking lots themselves, and from the fill on which the parking lots were constructed. This is particularly the case in front of South Lot, where the erosion has resulted in a layer of concrete debris on the beach and lower part of the bluff face. The erosion has also exposed additional debris under the parking lot that will eventually fall onto the beach with further bluff-slope erosion.

Sand Placement South of South Lot (October 1999)

The most recent action taken was the placement of approximately 20,000 cubic yards of sand along a 370-foot-long reach of the bluffs south of South Lot to form a temporary sand barrier in October 1999. This was done in response to erosion during the 1998/99 storm season that resulted in loss of bluffs fronting the Great Highway, uncovering of a number of steel H-piles, and exposure of the steel sheet piles and a rock protective layer covering a portion of CCSF's Southwest Ocean Outfall. The erosion created over-steepened bluffs that were approximately 25 feet high, with the top edge of the bluff less than 30 feet from the edge of the Great Highway.

Observations from March 2000 (CH2M Hill, 2000)

Beach Observations

Wave runup and breaking waves are reaching the toe of the bluff at a much greater frequency, especially during the winter, when the beach profile is at its lowest and waves generated by storms are larger. The beach profile is decreasing in elevation each successive year, greatly reducing the beach width at the site. Beach width, defined as the distance from the bluff toe to elevation 6 feet MLLW, is less than 200 feet (60-146 ft. in April 1996), which is conducive to continued bluff slope erosion from wave runup.

Depth contours on USACE 1993 topographic drawings showed an indention of nearshore depth contours offshore of the existing temporary revetment, forming an embayment that allows larger waves to break closer to shore. Seasonal changes in the embayment are not known. Observations following the 1997/1998 storm season indicate that this embayment may be continuing to form and move shoreward.

Erosion south of South Lot in 1999 was also accompanied by the formation of a rip embayment centered over the ocean outfall that allowed larger waves to break in closer to shore.

Rebuilding of the natural beach could resume, but is not likely for another 7-10 years based on limited historical data that suggest there could be a long-period cyclical pattern to beach changes. (It should be noted that the suggestion of a long-term cyclical pattern of beach rebuilding is based on limited data, and there is no guarantee that this will happen.)

Bluff Observations

The unprotected portions of the bluff continue to be eroded by waves. In general, the bluffs have been over-steepened due to erosion at the toe, making them more susceptible to slope failure.

Erosion of the bluffs fronting the parking lots has resulted in collapse of the western portions of the lots, with asphalt falling onto the beach and subsequent loss of a number of parking spaces. CCSF had closed both lots in response to this.

Erosion near the top is evident from the formation of erosional gullies in the top of the bluff in areas that water tends to accumulate and pond. In March 1997, one storm formed a gully that eroded up to approximately 15 feet farther into the bluff, reaching a point less than 15 feet from the Great Highway. CCSF filled this gully with rock and gravel and has not seen any further erosion since that time. However, additional gullies have formed in other locations in subsequent storms.

Additional Data

Discussions with CCSF staff also revealed the following activities which are relevant to the study area.

2003 : About 23,000 CY of material was excavated in front of the seawall promenade (Noriega to Santiago) and placed on the sand barrier, near the SWOOP outfall. The excavation extends about 25 feet in front of the seawall, within CCSF property

2004 : About 15,000 CY of material excavated in front of the seawall promenade and placed on the sand barrier

The 1995 M&N study included volume of material dredged from the Bar Channel up to 1994. The volume and frequency of material dredged from the SF Bar Channel between 1995 and 2002, and available information on the amount of sand mined at the flood shoals within SF Bay (Presidio, Pt Knox, Middleground, and Alcatraz shoals) is presented below.

TABLE 3-2

VOLUME OF DREDGING AT SF BAR CHANNEL AND SAND MINED AT FLOOD SHOALS

Year	Volume of Dredging As Reported (CY)	Volume of Sand Mined at Flood Shoals As Reported (CY)
1995	295,000	Presidio: 153,000 ; Pt Knox 46,000
1996	1,009,000	Unknown
1997	480,800	Unknown
1998	393,800	Presidio 671,000 ; Pt Knox 245,000 ; Middleground 332,000
1999	270,000	Presidio 586,000 ; Pt Knox 334,000 ; Middleground 397,000; Alcatraz 88,000
2000	667,000	Presidio 644,000 ; Pt Knox 304,000 ; Middleground 359,000; Alcatraz 173,000
2001	78,000	Unknown
2002	300,000	Unknown

In addition to the above dredging and mining, dredging occurred also at the San Francisco Marina as listed below.

Year	Volume
2000	1,300 CY
2001	14,000 CY
2002	0
2003	0
2004	25,000 CY

Ongoing Monitoring

City and County of San Francisco

CCSF has been performing routine maintenance annually or as required, depending primarily on the changes that occurred during the previous winter storm season. Activities involve placement of additional stone in the face of the EQR to repair slumping in the revetment and replacing stones displaced during storms. Stones are also placed to fill in erosion gullies and eroded areas adjacent to both ends of the EQR. Additional sand is being placed to rebuild the existing sand barrier south of South Lot. These routine maintenance items help ensure that the shoreline is adequately protected in the protected areas until a long-term erosion control strategy can be implemented for the area.

Response to Critical Erosion Events

The CH2M Hill report (CH2M Hill, 2000) describes the need for monitoring activities and presents certain trigger points when action by CCSF may need to be initiated. The following is an excerpt:

> "The City will respond to critical erosion events that threaten the highway or other infrastructure underneath the highway, but will not protect the existing parking lots from further erosion unless the erosion reaches a trigger point, as discussed below. The City may install additional temporary shore protection and/or repair existing temporary structures to prevent further erosion of the bluff that threatens the highway or other infrastructure. This additional temporary protection could be anywhere in the monitoring area. …The extent of allowable erosion is discussed along with action required to mitigate further retreat of the shoreline."

A critical change is one in which action must be taken to prevent potential damage to the Great Highway or other infrastructure either during the wave event causing the erosion or prior to the next storm or high tide. In most cases, a critical change will result from the following events:

- Erosion of the bluff slopes
- Damage to EQR
- Erosion of the sand barrier
- Erosion at or near the north and south ends of the EQR
- Erosion gullies in bluff slopes"

US Geological Survey

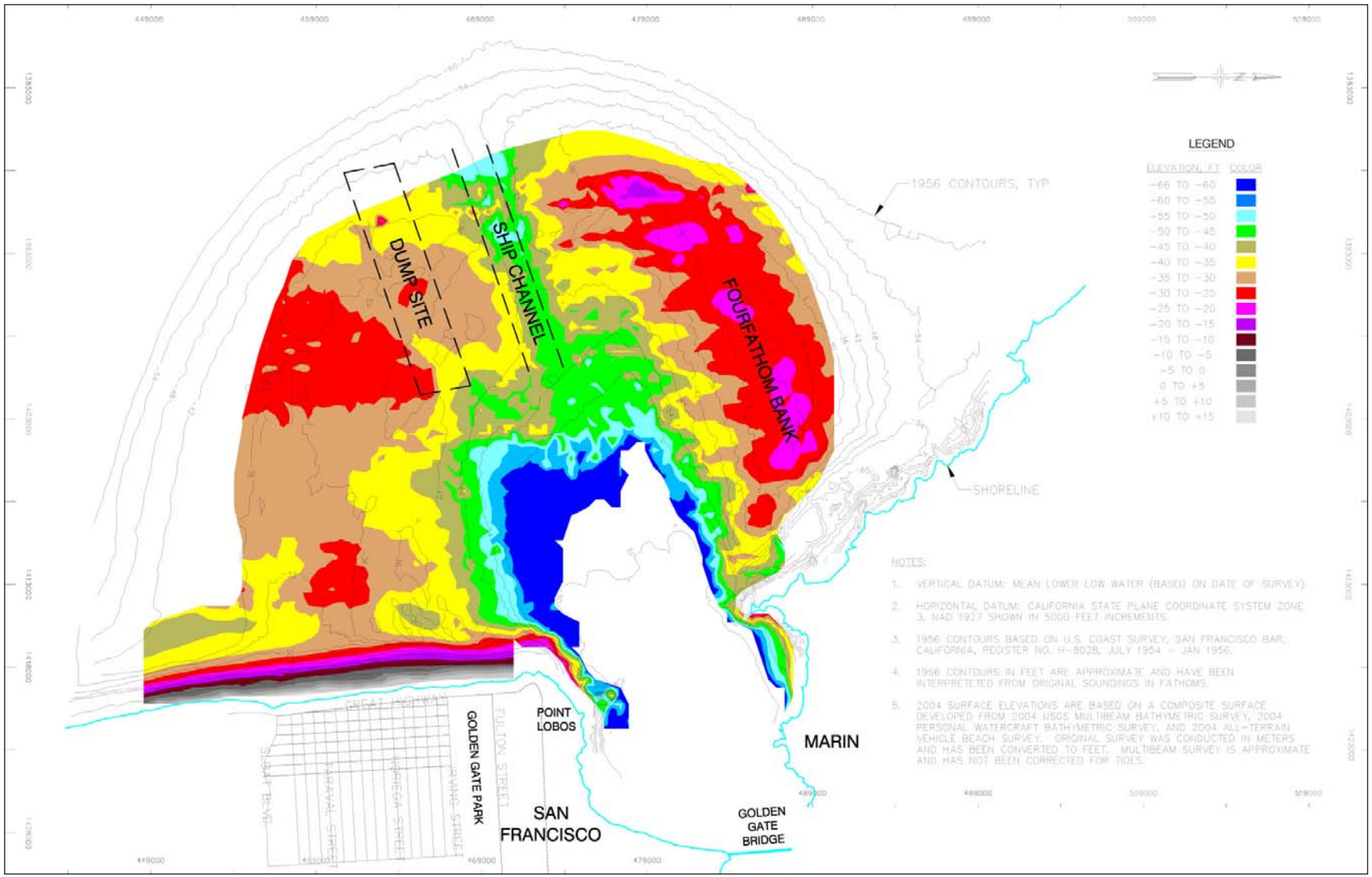
One of the most significant new datasets has been a multibeam bathymetric survey of the SF Bar, and profiles through the surf zone, by the USGS in 2004. The USGS has been monitoring Ocean Beach, including changes in shoreline location, nearshore bathymetry, and sediment grain size since 2004. These activities are described in more detail in the next section. A preliminary composite survey from the 2004 survey activities is shown on Figure 3-5. The limit of the Bar from the 1956 survey is shown in the background to serve as a reference. It should be noted that the survey is very preliminary, and is unadjusted for tides as of the time of this report. A mean tide correction has been applied by USGS, therefore the potential error in elevations could be as large as 4 feet. The survey is reproduced here primarily because it serves as an indicator, preliminary as it may be, of changes and trends that have occurred since 1956 (date of last USGS survey).

3.3 Sediment Transport Processes and Shoreline Changes

Summary of Recent Relevant Studies

Sediment transport studies conducted to date for Ocean Beach and vicinity have been mostly qualitative, primarily because of the complexities in tidal processes and high-energy wave climate, man-induced activities, and the episodic nature of transport patterns. In addition, the economic justification for long-term data collection and monitoring efforts did not exist because erosion-related issues were mostly minor in nature. Studies conducted to date have been a result of large civil works projects (such as the Westside Sewer Transport and the Southwest Ocean Outfall), as well as recent erosion of shoreline/bluffs in the area near the San Francisco Zoo which threaten existing infrastructure including the Great Highway and the Merced Sewer Transport Box.

The body of knowledge has grown substantially since the late 1970s based on studies related to the outfalls and transport boxes (Johnson, Woodward Clyde, CCSF), recent erosion near the 2 parking lots south of Sloat (CCSF, CH2M Hill, Moffatt & Nichol, USACE), and dredging of the Bar Channel (ADEC 2001). Recent monitoring activities by CCSF were discussed in Section 3.2, and the older outfall related studies were reviewed and summarized in USACE/M&N studies. A brief summary of four studies from the 1995-96 period, including the more recent ADEC study (related to San Francisco Airport related dredging), is presented below. Implications to these findings based on recent data collection efforts by USGS is provided in the next section.



SOURCE: Moffatt and Nichol Engineers

Figure 3-5

Unadjusted Bathymetry of Study Area - USGS 2004

Moffatt & Nichol Study (1995)

A sediment budget for the study area (approximately Bolinas to Fort Funston, and flood and ebb tide shoals) was postulated in the study, and used in the Storm Damage Study (USACE 1996) to develop alternatives for erosion protection in the area south of Sloat. The data used in preparing this budget were shoreline surveys and photographs, hydrographic surveys of the ebb tide shoal, and a comprehensive literature survey including local knowledge.

Although shoreline and bathymetry data were limited to Ocean Beach (from the Cliff House south to the Fort Funston bluffs) and the SF Bar, it was recognized that the littoral cell extended farther north and south as well as into SF Bay. Mineralogy studies by Moore, Cherry, Wilde, Yancey, Sayles and Kamel support the hypothesis that Duxbury Pt near Bolinas and Pt San Pedro in Pacifica are approximately the limits of littoral movement (Bolinas Bay and San Francisco Cells) which affect the study area. Little, if any, sediment is transported beyond these points, and littoral transport was only of local importance within this area. Within this area, large amounts of sand move episodically in response to storms from the northwest through southwest directions.

The morphology of the SF Bar influences wave refraction which has a direct relationship with the morphology of Ocean Beach. The study correlated historic changes to shoreline position to Bar morphology (location and dimensions). However, man-induced activities in the system mask the natural cause and effect relationship. Significant findings from the study were:

- In general, a net northward littoral transport pattern was hypothesized for Ocean Beach, based on shoreline change data and a timeline of beach nourishment practices. This was supported by limited deterministic wave analysis conducted for the SWOO project and for the Storm Damage Reduction study.

- The Bar morphology is integrally linked to Ocean Beach shoreline location, as evidenced from ongoing shoreline recession/beach nourishment practices when the Bar dredging project dumped material offshore of the Bar. Since ca. 1971 dredged material is being placed on the south lobe of the Bar and shoreline recession, along with the need for beach nourishment in most areas has decreased substantially.

- The long-term shoreline position in the reach south of the South Lot (Reach 1) is less influenced by the Bar, and more by cross shore transport and by the bluffs which serve as a source of sand to the beaches. A long term erosional trend was found for this reach. Alongshore transport also exists in response to storms (for example south swells in summer), but the material is transient and moves quickly away either north or south. Material moving southwards from Ocean Beach does not remain in this reach.

- The reach between Sloat and the southerly extent of the South Lot (Reach 2 in study) is subject to reversals in transport direction based on wave climate, and the shoreline is fluctuating about a mean position. Aerial photo analysis between 1938 and 1992 confirmed this finding.

- Net transport over the south lobe of the Bar is towards Ocean Beach, net transport over Fourfathom Bank is along the crest, towards the Gate. Transport between SF Bay and the Bar is seasonal and storm influenced, but is an important component of the overall budget.

- Reduction in tidal prism and sediment supply from the Sierras has caused a radial shrinking of the Bar towards the Gate between the late 1800's and 1950's. The flood tidal channel along Ocean Beach (South Channel) became shallower due to the larger tidal exchange through the dredged channel.

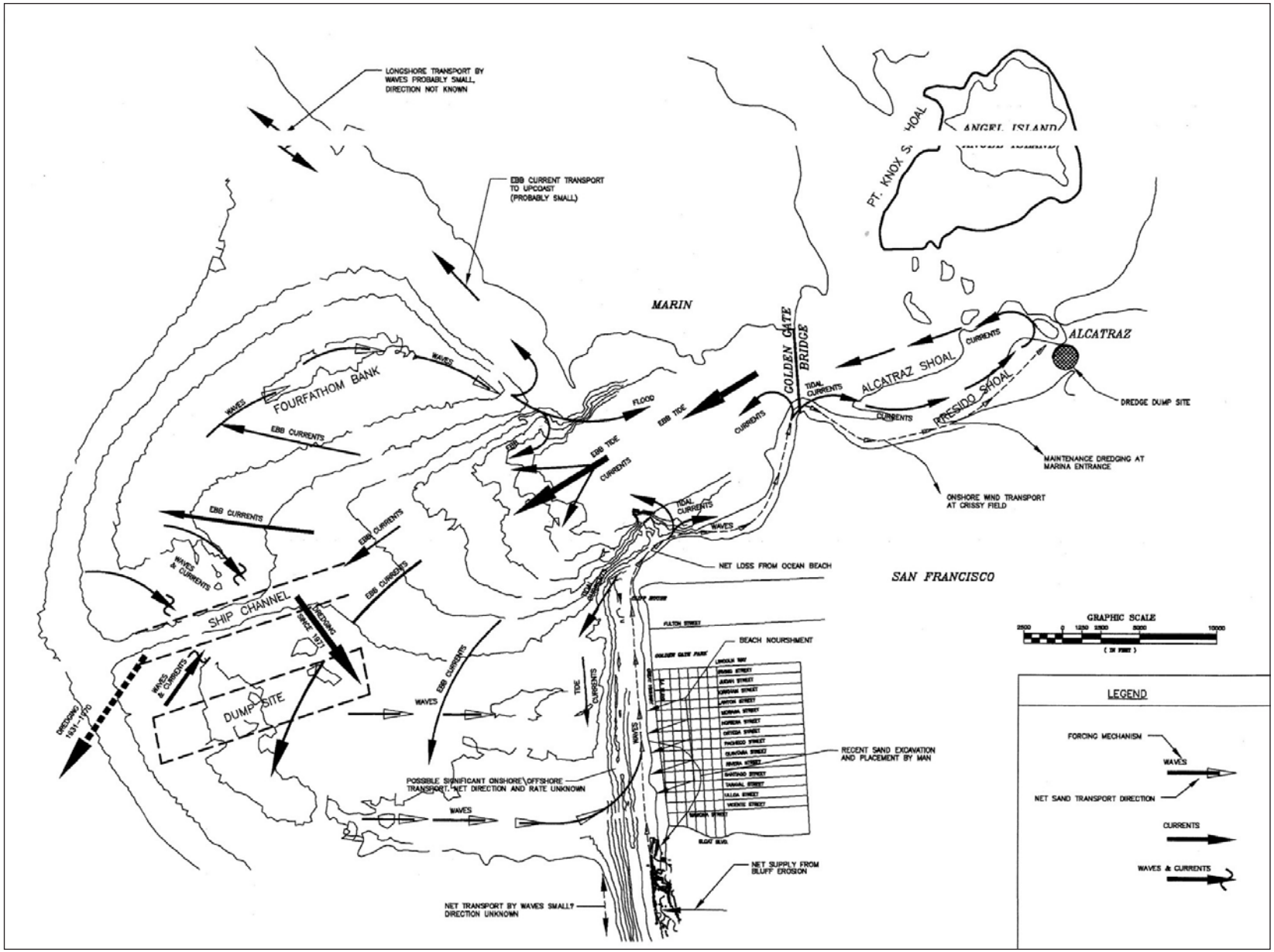
Net transport processes were described graphically, and a sediment budget was prepared for the study area. The net transport schematic is reproduced in Figure 3-6.

U.S. Army Corps of Engineers Storm Damage Reduction Feasibility Study (1996)

The San Francisco District conducted numerical simulations of long-term shoreline changes at Ocean Beach using GENESIS (alongshore transport) and SBEACH (cross-shore transport). The focus of the study was on three specific study reaches (Moraga to Noriega, south end of the new seawall near Santiago, and Sloat to the Ft Funston bluffs).

Due to the inherent complexities in bathymetry, wave transformation, and influence of large episodic storm events on long-term shoreline location, the GENESIS model could not simulate processes well at the southern end of the study area (near Sloat Blvd) and the M&N study described above was used to indicate shoreline trends and sediment budget.

Storm induced response of the beach was simulated using the SBEACH 3.0 numerical model. Based on results of the modeling runs and a statistical analysis of several simulations over a 50-year project life, the rate of erosion for the two reaches north of Sloat was not projected to be high enough to warrant Federal interest in storm damage reduction. The reach south of Sloat had a significant rate of erosion which would threaten public facilities including the parking lot, Merced Transport Box, and the Oceanside Treatment Plant in addition to loss of recreational opportunities and environmental damage. Under the assumption that no erosion control measures are implemented until the parking lots erode, the probability that the Merced Transport Box would be damaged varied from 15% to 22% (annual probability) depending on when protection is installed. The probability of road closure was significantly higher. The mean time until the sewer box, road, and parking lot were damaged varied from 1 year to 6 years (again, depending on when protection is installed). If no storm damage reduction was implemented at all, the parking lots, road and sewer would erode until the erosion ultimately reached the treatment plant (in about 67 years). A low seawall similar to the Taraval seawall was recommended, but it did not receive a favorable review from GGNRA and consequently CCSF. The Feasibility Study was therefore terminated in 1996. Results of the modeling / dune retreat analysis are reproduced below for informational purposes.



SOURCE: Moffatt and Nichol Engineers

Figure 3-6

Transport Processes - Shchematic Patterns

TABLE 3-3

RESULTS OF DUNE RETREAT MODELING

No Action **until Following Condition Is Reached**	**Probability of Damage to Merced Transport Box**	**Probability of Bluff Edge Eroding to Great Highway**	**Mean Time until This Occurs**
Half the lots have eroded (20' recession)	15%	36%	1 year
Lots completely eroded (65' recession)	22%	100%	3 yrs
Lots, road, and sewer eroded (104' recession)	100%	100%	6 yrs
Erosion reaches Oceanside WPCP (200' recession)	100%	100%	67 yrs

CH2M Hill Study (1996)

CCSF sanctioned this study for the area south of Sloat to investigate the feasibility of implementing shoreline protection for critical areas in the near-term, to prepare an Emergency Response Plan which would address future erosion, and to formulate long-term solutions for this area.

The data and findings from the M&N and USACE studies, supplemented with beach profiles from 1995 and 1996 and an analysis of dune retreat, were used to formulate alternatives for immediate as well as long-term shoreline protection. Projected future dune profiles were prepared, and the probability of damage to the Great Highway was estimated. It was estimated that there was a 50% chance that the bluff edge would reach the southbound edge of the Great Highway within 10 years if the bluff were left unprotected. There was also a 16% chance that the bluff toe would be inland of the Merced Transport Box.

The recommendation for the immediate term was to place toe protection (using quarry stone) between the 2 parking lots, and to monitor performance as well as ongoing erosion north and south of the new structure. A timeline of events and observations between 1996 and 2001 were described in Section 3.2.

ADEC Study (2001)

The study was conducted to assess the feasibility of deepening the Bar Channel and using the dredged material for construction purposes. Hydrodynamics, waves, and sediment transport for existing conditions were simulated using sophisticated two-dimensional numerical models to establish baseline conditions. This modeling effort was the first of its kind for the study area.

In the absence of recent bathymetry, the 1954-56 bathymetry was utilized and several combinations of wave heights/periods/direction bands were simulated for a mean tide range to characterize average annual transport patterns. Due to the lack of calibration data and inherent complexity of the system, the sediment transport simulations should be viewed with some judgment, but they do provide an overall estimate of transport rates and directions. Existing

shoaling patterns within the footprint of the Bar Channel were obtained by comparing pre- and post-dredge surveys from 1999. The shoaling pattern is shown on Figure 3-7, which indicates transport from Fourfathom Bank to the northwest portion of the ship channel.

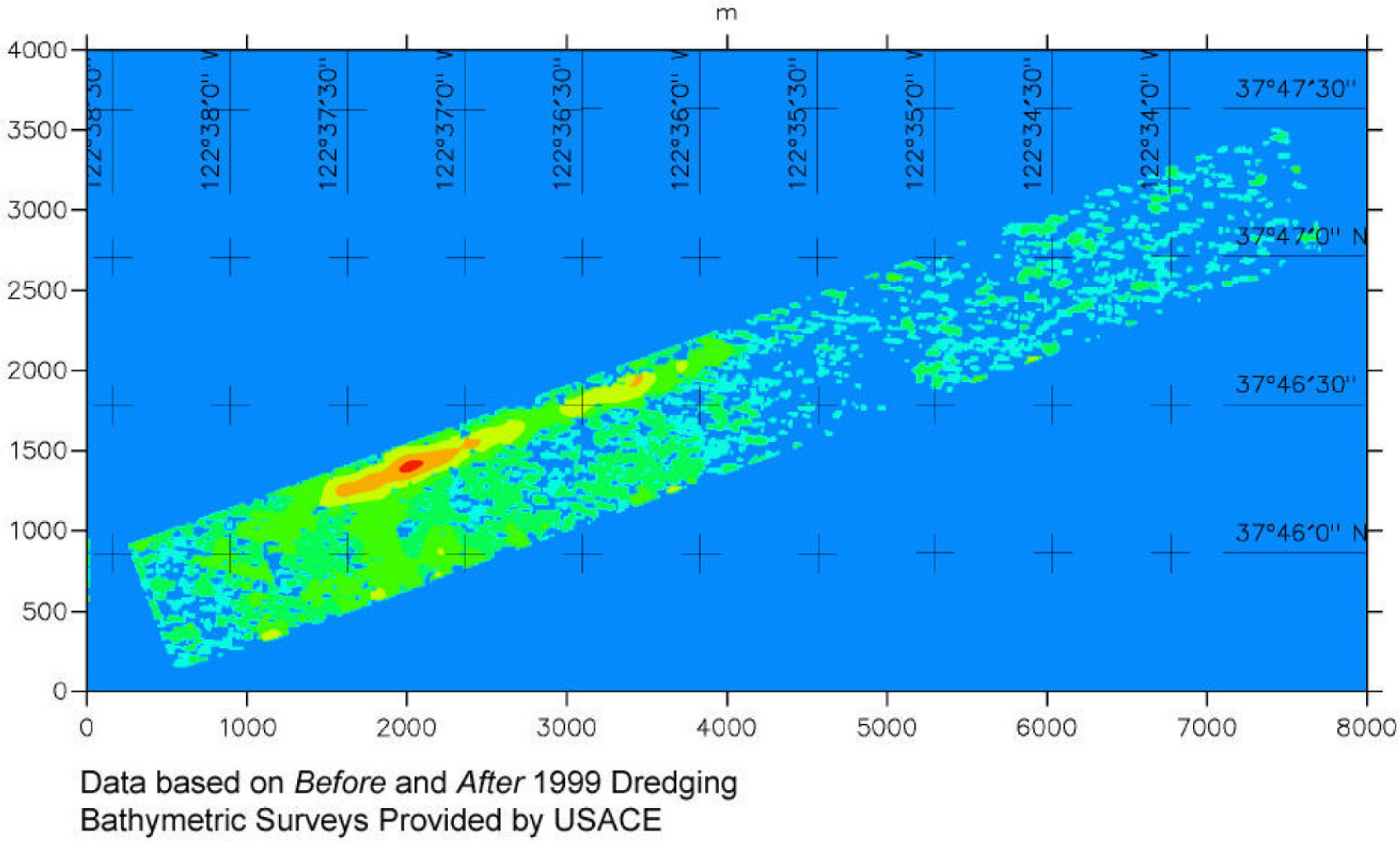
Wave transformation, using USACE's Pacific Coast Wave Information Studies (WIS) database to generate offshore boundary conditions, was simulated for 42 combinations of height, period, and direction. This captured about 84% of the wave climate (waves from west through northwest directions, 5 sec to 14.5 sec periods, 1.6 ft to 18 ft wave heights) with the balance either being local seas (small wave heights, short periods) or infrequent directions (about 5% occurrence).

Modeling results for wave transformation for a significant wave height of 2.5 m at 11.2 sec from the west, west-northwest, and northwest directions are shown on Figure 3-8. Transformation from deeper water farther west is not shown, but modeling extended beyond the Farallon Islands. Wave amplification, particularly in the reach between Noriega and Santiago for west waves is visible in the left panel. The wave vectors on all 3 panels show significant refraction, such that the energy flux is in a northerly direction along Ocean Beach even for northwest waves.

Radiation stresses from the wave simulations were combined with a mean tide to simulate wave + tide induced hydrodynamics. Results for a snapshot in time (peak flood and peak ebb at the Gate) are shown on Figures 3-9 and 3-10. Patterns are complex and flow reversals occur, particularly in the flood channels (Bonita Channel and South Channel near Seal Rocks).

The combined hydrodynamic model (wave induced stresses + tidal currents) was used to drive the sand transport model. The 42 individual simulations were statistically combined using percent occurrence of waves to develop a net annual transport pattern shown on Figure 3-11. A shoaling rate of about 400,000 CY/year was estimated for the Bar Channel footprint. This is close to the annual maintenance dredging volume for the channel, which indicated that the model was reproducing reasonably accurate conditions at least in the vicinity of the channel which was the area of emphasis for the study.

Along Fourfathom Bank, transport was in an easterly direction towards Pt Bonita and Bonita Channel. The transport rate was estimated to be about 82,000 CY/yr. Along the south lobe of the Bar, transport was generally in a south easterly direction (off the crest of Bar). A transport rate of about 100,000 CY/yr was estimated. Although the vectors along Ocean Beach are in a southerly direction, they are in water depths greater than 15 feet. It is uncertain if flood currents along Ocean Beach reverse this transport in shallower depths and cause northerly movement of sediment. Also, since a mean tide cycle was used and waves from a southerly direction were not included, the results may be weighted more towards a southerly transport direction along Ocean Beach. Large summer swells and strong flood currents periodically produce significant northerly transport along Ocean Beach.

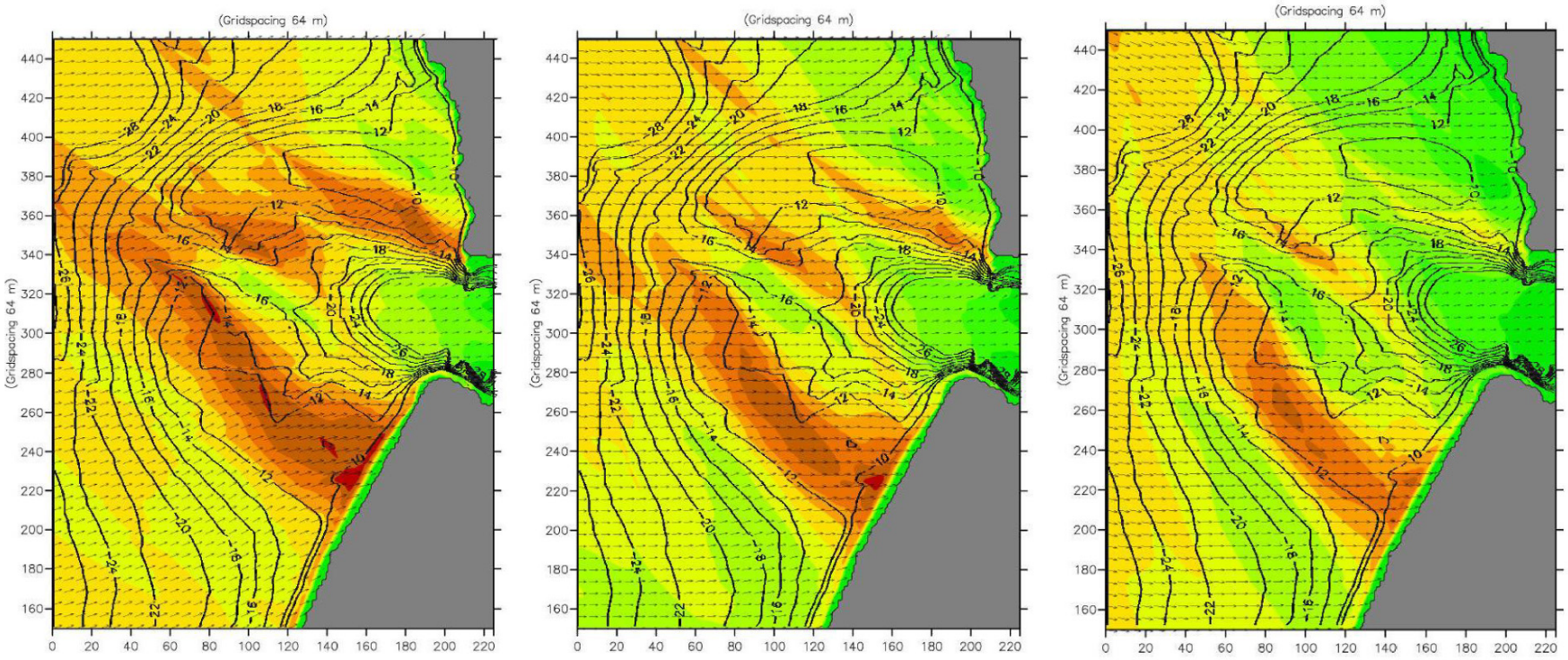


Data based on *Before* and *After* 1999 Dredging Bathymetric Surveys Provided by USACE

SOURCE: Moffatt and Nichol Engineers

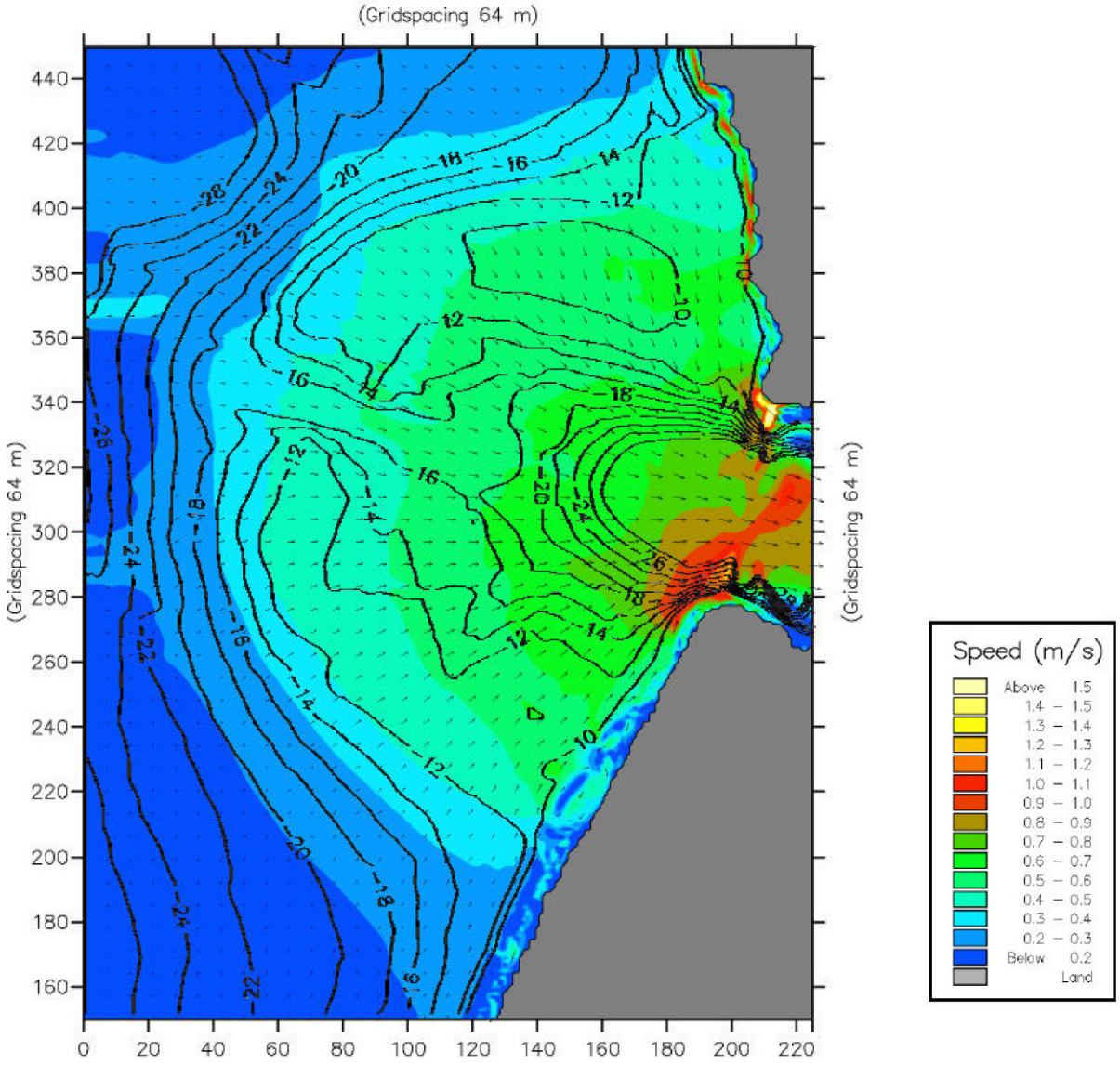
Figure 3-7

SF Bar Channel - Shoaling Patterns



SOURCE: Moffatt and Nichol Engineers

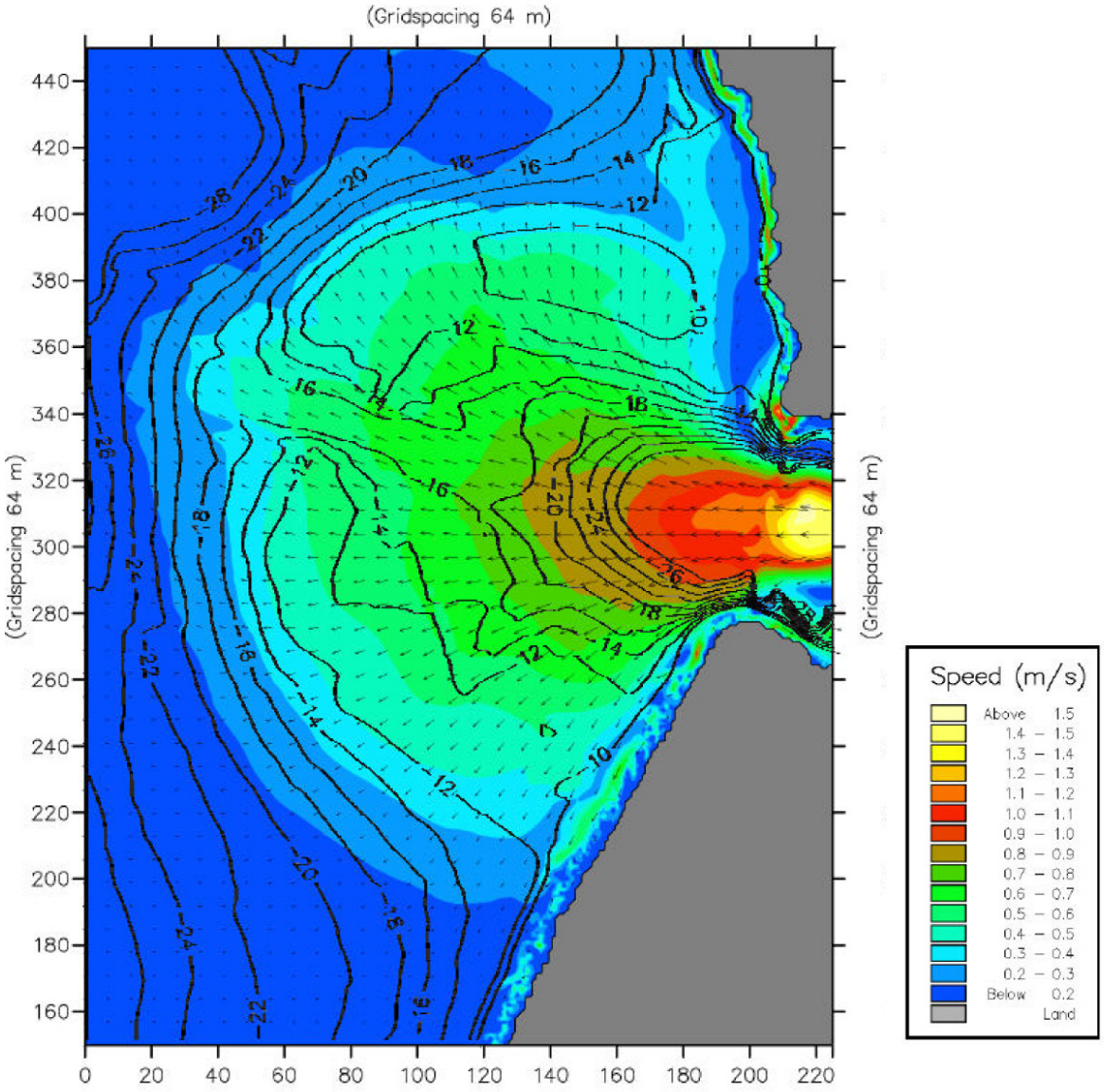
Figure 3-8
Wave Transformation in Study Area



For 2.5m wave height, 11.2s, 270^0
Contours in meters

SOURCE: ADEC, 2002

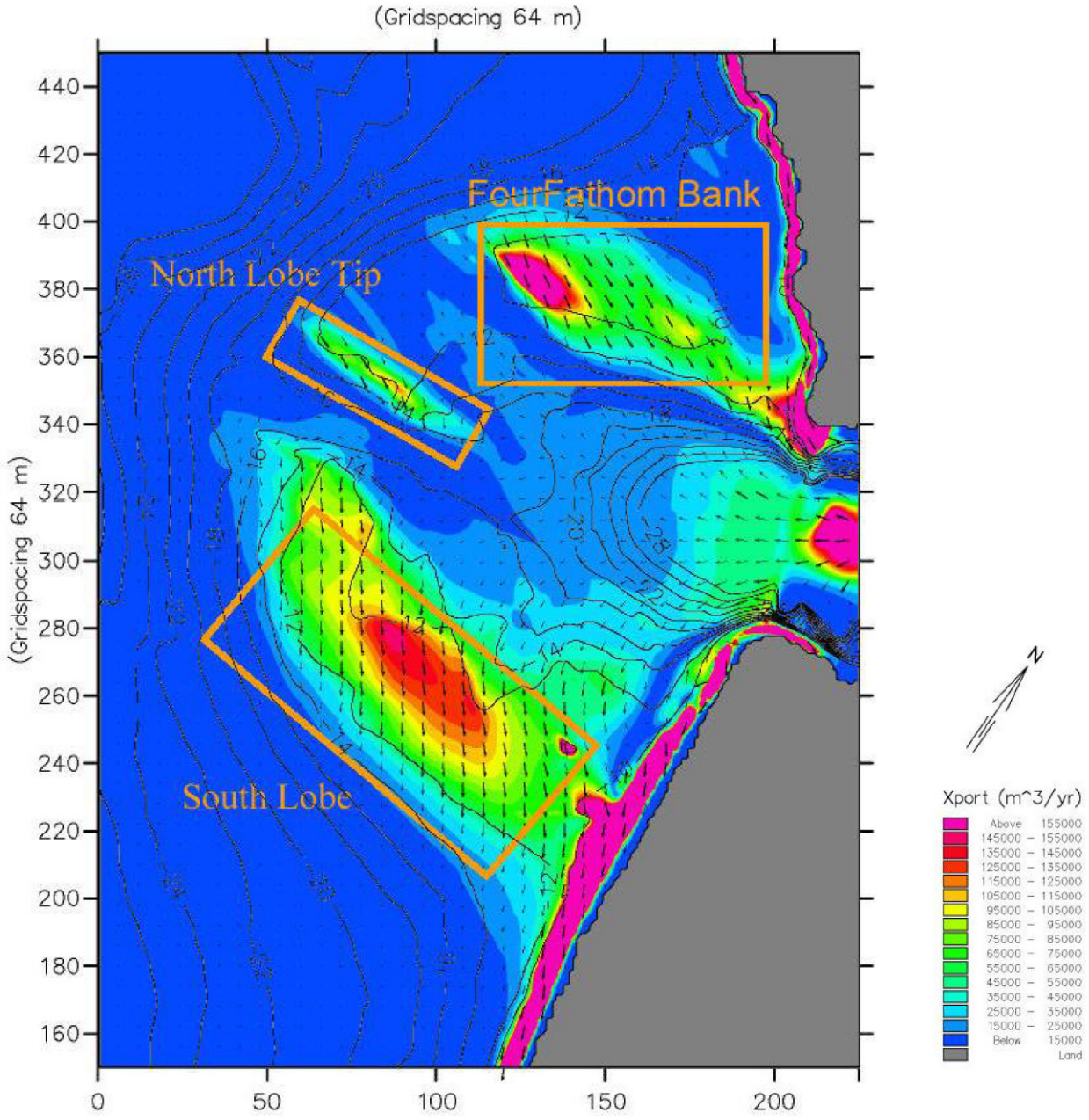
Figure 3-9
Wave + Tide Induced Currents
(Peak Flood Condition)



For 2.5m wave height, 11.2s, 270^0
Contours in meters

SOURCE: ADEC, 2002

Figure 3-10
Wave + Tide Induced Currents
(Peak Ebb Condition)



Contours in meters

SOURCE: ADEC, 2002

Figure 3-11
Annualized Transport in Study Area

Since a uniform grain size (d_{50}=0.2 mm) was used, the transport rate may be higher than actual. However, the largest uncertainty in these results is the bathymetry (last survey was in 1954–56) which was expected to be very different in the region of the disposal site due to the navigation project.

USGS Studies (ongoing)

The USGS, Pacific Science Center in Santa Cruz, has been conducting an extensive monitoring program for Ocean Beach and offshore to provide scientific data that will allow the various government agencies involved with Ocean Beach to make the best informed management decisions in the future (see complete USGS scope of work in Appendix 2A). Using periodic 3D beach mapping, onshore and offshore bathymetric surveys, video monitoring, sediment sampling, historical data analysis, and numerical modeling, the USGS intends to study and analyze the processes that control the morphological evolution of Ocean Beach.

The scientific goals of the Ocean Beach project are :

- To identify processes responsible for changes in beach morphology, erosion, transport, and deposition of sediment;
- To evaluate littoral sediment budgets, interaction of littoral sediment with coastal geomorphology, and the role of surface waves and tidal currents on sediment transport and deposition;
- To document the evolution of modern beach morphology and sedimentation patterns.

Monitoring Tasks

As part of this effort, the following specific monitoring activities are anticipated. A recent presentation at the American Geophysical Union Conference by Dr. Patrick Barnard, one of the primary authors, included a preview of the results of the monitoring efforts (USGS, 2004).

- Monthly beach surveys from Cliff House to the Fort Funston bluffs using all terrain vehicles with kinematic Global Positioning System (GPS).
- Cross-shore profiles through the surf zone on an approximately quarterly cycle, using personal water craft mounted with kinematic GPS and echo sounder equipment.
- Grain size monitoring using a digital bed sediment camera where the images are correlated to grain size and distribution.
- Real time visual monitoring using a web-based camera system that has been installed at the top of the Cliff House Restaurant at the northern end of Ocean Beach. The camera, pointing south, is used to monitor beach and nearshore morphology and observe processes in real-time. The images are archived and will be used to track short-term shoreline changes and beach evolution, sand bar migration, rip channel development and evolution, storm effects and beach evolution.

- A multibeam/side scan survey at the mouth of San Francisco Bay, the first survey covering this region in almost 50 years, including immediately offshore of Ocean Beach ;

- Airborne LiDAR surveys conducted along the coast before and after the 1997-98 El Niño season, and in the fall of 2002. The intent was to measure shoreline and volume changes as a consequence of El Niño-influenced winter storms.

Anticipated Analysis Tasks:

Based on current funding availability, the USGS Ocean Beach Coastal Processes Study is scheduled to conclude in September 2005. It is anticipated that the analysis of monthly beach changes, quarterly near-shore morphological changes, and offshore bedforms will be completed by then. In addition, near-shore processes including wave refraction, shoaling, and breaking, and tidal- and wind-driven circulation, are being simulated using the Delft3D model for the mouth of San Francisco Bay with focus on Ocean Beach. It is possible that short-term coastal changes (storm and/or seasonal scale) will be analyzed by the September 2005 timeframe using the above monitoring data and numerical models.

Detailed sediment transport and simulations of morphological evolution of shoreline and near-shore bathymetry (including storm-induced shoreline response) will require substantial calibration efforts, and the timing will probably be subject to funding availability. It will also require substantial efforts in characterizing the sediment budget, to serve as inputs at the model boundaries.

Aerial photographs and historic T-sheets dating back to the early 20th century could be used to calculate long term (decadal scale) trends in shoreline position similar to the work described in the M&N study (1995). However, a description of these tasks or other numerical models for shoreline evolution and /or cross shore transport is not discussed in the attached USGS scope and will most likely be based on timing and available budget.

3.4 Implications of New Data

Summary of Findings

Much of the description in this section is based upon USGS data, which is considered to be preliminary at present, and is pending appropriate in-house quality control and review. Some data can be considered more reliable than others (for example, the multibeam survey of the Bar has not yet been corrected, whereas the jet-ski and ATV data has been reduced to project datum). Therefore, these findings should also be considered to be preliminary, and will need to be updated when the data become final and when the final USGS reports are published.

Shoreline Changes

Prior Moffatt & Nichol studies included shoreline position data for Ocean Beach for the period 1850 to 1992 (M&N 1994, M&N 1995). These data were from U. S. Coast and Geodetic Survey surveys between 1850 and 1929, fall season aerial photographs between 1938 and 1992, and the

NOS survey from 1954-56. Linear trends for each reach as defined in the study (see Figure 3-2) were also estimated.

USGS data from the LiDAR survey in Fall 1997 and the ATV survey in Nov 2004 were added to that historic shoreline dataset to assess beach performance since Nov 1992. The updated shoreline position data is presented in Figures 3-12 through 3-16. Linear trends for the following three specific time periods are also shown.

1850 to 1900 which was the pre-Great Highway construction period

1929 to 1970 the period after construction of the Highway, up to when Bar Channel dredged material was disposed offshore of the Bar

1971 to 2004 the period since Bar dredged material is being placed on the south lobe, up to the present

More frequent cross section monitoring data were available for the reach south of Sloat, and are included in the Ch2M Hill reports. Significant observations are presented below.

- The 1970s to 1992 period corresponded to significant accretion at Ocean Beach, except in the area south of the outfall location. In general, the data for all reaches show that the 1992 shoreline was about the farthest seaward (widest beach) location in recent history and that the beaches have not recovered completely from the El Nino events in 1995 and 1997[1].

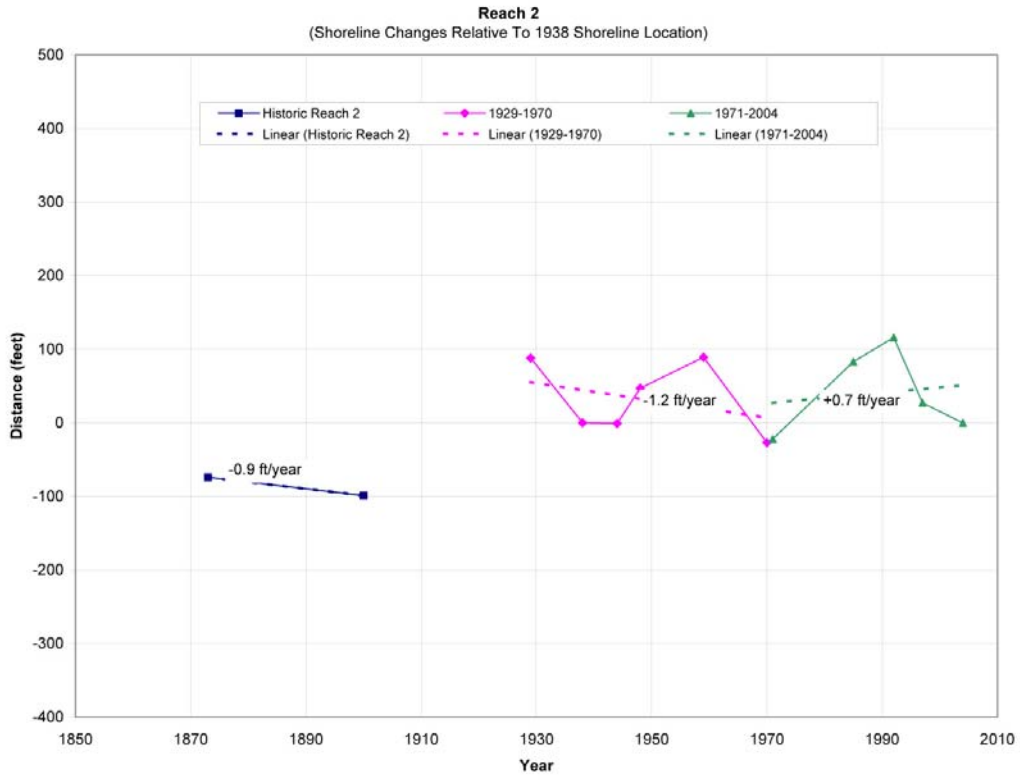
- Reach 1 continues to show an erosional trend even after 1971, which confirms that this reach may not be affected by Bar related dredging practices. The erosional trend, which shows up as a lower rate compared to the past, is primarily because the winter shoreline is at the bluff toe which typically recedes slower than a sandy beach.

- The shoreline in Reach 2 continues to fluctuate about a mean position - this fluctuation has been between 100 and 150 feet, and is different from the annual seasonal fluctuation. The bluff toe has receded significantly in this reach, as described in the CH2M Hill studies, and is armored between Sloat and the south end of the South Lot. The positive trend indicated in the figure is more a result of the 1992 shoreline location relative to the 1970's position. Over a longer period, the trend is relatively flat.

- North of Sloat, all reaches show an accretional trend between 1971 and 2004. Significant events affecting shoreline locations in these reaches include the new seawall construction in Reach 6 (1989 to 1992), and the Westside Sewer Box (1981) both of which placed significant fill on the beach and dunes. The effect of the Taraval seawall in Reach 5 (1941) is also visible on Figure 3-14.

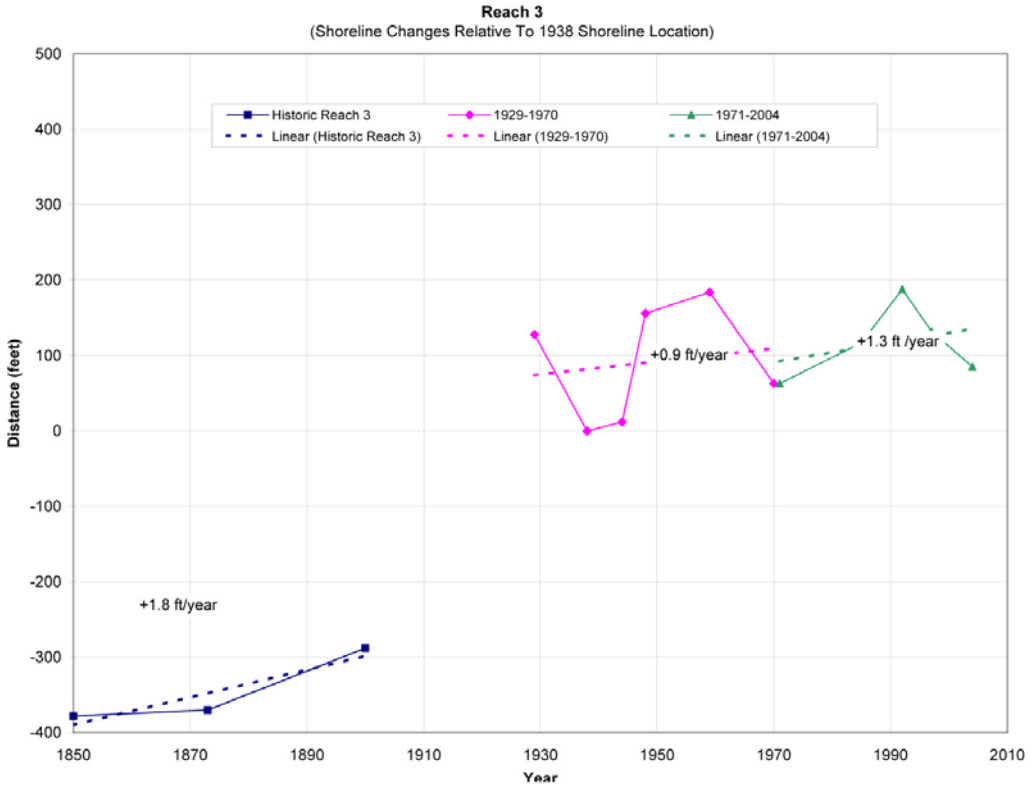
Converting shoreline changes between 1971 to 2004 to profile volume changes, using the method described in the 1995 M&N study, results in accretion of about 4 million cubic yards (or 120,000 cubic yards per year). Compared to this, the period 1929 to 1970 showed a net loss of about 1.6 million cubic yards (or -39,000 cubic yards per year). The recent accretion does however include nourishment activities that have occurred in the study area.

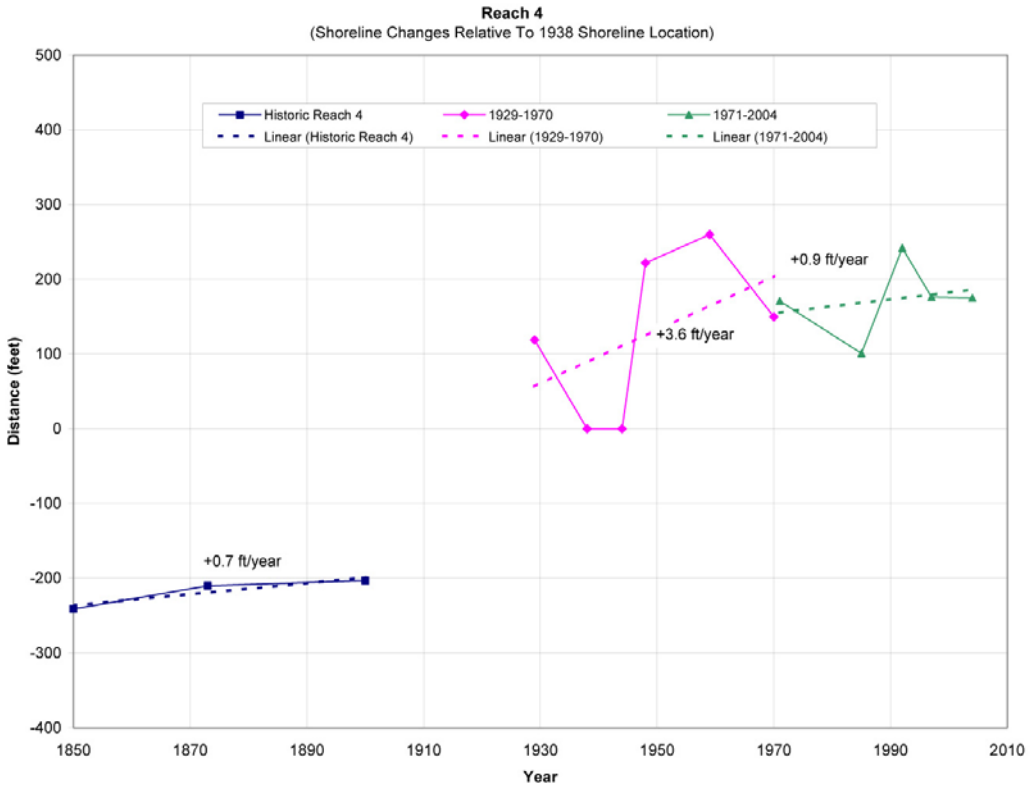
[1] The 1950s shoreline locations for reaches 5, 6, and 7 (Taraval to Moraga) are influenced by construction of the Taraval seawall and beach nourishment.



SOURCE: Moffatt and Nichol Engineers

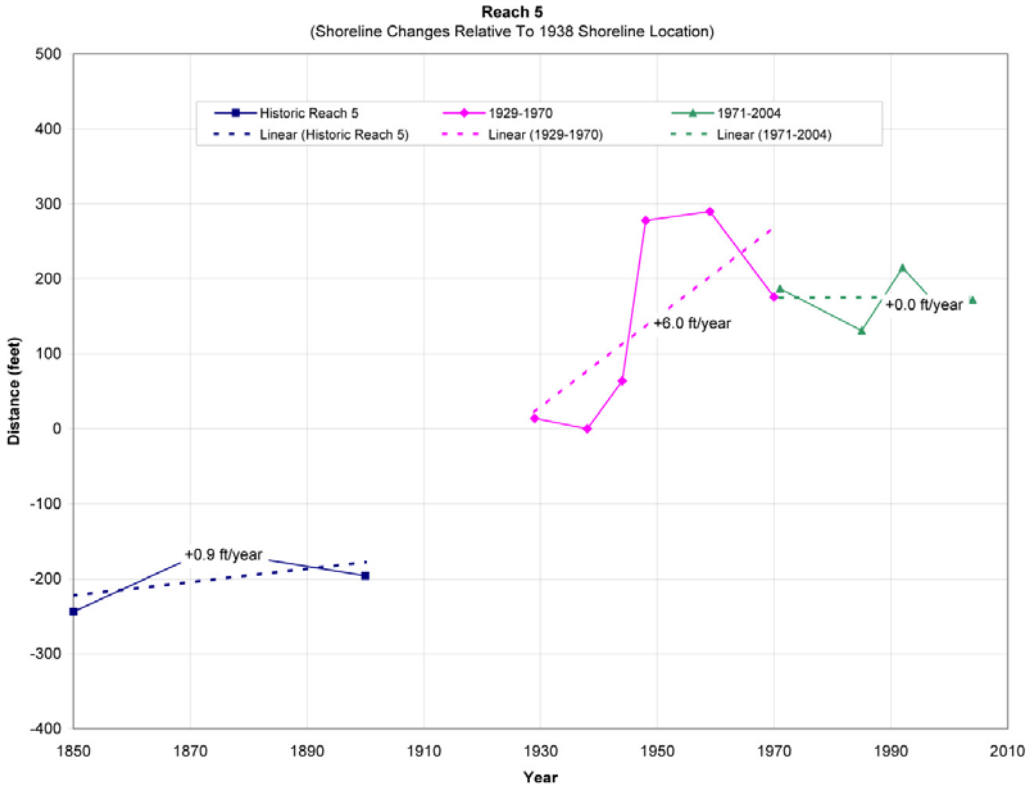
Figure 3-12
Shoreline Change in Study Area-
Reaches 1 and 2

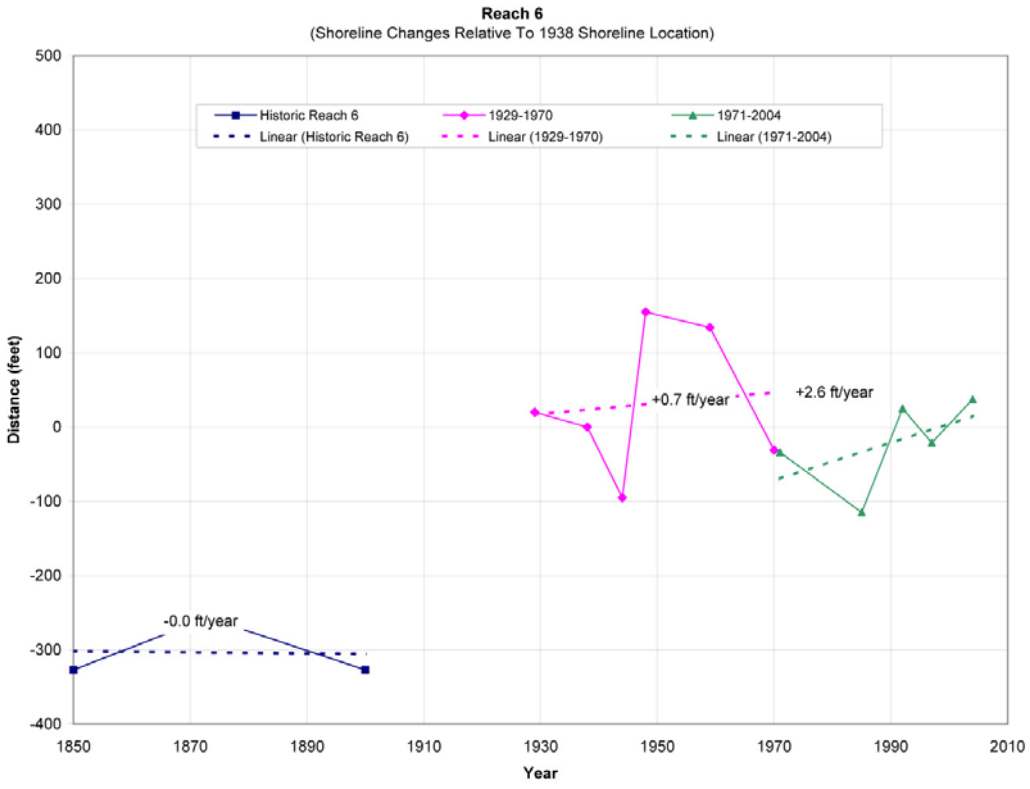




SOURCE: Moffatt and Nichol Engineers

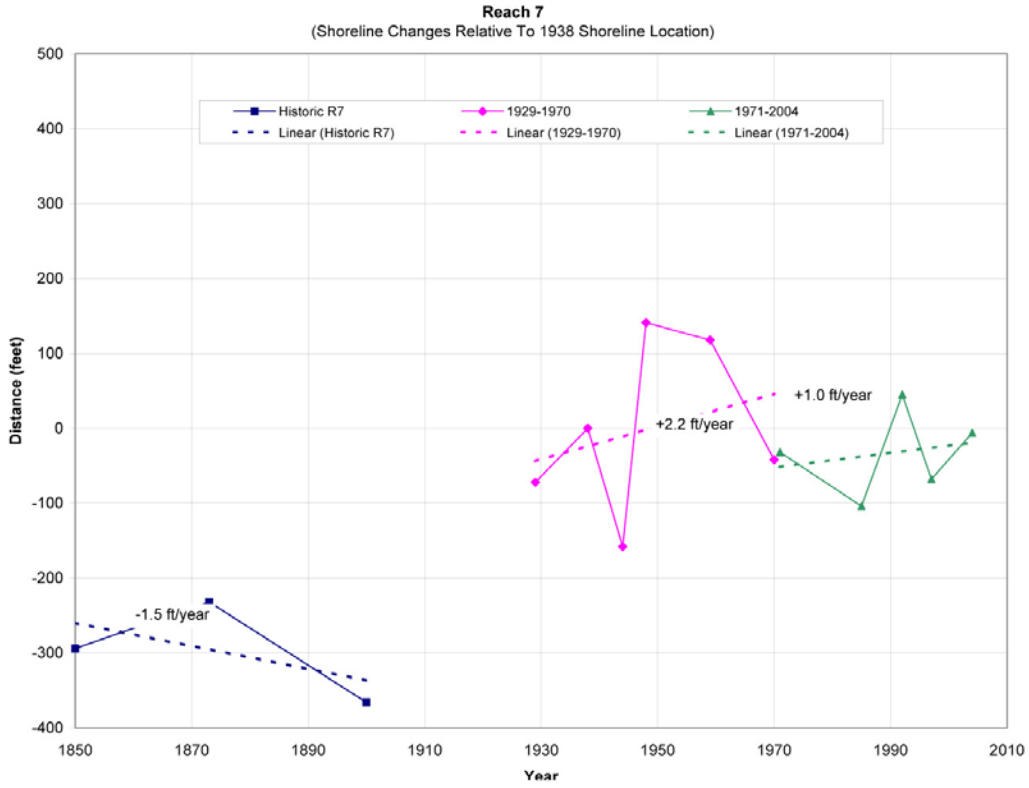
Figure 3-13
Shoreline Change in Study Area-
Reaches 3 and 4

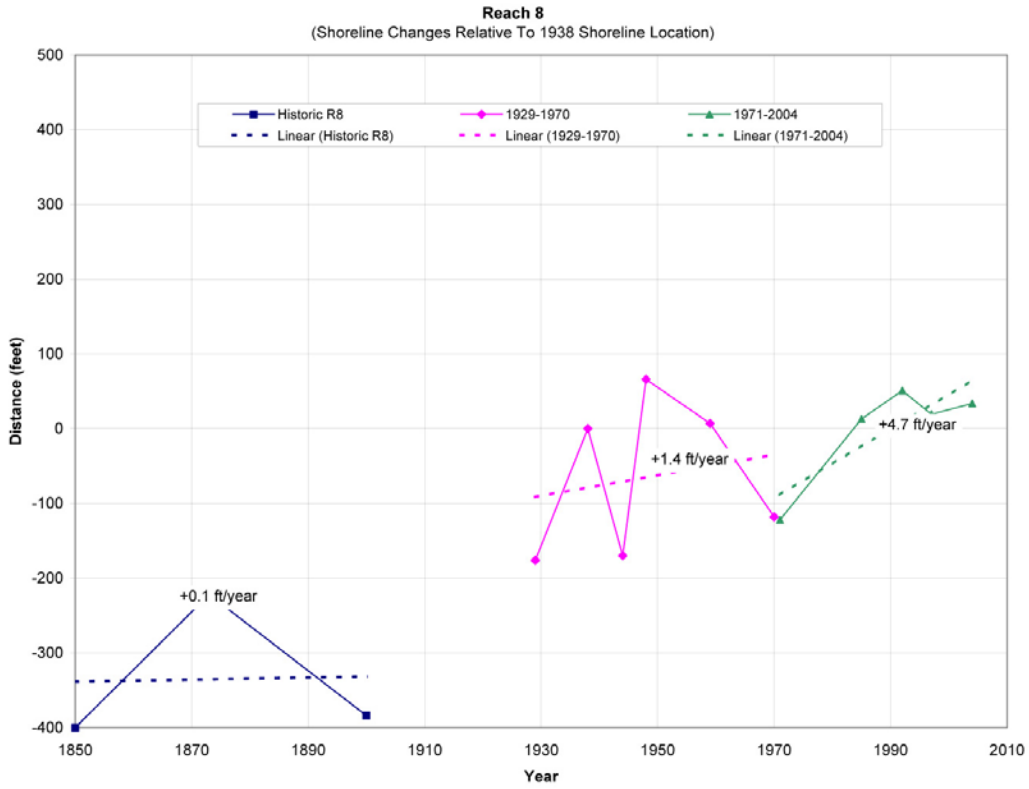




SOURCE: Moffatt and Nichol Engineers

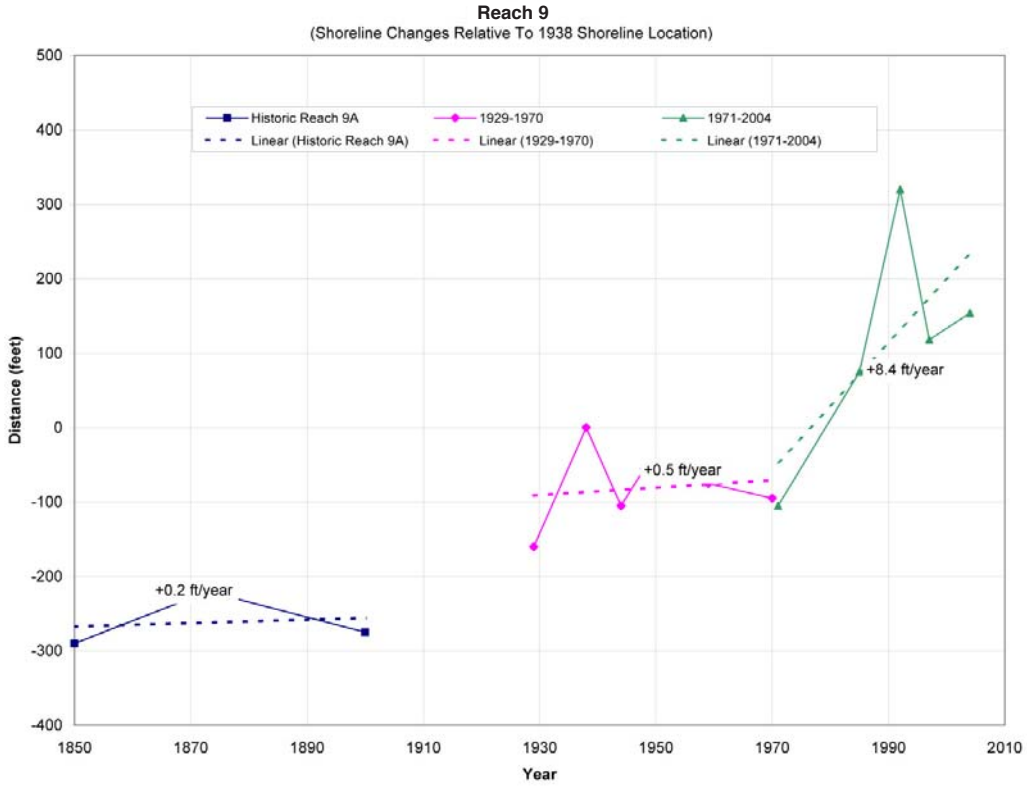
Figure 3-14
Shoreline Change in Study Area-
Reaches 5 and 6

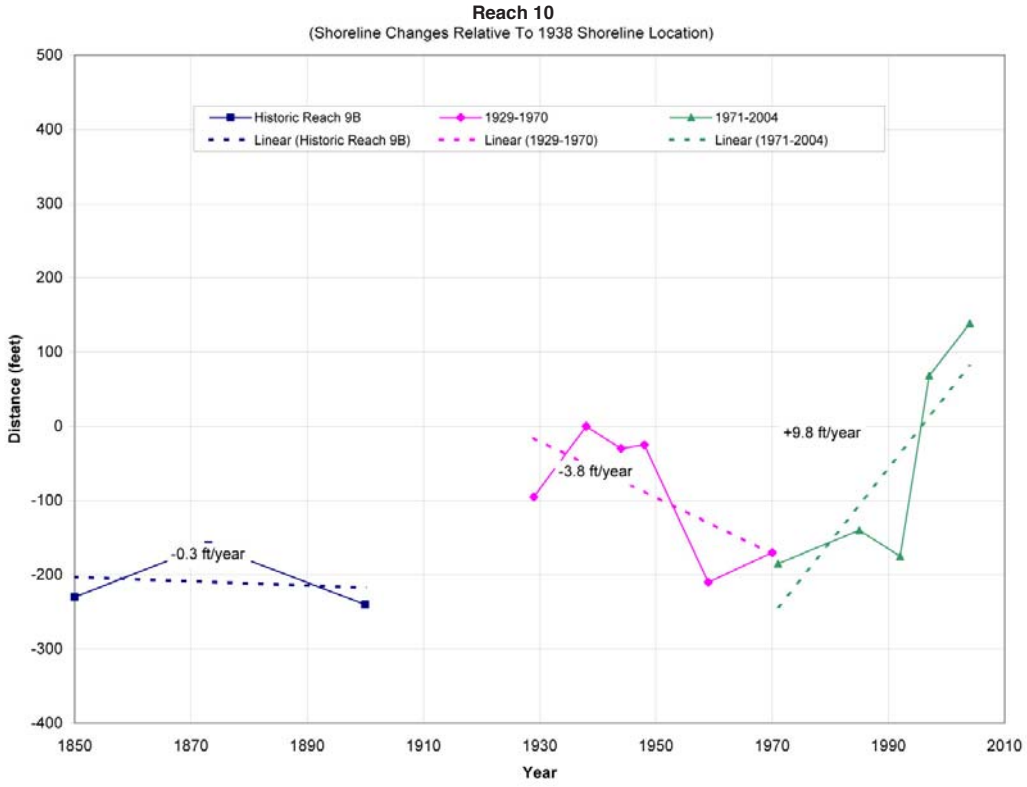




SOURCE: Moffatt and Nichol Engineers

Figure 3-15
Shoreline Change in Study Area-
Reaches 7 and 8





SOURCE: Moffatt and Nichol Engineers

Figure 3-16
Shoreline Change in Study Area-
Reaches 9 and 10

Nearshore profiles from the 1995 M&N study (near Taraval) as well as from the recent jet-ski profiles by USGS are shown on Figure 3-17. Preliminary data from USGS show that closure or "pinchout" depths probably decrease north of Sloat, concomitant with lower wave energy as one goes north. Line 3 shows pinch-out at about -8m (26 ft, MLLW datum), Line 6 at about 9m (30 ft), and Line 14 shows seasonal variation even at 12m (40 ft) depths. The South Channel is also visible on Line 3.

Changes to SF Bar

The multibeam survey of a significant portion of the Bar completed in Fall 2004 is the primary source of data for this section. As described earlier, the survey data has not yet been completely finalized, so the results are very preliminary. In addition, the contours provided by USGS were extracted from a standard digital terrain model (DTM) which relied upon limited data over Fourfathom Bank.

A bathymetric change map between 1956 and 2004 is shown on Figure 3-18. Recognizing that the potential error in soundings could be large, an error bar of +/- 4 feet is applied (green color indicates 4 feet of accretion or erosion). A significant amount of accretion has occurred southeast of the disposal site and along the middle portion of Ocean Beach beyond the 30 feet depth contour. The maximum elevation change is about 18 feet near the southeast end of the designated disposal site. The top elevation of Four-Fathom-Bank does not show much change (within the +/- 4 feet error bar).

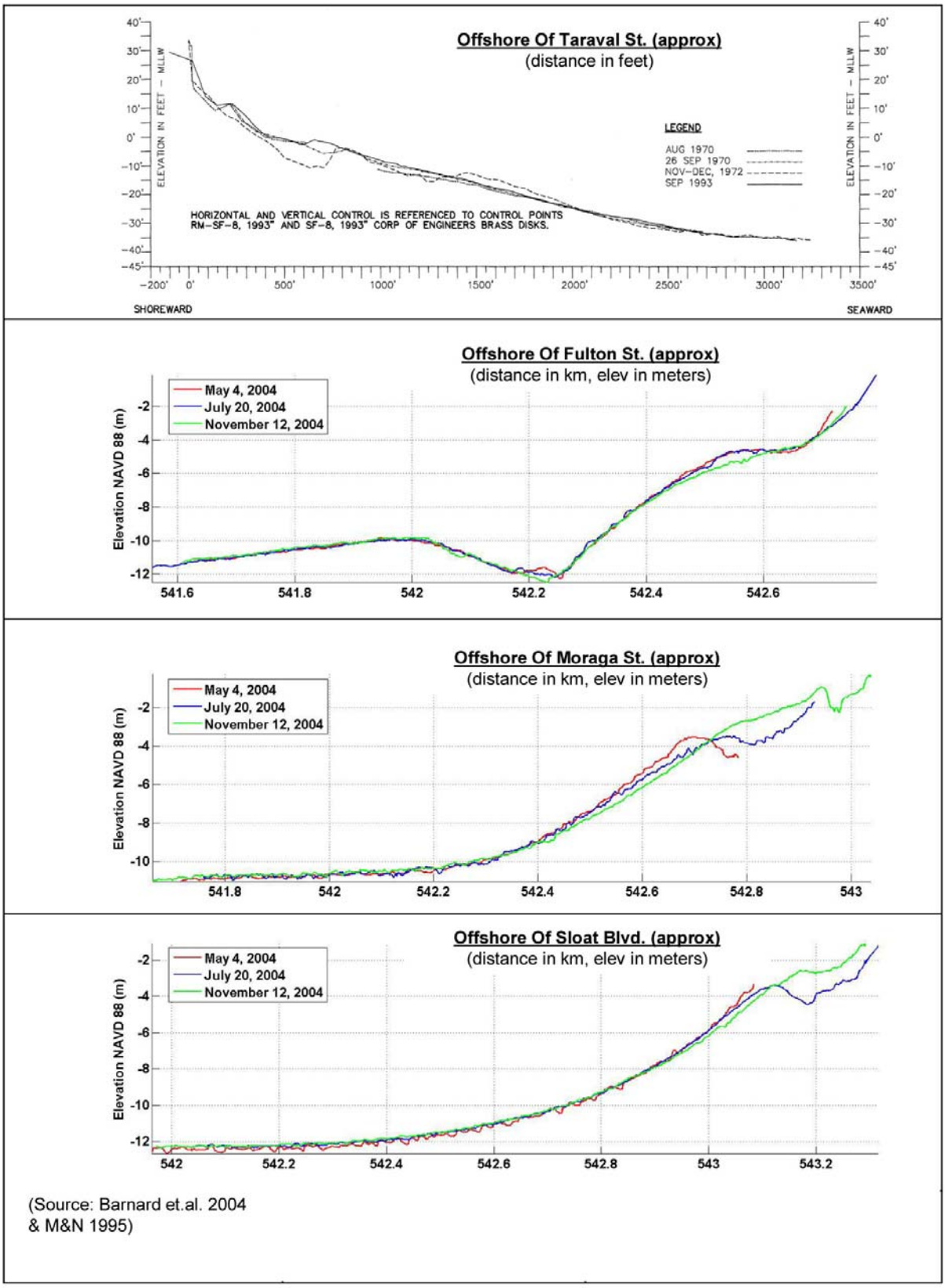
The calculated volume change between the 1956 survey and the 2004 survey is approximately 152 million cubic yards (accretion). This volume is not adjusted for the potential error in soundings, because the number varies across the surveyed area. Most of the volume change occurs at the South Lobe, near the Dump Site. The surveyed area was divided into five areas (Areas 1 through 5 in Figure 3-18) for comparisons of volume change. Volume changes within individual areas is shown below.

TABLE 3-4

VOLUME CHANGES (1956 TO 2004)

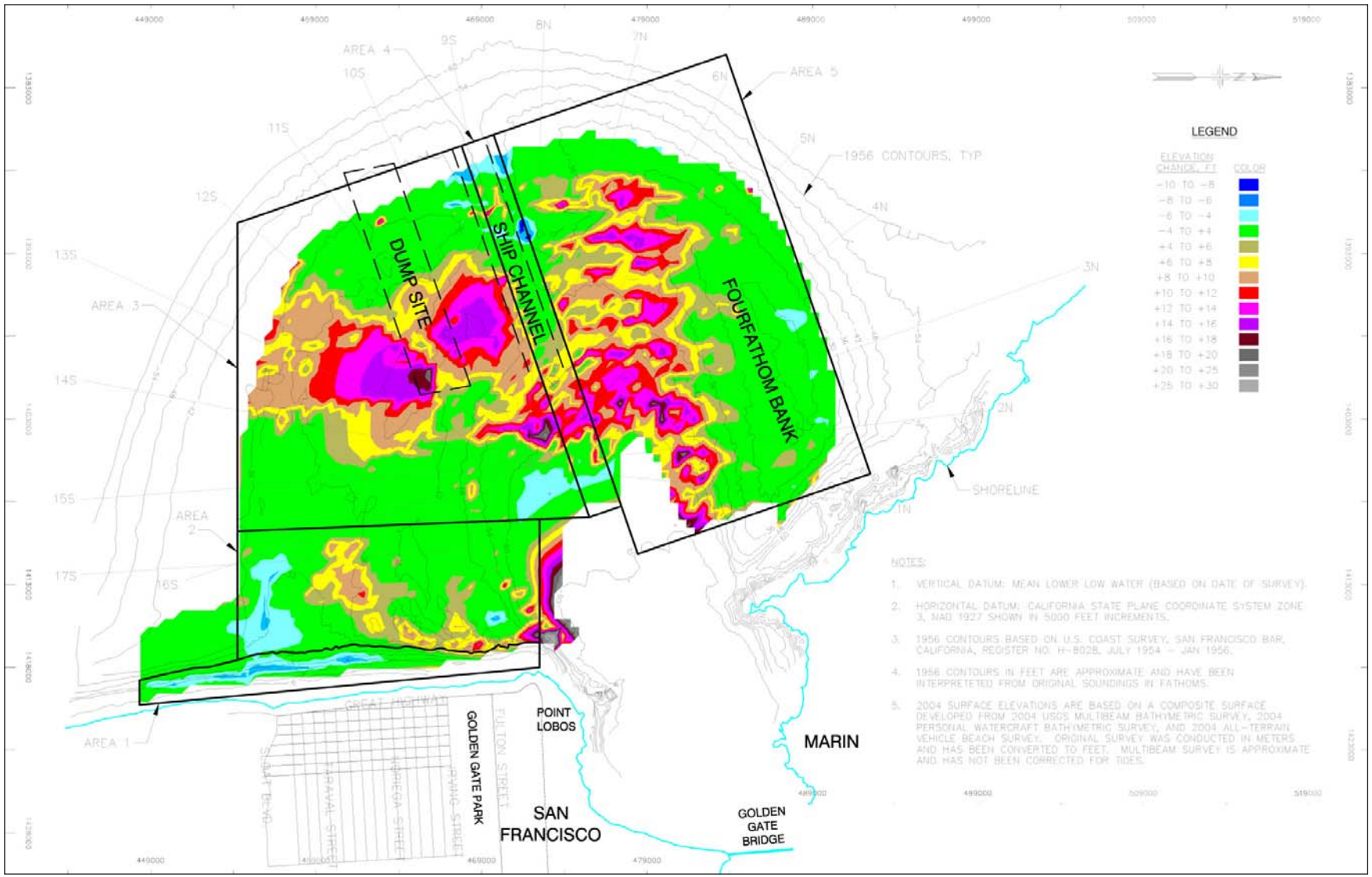
Location	Plan Area (acres)	Volume Change, CY (+) accretion (-) erosion
Area 1	1,070	2,290,000
Area 2	3,140	9,850,000
Area 3	8,450	61,540,000
Area 4	1,115	4,770,000
Area 5	9,140	49,960,000

It is not known if the SF Bar is continuing to shrink, primarily because the survey did not extend beyond the crest of the Bar. The 1995 M&N study used radial profiles to compare changes to Bar



SOURCE: Moffatt and Nichol Engineers

Figure 3-17
Near-Shore Profiles Showing Pinch-Out Depths



SOURCE: Moffatt and Nichol Engineers

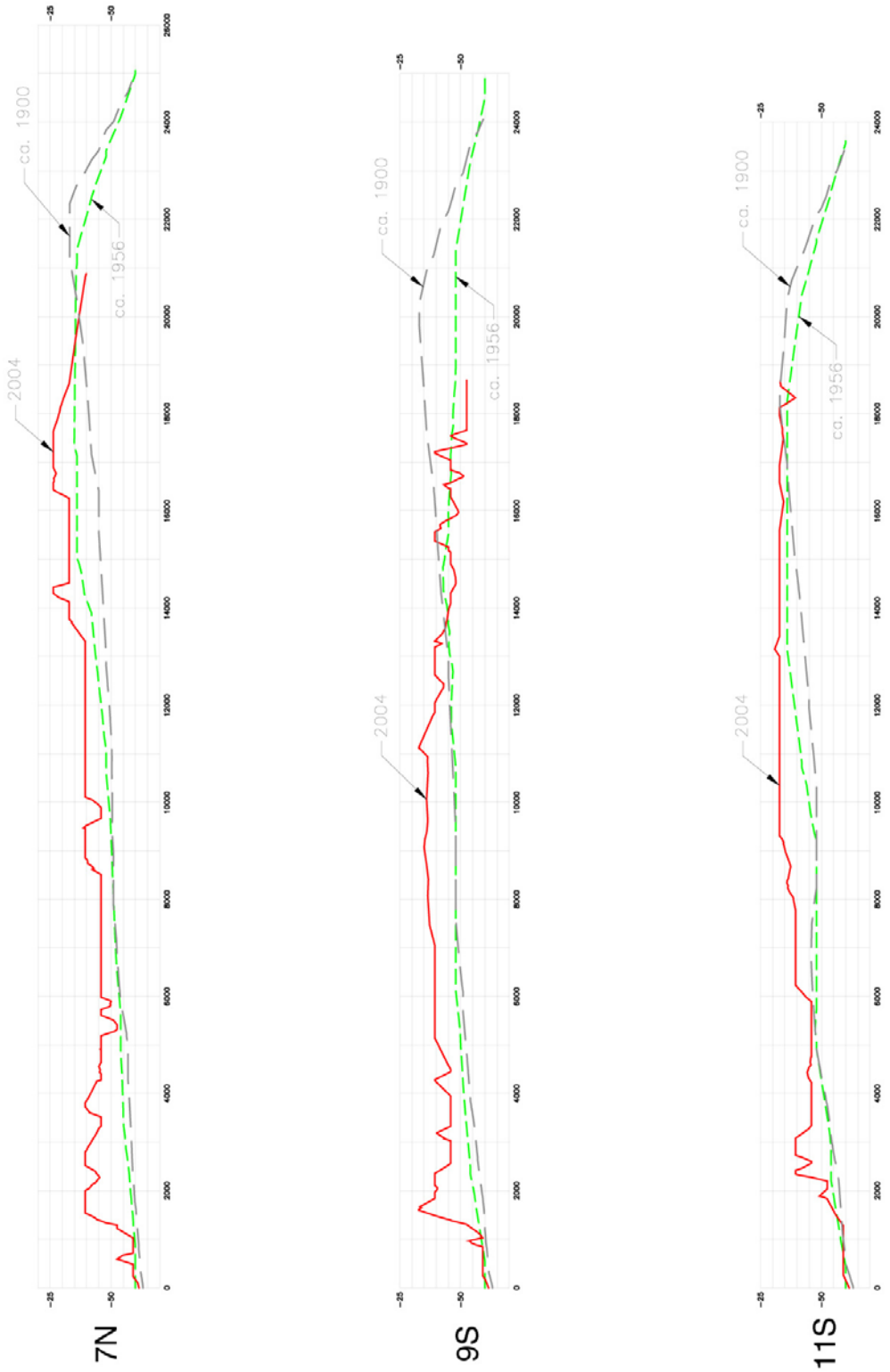
Figure 3-18

Net Changes in SF Bar Bathymetry (1956 to 2004)-Plan View

morphology between 1873 and 1956. They are included on Figure 3-19. Profiles 3N through 7N indicate 10-15 ft of accretion occurred between 1956 and 2004 along the inner cusp of the Four-Fathom Bank. Similarly, profiles 9S through 14S show 10-15 ft of accretion occurred between 1956 and 2004 along the cusp of the South Lobe. Even though these numbers could change significantly after the 2004 survey is corrected, it is evident that substantial accretion has occurred along the inner face of the Bar as well as areas farther landward.

With the shoaling at the Bar near the disposal site, more wave energy is probably dissipating due to shallower depths, thereby reducing the potential to move sediment from areas farther landward. Whether this has affected the sand supply rate to beaches south of Sloat Blvd is not know, but has probably been happening since the disposal practice started in 1971.

Results of wave modeling by M&N (ADEC 2000) show that the SF Bar alters the wave pattern near Ocean Beach. The predominant west through northwest direction waves refract around the Bar and approach Ocean Beach from the west through west-southwest direction. This indicates a potential for a net northward sand transport along Ocean Beach. Numerical simulations by USGS and M&N also show flow reversals occurring just offshore of Ocean Beach during ebb tide cycles. This has the potential to create a net northward longshore current along Ocean Beach north of Reach 7, and move sand to the north. However, the modeling results by USGS and ADEC need to be re-evaluated in the light of significant changes to bathymetry that have occurred near the disposal site, which is one of the most important sources of sand to Ocean Beach.



SOURCE: Moffatt and Nichol Engineers

Figure 3-19
Net Changes in Bathymetry (1956 to 2004)-
Section View

References

Journal Articles

Berrigan, 1985a, "The Taraval Vertical Sea Wall", by Paul D. Berrigan, Journal of the American Shore and Beach Preservation Association, January 1985

Berrigan, 1985b, "Seasonal Beach Changes at the Taraval Seawall", by Paul D. Berrigan, Journal of the American Shore and Beach Preservation Association, April 1985

Berrigan, 1985c, "Variations of Wave Attack Along Ocean Beach San Francisco, California, by Paul D. Berrigan, Journal of the American Shore and Beach Preservation Association, October 1985

Cross, 1980, "Ocean Wave Statistics for San Francisco", by Ralph H. Cross, III, Journal of the American Shore and Beach Preservation Association, July 1980

Domurat, et al, 1979 "Beach Erosion Control Study Ocean Beach, San Francisco, California", by George W. Domurat, Douglas M. Pirie, and John F. Sustar, Journal of the American Shore and Beach Preservation Association, October 1979

Johnson, 1971, "The Significance of Seasonal Beach Changes in Tidal Boundaries", by J. W. Johnson, Journal of the American Shore and Beach Preservation Association, April 1971

Reports

CCSF, 1986, "Ocean Beach - Beach Nourishment Plan, Volume 1," by San Francisco Clean Water Program, August 1986

CCSF, 1986, "Ocean Beach - Beach Nourishment Plan, Volume 2," by San Francisco Clean Water Program, August 1986

CH2M HILL, 1996. "Ocean Beach Coastal Erosion Protection – Initial Assessment," Final Technical Memorandum – Task 2, to Karen Kubick/CCSF, from Ken Lilly/CH2M HILL and Don Kingery/CH2M HILL, October 1, 1996.

Galvin, 1980, "Redesign of Ocean Beach San Francisco" by Cyril Galvin, Prepared for City and County of San Francisco Clean Water Program, September 1980

Harding-Lawson Associates 1976, Westside Transport Project Phase 1 Soil Investigation, 1996

Johnson, 1977, "Shoreline Characteristics Ocean Beach - San Francisco", by J. W. Johnson, prepared for the Bureau of Sanitary Engineering, Department of Public Works, City and County of San Francisco, May 1977

Moffatt & Nichol, 1995, "Sediment Transport Processes Study - Ocean Beach San Francisco, California," prepared for USACE, San Francisco District, 211 Main Street, San Francisco, CA, by Moffatt & Nichol, Engineers, July 1995

Moffatt & Nichol, 1995, "Shoreline Mapping for Ocean Beach, San Francisco, California", final Report prepared for USACE, San Francisco District, 211 Main Street, San Francisco, California by Moffatt & Nichol Engineers, January 1994

Noble Coastal & Harbor, 1985, "Great Highway - Ocean Beach Coastal Engineering Report Seawall Design", prepared for Clean Water Program, City and County of San Francisco, Noble Coastal & Harbor Engineering and Dr. Per Bruun, July 1985

Olmsted and Olmsted, 1979, "Ocean Beach Study: A Survey of Historic Maps and Photographs....", prepared for San Francisco Wastewater Program, City of San Francisco, R. Olmsted and N. Olmsted, February 1979

Parsons Brinkerhoff Quade and Douglas 1990, Lake Merced Transport Tunnel Geotechnical Design Summary Report, November 1990

USACE, 1960, "Wave Statistics for Seven Deep Water Stations Along the California Coast", by U.S. Army Corps of Engineers, Los Angeles, California, San Francisco, California, December 1960

USACE, 1987, "Pacific Coast Hindcase Phase II Wave Information, by U.S. Army Corps of Engineers, Coastal Engineering Research Center, Department of the Army, Waterways Experiment Station, P.O. Box 6312, Vicksburg, Mississippi 39180-0631, May 1987

USACE, 1996, "Ocean Beach Storm Damage Reduction Feasibility Study," Final Feasibility Study for the City and County of San Francisco, by US Army Corps of Engineers, San Francisco District, 24 September 1996.

Woodward-Clyde, 1978a, "Coastal Engineering Evaluation Southwest Ocean Outfall Project", Subtask 3-2 Report prepared for PBQ&D, Inc, by Woodward-Clyde Consultants, January 1978

Woodward-Clyde, 1978b, "Coastal Engineering Evaluation - Southwest Ocean Outfall Project," Subtask 3-2 Addendum by Woodward-Clyde Consultants, June, 1978

Beach Surveys and Evaluation Reports

CH2MHILL Ocean Beach Inspection Report No. 1 (June 2000)

CH2MHILL Ocean Beach Inspection Report No. 2 (November 2000)

CH2MHILL Ocean Beach Inspection Report No. 3 (April 2001)

CH2MHILL Ocean Beach Inspection Report No. 4 (September 2001)

CH2MHILL Ocean Beach 2000 Status and Erosion Report no.1 June 2000

CH2MHILL Ocean Beach 2001 Status and Erosion Report no.2 June 2001

CHAPTER 4
Existing Environment and Potential Constraints

4.1 Introduction

This chapter presents topics included in the preliminary assessment of the Ocean Beach-Great Highway Storm Damage Protection Project and a rationale for their inclusion. Information collected for this preliminary assessment provides an overview of key social and environmental issues in order to better understand and compare Project Alternatives and their potential impacts. Topics were selected based on federal law, regulations, and executive orders; applicable management policies; and concerns expressed by the public, DPW and USACE staff, and other agencies affiliated with the project area. More comprehensive and detailed environmental investigation and analysis would be required during subsequent project phases for compliance with environmental regulatory requirements including the California Environmental Quality Act (CEQA) and the National Environmental Protection Act (NEPA).

A brief rationale for each impact topic considered in this chapter is given below. A description of the existing conditions for each selected topic is provided later in this chapter. The affected environment described in this chapter encompasses the geographical area affected by the alternatives. The local context for the proposed project is the 3,000-foot section of Ocean Beach-Great Highway located south of Sloat Boulevard and north of Fort Funston, and the regional context for the proposed project is the Golden Gate National Recreation Area (GGNRA) and Great Highway, including access points to the San Francisco and SFPUC Wastewater Treatment Plant. A brief discussion of potential constraints and considerations for each alternative, are presented at the end of this section.

4.2 Topics Considered in This Preliminary Assessment

Natural Resources

National Park Service, NOAA's National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Coastal Commission management policies, regulations, and natural resource management guidelines call for the consideration of natural resources in planning proposals. It is therefore necessary to characterize both these natural resources and the environmental consequences to these resources that could result from implementation of the Ocean Beach-Great Highway Storm Damage Protection Project alternatives.

Preliminary assessments were performed for the following natural resource topics: land use, biological resources; cultural resources; hazardous materials; noise; and air quality.

Social Resources

Stewardship of GGNRA requires consideration of two integrated purposes: to preserve the park's unique natural and cultural resources and scenic beauty, and to make these resources available to visitors for study, enjoyment, and recreation. Conserving the GGNRA's scenery is a crucial component of the National Park Service 1916 Organic Act. A preliminary analysis of social resources provides the context for understanding potential effects of Project Alternatives on the social environment within the Ocean Beach-Great Highway Project area. Specifically, the traffic segment provides clear guidelines for the studies needed to assess impacts.

Preliminary assessments were performed for the following social resource topics: transportation, local business conditions, and recreational access and public use, and visual resources.

4.3 Natural Resources Discussion

Existing Land Use Conditions

In general, the area immediately east of Ocean Beach and the Great Highway is developed with residential, park, and commercial uses. Access to the entire length of Ocean Beach would be from the Great Highway. (See Figure 4-1).

Existing land uses that are considered sensitive receptors are located adjacent to the Great Highway and Ocean Beach, and could be adversely affected by project construction. Land uses most affected by construction activities would be residential, commercial, and park uses. There are no schools located adjacent to the Great Highway or Ocean Beach. Residential uses predominate the 3.7-mile stretch of Ocean Beach, occurring along approximately 2.2 miles or 16 blocks. In general, residential uses are located on two blocks north of the Park and 14 blocks south of the Park. Park uses occur along approximately 1.3 miles of Ocean Beach (Golden Gate Park and San Francisco Zoo), while commercial uses occur along one block or 0.1 mile (south of Golden Gate Park).

Residential, commercial, and park uses adjacent to the entire length of Ocean Beach are located away from the beach itself, on the eastern side of the Great Highway. North of Golden Gate Park, the closest residential buildings are located between 60 and 180 feet of the Great Highway centerline. South of the Park, the closest residences to Ocean Beach are set back approximately 170 feet or more from the Upper Great Highway centerline, and less than 50 feet from the Great Highway centerline. Commercial uses on the block south of Lincoln Way also front on the Great Highway.

SOURCE: Environmental Science Associates

SFDPW Great Hwy-Ocean Beach Erosion / 202262 ■

Figure 4-1
Project Location

At Golden Gate Park, the Beach Chalet, a restaurant and visitors center, fronts on the Great Highway. It is located approximately 130 feet from the center of the Great Highway centerline. Other Park uses include the Dutch Windmill, Murphy Windmill, and soccer fields, all located over 300 feet from the Great Highway centerline. Other recreation-related uses include parking lots for Ocean Beach.

At the San Francisco Zoo, the Children's Zoo and African Savanna exhibit are located along the western Zoo boundary. Exhibits along the western boundary of the Children's Zoo include Native American Animals, Family Farm, Insect Zoo, and Education Center. These exhibits are located as close as 600 feet from the bluffs and 480 feet from the Great Highway centerline. The African Savanna exhibit is located approximately 550 feet from the bluffs and 400 feet from the Great Highway centerline.

Biological Resource Conditions

The Ocean Beach-Great Highway project site supports 3,000 linear feet of beach, coastal bluff and open water habitat. The beach is flat and subject to tidal action. The coastal bluff (or cliff) is vertically sloped in most areas and supports either paved parking or a road on the top. Riprap stabilizes portions of the cliff banks and other areas of the banks are continuing to erode.

Terrestrial Wildlife Issues

The project site and its vicinity provides habitat primarily for sensitive and common bird species. Bank swallow (*Riparia riparia*), a state-listed threatened species and federally-listed species of concern, is the only listed species known to breed within the project site. Potential nest sites were evident in the fine-textured/sandy cliffs mostly in the northern portion of the project site, where no riprap is present. Bank swallows are colonial nesters (i.e., in large groups), usually in riparian and other lowland habitats. The colony at Fort Funston, immediately south of the project site, is the largest nesting colony in the San Francisco Bay Area: more than 700 burrows (approximately 40 to 50 percent of which are occupied) were present in 1997 (NPS, 1999).

Western snowy plover (*Charadrius alexandrinus nivosus*), a federally-listed threatened and state-listed species of special concern, winters on Ocean Beach from early July through mid-May, but never during the height of the breeding season, which is mid-May through June (NPS, 1997). The National Park Service established a snowy plover management area from Sloat Boulevard in the south to Stairwell 21 in the north along the O'Shaughnessey seawall, based on several years of monitoring data (NPS, 1999). Pet leash restrictions, sand management and shoreline stabilization activities are enforced in this management area.

Peregrine falcon (*Falco peregrinus anatum*), a state endangered species and federal species of concern, irregularly visits Ocean Beach throughout the year (NPS, 1997). A known roost is within one mile of Ocean Beach (NPS, 1997). California brown pelican (*Pelecanus occidentalis*), a state and federally endangered species, appears just offshore most of the year and roosts near the Cliff House (NPS, 1997).

Other species of interest that occur in the project site or its vicinity include a number of shorebirds. Sooty shearwater (*Puffinis griseus*) appears offshore along Ocean Beach at the end of June. Brandt's cormorant (*Phalacrocorax penicillatus*), breeds at Seal Rocks and can be found along the shore. Ocean Beach supports concentrations of migrating and wintering shorebirds (NPS, 1999), e.g., mew gull (*Larus canus*), Forster's tern (*Sterna forsteri*), elegant tern (*Sterna elegans*) and Caspian tern (*Sterna caspia*), willet (*Catoptrophorus semipalmatus*), sanderling (*Calidris alba*), western sandpipers (*Calidris mauri*), least sandpipers (*Calidris minutilla*), dunlin (*Calidris alpina*), and short-billed dowitchers (*Limnodromus griseus*) (NPS, 1999).

The site conditions and past anthropogenic disturbances limit the potential for invertebrates, such as globose dune beetle (*Coleus globosus*) and bumblebee scarab beetle (*Lichnanthe ursina*), which require loose sandy areas where common foredune plants grow. The use of the site by terrestrial mammals is primarily limited to domestic dogs.

Aquatic Species Issues

Fish species, including state and federally-listed salmonid species, may occasionally migrate through the ocean waters. For example, there are three creeks in southern San Mateo County, San Gregorio, Pescadero, and Gazos Creeks, that support Coho salmon which migrate northward. However, none of the listed anadromous fish species breed in the waters adjacent to the project site. Whale species and Steller sea lion may migrate through the Pacific Ocean, but there is no potential breeding habitat or potential occurrence of these species in the project study area.

Common fish species occur in the ocean within the project area and could be exposed to short-term construction-related impacts (e.g., turbidity) due to installing a breakwater. However, a study conducted in the Great Lakes found that fish generally avoid areas under construction (U.S. Army Engineer Waterways Experimental Station, 1985).

Plant Issues

No suitable habitat is present for sensitive plant species within the project site. Moreover, the environmental conditions and past anthropogenic disturbances preclude a diverse community of common native plant species establishing on site. Few scattered small patches of non-native species including, seafig (*Carpobrotus chilensis*), New Zealand spinach (*Tetragonia tetragonioides*), and horned searocket (*Cakile maritima*), were found growing in the open cracks of the cliff banks. Fort Funston, which is immediately south of the project site, provides the most favorable dune habitat for sensitive plant species. Additionally, Fort Funston supports central dune scrub, a native plant community that typically occurs along the coast of California.

Cultural Resource Conditions

Ocean Beach and the offshore waters are areas of high sensitivity for historical resources, primarily shipwrecks, including those that have been located by archaeologists and other wrecks whose locations remain undetermined. During the late 19th century, several steam and sailing vessels were lost from running aground on the San Francisco Bar and vicinity, some of which were broken up in rough seas and washed ashore along Ocean Beach. Two known shipwrecks

near the foot of Ortega Street are historically significant and have been listed in the National Register of Historic Places. There are other wrecks in the area that may require some consideration later in the planning phase.

The *King Philip*, a three-masted ship, ran aground in 1878 and was driven high up on Ocean Beach by the winds. The surf pounded the vessel, breaking her up, with the hull sinking into the sand. The vessel's remains were visible until the early 20th century, but later beach-dune bulldozing buried the site. Winter storms between 1982 and 1984 exposed the hull of the *King Philip*, which the National Park Service studied and determined that 40-50 percent of the hull survived intact (Delgado and Haller, 1989). The study also identified the remains of the *Reporter*, a three-mast schooner that sank in 1902 after grounding off Ocean Beach. The ship washed ashore and the remains were buried by migrating sands near the location of the *King Philip*.

Because of the significance of these historical resources, especially the *King Philip* which may be the only known wreck of an American middle clipper ship and possibly the most-intact known remains of any wooden ship along the California coast, future alternative evaluations will take these resources into account.

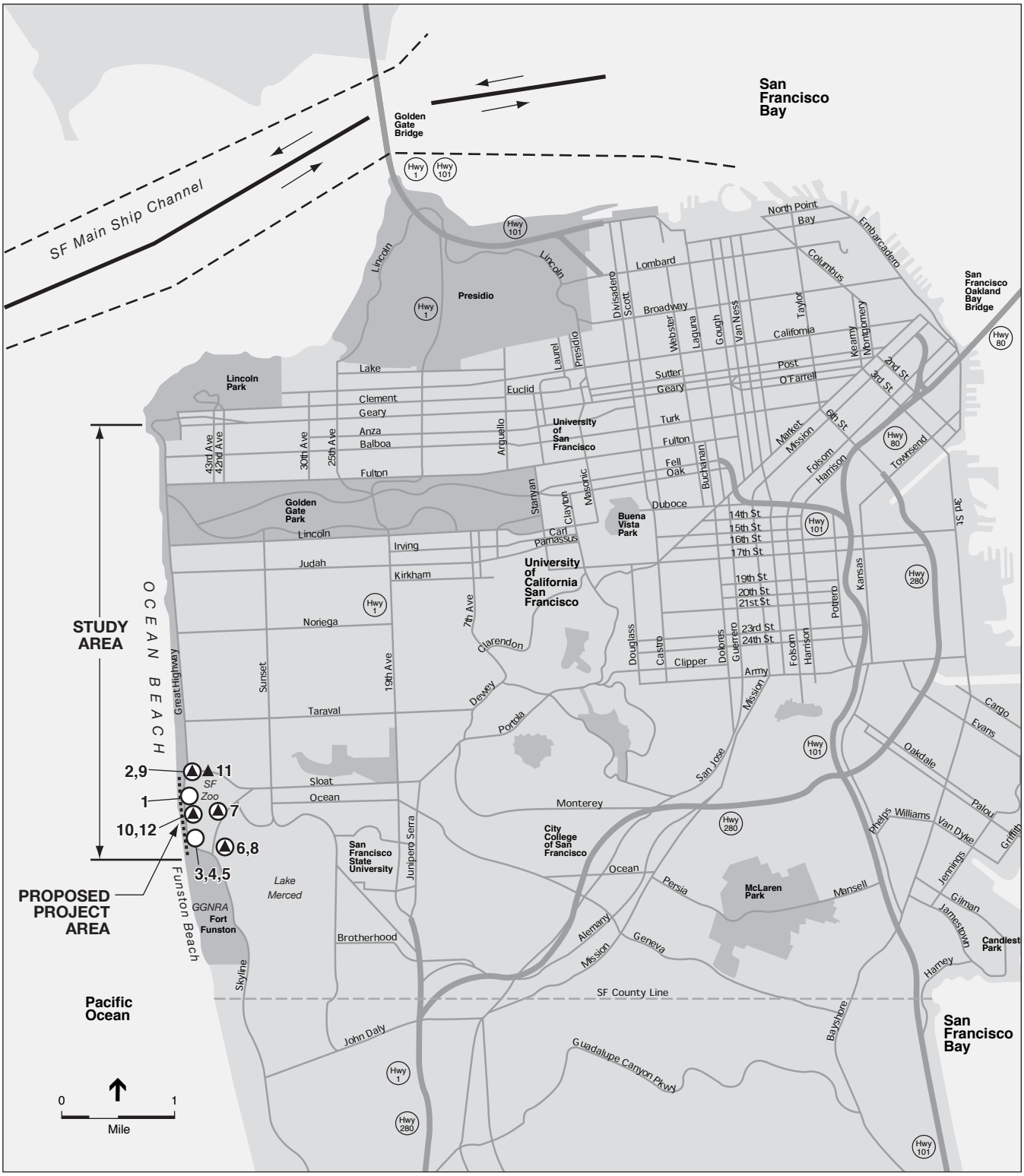
Hazardous Materials Conditions

An environmental database review (EDR, 2005) was conducted to identify permitted uses of hazardous materials, environmental cases, and spill sites where soil and groundwater contamination may be present within ¼ mile of proposed project area. A ¼ mile buffer zone was selected because hazardous materials released to the groundwater can migrate over distances and can potentially affect soil quality in the areas where construction would occur.[1]

Permitted Uses

There are 10 permitted hazardous materials use sites within the ¼ mile of the proposed project area as shown on Figure 4-2. These are facilities that are authorized to use hazardous materials or handle hazardous wastes and comply with current hazardous materials and hazardous waste regulations. Because the use and handling of hazardous materials at permitted sites are subject to strict regulation, the potential for a release of hazardous materials from these sites is generally considered low unless there is a documented chemical release in which case the site would be also tracked in the environmental databases as an environmental case (described below). Permitted sites without documented releases are nevertheless considered potential sources of hazardous materials to the soil and/or groundwater because of accidental spills, incidental leakage or spillage that may have gone undetected.

[1] A description of each database reviewed and the date of the database is included in Attachment 4 – C.



▲ Environmental Case
□ Spill Site
○ Permitted Hazardous Materials Use

Note: See Tables 1 and 2 for site addresses, locations are approximate provided by EDR and not field checked.

SOURCE: EDR, 2005; Orion Environmental Associates

SFDPW Great Hwy-Ocean Beach Erosion / 202262 ■

Figure 4-2
Location of Hazardous Materials

Of the 10 permitted uses identified, 5 are identified as historic underground storage tank (UST) sites identified in the California Facility Inventory (CA FID) database or Hazardous Substance Storage Container (HIST UST) database. These are included in this summary of permitted hazardous materials uses, but are also considered an indication of the potential to encounter hazardous materials in the soil and/or groundwater because these tanks have not been historically subject to regulation. Even though a site may not be listed in the leaking underground storage tank database, a release could have gone undetected and if any excavation occurs in the vicinity, there would be a potential to encounter hazardous materials in the soil and/or groundwater.

Environmental Cases

Of the 10 permitted hazardous material use sites, there are 5 environmental cases identified within 1/4 mile of the proposed project area as shown on Figure 4-2. Environmental cases are those sites suspected of releasing hazardous substances or sites that have required hazardous materials investigations and are identified on regulatory agency lists. Identification of hazardous materials at these sites is generally prompted by site disturbance activities such as removal or repair of an underground storage tank, a release of hazardous materials, or excavation for construction. The status of each environmental case varies and can be listed as either active (on-going investigations or remediation), closed (remediation or clean-up completed and approved by the regulatory agency), or unknown.

As shown on Figure 4-2, there are four leaking underground storage tank sites (LUST database) and one formerly used defense site (FUDS database) located near the southern portion of the Great Highway where erosion damage is closest to the highway.

Leaking underground storage tank sites have typically resulted in soil and/or groundwater contamination and may be undergoing investigation or remediation. Some of these cases may have been sufficiently remediated and closed by the regulatory agencies, although some contamination may remain in place. Identification as a formerly used defense site indicates that the facility is a formerly used military site that is or will undergo corrective action by the U.S. Army Corps of Engineers.

The leaking underground storage tank sites and formerly used defense site identified in this area include:

- The Recreation Center for the Handicapped located at 207 Skyline Boulevard (Site No. 1). There was a release of gasoline from a UST at this facility in 1999. The database review reports that groundwater quality was affected and MTBE was identified in the groundwater. No remedial action was taken, but as of 2002, the site is reported to be conducting post remedial action monitoring.

- Harding Park Golf Course located at 99 Harding Park Road (Site No. 6). There was a release of gasoline from a UST at this facility in 1998. Groundwater quality was affected. Soil was excavated and disposed of and the case was closed by the regulatory agencies in 2001. There was also a release of diesel from a UST in 2003. Only soil quality was affected and the case was closed by the regulatory agencies in 2003.

- The Chevron Station located at 2940 Sloat Boulevard (Site No. 9). There was a release of gasoline from a UST at this station in 1984. Groundwater quality was affected and free product was observed on the groundwater. Soil and groundwater were remediated. The case was closed by the regulatory agencies in 1996.
- The Unocal station at 2710 Sloat Boulevard (Site No. 11). There was a release of gasoline from a UST at this station in 1994 and groundwater quality was affected. Soil was excavated and disposed of and the case was closed by the regulatory agencies in 1996.
- San Francisco AAA Battalion 61-N (Site No. 12). No additional information regarding this site is provided in the database review.

Noise Effects on Sensitive Receptors

Construction activities required for storm damage protection would generate short-term increases in noise levels in the vicinity. The potential impacts due to increases in noise would depend on the type of construction activity as well as the distance to the closest sensitive receptor. For purposes of this preliminary assessment, it is assumed that project construction would occur during the daytime weekday hours only, except in the case of a nearshore sand placement alternative which could include round-the-clock operations. Depending on the conditions at any given location, construction equipment could include backhoes, excavators, soil compactors, dump trucks, water trucks, loaders, forklifts, pile drivers, air compressors, trucks, and portable generators.

Article 29 of the Police Code, Sections 1907 and 2908 regulates construction equipment and construction work at night. Section 2907(b) specifies a noise limit of 80 dBA at 100 feet (or an equivalent sound level at some other convenient location) for any powered construction equipment. Impact tools, pavement breakers, and jackhammers are exempted from this noise limit provided they are equipped with appropriate noise-attenuating mufflers, shields, and/or shrouds.

Air Quality Effects on Sensitive Receptors

In general, sensitive receptors identified under noise impacts also would be sensitive to odors or air pollutants generated by construction activities and associated trucks and construction vehicles. These include facilities that house or attract children, the elderly or people with illnesses, including residential areas, schools and parks. To the extent that these uses occur, they are located downwind of all the alternatives.

Under all alternatives, earthmoving activities associated with construction of storm damage protection alternatives would likely generate an increase in dust (including inhalable particulates, PM10) and equipment exhaust emissions during combustion of diesel fuel. Construction dust control would be subject to the requirements of the Bay Area Air Quality Management District. Since diesel emissions have been identified by the California Air Resources Board as a toxic air contaminant (TAC) and there are residential uses located downwind of Ocean Beach, it would be important to reduce construction-related diesel emissions to the extent feasible.

4.4 Social Resources Discussion

Traffic Conditions

The Great Highway is a four-lane divided arterial. The segment of the Great Highway south of Sloat Boulevard provides a through connection to State Route 35 (Skyline Boulevard) near the northern end of Lake Merced. State Route 35 connects with State Route 1 and Interstate 280. That same segment provides local access for the San Francisco Zoo and the Oceanside Water Pollution Control Plant (ingress/egress for northbound traffic only). If continued erosion were to reduce the land available for the four travel lanes, then some traffic would divert (either voluntarily or involuntarily) to the Sloat Boulevard – Skyline Boulevard alternative route between the intersections of Great Highway / Sloat Boulevard and Skyline Boulevard / Great Highway. Relative traffic volumes on weekdays and weekend days (daily and during peak hours) need to be determined for these two routes in order to analyze the impact that diverted traffic would have on congestion and operating conditions on Sloat and Skyline Boulevards. The effects on emergency vehicles (fire, police and ambulance vehicles) that currently use the Great Highway are also a concern to evaluate. The ability of other access points for the zoo to absorb more traffic (if Great Highway access were affected) needs to be assessed. Access for the treatment plant is limited to ingress from the Great Highway (described above), and egress to Skyline Boulevard (at Harding Road), and the effect of losing (versus maintaining) those access points needs to be addressed.

Local Business Access Conditions

There is one neighborhood commercial area located adjacent to the Great Highway. In addition, the Great Highway provides direct access to the Beach Chalet, which houses a restaurant and visitor center. There are two entrances to the San Francisco Zoo's parking lots: one on the Great Highway and a second on Sloat Boulevard just east of the Great Highway. There is one exit from the Zoo's parking lots and it directs all exiting vehicles onto the northbound lanes of the Great Highway.

Recreational Access and Public Use Conditions

The project area supports passive recreational uses including, but not limited to, bird watching, hiking, beach sports, surfing, and wildlife observation.[2] There are two parking lots south of Sloat Boulevard sandwiched between the Great Highway and the ocean that provide access for visitors by car. During high-demand times, vehicles are also parked on the shoulder of the Great Highway. If continued erosion were to reduce the land available to accommodate parking, then people who currently park in the above-described areas would be forced to park elsewhere (which would entail a longer walk to the destinations they seek).

In the proposed storm damage protection area, there is an abundance of "volunteer" trails, informally created by Ocean Beach visitors, originating from the eroding parking lot and highway

[2] SFPUC's Water Quality Bureau conducted a comprehensive Recreational Use Study (1998-2000) that quantifies usage in the project area for water and non-water contact activities, including swimming, surfing, wading, board sailing, kayaking, walking, jogging, picnicking, sunbathing, and surf fishing.

shoulder. These trails exacerbate current erosion conditions and contribute to loss of bluff material.

Visual Resource Conditions

The proposed project area is a modified natural beach in an urban environment. The coastal bluff is vertically sloped in most areas and supports either paved parking or a road on the top. Prior to1995, artificial bluff material, which consists mostly of fill material from historic development, formed a wide enough barrier between the Great Highway and the ocean that erosion was not a perceived problem. Since 1995, however, winter storms have eroded large areas of the man-made bluffs. Riprap currently stabilizes portions of the bluff banks, while other areas of the banks are continuing to erode.

4.5 Preliminary Constraints Discussion

This section explores how the project area's natural resource and social conditions may constrain the feasibility of implementing the various storm damage reduction measures under consideration for the Ocean Beach Project area. This discussion evaluates the extent to which alternatives may be limited by existing biological resource, hazardous materials, local business, noise and air quality conditions. Based on the individual resource section, alternatives that would have similar constraints have been grouped together to limit redundancy.

Biological Resources

No Project and Facilitated Retreat Alternatives

Bank swallow (*Riparia riparia)*, a state-listed threatened species and federally-listed species of concern is the only listed species known to breed within the project site. Potential nest sites were evident in the fine-textured/sandy cliffs mostly in the northern portion of the project site, where no riprap is present. Without storm damage protection measures, bluff material would likely be depleted over time as the result of persistent littoral processes and by the battering action of waves occurring during storms.

Hard Structure Alternatives

A seawall or revetment would compromise potential bank swallow nest sites found in the fine-textured/sandy cliffs. An offshore breakwater or artificial reef installation would not impact any state or federally-listed terrestrial or aquatic species, but could cause short-term construction-related impacts (e.g., increased turbidity, decreased dissolved oxygen resulting from sediment disturbance) to common fish species in the project area. Essential fish habitat for anadromous fish beyond the project area, and would not be affected by short-term construction-related impacts.

Soft Structure and Beneficial Reuse Alternatives

Onshore beach nourishment and beneficial reuse of dredged materials would not have a likely impact on potential bank swallow nest sites. Impacts to snowy plover (federally-listed threatened species and state-listed species of concern) breeding capacity are not likely, given that the species

solely inhabits the project area outside of the breeding season. However, depending on location and season, construction activity could compel this species to vacate the area. In addition, depending on the ultimate disposal location for dredged materials, there could be short-term, construction-related impacts to benthic communities.

Cultural Resources

Given that the presence of cultural resources is limited to the offshore area, the preliminary constraints discussion is limited to those alternatives that apply to submerged lands.

Breakwater or Offshore Reef Alternative

There are no specific locations for construction activities under this alternative. Placement of an offshore hard structure would need to take under consideration, the potential presence of shipwrecks in the vicinity of the project area. A breakwater or offshore reef could potentially compromise the integrity of the cultural resource.

Beneficial Reuse of Dredged Materials

There are no specific locations for construction activities under this alternative. For nearshore pumping of dredged materials, there would be the potential for dredged materials to temporarily cap a shipwreck. It would be important for a potential capping event to be documented.

Hazardous Materials

Based on the known presence of permitted hazardous materials sites , including environmental cases, within ¼ mile of the proposed project site, there is the potential to encounter hazardous materials in this area and it is likely that implementation of some of the procedures described below could be required.

No Action and Facilitated Retreat Alternatives

If continued erosion under the no action or facilitated retreat alternative were to expose existing soil contamination, then the exposed soil could cause public health and water quality or other environmental impacts. If continued erosion under the no action alternative occurred with only emergency response to erosion damage, then construction workers and the public could be exposed to hazardous materials. Under the facilitated retreat alternative, the relative location of potentially threatened sites should be identified and evaluated for the potential to encounter contaminated materials; corrective action should be taken before any erosion were to expose soil contamination, thereby preventing degradation of water quality and potential public heath and environmental effects before they occur.

Hard Structures Alternatives

The presence of hazardous materials in soil that would be excavated for placement of the hard structures could require special procedures during construction. If, based on the results of the database search or on-site visual indications, hazardous materials are suspected in the soil at

proposed construction sites, construction activities would be subject to hazardous materials and hazardous waste regulations. It may be necessary to conduct sampling to characterize the chemical quality of the soil, to implement health and safety measures for the protection of the workers and public, to implement special handling of the soil, and to dispose of the soil at an approved off-site location. However, compliance with applicable hazardous materials regulations, including preparation of a health and safety plan and implementation of safety precautions to protect construction workers and the public from unacceptable exposure to hazardous materials during construction, as well as adherence to appropriate soil management procedures, would minimize potential public health and environmental impacts associated with hazardous materials.

Soft Structure and Beneficial Reuse Alternatives

Because the placement of soft structures on the beach or in the nearshore would not require excavation of soil in the project area, the presence of a permitted hazardous materials use site or environmental case would not likely constrain the placement of these structures. The only exception is that soft structures should not be placed within the boundaries of a known site. However, there are no identified permitted hazardous materials use sites or environmental cases located to the west of the Great Highway near the project area. Therefore, the existing conditions relative to hazardous materials in subsurface materials should not be a constraint on the placement of soft structures in the project area at locations west of the Great Highway.

Local Business

No Action Alternative

If activities are limited to emergency repair actions, it is possible that emergency repair work could occur on the Great Highway (Upper Great Highway between Golden Gate Park and the Zoo) along the entire section of Ocean Beach. Such work could cause temporary disruption of access to the Beach Chalet and Zoo. Provisions to ensure continued access to these businesses would need to be implemented. While Great Highway does serve as a commuter road, all other residential and commercial uses appear to have separate access (e.g., access to Great Highway where it is separated from the Upper Great Highway or cross-streets).

Hard and Soft Structure Alternatives

Short-term construction-related activities, such as transport of materials, pile driving, building and/or earthmoving would occur in the bluff vicinity and could disrupt access to and from the Zoo's parking lot, particularly its sole exit on the Great Highway. Other commercial and recreational uses including the Beach Chalet in Golden Gate Park or commercial uses south of the project area are not expected to be disrupted by the construction-related activities of these alternatives.

Beneficial Reuse of Dredged Materials

For nearshore or onshore pumping of dredged materials, there would be potential disruptions to local business similar to what is noted for the soft structure alternative. The alternative would

likely involve earthmoving vehicles to distribute sand throughout the project area. There could also be long-term impacts to Great Highway traffic flows if the natural dispersion of disposed sand does not successfully nourish the eroded beach south of Sloat Blvd, and the Highway needs to be realigned to address public safety concerns.

Facilitated Retreat Alternative

As there are no specific locations preordained for construction activities under this alternative, the potential local business access constraints are challenging to quantify. Actions that accompany a facilitated retreat alternative, such as potential highway alignment and/or parking lot removal, are anticipated at a much later date compared to the other alternatives. There could be long-term impacts to Great Highway traffic flows if lanes need to be permanently closed for public safety.

Noise

No Project Alternative

There are no specific locations for construction activities under this alternative. If activities are limited to emergency repair actions, it is possible that emergency repair work could occur as close as the west side of the Great Highway (Upper Great Highway between Golden Gate Park and the Zoo) along the entire section of Ocean Beach. Although construction noise would meet the City's 80-dBA noise limit, construction could occur closer to residential and park uses than the other alternatives in the event repair work is required on the Great Highway/Upper Great Highway. Construction noise could occur as close as approximately 200 feet from residential uses, 270 feet from the Beach Chalet (450 feet or more from other Golden Gate Park uses), and 500 feet of the closest exhibits at the San Francisco Zoo. At 200 feet, most construction-related noise (with or without noise controls) could noticeably exceed ambient noise levels, particularly if pile driving is required for any road repair. However, repair projects would likely be smaller in scope and more limited in duration than the other alternatives.

Hard Structure Alternatives

Construction of a seawall could require pile driving, which would generate the highest noise levels and would pose the most intensive construction activities in proximity to the Zoo exhibits. Construction of a seawall or placement of large rocks along the bluff or further inland (but west of the Great Highway in the bluff vicinity) would result in operation of heavy equipment at a minimum distance of approximately 500 from the San Francisco Zoo exhibits and 350 feet from the closest residential uses.

At 500 feet, noise from construction equipment could be maintained at or below ambient noise levels with the use of feasible noise controls except for pile driving. However, if pile driving is required, construction-related noise (with or without noise controls) could exceed daytime ambient noise levels at the Zoo,[3] and could disturb animals at the Zoo, particularly those in the Children's Petting Zoo and African Savanna (including zebras and gorillas). Monitoring by

[3] Noise levels collected as part of the Oceanside Water Pollution Control Plant indicated ambient noise levels of 53 to 70 dBA (during the day).

zookeepers during construction of the Oceanside Water Pollution Control Plant (located south of the Zoo) indicated reactions such as zebras stampeding due to unusually noisy conditions, numerous instances of distressed or aggressive behavior of birds at the Aviation Conservation Center, and gorillas displaying aggressive/agitated behavior during noisy earthwork. Some Zoo animals were observed to be sensitive to impulsive noise, particularly during the breeding season. Examples of impulsive noise include pile drivers, jackhammers, and drilling equipment (City and County of San Francisco, 1997).

The closest residential receptors to the bluff are located 400 feet or more away. At this distance, noise from all construction activities except for pile driving could be maintained at acceptable levels for residential use (60 dBA or less) with the use of feasible noise controls. Pile driving noise would exceed ambient noise levels at the closest residential receptors with or without noise controls.

During construction, transport of materials to the bluffs would increase truck traffic on the Great Highway and the truck access route, resulting in temporary, increased traffic noise. Zoo exhibits are located as close as approximately 400 feet from the Great Highway centerline.

Noise impacts associated with increased truck noise along the Great Highway and the truck access route would depend on the level of background noise already occurring along the truck route as well as specific truck-activity characteristics.

Soft Structure Alternatives

Similar to the hard structure alternatives, placement of sand deposits at the current bluff location or further inland (but west of the Great Highway in the bluff vicinity) could result in operation of heavy equipment at a minimum distance of approximately 500 feet from the San Francisco Zoo exhibits and 400 feet from the closest residential uses. However, it anticipated that these alternatives would not likely require pile driving. Therefore, construction noise impacts in the bluffs vicinity would be less than the Hard Structure alternatives.

Construction noise associated with the Soft Structure alternatives would be associated primarily with earthmoving equipment and haul trucks. At distances of 400 - 500 feet, noise levels associated with earthmoving equipment could be maintained at levels generally at or below ambient noise standards in the Zoo vicinity. Like the Hard Structures alternative, it is anticipated that there would be increased truck noise along the Great Highway and the truck access route. However, the effect of construction-related truck traffic would depend on the level of background noise already occurring along the truck route as well as specific truck-activity characteristics.

Beneficial Reuse of Dredged Materials

Depending on the disposal location of dredged materials, dredge pumping and earth moving activities would have varying levels of noise impacts. Disposing dredged materials at the current bluff location would be similar to soft structure construction impacts (see above), with an additional noise factor occurring from round the clock onshore dredge pumping and earth moving

activities. Disposing dredged materials at a nearshore location would have minimal noise impacts to the Ocean Beach project area because the movement of dredged sand would be dependent on natural processes.

Facilitated Retreat

There are no pre-specified locations for construction activities under this alternative. Noise impacts associated with this alternative are variable, depending on the ultimate location of the receded shoreline. Some management techniques could entail higher noise impacts than others. For example, if the Great Highway requires realignment, the highway median would be shifted landward. Assessing the implications of this alternative may require noise modeling in order to more fully understand the range of impacts.

Air Quality

No Project Alternative

There are no specific locations for construction activities under this alternative. However, any emergency repair actions could generate dust and diesel exhaust emissions closer to residential and park uses than the other alternatives. However, repair projects would likely be smaller in scope and shorter in duration than the other alternatives, minimizing potential exposure of these sensitive receptors.

Hard Structure Alternatives

These alternatives would generate dust and exhaust emissions as part of any required excavation work. In addition, construction of a seawall or placement of large rocks along the bluff or further inland (but west of the Great Highway in the bluff vicinity) would require the most intensive operation of heavy equipment. Increased exhaust emissions also would be associated with trucks required for transport of construction materials (e.g., concrete, gunite, or boulders). Therefore, equipment exhaust emissions would likely be greater for these alternatives than the other alternatives.

Soft Structure Alternatives

Placement of sand deposits at the current bluff location or further inland (but west of the Great Highway in the bluff vicinity) would require operation of earthmoving equipment at the construction site and transport of sand to this site. Equipment exhaust emissions would be associated with both activities. Given the shorter construction period needed to implement this alternative, it is anticipated that overall equipment exhaust emissions would be lower than those occurring from implementing a hard structure.

Beneficial Reuse of Dredged Materials

Dredging and disposal of materials from the SF Main Ship Channel are typically exempt from general conformance to air quality standards because USACE is performing a channel maintenance task. However, if the dredged materials were deposited at an upland occasion, it

could be anticipated that this is an additional action. In this case, air quality impacts would occur from pumping sand onshore, in addition to the construction activities associated with soft structure/beach nourishment tasks.

Facilitated Retreat Alternative

There are no specific locations for construction activities under this alternative. This alternative could involve removal and hauling of historic fill from the bluff area. Over time, there may be air quality impacts from construction activities involving highway realignment.

4.6 Conclusion

This chapter is intended to provide baseline information about the project area; to identify areas that will require further study as alternatives become more fully developed; and to help evaluate the extent by which the various alternatives could be limited by existing resource conditions. As the alternatives screening moves forward, these resource constraints will be considered alongside the policy constraints of agencies with jurisdictional authority and/or property ownership of the project area.

References

California Department of Fish and Game (CDFG), 2005. Natural Diversity Data Base Report for South San Francisco USGS Quadrangle. (RareFind Version 3.0.5)

City and County of San Francisco, Department of City Planning, 1997. *San Francisco Recycled Water Master Plan and Groundwater Master Plan, Final Environmental Impact Report.* August 7.

Delgado, James P. and Stephen A. Haller, 1989 *Submerged Cultural Resource Assessment: Golden Gate National Recreation Area, Gulf of the Farallones National Marine Sanctuary and Point Reyes National Seashore*. Prepared for the U. S. Department of Commerce and the Department of the Interior.

Environmental Data Resources, Inc. 2005. The EDR Radius Map Report, Ocean Beach-Great Highway Project. Inquiry number 01345339.1r. January 19.

National Park Service (NPS), Division of Natural Resource Management and Research, 1997. Snowy Plover Management Plan for Ocean Beach, Golden Gate National Recreation Area.. May.

National Park Service (NPS), Division of Natural Resource Management and Research, 1999. Natural Resources Section of the Resources Management Plan, Golden Gate National Recreation Area. December.

San Francisco Public Utilities Commission (SFPUC), Water Quality Bureau. Ocean Beach Recreational Use Survey 1998 – 2000. Submitted in 2002 to the California Regional Water Quality Control Board, San Francisco Bay Region.

U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center, 1985. Biological Effects of Breakwater Construction on Aquatic Communities in the Great Lakes.

CHAPTER 5
Stakeholder Perspectives

5.1 Introduction

Stakeholder agency input from local, state and federal entities is an essential component of the San Francisco Department of Public Works and the U.S. Army Corps of Engineers' (project sponsors) feasibility study process for the Ocean Beach-Great Highway Storm Damage Protection Project. From a planning standpoint, local, state and federal agencies with jurisdiction over the project area have a tremendous amount of site-specific knowledge that is invaluable to the project sponsors in developing a pre-NEPA/pre-CEQA alternatives screening process. In addition, the State funding authorities for the California Beach Erosion Control Grant Program, Cal Boating and the California Resources Agency, require grant recipients to develop solutions that comply with all relevant agency policies and guidelines. From an implementation standpoint, stakeholder agency input is necessary to effectively incorporate the proposed project area's multiple management authorities. Depending on the selection of preferred storm damage reduction measures, the project may be subject to various agency policies and management guidelines, as well as regulatory permitting processes.

As part of the feasibility study, the project sponsors developed a thorough index of agency policies and management guidelines as they pertain to the Ocean Beach-Great Highway Storm Damage Protection Project (see Chapter 2 for the list of agencies). All agencies with potential management or permitting authority over the project, or that would be affected by the outcome of the project were included in this index. The project sponsors then implemented a two-pronged stakeholder input approach:

- A questionnaire was distributed to stakeholder agencies which addressed familiarity with the Ocean Beach-Great Highway project area and issues; clarified jurisdictional authority and boundaries; requested internal guidance on management decisions; inquired about the proposed range of alternatives; and requested agency preferences.

  The purpose of the questionnaire was to further inform and refine the index of policies and management guidelines as they pertain to the Ocean Beach-Great Highway Storm Damage Protection Project; and to facilitate the design of the stakeholder agency workshop in which agency representatives would participate in a pre-NEPA/pre-CEQA alternatives screening process and subsequently engage in a collaborative discussion. Nearly all contacted agencies participated and provided responses (see 5.2 Results).

- A stakeholder agency workshop was held to facilitate discussion of project alternatives in light of updated information on coastal processes, agency policies and management practices, and environmental constraints in order to identify long-term protection measures that could address diverse needs, provide multiple benefits within the existing regulatory framework, and to be responsive to the public's financial capabilities.

  The half-day workshop provided participating stakeholder agencies with updated information on coastal sediment processes and USACE's Operations Plan Proposal for maintaining the SF Main Ship Channel. In particular, USACE's presentation highlighted an emerging beneficial reuse opportunity to address storm damage protection issues at Ocean Beach (see Appendix 2C), as well as Federal-State cost sharing prospects.

  These updates served to inform stakeholder agencies of current planning efforts and explore potential project alternatives. The core activity of the workshop was an alternatives screening exercise in which agency representatives vetted internally in order to come to consensus on alternatives that met internal management guidelines and policies. The results of the screening process are illustrated in Section 5.3. This screening exercise was followed by an inter-agency discussion addressing potential long-term solutions for Ocean Beach-Great Highway protection, local coastal planning needs, project funding constraints and capabilities, the Operations Plan Proposal, and the current SFDPW-USACE feasibility process.

5.2 Questionnaire Results

The questionnaire addressed the following topic areas: a) applicable jurisdictional authority; b) internal guidance on management and enforcement in the project area; c) adequacy, preference, and acceptability of a range of alternatives, and d) projected agency involvement in the ongoing project.

Jurisdiction

Crafting a long-term solution to Ocean Beach's erosion issues is challenging given the potential complexity of multiple jurisdictions, diverse management guidelines, and consultation privileges in one project area. Table 5-1 outlines the stakeholder agencies whose jurisdictional interest lies within the project area.

Internal Guidance on Management and Enforcement

Several stakeholder agencies noted internal guidance that directs management, planning, and enforcement activities within their jurisdiction:[1]

[1] Agencies omitted from this section responded that they did not have pertinent internal guidance (memos, letters, directives).

TABLE 5-1

STAKEHOLDER AGENCIES WITHIN THE PROJECT AREA

Stakeholder Agency	Jurisdictional Boundary and/or Authority within the Project Area
USACE	Navigable Waters of the United States
National Park Service's GGNRA	All of the beach at Ocean Beach, as well as lands to the north and south, are within the GGNRA administrative boundary. The eastern boundary of GGNRA's jurisdiction is approximately 55 feet west of the Great Highway. Through a State Lands lease, GGNRA's land jurisdiction extends 1,000 feet waterward of ordinary high water mark.
NMFS	Essential Fish Habitat (EFH), upland activities that impact EFH
USFWS	Listed T & E species and related habitat
California Coastal Commission	Direct permitting authority over any structures located on the beach or base of the bluff (tidelands) Appeal jurisdiction over any project located between the sea and the first public road; or 300 feet of the inland extent of any beach, whichever is greater. Also applies to projects within 300 feet of the top of any seaward face of any coastal bluff
CDBW	California coastal shoreline
CDFG	Listed T & E species and related Habitat
CSLC	Three mile-wide section of tidal and submerged land adjacent to the coast and offshore islands, including bays, estuaries, and lagoons
SF Department of Parking and Traffic	City and County limits of San Francisco
SF Department of Public Works	City and County limits of San Francisco; Maintain Public Right of Way
SF Recreation and Parks Department	Entirety of Great Highway, including median, from Point Lobos Ave to the southern edge at Skyline Boulevard; San Francisco Zoo, which is bounded by The Great Highway, Sloat Boulevard, Herbst Road and Skyline Boulevard.[2]
San Francisco Public Utilities Commission	The San Francisco PUC operates the Lake Merced Transport, the Oceanside Water Pollution Control Plant and the Southwest Ocean Outfall (SWOO) for the discharge of treated wastewater into the Pacific Ocean offshore of San Francisco. – The 14 foot diameter Lake Merced Transport runs roughly under the Westside edge of Great Highway median strip. The top of the pipe is roughly at zero City Datum. – The entrance to the Oceanside WPCP is from the north bound lane of the Great Highway. – The Southwest Ocean Outfall runs under the Great Highway and goes offshore roughly 4 miles (it is 4.5 miles long but angles offshore). It is deep. The junction structure is east of the north bound lane.
San Francisco Zoo	Maintenance and operation of SF Zoo

- USACE follows Engineering Regulation 1105-2-100: Chapters 3, 4, and Appendix E of the Civil Works Missions and Procedures to determine actions and procedures for storm damage reduction. While the entirety of the applicable language from ER 1105-2-100 can be found in Appendix 2 of this document, the following six bullets summarize the guidance.

[2] Although the SF Zoo is under the San Francisco Recreation and Parks Department's jurisdiction, the Zoological Society is responsible for the maintenance and operations of the Zoo.

- **Chapter 3** defines USACE's role in maintaining navigational channels: to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation. It also specifies USACE policies for the placement of dredged materials. USACE accomplishes their navigational objective through a combination of capital improvements and the operation and maintenance of existing projects.
- **Chapter 3** also provides guidance for Hurricane and Storm Damage Reduction actions, and specifically outlines the types of improvements allowed under this action. It further clarifies USACE's policies on geographic applicability, erosion control measures, historic shoreline, formulation and establishing (of) USACE participation, public use and its relation to federal participation, shorelines owned by federal agencies, and periodic nourishment. Lastly, it outlines the steps to evaluate benefits for hurricane and storm damage prevention projects.
- **Chapter 4** defines the types of studies and reports required for Civil Works projects, including feasibility phase studies, and National Environmental Policy Act documentation. The objective of feasibility studies is to investigate and recommend solutions to water resources problems. Cost of feasibility studies, except single purpose inland navigation studies, are 50 percent Federal and 50 percent non-Federal as defined in Section 105 of the WRDA of 1986. Lastly, Chapter 4 outlines the general requirements for reconnaissance and feasibility phases, including interagency coordination procedures.
- **Appendix E** sets out the specific protocols for federal and non-federal participation. It reiterates USACE's understanding that erosion control measures have no separate status as a project purpose or as a project output. Thus, erosion control measures such as beach fill or nourishment, breakwaters, and revetments are purely means to an end for hurricane and storm damage reduction or recreation improvements.
- USACE is also guided by the **Environmental Operating Principles** established in 2002. These principles are rooted in the various environmental laws, statutes, and regulations, as well as USACE's four pillars of compliance, restoration, prevention, and conservation, which govern the environmental approach for all USACE activities.
- Finally, it is standard procedure for USACE to submit documents to the South Pacific Division or to Federal Headquarters for approval before publishing or implementing actions. USACE planning and implementation activities are also subject to Independent Technical Review. As a final review process, USACE follows Quality Control measures as outlined within their Quality Management Plan.

- National Park Service management of Ocean Beach requires plans be consistent with all Management Guidelines noted in Chapter 2 and Appendix 2D. Internal policy guidance on specific shoreline protection issues includes §4.8.1. Protection of Geologic Processes; §4.8.1.1 Shorelines and Barrier Islands; §9.1.1 Siting of facilities; §9.1.1.6) Siting of Facilities to Avoid Natural Hazards; and §9.1.3.3 Borrow Pits and Spoil Areas. Specific language can be found in Chapter 2: Management Guidelines. General management policies contained within Appendix 2D, (§ 1.4.4, §1.4.5, § 1.4.6, § 1.4.7, and §4.1) define the prohibition of impairment to park resources and values and outline the National Park Service's decision-making requirements to avoid park impairments.
  - In addition to the 2001 Management Policies, all NPS management actions must be consistent with GGNRA's General Management Plan (1980) and the 1975 agreement with CCSF that transferred lands to GGNRA. Director's Order 12 (DO-12) guides GGNRA's implementation planning.
- California Department of Fish and Game (CDFG) has a Marine Environmental Review Unit which meets on a weekly basis to discuss complex projects and develops departmental comments based on existing policies.
- California State Lands Commission's (CSLC) staff recommendations on projects within their jurisdiction are guided by Article 11, Title 2, Division 3, Chapter 1, California Administration Code, concerning the CSLC's Regulations Protecting Environmentally Significant Lands.
- SFDPW follows the City of San Francisco's rules and regulations including: City Charter, Administrative Code, Planning Code, Building Code, Public Works Code, Traffic Code, Ordinances, Board of Supervisor's Resolutions, SFDPW Director's directives, SFDPW departmental policies. In the event of an emergency, the SFDPW Director has the authority to take action to protect life and property.
- SF Department of Parking and Traffic (SFDPT) follows the City's rules and regulations pertaining to the Traffic Code, specifically the regulations for working in San Francisco Streets.
- San Francisco Recreation and Parks Department (SFRPD) is governed by Park Code provisions. The following codes may apply to the Ocean Beach-Great Highway Storm Damage Reduction Project, depending on the potential impacts to the Great Highway: Article 3, "Regulations" Section 3.16; Article 6, "Traffic Regulations" Section 6.01; and Article 7 "Permits" Section 7.04(b), 705, 7.06, 7.07. The Recreation and Park Commission oversees the regulations in the park code, and has the authority to grant, deny, revoke or impose conditions on any permit. In addition, the Ocean Beach-Great Highway Project would require discretionary approval by the Recreation and Park Commission and Planning Commission prior to construction.

Sufficiency of Alternatives

Comments on the sufficiency of alternatives were minimal, given the early nature of this vetting process.

- California Department of Boating and Waterways (Cal Boating) requested that Regional Sediment Management be added and addressed as an alternative; making specific reference to USACE's pilot dredging activities. Cal Boating noted that the 300,000 to 500,000 cubic yards of sand being dredged annually from the San Francisco Bar to maintain adequate navigation depths could be utilized either on Ocean Beach or deposited in the nearshore where it would be available to the littoral budget in the immediate area of need.[3]
- CSLC noted that the public should be aware that the City and County of San Francisco currently has a lease with their agency that allows for the offshore dumping of sand on a 151.90-acre parcel off the Ocean Beach shoreline.[4] The lease expires in 2027. If the new project is constructed within the lease area or extends beyond the lease premises within CSLC's jurisdiction, an amendment to the existing lease or a new lease would have to be executed with CSLC. This has direct implications for Alt 3A (Soft Structures at Current Shoreline) and Alt 6 (Nearshore Sand Replacement) if a new location for offshore sand dumping were to be chosen. Prior to the execution of the new lease, the CSLC may require an EIR be performed to assess potential environmental impacts.
- A variety of stakeholder agencies noted that while the range of alternatives is sufficient, it is the screening criteria that are critical in evaluating the suitability of project alternatives. The National Park Service specifically noted that ensuring that a reasonable range of alternatives is adequate requires a formal process that takes into consideration the alternative's technical and economic feasibility, as well as whether it meets the objectives of the project. For this reason, GGNRA staff did not want to foreclose any options that could meet these criteria.

Preferred Alternatives

Comments on preferred alternatives addressed management policies, resource concerns, continued operations of facilities, and budget constraints.

- Cal Boating promotes the use of soft alternatives, such as Regional Sediment Management (RSM) and beach restoration, over the use of structural protection.
- GGNRA noted that while they have not done any screening of the alternatives to determine to what extent they are consistent with their management plans and policies, generally speaking, alternatives that impact the scenic beauty and natural character of the area would be inconsistent with their management responsibility of Ocean Beach. Consequently, GGNRA would generally prefer soft alternatives, with the use of hard structures only as a "last resort."
- NOAA'S National Marine Fisheries Service (NMFS) would prefer soft structure alternatives over those that involve off-shore construction, including breakwater structures and artificial reef construction. Soft structure alternatives would only be a concern if there

[3] While this alternative was not originally included in the questionnaire, it was incorporated into the alternative screening exercise as Alternative 6, *Nearshore Sand Placement.*

[4] The CSLC lease number is PRC 5433.

were rocky outcrops or aquatic vegetation present in the project area. (There are none present in the project area.)

- SF Environment views a facilitated retreat alternative as most in step with agency policy.
- Due to budgetary limitations, SFDPW prefers alternatives that do not require substantial ongoing maintenance. Given this limitation, hard structures such as breakwaters, reef construction, or seawall revetment are preferred.
- San Francisco Public Utilities Commission (SFPUC) prefers either hard or soft alternatives placed at the current bluff location.
- SFRPD generally supports an alternative involving minor development inland. Improvements along the current bluff location are preferred.

Acceptability of Alternatives

- There are no alternatives that Cal Boating deemed unacceptable. They support projects on the basis of good science and engineering, and that are supported by the local governing agency.
- The California Coastal Commission (CCC) held that shoreline armoring projects are generally inconsistent with the policies of the California Coastal Act concerning coastal access, visual resources, alteration of shoreline processes, and habitat protection. However, the Coastal Act requires the Commission to approve permits for shoreline armoring project when:

  1. it is necessary to protect an existing structure that is in danger from erosion,
  2. there is no less environmentally damaging feasible alternative, and
  3. impacts to local shoreline sand supply are avoided or mitigated.

  As such, alternatives to shoreline armoring, particularly retreat, when feasible are required under the Coastal Act.
- GGNRA stated that in order to determine if an alternative is unacceptable (versus unreasonable) requires some level of impact analysis. If it is determined that an alternative would impair the resources of GGNRA (for which GGNRA was established), the alternative would be considered unacceptable. Impairment analysis is a distinct step in the National Park Service process for conducting impact analysis.
- There are no alternatives that USACE deems unacceptable, as long as they are publicly acceptable and implementable.
- NMFS stated that off-shore alternatives and/or a seawall at the edge of the beach area would not be acceptable. Any type of seawall construction would need to be as far inland as possible. NMFS maintained that these alternatives are believed to cause further erosion of the beach, and therefore, the agency is generally not in favor of them.
- With respect to the Managed Retreat Alternative, SFDPT requested the identification of possible detour routes/alternative routes in the event of closure of traffic lanes.
- SFDPW stated that a “no action” alternative would not be acceptable.

- SF Environment stated that a hard structure alternative would be the least compatible with agency interests due to the fact that it creates the least natural environment at Ocean Beach.
- SFPUC could not support any of the options that would result in the loss of the traffic lanes and possible exposure or loss of cover to the Lake Merced Transport facilities. The north bound traffic lane is important to the SFPUC as a means of access to the Oceanside WPCP. The northbound lane is also important in case of emergency in order to have two means of egress out of the WPCP facility. There is also concern that if the cover on the Lake Merced Transport is reduced there could be issues with structural stability or buoyancy effects.
- The SFRPD stated that they recognize the severity of erosion along the Great Highway and that they fully support a project proposal to address and minimize its effect in that area. However, SFRPD would not support an alternative that would conflict with its departmental plans and policies, specifically alternatives that would block views of South Lake or historical structures from the Great Highway, degrade the sand dune ecosystem, discourage public access to the beach, or threaten wildlife habitat.

Agency Involvement

There was minimal response to this question asking how stakeholder agencies perceived themselves being involved in the project process in the future. Most wanted to be kept informed in some capacity as details on the alternatives became more concrete. In addition to the current project partnership between SFDPW and USACE:

- GGNRA responded that they would like to be an actively participating partner in the project since a majority of the project area is within their jurisdiction, and that GGNRA would likely need to permit and approve the activity(s) in order for the project to be implemented. However, up to this point in time, limited resources have prevented GGNRA from fulfilling this role. Given their expertise on the project area, GGNRA and the larger National Park Service organization have information and experience that would be invaluable to the planning and implementation of this project.
- NMFS is available to provide technical assistance.
- SFDPT requested to be informed on road conditions and the future of the roadway.
- SFRPD aims to be a cooperating stakeholder in the decision making process for the Great Highway Project, and a support mechanism to enhance interagency coordination wherever possible.

5.3 Alternatives Screening Workshop Results

At the stakeholder agency workshop held on April 12, 2005, agency representatives were asked to evaluate the range of alternatives to determine which storm damage protection measures met internal agency management guidelines and policies. During this process, the project sponsors acknowledged that it was important to consider measures separately for the purposes of this alternatives screening process, but that individual measures would likely be combined at a future

date. Agencies with multiple representatives in attendance discussed these measures internally before providing a collective agency response.

The following agencies and organizations were present at the workshop and participated in this alternatives screening exercise: US Army Corps of Engineers, National Park Service's GGNRA, California Coastal Commission (CCC), SFDPW, SFDPT, SF Environment, SFPUC, SFRPD, and the San Francisco Zoo.[5] The exercise involved a qualitative ranking process, in which agencies indicated each alternative's consistency with internal management guidelines and policies by applying a red, yellow, or green dot to a large-scale matrix (a replica of the matrix can be found on page 5-15 of this Chapter). Following the exercise, participants engaged in dialogue and discussion with the project sponsors to address the storm damage reduction alternatives, funding constraints and opportunities, and future planning efforts (See Appendix 5.2 Workshop Discussion Summary). This clarified the project sponsors' understanding of agencies' core concerns and highlighted areas where related planning efforts could be initiated by local agencies.

Federal Agency Workshop Participants

United States Army Corps of Engineers.

Measures that meet USACE's internal management guidelines and policies included:

- Alt 1, *No project alternative;*
- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place;*
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;*
- Alt 4a, *Construction of an off-shore reef;*
- Alt 4b, *Construction of a breakwater.*
- Alt 3a, *Soft Structures placed at the existing shoreline.*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat; and*
- Alt 6, *Nearshore Sand Placement.* USACE is directly involved in the pilot project that would facilitate the implementation of Alternative 6.

There are no measures that do not meet USACE's internal management guidelines and policies, however USACE provided the following feedback to the alternatives screening exercise:

> *USACE staff had a lengthy discussion at the agency forum about whether or not to put up all green dots, all yellow, or to mix red and green. From a management guideline and policy perspective, USACE could look at all of the storm damage alternatives put forward. However, during the analysis the alternatives would have to go through a screening process, as set forth in the Principles and Guidelines (ER 1105-2-100). At a minimum, the alternative must have a Benefit/Cost ratio greater than 1. Alternatives are also compared against one another in four different categories: completeness, effectiveness, efficiency, and acceptability. To clarify, completeness is the extent to which*

[5] It should be noted that an Ocean Beach Task Force representative also was present at the agency meeting, as an invited guest of San Francisco Environment.

the alternatives provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities. Effectiveness is the extent to which the alternatives contribute to achieve the planning objectives. Efficiency is the extent to which an alternative is the most cost effective means of achieving the objectives. Acceptability is the extent to which the alternatives are acceptable in terms of applicable laws, regulations and public policies.

National Park Service's Golden Gate National Recreation Area.

Measures that meet GGNRA's internal management guidelines and policies include:

- Alt 3a, *Soft Structures placed at the existing shoreline;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that may meet GGNRA's internal management guidelines and policies include:

- Alt 1, *No project alternative;*
- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;*
- Alt 4a, *Construction of an off-shore reef;* and
- Alt 4b, *Construction of a breakwater.*

Measures that did not meet GGNRA's internal management guidelines or policies for the project area include:

- Alt 2b *Hard Structures established further inland, abandoning shoreline in place.*

State Agency Workshop Participants

California Coastal Commission

Measures that meet CCC's internal management guidelines and policies include:

- Alt 3a, *Soft Structures placed at the existing shoreline;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that may meet CCC's internal management guidelines and policies include:

- Alt 2c, *Hard Structures established further inland and removal of existing rubble;* and
- Alt 4a, *Construction of an off-shore reef.*

Measures that did not meet CCC's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;*
- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b *Hard Structures established further inland, abandoning shoreline in place;* and
- Alt 4b, *Construction of a breakwater.*

Local Agency Workshop Participants

SF Environment.

Measures that meet SF Environment's internal management guidelines and policies include:

- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that may meet SF Environment's internal management guidelines and policies include:

- Alt 2c, *Hard Structures established further inland and removal of existing rubble.*

Measures that did not meet SF Environment's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;*
- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b *Hard Structures established further inland, abandoning shoreline in place;*
- Alt 4a, *Construction of an off-shore reef;* and
- Alt 4b, *Construction of a breakwater.*

SF Department of Parking and Traffic

The measures that met SFDPT's internal management guidelines and policies include:

- Alt 4a, *Construction of an off-shore reef;* and
- Alt 4b, *Construction of a breakwater.*

Measures that may meet SFDPT's internal management guidelines and policies include:

- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that did not meet SFDPT's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;*
- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place;* and
- Alt 2c, *Hard Structures established further inland and removal of existing rubble.*

SF Department of Public Works

Measures that meet SFDPW's internal management guidelines and policies include:

- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 4a, *Construction of an off-shore reef;*
- Alt 4b, *Construction of a breakwater;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that may meet SFDPW's internal management guidelines and policies include:

- Alt 3a, *Soft Structures placed at the existing shoreline.*

Measures that did not meet SFDPW's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;*
- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place;*
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*; and
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment.*

SF Recreation and Parks Department

The measures that met SFRPD's internal management guidelines and policies include:

- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 3a, *Soft Structures placed at the existing shoreline;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 4a, *Construction of an off-shore reef;* and
- Alt 4b, *Construction of a breakwater.*

Measures that may meet SFRPD's internal management guidelines and policies include:

- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place;*
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;* and

- Alt 6, *Nearshore Sand Placement.*

Measures that did not meet SFRPD's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;* and
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment.*

SF Public Utilities Commission

Measures that meet SFPUC's internal management guidelines and policies include:

- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place*;
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;*
- Alt 3a, *Soft Structures placed at the existing shoreline;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 4a, *Construction of an off-shore reef;*
- Alt 4b, *Construction of a breakwater;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that did not meet SFPUC's internal management guidelines or policies for the project area include:

- Alt 1, *No project alternative;* and
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment.*

SF Zoo

Measures that meet SF Zoo's operational concerns include:

- Alt 3a, *Soft Structures placed at the existing shoreline;*
- Alt 3b, *Soft Structures placed further inland and removal of existing rubble*;
- Alt 5, *Facilitated Retreat: remove rubble to equilibrium, possible road realignment;* and
- Alt 6, *Nearshore Sand Placement.*

Measures that may meet SF Zoo's operational concerns include:

- Alt 2a, *Hard Structures established at the existing shoreline;*
- Alt 2b, *Hard Structures established further inland, abandoning the shoreline in place;*
- Alt 2c, *Hard Structures established further inland and removal of existing rubble;*
- Alt 4a, *Construction of an off-shore reef;* and
- Alt 4b, *Construction of a breakwater.*

Measures that did not meet SF Zoo's concerns for the project area include:

- Alt 1, *No project alternative.*

5.4 Future Steps

The workshop was a critical step in the preliminary screening of project alternatives. As the SFDPW-USACE feasibility study continues, USACE will coordinate with resource and regulatory agencies to perform a demonstration of dredged material disposal in the nearshore waters adjacent to Ocean Beach, together with survey monitoring to determine how sand may disperse from the new area. If the Pilot Study Area is environmentally and economically feasible, USACE will pursue having the area permanently designated as an alternative disposal area to be used in conjunction with SF-8, to assure continued maintenance of the economically vital Main Ship Channel, and offer adaptive sediment management within the littoral cell. The combination of this pre-scoping data, USACE channel maintenance activities, and further USGS and consultant studies will collectively be used to inform the upcoming pre-CEQA/pre-NEPA scoping process for the Ocean Beach-Great Highway Storm Damage Protection area.

Does The Alternative Meet Your Internal Management Guidelines And Policies?	Alternative 1 (No action) (Emergency response only +ad hoc sand enhancement on southern end)	Alternative 2a Hard structures (seawall, revetment) at existing shoreline location	Alternative 2b Hard structures further inland; Abandon shoreline in place	Alternative 2c Hard structures further inland; Remove rubble	Alternative 3a Soft structure (dune or beach) at existing shoreline position	Alternative 3b Soft structures (dune or beach) Further inland; Remove rubble	Alternative 4a Off shore reef	Alternative 4b Breakwaters	Alternative 5 Facilitated retreat; Remove rubble to equilibrium; Possible road realignment	Alternative 6 Nearshore sand placement
Yes	Federal US Army Corps of Engineers (USACE)	Federal USACE Local SFDPW SFPUC SFRPD	Federal USACE Local SFPUC	Federal USACE Local SFPUC	Federal NPS (with?) USACE State: CCC Local SFPUC SFRPD Zoo	Federal NPS (with?) USACE State CCC Local SF Envr SFRPD SFPUC Zoo	Federal USACE Local SFDPT SFDPW SFPUC SFRPD	Federal: USACE Local SFDPT SFDPW SFPUC SFRPD	Federal NPS USACE State CCC Local SF Envr Zoo	Federal NPS USACE State CCC Local SFDPW SF Envr SFPUC Zoo
Maybe (Conditional "yes" response, in some cases depending on mitigation measures)	Federal NPS	Federal NPS Local Zoo	Local SFRPD Zoo	Federal NPS State CCC Local SF Envr SFRPD Zoo	Local SFDPW	Local SFDPT	Federal NPS State CCC Local Zoo	Federal NPS Local Zoo	Local SFDPT	Local SFDPT SFRPD
No	State: CCC Local SFDPT SFDPW SF Envr SFPUC SFRPD Zoo	State CCC Local SFDPT SF Envr	Federal NPS State CCC Local SFDPT SFDPW SF Envr	Local SFDPT SFDPW	----------	Local SFDPW	Local SF Envr	State CCC Local SF Envr	Local SFDPW SFRPD SFPUC	----------

APPENDIX 1

APPENDIX 1A
Public Outreach

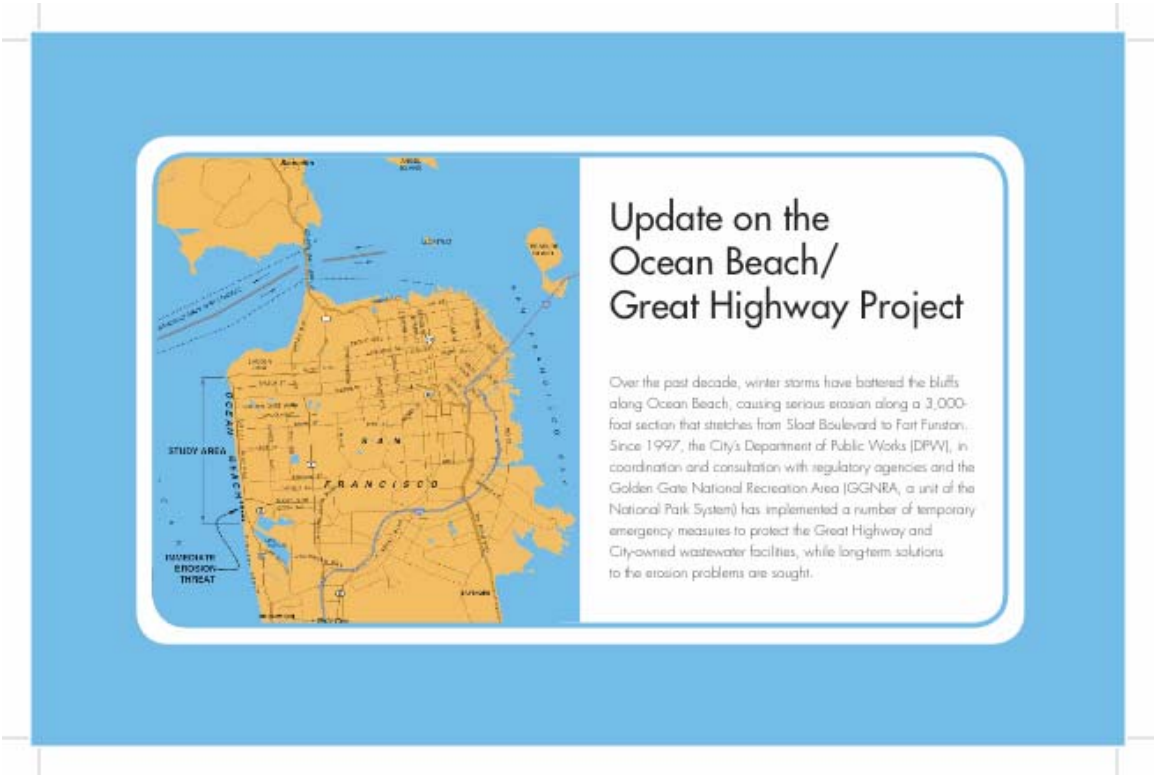
The San Francisco Department of the Environment and Department of Public Works took special measures in the late Fall of 2004 to reach out and inform and involve the public early in the Ocean Beach project. Specific outreach measures included:

- Contacting County Supervisors from Districts 1, 4 and 7 (covering the western areas of the city that lie along Ocean Beach) to provide a project update and to obtain suggestions as to the best ways to inform their constituents about the project;
- Mailing a postcard notice to representatives of more than 75 community organizations in the western portion of San Francisco;
- Issuing a Department of the Environment press release about the project on October 15, 2004;
- Creating a special Ocean Beach project website (www.sfoceanbeach.org) that received nearly 4,000 hits between mid October and the end of December, 2004;
- Publishing an article about the project in the Sunset Beacon and Richmond Review and West of Twin Peaks Observer newspapers in November, 2004;
- Contacting neighborhood organizations in the western portion of the city to offer to make a presentation about Ocean Beach issues and alternatives at their general membership meeting;
- Publishing a notice about the project in the Fort Miley Veterans Administration Hospital's daily e-mail bulletin for employees from October 25 through November 5, 2004;
- Posting fliers at GGNRA, the San Francisco Zoo, Harding Park, and at the SF Environment EcoCenter;
- Scheduling meetings with the West of Twin Peaks Council and other community groups to make a presentation to their members about the Ocean Beach project; and
- Meeting with newly elected Supervisor Elsbernd and his staff to brief them on the project and process, and seek their input.

All outreach materials designated Frank Filice, DPW Manager of Capital Planning, as the contact person, listing his direct telephone number and/or e-mail address. He received only one telephone inquiry about the project, although the project website was visited almost 4,000 times

between mid-October and December 31, 2004. The following pages are examples of the Project's outreach products.

Postcard



Press Release

FOR IMMEDIATE RELEASE

October 15, 2004
Contact: Mark Westlund (415) 355-3714

The City and County of San Francisco, the U. S. Army Corps of Engineers (USACE) and the Golden Gate National Recreation Area (GGNRA) are seeking public comments on the range of alternatives being considered to provide a long-term solution to erosion problems along Ocean Beach from Sloat Blvd. south to Fort Funston. This area has experienced considerable erosion during winter storm events over the past decade. Parking lots and ramps providing beach access have been damaged, and portions of the Great Highway and City wastewater facilities are threatened.

The City and County of San Francisco recently received a $1.1 million grant from the California Department of Boating and Waterways. This funding will allow the San Francisco Department of Public Works (DPW)--in partnership with USACE and GGNRA (a unit of the National Park System)--to define and evaluate a range of long-term potential solutions to the Ocean Beach erosion problems. Alternatives to be evaluated include potential construction of an off-shore reef or breakwater, construction of hard or soft structures on land (either at the location of the existing bluff or further inland) and Managed Retreat (which could result in rerouting southbound traffic along the Great Highway).

To obtain more information about this project, go to: www.sfoceanbeach.org.

Short Bulletins

For use in community newspapers/newsletters with limited space

Do you visit Ocean Beach?

Ocean Beach south of Sloat Blvd has been subject to beach and bluff erosion over the past several years. This erosion has impacted beach access and parking, as well as walking on the beach. If you visit this area of Ocean Beach, you may be interested in finding out about the Ocean Beach/Great Highway project that could affect the character of the beach, as well as beach access, parking and travel along the Great Highway. You can request information by calling Frank Filice at (415) 558-4011 or access information at: www.sfoceanbeach.org

For the VA Hospital employee daily electronic bulletin

Do you commute to work along the Great Highway?

Past winter storms have closed down or limited the use of south bound lanes from Sloat Blvd to Fort Funston. If you commute along this area, you may be interested in finding out about the Ocean Beach/Great Highway project and how it could affect travel along the Great Highway, as well as beach access and parking south of Sloat. Find information at: www.sfoceanbeach.org

Newspaper Article

Update on the Ocean Beach/Great Highway Project, October 2004

Over the past decade, winter storms have battered the bluffs along Ocean Beach, causing serious erosion along a 3,000-foot section that stretches from Sloat Boulevard to Fort Funston. Since 1997, the City's Department of Public Works (DPW), in coordination and consultation with regulatory agencies and the Golden Gate National Recreation Area (GGNRA, a unit of the National Park System) has implemented a number of temporary emergency measures to protect the Great Highway and City-owned wastewater facilities, while long-term solutions to the erosion problems are sought.

Many different agencies are involved in studying and managing resources in this area, making the decision process complex. In addition, there is controversy over whether hard structures (such as seawalls or banks of large rocks) are better or worse than "softer" approaches (such as periodic replacement of sand barriers) or letting nature retake some man-made structures, including parking or roadway surfaces.

The California Department of Boating and Waterways and the California Resources Agency recently granted over $1 million to DPW to continue the evaluation of alternative long-term solutions in partnership with the U. S. Army Corps of Engineers (USACE). Alternatives to be considered include approaches such as No Action or Managed Retreat, as well as other approaches, including the construction of an off-shore reef or breakwater and both hard and soft structures on-shore. DPW, in cooperation with the Department of the Environment, USACE and GGNRA, encourages public involvement in the Ocean Beach alternatives identification and evaluation process. For more information or to obtain project fact sheets, go to: www.sfoceanbeach.org, or call Frank Filice, DPW's Manager of Capital Planning, at (415) 558-4011.

One Page Notice

Update on the Ocean Beach/Great Highway Project, October 2004

Over the past decade, winter storms have battered the bluffs along Ocean Beach, causing serious beach and bluff erosion along a 3,000-foot section from Sloat Boulevard to Fort Funston. Since 1997, the City's Department of Public Works (DPW) in coordination and consultation with regulatory agencies and the GGNRA (a unit of the National Park System) has implemented a number of temporary emergency measures to protect the Great Highway and City-owned wastewater facilities, while long-term solutions to the erosion problems are sought.

Many different agencies are involved in studying and managing resources in this area, making the decision process complex. In addition, there is controversy over whether hard structures (such as seawalls or banks of large rocks) are better or worse than other approaches (such as periodic replacement of sand barriers) or letting nature retake some man-made structures, including parking or roadway surfaces.

The California Department of Boating and Waterways and the California Resources Agency recently granted over $1 million to San Francisco to continue the evaluation of alternative long-term solutions in partnership with the other involved agencies. Alternatives to be considered include approaches such as No Action or Managed Retreat, as well as active approaches, including the construction of an off-shore reef or breakwater and both hard and soft structures on-shore. Some of these alternatives could affect the character of the beach, access and parking, or travel routes along the Great Highway. DPW, in cooperation with the Department of the Environment, encourages public involvement in the Ocean Beach alternatives identification and evaluation process. For more information or to obtain project fact sheets, go to: www.sfoceanbeach.org, or call Frank Filice, DPW's Manager of Capital Planning, at (415) 558-4011 if you have comments or questions about this project.

APPENDIX 2

APPENDIX 2A

U.S. Army Corps of Engineers' Authorities, Policies and Management Guidelines as They Relate to the Ocean Beach Shoreline Protection Project[1,2]

The following information is a compilation of USACE's authorities, policies and management guidelines that pertain to shoreline protection. This information is gathered from Engineering Regulation 1105-2-100: Chapters 3, 4; Appendix E of the Civil Works Missions and Procedures; and the Environmental Operating Principles.

ER 1105-2-100

Chapter 3: Corps Civil Works Missions

3-1 Purpose and Authorities. Federal interest in water resources development is established by law. Within the larger Federal interest in water resource development, the Corps of Engineers is authorized to carry out projects in seven mission areas: navigation, flood damage reduction, ecosystem restoration, hurricane and storm damage reduction, water supply, hydroelectric power generation and recreation. Navigation projects include both inland and deepwater projects. Ecosystem restoration projects improve ecosystem structure and function. Wherever possible, and subject to budgetary policy, projects shall combine these purposes to formulate multiple purpose projects. For example, flood damage reduction projects could include ecosystem restoration and recreation; navigation projects could include hydroelectric power generation and ecosystem restoration. In carrying out studies to address problems and take advantage of opportunities within these mission areas, every effort should be made to formulate alternative plans that reasonably maximize the economic and environmental value of watershed resources, including urban watershed resources. In addition, every effort shall be made to be responsive to National, State and local concerns by considering the full range of programs available to provide solutions in a timely and cost-effective manner. Such programs may include Congressionally authorized projects, continuing authorities projects, planning assistance to states, flood plain management services and emergency authorities.

3-2 Navigation *[as it relates to the disposal of dredged material and the Ocean Beach Shoreline Protection Project.]*. The role of the U. S. Army Corps of Engineers with respect to navigation is to provide safe, reliable, and efficient waterborne transportation

1 Note: Items that were not applicable to the Ocean Beach Shoreline Protection Project were not included; thus, some of the information below may not "flow" with respect to numbering and sequencing.

2 Document prepared November 2004

systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation. The Corps accomplishes this mission through a combination of capital improvements and the operation and maintenance of existing projects. Capital improvement activities include the planning, design, and construction of new navigation projects. These activities are performed for the navigation of shallow draft (equal to or less than 14-foot draft) and deep draft (greater than 14-foot draft) vessels on both inland waterways and harbors, and coastal and lake ports, harbors and channels.

With the exception of projects implemented pursuant to a continuing authority, Congress specifically authorizes harbor and waterway projects. Financial responsibility for project components is specified in the WRDA of 1986, as amended.

a. Types of Improvements. General navigation features of harbor or waterway projects are channels, jetties or breakwaters, locks and dams, basins or water areas for vessel maneuvering, turning, passing, mooring or anchoring incidental to transit of the channels and locks. Also included are dredged material disposal areas (except those for the inland navigation system, the Atlantic Intracoastal Waterway and the Gulf Intracoastal Waterway) and sediment basins. Special Navigation Programs include removal of wrecks and obstructions, snagging and clearing for navigation, drift and debris removal, bridge replacement or modification, and mitigation of project-induced damage. These programs are described in more detail in paragraph 3-2a(2).

b. Specific Policies.

(6) Placement of Dredged Materials on Beaches. Construction and maintenance dredging of Federal navigation projects shall be accomplished in the least costly manner possible. When placement of dredged material (beach quality sand) on a beach is the least costly acceptable means for disposal, then such placement is considered integral to the project and cost shared accordingly. When placement of dredged material on a beach costs more than the least costly alternative, the Corps may participate in the additional placement costs under the authority of Section 145 of the WRDA of 1976, as amended. The additional cost of placement may be shared on a 65 percent Federal and 35 percent non-Federal basis if: (1) requested by the State, (2) the Secretary of the Army considers it in the public interest, (3) the added cost of disposal is justified by hurricane and storm damage reduction benefits and (4) the shoreline on which the material is placed is open to public use.

(7) Use of Dredged Material for Ecosystem Restoration. When determining an acceptable method of disposal of dredged material, districts are encouraged to consider options that provide opportunities for aquatic ecosystem restoration. Where environmentally beneficial use of dredged material is the least cost, environmentally acceptable method of disposal, it is cost shared as a navigation cost. Section 204 of the WRDA of 1992, as amended, provides programmatic authority for selection of a disposal method for authorized projects that provides aquatic restoration or environmental shoreline erosion benefits when that is not the least costly method of disposal. The incremental cost of the disposal for ecosystem restoration purposes over the least cost method of disposal is cost shared, with a non-Federal sponsor responsible for 25 percent of the costs. Smaller projects typically will be pursued within the programmatic limits of Section 204, as amended. Section 207 of the WRDA of 1996 amended this authority. Section 207 will primarily be used with new

navigation projects or in conjunction with maintenance dredging when the incremental cost is large. Projects pursued under Section 207 authority are separately budgeted and will not count towards the Section 204 programmatic limit. (See Appendix E for more information related to Section 207 and Appendix F for additional information regarding Section 204).

(8) Dredged Material Management Plans. Dredged material management planning for all Federal harbor projects is conducted by the Corps to ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically warranted, and that sufficient confined disposal facilities are available for at least the next 20 years. These plans address dredging needs, disposal capabilities, capacities of disposal areas, environmental compliance requirements, potential for beneficial usage of dredged material and indicators of continued economic justification. The Dredged Material Management Plans shall be updated periodically to identify any potentially changed conditions.

3-4 Hurricane and Storm Damage Reduction. Congress has authorized Federal participation in the cost of restoring and protecting the shores of the United States, its territories and possessions. Under current policy, shore protection projects are designed to reduce damages caused by wind-generated and tide-generated waves and currents along the Nation's ocean coasts, Gulf of Mexico, Great Lakes, and estuary shores. Hurricane protection was added to the erosion control mission in 1956 when Congress authorized cost-shared Federal participation in shore protection and restoration of publicly owned shore areas. Protection of private property is permitted only if such protection is incidental to the protection of public areas, or if the protection of private property would result in public benefits. Federal assistance for periodic nourishment was also authorized on the same basis as new construction, for a period to be specified for each project, when it is determined that it is the most suitable and economical remedial measure.

a. Types of Improvements. The improvements are usually structural measures including such features as beach fill, groins, seawalls, revetment, breakwaters, and bulkheads. Nonstructural measures, such as property acquisition, shall also be considered.

b. Specific Policies.

(1) Geographic Applicability. The shore protection authority is applicable to the shores of the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, estuaries, and bays directly connected therewith of each of the states, the Commonwealth of Puerto Rico, the US Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. The authority extends only that distance up streams where the dominant causes of damage are coastal storms or ocean tidal action (or Great Lakes water motion) and wind-generated waves. The program does not address damages caused by stream flows or vessels.

(2) Erosion Control Measures. In the past, particularly prior to passage of the WRDA of 1986, beach fill or beach restoration was frequently considered an erosion control measure, and erosion control was treated as a project output or project purpose. As a result of enactment of the law, however, erosion control has no separate status as a project purpose or as a project output. Thus, erosion control measures (e.g., beach fill) shall be treated as means to the ends of

hurricane and storm damage reduction, ecosystem restoration, or recreation; similar to breakwaters or revetments.

(3) Historic Shoreline. Existing authority provides for restoration and protection of beaches. It provides for extending a beach beyond its historic shoreline only when the extension is desirable for engineering reasons, is environmentally acceptable, and is an economically justified means to prevent or reduce storm damage behind the historic shoreline. In the case of multi-purpose projects that include ecosystem restoration as a project purpose, extending a beach beyond its historic shoreline is acceptable if it is environmentally justified.

(4) Formulation and Establishing Corps Participation. Single purpose shore protection projects are formulated to provide hurricane and storm damage reduction. Highest priority is for reducing damages to existing development. Reducing flooding on, or erosion to, undeveloped lands is not a high priority; and Federal participation in protection of privately owned, undeveloped shores, will not be pursued. Recreation is an incidental output.

(a) The Corps participates in single purpose projects formulated exclusively for hurricane and storm damage reduction, with economic benefits equal to or exceeding the costs, based solely on damage reduction benefits, or a combination of damage reduction benefits and recreation benefits. Under current policy, recreation must be incidental in the formulation process and may not be more than fifty percent of the total benefits required for justification. If the criterion for participation is met, then all recreation benefits are included in the benefit-to-cost analysis. Costs incurred for other than the damage reduction purpose, i.e., to satisfy recreation demand, are a 100 percent non-Federal responsibility.

(b) The Corps also participates in multiple purpose projects formulated for hurricane and storm damage reduction. For multi-purpose projects that include ecosystem restoration as a project purpose, the combined NED/NER Plan will be formulated in accordance with the guidance in paragraph 2-3g(3) and Appendix E of this regulation.

(5) Public Use and its Relation to Federal Participation. Federal involvement in shore protection has developed historically in relation to beaches, generally with efforts to stabilize, create or restore beaches. It is intended that beaches receiving public aid should not provide exclusively private benefits; and therefore, whenever a hurricane and storm damage reduction project involves beach improvements, public ownership and use of the beach is required. Items related to public use are discussed below.

(a) User Fees. Reasonable beach recreation use fees are allowable when used to offset the non-Federal sponsor share of project costs.

(b) Parking. Lack of parking may constitute a restriction on public access and use. Therefore, eligibility for Federal participation is precluded in areas where there is a lack of sufficient parking facilities provided for the general public (including nonresident users) reasonably near and accessible to the project beaches. In some instances non-Federal plans may encourage or direct substitution of public transportation access for private automobile access.

(c) Access. Corps participation is conditioned on provision of reasonable public access rights-of-way, consistent with attendance used in benefit evaluation and in accordance with local recreational use objectives.

(d) Beach Use by Private Organizations. Federal aid to private shores owned by beach clubs and hotels which limit beach use to members or guests, is contrary to the intent of Public Law 826 of 1956.

(e) Public Shores with Limitations. Publicly owned beaches which limit use to residents of the community or a group of communities are not considered to be open to the general public and are treated as private beaches.

(6) Shore Lines Owned by Federal Agencies.

(a) Work to provide shore protection to lands under the jurisdiction of another Federal agency shall be accomplished on a reimbursable basis, upon request from the agency. In the event protection has not been requested and such lands are within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

(b) Protection of (non-Civil Works) Department of the Army lands shall be accomplished with military funds, not civil works funds. If the lands are a minor part within the study area, Civil Works funds may be used if including them in a project is more cost effective than excluding them.

(7) Periodic Nourishment. In accordance with Public Law 826 of 1956 (Beach Nourishment), when the Chief of Engineers **determines** that the most suitable and economical remedial measures would be provided by a periodic nourishment project, the Chief may consider the periodic nourishment as continuing construction for the length of time that the Chief specifies. Classifying the periodic nourishment as continuing construction establishes the Federal interest in cost sharing renourishments, usually for the economic life of the project. If the NED plan for a shore protection project includes a combination of structures and periodic nourishment, the renourishments may be considered continuing construction while future costs needed to operate, maintain, repair, rehabilitate or replace the structural components are considered operation and maintenance which is a non-Federal responsibility.

(a) New Projects. Federal participation in periodic nourishment may be recommended to continue for the lesser of: (1) project economic life, (2) physical life of structural features required for the project, or (3) fifty years.

(9) Specific policies for hurricane and storm damage reduction are presented in more detail in ER 1165-2-130.

(c) Evaluation Framework. The measurement standard and conceptual basis for benefits is willingness to pay for each increment of output from a plan. In some planning situations it is infeasible to directly measure willingness to pay; therefore, alternative techniques are used to estimate

the total value of a plan's output. The evaluation of hurricane and storm damage reduction projects shall be conducted following the process described in paragraph 2-3e of this regulation. The procedures described in the following paragraphs apply to the estimation of benefits used in the economic evaluation of hurricane and storm damage reduction projects and summarize requirements and procedures. Appendix E provides additional guidance on these requirements and procedures.

(1) National Economic Development Benefits. For hurricane and storm damage reduction projects estimated benefits are principally reductions in actual or potential damages to affected land uses. Damages are most frequently due directly to storms or to the resultant shoreline erosion. Storm damage reduction benefits are categorized as wave damage reduction benefits, inundation reduction benefits and other benefits. Erosion protection benefits include loss of land, structural damage prevention, reduced emergency costs, reduced maintenance of existing structures and incidental benefits. The primary benefit to be claimed in hurricane and storm damage reduction projects is reduction of damages to existing structures. Recreation benefits are incidental and are measured in accordance with the guidance provided in paragraph 3-7 of this regulation and in Appendix E.

(2) With- and Without-Project Conditions. The assumptions described in paragraph 3-3c(3) are also applicable to hurricane and storm damage reduction studies. In addition, whenever a hurricane and storm damage reduction project involves beach improvements, public ownership and use of the beach is required, as described in paragraph 3-4b(5) of this regulation.

(3) Evaluation Procedure. The steps to evaluate benefits for hurricane and storm damage prevention projects are described in the following paragraphs. The level of effort expended on each step will depend on the scope and nature of the proposed improvement, the state of the art to accurately develop the estimates and the sensitivity of project formulation and evaluation to further refinement.

(a) Step 1 – Delineate the Study Area. The study area is that area affected by storms and erosion problems and by proposed alternatives. It includes areas indirectly affected by the problems and projects such as downdrift areas and navigation and other projects outside the immediate project site.

(b) Step 2 – Define the Problem. In this step, existing storm damage and erosion problems are identified and described. The description of existing conditions should include a history of the economic and social effects of storm damage and erosion problems in the area, a history of storms and erosion trends and historical floods and wave attack problems. A determination of the degree of protection afforded by existing structures is also made as part of this step. This includes an assessment of the level of protection actually provided by the structure, its structural integrity, the remaining useful life and operation and maintenance requirements.

(c) Step 3 – Select Planning Shoreline Reaches. Reaches are the primary economic subunit of analysis. Geomorphic conditions, land uses and type

or level of existing protection are criteria used in the designation of reaches.

(d) Step 4 – Establish Frequency Relationships. Two types of frequency relationship are developed for the analysis. These are elevation-frequency relationship and erosion-frequency relationship. The first one shows the relationship between wave and water level and frequency of occurrence and is used to derive expected annual inundation damages. The second one shows the relationship between periodic erosion (or accretion) and frequency of occurrence and is used to estimate erosion-induced damages.

(e) Step 5 – Inventory Existing Conditions. An inventory of affected properties, including land, is performed to estimate potential damages. The inventory is done by land use activities (i.e., residential, commercial, industrial, etc.) and includes variables such as value, use, ground elevation, distance from the water, construction materials, area, and number of stories. Areas likely to be developed in the future or where land use changes could occur are also identified.

(f) Step 6 – Develop Damage Relationships. Damage relationships describe the expected value of structural or contents damages caused by various factors, such as depth of flooding, duration of flooding, sediment load, wave heights, amount of shoreline recession and warning time. Generalized or site-specific damage relationships can be used depending on the scope of the study and the availability of applicable generalized relationships. Generalized damage relationships are those developed for other geographic areas with similar characteristics to the study area. Site-specific damage relationships are usually required to estimate wave attack and erosion damages. These damage relationships are developed using actual damage data from past storm events. Estimates of losses for buildings, roads, protective works, and other features are developed at current price levels for existing development. Damage relationships are developed for each land use category. Anticipated damages from land loss due to erosion are computed as the market value of the average annual area expected to be lost. Nearshore land values are used to estimate the value of land lost. A risk-based analytical framework should be used to develop the damage relationships.

(g) Step 7 – Develop Damage-Frequency Relationships. The damage-frequency relationships represent how the damage associated with a given event (i.e., storm, wave, erosion) is related to the frequency of that event (probability of occurrence). The damage relationships developed in step 7 are combined with the frequency curves (developed by the hydraulic and hydrologic engineers) to estimate the damage-frequency relationships. Damage-frequency relationships (curves) are developed for each of the applicable damage mechanisms, i.e., long-term erosion, recession, inundation and wave attack and for each land use category. These relationships should be developed using a risk-based analytical framework.

(h) Step 8 – Calculate Expected Annual Damages and Benefits. The expected annual damage is the expected value of erosion losses and

storm damages in any given year. Expected annual damages are calculated by computing the area under the damage-frequency curve using a life-cycle approach. Expected annual damages are calculated for the with- and without-project conditions. The difference between the with- and without-project expected annual damages represents the benefit associated with the project.

d. Cost Sharing Requirements. Paragraph 2-8 discusses general cost sharing considerations applicable to all project purposes including hurricane and storm damage prevention. Specific cost sharing requirements for this purpose are discussed in Appendix E.

e. Other Authorities. Other authorities that may be applicable to this project purpose are discussed in paragraph 3-10.

Chapter 4: Types of Studies, Reports and Procedures

4-1 Types of Studies and Reports. The process by which projects are formulated and evaluated is one step in the larger project delivery process. In addition to formulation and evaluation, the project delivery process includes the preparation of the decision document, and the technical and policy reviews of that document and its supporting material. It is intended that the production and reviews of planning decision documents also reflect the same common sense approach as described in the Introduction to Chapter 2. Planning decision documents should be prepared in a timely and cost-effective manner, consistent with the size and complexity of the project. Likewise, the time and effort spent in technical and policy review and in responses to review comments should reflect the size and complexity of the project. Wherever possible, technical and policy review should be incorporated positively and proactively into early phases of the planning and documentation processes and throughout these processes, rather than at the end. Planning studies and reports are:

(2) Feasibility Phase *[This is the current phase of the Ocean Beach Shoreline Protection Project, May 2005]*. The objective of feasibility studies is to investigate and recommend solutions to water resources problems. Cost of feasibility studies, except single purpose inland navigation studies, are 50 percent Federal and 50 percent non-Federal as defined in Section 105 of the WRDA of 1986. Typical studies should be completed in 18-36 months. The results of these studies are documented in a feasibility report that includes documentation of environmental compliance. (See Appendix G for additional information on the content of the feasibility report.)

(4) National Environmental Policy Act (NEPA) Documentation. The scope and nature of the changes in the environmental effects of the project identified as a result of acquisition of new information, of changed conditions, or changes in the project will determine the appropriate type of NEPA documentation. Options include an Environmental Assessment, which may result in a Finding of No Significant Impact or a Supplemental Environmental Impact Statement. Guidance regarding NEPA documentation is contained in ER 200-2-2.

c. General Requirements for Reconnaissance and Feasibility Phases.

(1) Study Expansion. Expansion of a study's geographic extent or purposes beyond those specified in the congressional authorization is not allowed without additional congressional authority. Where existing congressional authority is not a constraint, guidance on expansion of cost or scheduling should be requested from the Division.

(2) Interagency Coordination. In the interest of improving interagency coordination on planning studies, and of avoiding issues arising late in the planning process, the following procedures apply:

(a) Appropriate Federal and non-Federal agencies shall be invited to participate in the Reconnaissance Review Conference (RRC), Issue Resolution Conferences (IRC), Feasibility Scoping Meeting (FSM), and the Alternative Formulation Briefing (AFB), as deemed appropriate. These conferences are discussed in Appendix G.

(b) Appropriate Federal and non-Federal agencies shall have opportunity for participation in developing the PMP.

(c) Federal agencies shall be invited to be cooperating agencies as defined by NEPA. Cooperating agencies are agencies with jurisdiction by law or with special expertise that qualify them to participate in a study (see 40 CFR 1508.5, Regulations Implementing the Procedural Provisions of the National Environmental Policy Act of 1969, as amended).

(d) All issues involving other agencies (concerns or non-agreement) should be raised and discussed in a separate section of the Memorandum for the Record (MFR) of the meetings held during the planning process. Issues that cannot be resolved at the local or regional level will be sent forward for resolution at the Washington level.

Appendix E: Civil Works Missions and Evaluation Procedures

E-25 Federal and Non-Federal Participation

a. General Requirements.

(1) The Federal approach to participation in shore protection is similar to that for participation in riverine flood damage reduction. Highest priority is for reducing damages to existing development. Reducing flooding on or erosion to undeveloped lands is not high priority. Federal participation in the protection of private undeveloped shores is prohibited by law.

(2) In the past, particularly prior to the WRDA of 1986, beach fill or beach restoration was frequently considered an erosion control measure, and erosion control was thought of, perhaps rather inexact, as a project output or project purpose. As a result of enactment of the law, however, erosion control has no separate status as a project purpose or as a project output. Thus, erosion control measures (beaches) are purely means to the ends of hurricane and storm damage reduction or recreation, just as breakwaters or revetments are.

(3) Beaches can be a factor complicating analysis and decision making, however, for in addition to reducing damages they also provide for recreation, and are in themselves highly desired amenities. Because of these characteristics, when hurricane and storm damage reduction plans include beach fill or restoration, Federal cost participation depends on shore ownership, use, and types and incidence of benefits.

(4) Construction costs are assigned, as appropriate, to the purposes of hurricane and storm damage reduction or recreation, and shared in the percentages designated in Section 103 of

Public Law 99-662, with any adjustments required to reflect conditions of ownership as discussed below and summarized in Table E-22.

b. Project Purposes.

(1) Hurricane and Storm Damage Reduction. The Federal share is 65 percent of the costs assigned to hurricane and storm damage reduction. The non-Federal share is 35 percent. Participation in the National Flood Insurance Program and other applicable Federal floodplain management programs is required. Non-Federal interests must provide LERRDs; fair market value is credited to the non-Federal share. When the value of LERRD is less than 35 percent the difference must be provided in cash during construction. When the value is more than 35 percent the excess will be refunded.

(2) Recreation. Federal participation in separable recreation measures is not permitted by current budget policies. Recreation related access facilities such as bathhouses, roads, ramps, toilets, parking areas and so on are a non-Federal responsibility. Costs for the facilities are not included as project costs unless they are required for recreation benefits claimed by the project, and the costs are not being "offset" by user fees.

Environmental Operating Principles

On March 26, 2002, during the dedication of the Davis Pond Fresh Water Diversion Project in Louisiana, Lt. General Robert Flowers announced the U.S. Army Corps of Engineers Environmental Operating Principles to guide USACE in its entire works. These principles are rooted in the various environmental laws, statutes, and regulations, as well as USACE's four pillars of compliance, restoration, prevention, and conservation, which govern all USACE activities when it comes to the environment. The principles are now integrated into USACE's Project Management Business Process and are as follows:

- Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.

- Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.

- Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

- Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.

- Seeks ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.

- Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.

- Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment.

APPENDIX 2B

Continuing Authorities Program (CAP) Possibilities for Ocean Beach[3]

Background

USACE can take an active role in shoreline protection through a process known as the Continuing Authorities Program (CAP). CAP allows USACE to respond to water resource problems without the need to obtain specific Congressional authorization for each project. This decreases the amount of time required to budget, develop, and approve a potential project for construction. As favorable studies progress towards more detailed design and construction, certain project costs must be shared with the local sponsor including any and all costs in excess of Federal project limits. Section 204 of the Water Resources Development Act and Section 103 are two sources of Federal authority that pertain to CAP eligibility for planning, designing, and implementing erosion control measures at Ocean Beach.

Section 204, Water Resources Development Act of 1992, as amended

A source of eligibility for Continuing Authorities Project (CAP) participation is found in **Section 204 of the Water Resources Development Act of 1992** (*Public Law 102-580*)[4], and **ER 1105-2-100** which both recognize that clean dredged materials can be used as a resource to benefit aquatic ecosystems. Section 204 delineates the purpose, base plan, and cost-sharing structure for the beneficial uses of dredged materials:

- Purpose. Section 204(a) authorizes the Secretary to "carry out projects for the protection, restoration, and creation of aquatic and ecologically related habitats, including wetlands, in connection with dredging for construction, operation, or maintenance by the Secretary of an authorized navigation project."

- Base Plan. Disposal of dredged material associated with the construction of maintenance dredging of navigation projects should be accomplished in the least costly manner consistent with sound engineering practice and meeting all Federal environmental requirements. This constitutes the base plan for navigation purpose. If the ecosystem restoration project is part of the base plane, it is a navigation (harbor or inland system) construction or maintenance cost and funded accordingly. Where the ecosystem restoration project is not part of the base plan for navigation purpose, the base plan serves as a reference point for measuring the incremental costs of the ecosystem restoration project that are attributable to the environmental purpose.

[3] Appendix F of ER-1105-2-100
[4] As amended by Section 207 of WRDA 1996 (*Public Law 104-303)*

- Cost-Sharing. Ecosystem restoration projects under Section 204 are funded as navigation construction or operation and maintenance costs up to the level of the base plan. For costs above this baseline, the non-Federal share of the project shall be 25 percent of the incremental costs associated with construction of the ecosystem restoration project, including provision of all LERRD. The non-Federal sponsor shall also be responsible for 100 percent of OMRRR {Operation, Maintenance, Repair, Replacement and Rehabilitation} associated with the ecosystem restoration.

- Work-in-Kind. No credit will be allowed for work-in-kind. The non-Federal sponsor's share of the costs for all planning and design work, whether done in one or two stages, completed prior to execution of a project cooperation agreement will be initially Federally-financed. The non-Federal sponsor will be responsible for these costs when the PCA is executed. These costs are considered to be part of the total project cost and cost shared. There is no funding limit for a Section 204 project under the Continuing Authorities Program.[5] The annual nation wide program limit is $15,000,000.

- The non-Federal sponsor can meet the requirement of Section 221 or can be a national non-profit organization that is capable of undertaking future requirements for operation, repair, replacement and rehabilitation (OMRR&R), or may be any non-profit organization if there is no future requirement for OMRR&R. All potential sponsors must be able to provide any required lands, easements, rights-of-way, relocations and dredged or excavated material disposal areas (LERRD). The affected local government must consent to the non-profit entity being a sponsor.

Section 103 River and Harbor Act of 1962, as amended

Another source of eligibility for the Continuing Authorities Program is found in Section 103 River and Harbor Act of 1962 *(Public Law 87-874)*, which addresses protecting public and private properties against damages caused by storm-driven waves and currents.

a. Eligibility. This authority may be used for protecting multiple public or private properties and facilities, and for the protection of single non-Federal public properties, against damages caused by storm driven waves and currents. All projects must be formulated for hurricane and storm damage reduction (HSDR), in accordance with current policies and procedures governing projects of the same type which are specifically authorized by the Congress.

b. Cost Sharing. The non-Federal sponsor must provide all LERRD {Lands, Easements, Relocations, Rights-of-Way, and Disposal areas}. Costs assigned to protection of Federally owned property are 100 percent Federal. Costs assigned to protection of privately owned undeveloped lands and shores which are not open to the public are 100 percent non-Federal. Costs assigned to areas where criteria for public uses are met are 35 percent non-Federal.

    - The feasibility study is initially Federally funded up to $100,000. Remaining study costs will be shared equally with the study sponsor. Costs for preparation of plans and specifications will be initially Federally financed and later recovered from the sponsor during project construction as part of total project implementation cost.

    - CAP Federal Funding Limits for a Section 103 project is $3,000,000. The annual nation wide program limit is $30,000,000.

5 Table F-1, Appendix F of Planning Guidance, ER 1105-2-100, 22 Apr 2000

- The non-Federal sponsor must be a public agency able to enter into an agreement in accordance with the requirements of Section 221 of the Flood Control Act of 1970. Section 221 specifies that the non-Federal sponsor be "a legally constituted public body with full authority and capability to perform the terms of its agreement and to pay damages, if necessary in the event of failure to perform."

APPENDIX 2C

Operations and Maintenance (O&M) of SF Bar Main Ship Channel Possibilities for Ocean Beach Erosion Protection[6]

The following information describes USACE's policy in participating in beach replenishment projects under Section 933 of Public Law 99-662. This Appendix outlines the project requirements for arranging Section 933 projects, and describes the current Section 933 project process addressing operations and maintenance of the SF Bar Main Ship Channel.

Section 933 of Public Law 99-662

It is USACE policy to participate in the additional costs for placing clean sand or other suitable material, dredged by USACE during construction or maintenance of Federal navigation projects, onto adjacent beaches or nearshore waters if the following requirements are met:

1) The added cost of such placement must be justified by the benefits associated with protection of such beach or beaches. Recreation benefits produced as a consequence of the basic project may exceed 50 percent of total project benefits, but economic justification must be demonstrated on the basis of recreation benefits limited to 50 percent of total benefits.

2) The beaches involved must be open to the public.

The state is the only acceptable non-Federal sponsor for section 933 projects. If the state requests, USACE may enter into an agreement with a political sub-division of the state, with the political sub-division responsible for the additional costs of placement.

Once the above requirements are met, the section 933 project is considered to be in the Federal interest and the cost sharing for the complete recommended plan is 65 percent Federal and 35 percent non-Federal. Cost allocation for different benefit categories is not necessary. If the placement does not meet federal economic justification criteria, the state may still request the material be placed on state beaches, provided 100 % of the additional costs are provided by non-federal interests.

When the initial state request is received, a study, funded from available appropriations for the navigation project to be dredged must be performed to determine the merit of so disposing of the

[6] Information gathered from Policy Guidance Letter (PGL) No. 22; Guidance for Placement of Materials on Beaches; and EP 1165-2-1 dated July 30, 1999.

dredged material, and weather 65% of the additional costs should be federally funded. If beach disposal is ultimately agreed to, the study costs will be considered to be part of the additional cost for such disposal. If 65% of the additional costs are to be Federally funded, the remainder of such Federal share will be funded from appropriations for the navigation project.

Recent State Request for 933 Study

The California Department of Boating and Waterways has submitted a formal written request to USACE's San Francisco District, dated November 29, 2004, to initiate a 933 study to place dredged material from the SF Main Ship channel maintenance on the beach or in the nearshore waters near the Sloat Boulevard erosion area. USACE plans to initiate the necessary studies to support a 933 disposal action with available appropriations for the navigation project.

O&M Nearshore Beneficial Reuse of Dredged Material

The SF Main Ship Channel is currently dredged to a depth of 55' by USACE's Hopper dredge, Essayons, on an annual basis, with sediments placed at the adjacent designated disposal area, SF-8, which is aligned parallel and to the south of the channel, about 3 to 5 miles offshore. Annual dredge volumes vary from about 250,000 cubic yards (cy) to 500,000 cy, depending on the degree of shoaling for the given year. The dredged sediments are comprised of over 95% sands and are part of the same littoral system and are compatible with the sand found at Ocean Beach.

Disposal at SF-8 began in 1971. Prior to that, dredged sediments were disposed out of the littoral system in deep water, about one mile southwest of the channel, and were not available to nourish Ocean Beach through natural sediment transport processes. Sediments disposed at SF-8 are redistributed within the littoral cell by natural transport processes, which may account in part for the gradual accretion of sediment and a widening of the northern stretch of Ocean Beach and areas inside the Golden Gate near Crissy Field since the change in disposal practice.

Despite natural dispersion from the disposal site, surveys and operations reports from the dredge Master indicate that SF-8 is accreting sediment and becoming shallower over time. The dredge Captain has reported hitting bottom, and reports that the site has experienced significant infill. The disposal site has become too shallow in large areas for the dredge to safely operate and maneuver to dispose of dredged material. When loaded with sand, the Hopper dredge has a draft of approximately 32 feet, and requires at least 38 – 40 feet, and preferably 42 feet of water depth to provide adequate keel clearance for coastal operations. Disposal operations are currently limited to a very small portion of the westernmost area of the disposal site.

Given the increasing navigational limitations at SF-8, an alternative disposal area to be used in conjunction with SF-8 is needed. Any such area should remain within the littoral cell so that sand is not lost as a natural resource to the system.

USACE has proposed an area adjacent to the erosion area south of Sloat Boulevard as an alternative beneficial re-use disposal area for sands dredged from the SF Bar Ship Channel. The proposed site is much closer to shore than SF-8, within 1 ½ miles, and the dredge may safely

navigate to the area through deeper waters outside the SF-Bar formation. Due to its closer proximity to shore, natural dispersion of disposed sand may help to nourish the eroded beach south of Sloat Blvd, and potentially reduce the threat to infrastructure in the area from storm events over the long term.

USACE will coordinate with resource and regulatory agencies to perform a demonstration of dredged material disposal in the proposed area, together with survey monitoring of the disposal mound to determine how sand may disperse from the new area. If the new proposed area is environmentally and economically feasible, USACE will pursue having the area permanently designated as an alternative disposal area to be used together with SF-8, to assure continued maintenance of this economically vital shipping channel, and offer adaptive sediment management within the littoral cell.

APPENDIX 2D

National Park Service Management Policies Potentially Applicable to Shoreline Management Issues[7]

General Management Guidelines

Management Policies § 1.4.4: The Prohibition on Impairment of Park Resources and Values

While Congress has given the Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The impairment of park resources and values may not be allowed by the Service unless directly and specifically provided for by legislation or by the proclamation establishing the park. The relevant legislation or proclamation must provide explicitly (not by implication or inference) for the activity, in terms that keep the Service from having the authority to manage the activity so as to avoid the impairment.

Management Policies §1.4.5: What Constitutes Impairment of Park Resources and Values

The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact to any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;

[7] Geologic Resources Division, National Park Service, February 2001

- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or

- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

- An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

- Impairment may occur from visitor activities; NPS activities in the course of managing a park; or activities undertaken by concessioners, contractors, and others operating in the park.

Management Policies § 1.4.6: What Constitutes Park Resources and Values

The "park resources and values" that are subject to the non-impairment standard include:

- The park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;

- Opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing any of them;

- The park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- Any additional attributes encompassed by the specific values and purposes for which it was established.

Management Policies § 1.4.7: Decision-making Requirements to Avoid Impairments

Before approving a proposed action that could lead to an impairment of park resources and values, an NPS decision-maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. If there would be an impairment, the action may not be approved.

In making a determination of whether there would be an impairment, a National Park Service decision- maker must use his or her professional judgment. The decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); relevant scientific studies, and other sources of information; and public comments.

When an NPS decision-maker becomes aware that an ongoing activity might have led or might be leading to an impairment of park resources or values, he or she must investigate and determine if there is, or will be, an impairment. Whenever practicable, such an investigation and determination will be made as part of an appropriate park planning process undertaken for other purposes. If it determined that there is, or will be, such an impairment, the Director must take appropriate action, to the extent possible within the Service's authorities and available resources, to eliminate the impairment. The action must eliminate the impairment as soon as reasonably possible, taking into consideration the nature, duration, magnitude, and other characteristics of the impacts to park resources and values, as well as the requirements of NEPA, the Administrative Procedure Act, and other applicable law.

(See Levels of Park Planning 2.3; Evaluating Environmental Impacts 4.1.3; Planning 5.2; General 8.1; Visitor Use 8.2; General 9.1. Also see Director's Order #12: Conservation Planning and Environmental Impact Analysis)

Management Policies §4.1: General Management Concepts

In cases of doubt as to the impact of activities on park natural resources, the Service will decide in favor of protecting the natural resources… Just as all components of a natural system will be recognized as important, natural change will also be recognized as an integral part of the functioning of natural systems. By preserving these natural components and processes in their natural condition, the Service will prevent resource degradation, and therefore avoid any subsequent need for resource restoration… The Service will not intervene in natural biological or physical processes, except when:

- Directed by Congress;
- In some emergencies in which human life and property are at stake;
- To restore natural ecosystem functioning that has been disrupted by past or ongoing human activities; or
- When a park plan has identified the intervention as necessary to protect other park resources or facilities.
- Any such intervention will be kept to the minimum necessary to achieve the stated management objectives.

(See The Prohibition on Impairment of Park Resources and Values 1.4.4; General Management Planning 2.3.1; Facility Planning and Design 9.1.1)

APPENDIX 2E

Magnuson-Stevens Act: Essential Fish Habitat Requirements

Essential Fish Habitat Requirements for Coastal Pelagic Species

The Coastal Pelagic Species (CPS) fishery includes four finfish (Pacific sardine, Pacific (chub) mackerel, northern anchovy, and jack mackerel) and the invertebrate, market squid. CPS finfish are pelagic (in the water column near the surface and not associated with substrate), because they generally occur above the thermocline in the upper mixed layers. For the purposes of Essential Fish Habitat, the four CPS finfish are treated as a single species complex, because of similarities in their life histories and similarities in their habitat requirements. Market squid are also treated in this same complex because they are similarly fished above spawning aggregations. The east-west geographic boundary of EFH for each individual CPS finfish and market squid is defined to be all marine and estuarine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the exclusive economic zone (EEZ) and above the thermocline where sea surface temperatures range between 10 C and 26 C.

Essential Fish Habitat Requirements for West Coast Groundfish

EFH for Pacific coast groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a healthy ecosystem. Descriptions of groundfish fishery EFH for each of the 83 species and their life stages result in over 400 EFH identifications. When these EFHs are taken together, the groundfish fishery EFH includes all waters from the mean higher high water line, and the upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon, and California seaward to the boundary of the U.S. Exclusive Economic Zone (EEZ). This FMP groups the various EFH descriptions into seven units called "composite" EFHs: This approach focuses on ecological relationships among species and between the species and their habitat, reflecting an ecosystem approach in defining EFH. Seven major habitat types are proposed as the basis for such assemblages or "composites." These habitat types include estuarine, rocky shelf, non-rocky shelf, canyon, continental slope/basin, neritic zone, oceanic zone (Further detail can be found at http://swr.nmfs.noaa.gov/hcd/grndfsh.pdf).

These major habitat types are readily recognizable by those who potentially may be required to consult about impacts to EFH, and their distributions are relatively stationary and measurable over time and space.

Essential Fish Habitat Requirements for Pacific Salmon

EFH for Pacific coast salmon (PCS) fishery includes those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH must include all those streams, lakes, ponds, wetlands and other currently viable water bodies and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception. The Pacific coast salmon fishery EFH also includes the marine areas off Alaska designated as salmon EFH by the Northern Pacific Fishery Management Council (MPFMC). The identification of EFH is based on the descriptions of habitat utilized by coho, Chinook and pink salmon.

APPENDIX 2F

SF Commission on the Environment's Ocean Beach Resolution

Urging the Mayor and Board of Supervisors of the City and County of San Francisco to address the challenges of Ocean Beach concerning erosion, natural resources, recreation, recycling and aesthetic issues, Resolution No. 001-02-COE was adopted by the Commission on the Environment on January 15, 2002. The text is included below with sections italicized that specifically pertain to the projects policy direction:

WHEREAS, Ocean Beach is the largest urban beach in Northern California, and

WHEREAS, Ocean Beach, which is managed under the guidelines of the National Park Service as part of the Golden Gate National Recreation Area, is a significant recreational and natural resource for the citizens of San Francisco, and

WHEREAS, Ocean Beach is an important tourist destination for people throughout the Bay Area, California and visitors from other States and Countries, and

WHEREAS, Ocean Beach is home to various native plants and animals of the Bay Area whose survival depends upon a healthy ecosystem, and

WHEREAS, individual, community, and civic stewardship of San Francisco's Ocean Beach is essential to Ocean Beach's attaining a state of environmental health and preservation, and

WHEREAS, Mayor Willie L. Brown, Jr. appointed the Ocean Beach Task Force in January 2000 to address and preserve the environmental well-being of Ocean Beach, and

WHEREAS, the Ocean Beach Task Force has been working over the last two years to identify challenges and present solutions for erosion, natural resource, recreation and aesthetic issues at Ocean Beach, and

WHEREAS, erosion is a significant issue for the Ocean Beach Task Force and is most severe south of Sloat Boulevard where infrastructure has been placed within the zone of natural beach fluctuations, and

WHEREAS, the Board of Supervisors of the City and County of San Francisco adopted a resolution urging the Department of Public Works to take necessary measures to protect the public safety, health, welfare, and property of the citizens of San Francisco with regard to the

dangerous condition created by erosion of protective sand dunes at Ocean Beach along the Great Highway, and

WHEREAS, accessibility to Ocean Beach is hindered because there is currently one disabled ramp, and

WHEREAS, there are safety hazards and a large amount of trash and debris that result from bonfires, residual burning logs and nails, and

WHEREAS, sand on the walkways and promenade can be an obstacle and potentially a safety hazard for walkers and bicyclists, and

WHEREAS, sand has accumulated on the seawall from Balboa Street to Lincoln Avenue and the promenade from Noriega Street to Santiago Street, and

WHEREAS, the Golden Gate National Recreation Area is currently proposing a change in garbage handling now, therefore, be it

RESOLVED, that the Commission on the Environment urges the Mayor and Board of Supervisors of the City and County of San Francisco to request agencies responsible for Ocean Beach to develop a partnership program facilitated by the Department of the Environment that a) promotes respect and stewardship for Ocean Beach, and b) establishes and achieves the long term goal of improving and maintaining Ocean Beach, by addressing educational, environmental, and public relations components that include but are not limited to:

1. Improving wildlife protection by:

    a. Initiating a program that discusses protection for all species and includes a habitat restoration and conservation plan.

    b. Maintaining support for current efforts and measures to protect wildlife at Ocean Beach, especially for the Snowy Plover and any endangered species.

2. Increasing recycling and reducing beach litter by:

    a. Installing PLEASE RECYCLE AND DO NOT LITTER signs.

    b. Providing more trash receptacles that promote recycling, while prohibiting scavengers and neighborhood dumping.

    c. Increasing frequency of trash and recycling collection by the Department of Public Works along the Promenade and the multi-use pathways between Lincoln and Sloat Boulevard.

    d. Increasing enforcement from both the U.S. Park Police and San Francisco Police Department.

3. Providing better access to recreation areas by:

a. Creating a MUNI connection to the major recreation areas in the City.

b. Requiring the Department of Parking and Traffic to designate handicapped parking near the existing disabled access ramp.

c. Requiring the Department of Parking and Traffic to encourage the Golden Gate National Parks and City Officials to work together to improve the ability of disabled patrons to enjoy the beach.

d. Encouraging the Golden Gate National Parks to improve the condition of seawall steps along the O'Shaughnessy seawall.

4. Reducing beach fires by:

a. Encouraging the Golden Gate National Parks to address the fire issue and create an effective system that reduces those impacts.

5. Installing additional public facilities by:
a. Improving and expanding restroom facilities in visitor friendly and open areas.

b. Adding emergency telephones at Ocean Beach because of active surf and expanding other telephone service.

6. Addressing windblown sand on the promenade and roadway by:

a. Creating a regular maintenance schedule from the Department of Public Works.

7. Removing eroded infrastructure by:

a. Cleaning remaining hazards around Sloat Boulevard including underwater piers and rubble on the beach that has migrated from the cliff face.

8. Developing a public relations campaign by:

a. Creating and implementing an outreach program that promotes the stewardship, preservation and restoration of Ocean Beach; and,

BE IT FURTHER RESOLVED, that the Commission on the Environment urges the Mayor and the Board of Supervisors of the City and County of San Francisco to support the Department of Public Works regarding:

1. Monitoring the beach and bluffs south of Sloat Blvd, including the area where sand was placed to sacrificially erode and nourish Ocean Beach.

2. Rerouting the southbound traffic from the Great Highway to Sloat, if necessary to protect public safety, and monitoring and studying the effects of such traffic changes to avoid unnecessary traffic impacts.

3. Supporting the policy of not placing rock during an emergency in the winter of 2002.

4. Preparing public notices and information announcements on issues and actions at Ocean Beach.

5. *Continuing to seek input from the Ocean Beach Task Force as an important mechanism for community and user input, as well as input from individuals, regulatory agencies and technical experts, the Board of Supervisors and other groups regarding the short, intermediate and long term planning efforts at Ocean Beach.*

6. *Promoting the design and installation of a new Great Highway alignment South of Sloat Blvd to Highway 35 that reduces or eliminates the risk of road closure resulting from coastal erosion.*

7. *Evaluating less costly and temporary alternatives to sacrificial sand placement, such as infrastructure relocation and restoration of the beach, dunes and bluffs in natural, sustainable configurations with recreational, ecosystem and aesthetic benefits, with the Golden Gate National Recreation Area and Ocean Beach Task Force at the most critical locations.*

8. *Supporting long-term solutions through the planning partnership process managed by the Army Corps of Engineers consistent with the alternatives recommended by of the Ocean Beach Task Force, with an emphasis on restoration of beaches, dunes and bluffs to the greatest extent practicable; and,*

BE IT FURTHER RESOLVED, that the Commission on the Environment urges the Mayor and the Board of Supervisors of the City and County of San Francisco to commit to reviewing and adopting policies pertaining to Ocean Beach that:

a. Are consistent with The Sustainability Plan for the City of San Francisco.

b. Are consistent with a holistic approach to natural resource management and habitat preservation; erosion control and resolution and restoration and revitalization of recreation and access.

c. Balance the interests of users with the need for regulation of beach use.

APPENDIX 4

APPENDIX 4A
Hazardous Materials Summary Tables

TABLE 4A-1

SUMMARY OF PERMITTED HAZARDOUS MATERIALS USES ADJACENT TO THE OCEAN BEACH-GREAT HIGHWAY PROJECT

Site No.	Site Name		Address	UST	CAFID UST	HIST UST	AST	HAZNET	EMISSIONS	FINDS	EDR Site No
1	National Guard	100	Armory Dr.	X							161
2	Rec & Parks/ Fleishacker Park	2800	Great Highway		X						T108
3	CCSF/PUC/WPC/WESTS	3000	Great Highway	X							216
4	San Francisco City and County/ Department of Solid Waste Management	3500	Great Highway					X	X	X	BE260/BE261/BE262/BE263
5	Olson Ohbayashi	3520	Great Highway					X			BE301
6	Harding Park Golf Course/ Rec & Parks	99	Harding Park Road		X						BS373/BS374/BS375
7	RCH, Inc./ Rec Center for Handicapped	207	Skyline Blvd.				X	X			AR206/AR207/AR208/AR209/AR210
8	Harding Park		Skyline/Harding Park			X					320
9	Sunset Chevron #82	2940	Sloat Blvd.		X	X		X			T100/T101/102/T103/T104
10	California National Guard	99	Zoo Road		X						AO200

SOURCES: Orion Environmental Associates; EDR, 2005
See Appendix 4C for a description of databases.
Abbreviations:

AST: Aboveground Petroleum Storage Tank Facilities
CA FID UST: Facility Inventory Database
EMISSIONS: Emissions Inventory Data
FINDS: Facility Index System
HAZNET: Hazardous Waste Information System
HIST UST: Hazardous Substance Storage Container Database
UST: Permitted Underground Storage Tank

TABLE 4A-2

SUMMARY OF ENVIRONMENTAL CASES AND SPILL SITES ADJACENT TO THE OCEAN BEACH-GREAT HIGHWAY PROJECT

Site No.	Site Name	Address		Database Environmental Case			EDR Site No
				LUST	CORTESE	FUDS	
6	Harding Park Golf Course/ Rec & Parks	99	Harding Park Road	X			BS373/BS374/BS375
7	RCH, Inc./ Rec Center for Handicapped	207	Skyline Blvd.	X	X		AR206/AR207/AR208/AR209/AR210
9	Sunset Chevron #82	2940	Sloat Blvd.	X	X		T100/T101/102/T103/T104
11	Unocal	2710	Sloat Blvd.	X	X		V109/V110
12	SF AAA BATT 61-N					X	AO194

SOURCES: Orion Environmental Associates; EDR, 2005
See Appendix 4C for a description of databases.

Abbreviations:
CORTESE: Cortese Hazardous Waste and Substances Site List
FUDS: Formerly Used Defense Sites
LUST: Leaking Underground Storage Tank System

APPENDIX 4B
Hazardous Materials and Community Disruption Approach and Methodology

Hazardous materials and community disruption issues are analyzed in this report on the basis of the conceptual alternatives considered for the project. The hazardous materials analysis includes a database search of known or suspected sites in the project vicinity with potential contamination (See Appendix 4C for database results). Community disruption considerations represents a synthesis of construction-related aspects of several environmental topics, including air quality, land use, noise, and traffic.

In order to evaluate the potential for environmental impacts, the following basic assumptions regarding construction methods were used:

- Placement of hard structures such as a seawall could require limited excavation of soil west of the Great Highway; groundwater would not be encountered during placement of these structures; and pile driving may be required as part of seawall construction;
- Ongoing erosion that would occur under the no action and facilitated retreat alternatives could result in road repair work along the Great Highway or Upper Great Highway and would have the potential to expose hazardous materials in the soil or groundwater at existing sites with soil or groundwater contamination;
- Placement of soft structures would not involve excavation or disturbance of the subsurface; and
- Construction would be required closest to the Great Highway, and closest to potential sensitive receptors and land uses involving hazardous materials, along the southern portion of the study area where erosion is infringing most near the highway.

Hazardous Materials Considerations

The hazardous materials analysis consisted of a review of environmental regulatory databases (EDR, 2005) to evaluate the potential presence of hazardous materials along the portion of Ocean Beach that would be subject to construction as part of the Ocean Beach-Great Highway Project. If hazardous materials were to be encountered, potential public health impacts that could result from construction of the proposed beach and erosion control features.

Detailed Conditions

The greatest number of permitted hazardous materials uses are concentrated near the southern portion of the Great Highway, north of Skyline Boulevard where erosion is currently infringing closest to the Great Highway. These include the National Guard Facility at 100 Armory Drive (Site No. 7) and San Francisco Public Utilities Commission Water Pollution Control Plant at 3000 Great Highway (Site No. 18) which have permitted USTs (UST database); Harding Park and the Harding Park Golf Course (Site Nos. 36 and 21) and the National Guard facility at 99 Zoo Road (Site No. 39) which have historic USTs (CA FID UST and HIST UST databases); the Recreation Center for the Handicapped at 207 Skyline Boulevard (Site No. 35) which has an above ground storage tank (AST database); and the City and County of San Francisco Department of Solid Waste Management facility at 3500 Great Highway (Site No.19) which reports air emissions to the California Air Resources Board (EMISSIONS database). The City and County of San Francisco Department of Solid Waste Management facility at 3500 Great Highway (Site No.19), Recreation Center for the Handicapped at 207 Skyline Boulevard (Site No. 35), and Olson Ohbayashi at 3520 Great Highway (Site No. 39) have manifested hazardous wastes for off-site disposal (HAZNET database). Of these permitted uses, only the Recreation Center for the Handicapped (Site No. 35) and the Harding Park Golf Course (Site No. 21) are identified as environmental cases discussed below.

Other permitted hazardous materials uses north of this area, where the shoreline is farther from the Great Highway include:

- three small quantity hazardous waste generators permitted under the Resource Conservation and Recovery Act (Site Nos. 8,15, and 18; RCRIS SQG database);
- one site with permitted USTs (Site No. 7; UST database);
- eight sites with historic USTs (Site Nos. 6, 7, 9, 15, 16, 17, 19, and 20; CA FID UST and HIST UST databases);
- two dry cleaners (Site Nos. 5 and 10; CLEANERS database); and
- two facilities that report air emissions to the California Air Board (Site Nos. 6 and 10; EMISSIONS database).
- 22 sites have manifested hazardous wastes for off-site disposal (HAZNET database)

A total of six sites were also identified in the Facility Index System (FINDS) database. However, this database generally includes information on facilities included in other more detailed databases. For this reason, sites identified in this database are not discussed separately.

Environmental Cases West of Project Area

The only environmental case located west of the Great Highway is the Great Highway Military Reservation (Site No. 43). This is a formerly used defense site but there is no additional information regarding this site provided in the database review.

Spills. The Emergency Response Notification System (ERNS) database includes spills or releases of chemicals reported to federal authorities and the California Hazardous Materials Incident Reporting System (CHMIRS) database includes hazardous materials spills and releases reported to the California Office of Emergency Services. There have been no reported spills in the project area from Sloat Boulevard to Skyline Boulevard.

Methodology for Hazardous Materials Evaluation

The environmental database review (EDR, 2005) was conducted to identify permitted uses of hazardous materials, environmental cases, and spill sites where soil and groundwater contamination may be present within ¼ mile of the Great Highway between Sloat Boulevard and Skyline Boulevard (referred to as the study area). A ¼ mile buffer zone was selected because hazardous materials released to the groundwater can migrate over distances and can potentially affect soil quality in the areas where construction would occur. A description of each database reviewed and the date of the database are included in Attachment A.

The number and type of permitted uses,[1] environmental cases,[2] and spill sites[3] within the study area are used as an indication of the relative potential for hazardous materials impacts to occur during construction. Limited site-specific information that is available from the database review is included where appropriate. Regulatory agency file reviews were not conducted to identify the specific chemicals present at each site, their concentrations, or the status of site closure. These conditions may change over time and this type of analysis should be conducted within three months of the startup of construction related activities. At that time, a new database review should be conducted to provide updated information on permitted hazardous materials uses, environmental cases, and spill sites. Site-specific information should be reviewed to identify the appropriate specific precautions and/or regulatory requirements required during construction related to hazardous materials.

Community Disruption Considerations

Detailed Noise Considerations

Table 4B-1 presents estimated maximum noise levels at varying distances that could occur at sensitive receptors located east of Ocean Beach due to operation of various types of construction equipment. As indicated in Table 4B-1, most types of construction equipment could meet this requirement with feasible noise controls implemented as necessary. All construction equipment except the exempted impact equipment could meet the City's 80-dBA noise limit.

1 Permitted uses refer to facilities that are authorized to use hazardous materials or handle hazardous wastes and comply with current hazardous materials and hazardous waste regulations.

2 Environmental cases refer to sites suspected of releasing hazardous substances or have had cause for hazardous materials investigations and are identified on regulatory agency lists. These are sites where soil and/or groundwater contamination is known or suspected to occur or to have occurred.

3 Spill sites are a location where a spill of hazardous materials has been reported to the state or federal agencies.

TABLE 4B-1

NOISE LEVELS AND ABATEMENT POTENTIAL OF CONSTRUCTION EQUIPMENT NOISE AT 100, 350, AND 500 FEET (IN DBA)

	Noise Level at 100 Feet		Noise Level at 350 Feet		Noise Level at 500 Feet	
Equipment	Without Controls	With (1) Controls	Without Controls	With (1) Control	Without Controls	With (1) Controls
Earthmoving						
Front Loaders	73	69	62	58	59	55
Backhoes	79	69	68	58	65	55
Dozers	74	69	63	58	60	55
Tractors	74	69	63	58	60	55
Graders	79	69	68	58	65	55
Trucks	85	69	74	58	71	55
Materials Handling						
Concrete Mixer	79	69	68	58	65	55
Concrete Pump	76	69	65	58	62	55
Crane	77	69	66	58	63	55
Derrick	82	69	71	58	68	55
Stationary						
Pumps	70	69	59	58	56	55
Generators	72	69	61	58	58	55
Compressors	75	69	64	58	61	55
Impact						
Pile Drivers	95	89	84	78	81	75
Rock Drills	92	74	81	63	78	60
Jack Hammers	82	69	71	58	68	55
Pneumatic Tools	80	74	69	63	66	60
Other						
Saws	72	69	61	58	58	55
Vibrators	70	69	59	58	56	55

(1) Estimated levels obtainable by selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme cost (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures).

SOURCE: U.S. Environmental Protection Agency, 1971

Methodology for Community Disruption Evaluation

Potential community disruption impacts were evaluated by determining the extent of potentially affected land uses and receptors during construction. This was done by identifying land uses east of Ocean Beach within a setback distance that encompasses worst case conditions where land uses could be subject to adverse noise levels.

It is assumed that all beach restoration activities would be confined to west of the Great Highway, which would be a minimum of 500 feet from the closest exhibits at the San Francisco Zoo, and 270 feet from the Beach Chalet/Visitors Center at Golden Gate Park. By evaluating the impacts at the closest uses, this analysis evaluates worst-case conditions regardless of the alternative, since any use located farther than these distances would be subject to lower noise levels. In general, noise generated by heavy equipment can be mitigated to an acceptable level with feasible noise controls at sensitive receptors located more than 100 feet from the construction activities.

Residential uses, schools, and parks are used as an indicator of impacts to sensitive receptors, while commercial/business uses are used as an indicator of potential business disruption. In addition, major roadway crossings are typically used as an indicator of potential traffic disruption impacts.

The land use identification was based on U.S.G.S. aerial photographs at a scale of 1 inch = 300 feet (http://terraserver-usa.com/), map of Golden Gate Park, map of San Francisco Zoo; the California State Automobile Association (AAA) map of San Francisco for street names and parks; and the Thomas Guide maps for school names and locations. [4]

[4] (http://www.parks.sfgov.org/site/recpark_page.asp?id=17796), (http://www.sfzoo.org/visit/map.htm);

APPENDIX 4C

Hazardous Materials Regulatory Databases Reviewed for Ocean Beach – Great Highway Project

A regulatory database review was conducted to identify permitted hazardous materials uses, environmental cases, and spill sites within ¼ mile of the Great Highway between Sloat Boulevard and Skyline Boulevard (EDR, 2005). The databases reviewed are listed in Tables 4C-1 and 4C-2 with the date of each database reviewed. Each database is described in the following sections.

Federal Regulatory Databases

Federal agencies publish numerous lists of sites that track permitted uses of hazardous materials, environmental cases, and spill sites. The lists reviewed are summarized in Table 4C-1. They include:

- The National Priority List (NPL) which is a subset of the CERCLIS database (described below) and includes priority sites for cleanup under the federal Superfund Program;
- The Proposed NPL sites (Proposed NPL) which includes sites proposed for addition to the NPL;
- Superfund Consent Decrees (CONSENT) which includes NPL sites with major legal settlements that establish responsibility and standards for cleanup;
- Records of Decision (ROD) list which includes NPL sites where a record of decision has been developed that mandates a permanent remedy and includes technical and health information to aid in the cleanup of the site;
- Federal Superfund Liens (NPL LIENS) list which includes sites where the US EPA has filed liens against real property to recover remedial action expenditures or the property owner has been issued a notification of potential liability;
- NPL Delisted sites (Delisted NPL) which includes sites that have been removed from the NPL because no further response is required in accordance with criteria contained in the National Oil and Hazardous Substances Pollution Contingency Plan;
- The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) which tracks potentially contaminated properties identified under CERCLA and SARA;

TABLE 4C-1

FEDERAL REGULATORY DATABASES REVIEWED

Name of List	Responsible Agency	Acronym	Date of List
National Priority List	USEPA	NPL	10/12/04
Proposed National Priority List Sites	USEPA	Proposed NPL	9/23/04
Superfund Consent Decrees	USEPA	CONSENT	3/5/04
Records of Decision	USEPA	ROD	9/9/04
Federal Superfund Liens	USEPA	NPL LIENS	10/15/91
National Priority List Deletions	USEPA	Delisted NPL	10/12/04
Comprehensive Environmental Response, Compensation, and Liability Information System	USEPA	CERCLIS	8/10/04
CERCLIS- No Further Remedial Action Planned	USEPA	CERCLIS NFRAP	8/10/04
Toxic Chemical Release Inventory System	USEPA	TRIS	12/31/02
Emergency Response Notification System	USEPA	ERNS	12/31/03
Hazardous Materials Information Reporting System	USDOT	HMIRS	9/8/04
Resource Conservation and Recovery Information	USEPA	RCRA	11/23/04
Biennial Reporting System	USEPA	BRS	12/1/01
RCRA Corrective Action Sites	USEPA	CORRACTS	9/23/04
RCRA Administrative Action Tracking System	USEPA	RAATS	4/17/95
Department of Defense Sites	USGS	DOD	10/1/03
Formerly Used Defense Sites	USACOE	FUDS	12/31/03
Brownfields Sites	USEPA	US BROWNFIELDS	N/A
Facility Index System	USEPA	FINDS	9/9/04
PCB Activity Database System	USEPA	PADS	6/29/04
Toxic Substances Control Act	USEPA	TSCA	12/31/02
Federal Insecticide, Fungicide and Rodenticide Act/TSCA	USEPA	FTTS	9/13/04
Federal Insecticide, Fungicide and Rodenticide Act/TSCA	USEPA	FTTS INSP	4/13/04
Section 7 Tracking Systems	USEPA	SSTS	12/31/01
Material Licensing Tracking System	NRC	MLTS	7/15/04
Underground Storage Tanks on Indian Land	USEPA	INDIAN UST	11/2/04
Leaking Underground Storage Tanks on Indian Land	USEPA	INDIAN LUST	10/3/04
Indian Reservations	USGS	INDIAN RESERV	10/1/03
Mines Master Index File	MSHA	MINES	9/13/04
Uranium Mill Tailings Sites	USDOE	UMTRA	4/22/04
Open Dump Inventory	USEPA	ODI	6/30/85

SOURCE: Environmental Data Resources, 2005

- The CERCLIS No Further Action (CERCLIS-NFRAP) database which lists sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require federal Superfund action or NPL consideration. As part of the U.S. EPA's Brownfields Program, these sites have been removed from the CERCLIS database to lift unintended barriers to redevelopment;

- The Toxic Chemical Release Inventory System (TRIS) which identifies sites which release chemicals to the air, water, or land as required by Title III of the Superfund Amendments and Reauthorization Act of 1986;

- The Emergency Response Notification System (ERNS) which identifies spills of oil or hazardous substances reported pursuant to Section 103 of CERCLA as amended, Section 311 of the Clean Water Act, and sections 300.51 and 300.65 of the National Oil and Hazardous Substances Contingency Plan;

- The Hazardous Materials Information Reporting System (HMIRS) which includes hazardous material spill incidents that were reported to the US Department of Transportation;

- Resource Conservation and Recovery Act Information (RCRA) which includes facilities permitted to handle hazardous wastes under RCRA including treatment, storage, and disposal facilities (RCRA-TSD); large quantity generators which report generation of greater than 1000 kilogram per month of non-acutely hazardous waste or 1 kilogram per month of acutely hazardous waste (RCRA-LQG); and small quantity generators which report generation of less than 1000 kilogram per month of non-acutely hazardous waste or 1 kilogram per month of acutely hazardous waste (RCRA-SQG);

- Biennial Reporting System (BRS) which is a national system administered by the EPA that collects data on the generation and management of hazardous wastes. RCRA Large Quantity Generators and Treatment, Storage, and Disposal facilities are included;

- RCRA Corrective Action Sites (CORRACTS) which includes RCRA permitted facilities that are undergoing corrective action. A corrective action order is issued, when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA;

- RCRA Administrative Action Tracking System (RAATS) which includes enforcement actions taken under RCRA pertaining to major violations including administrative and civil actions brought by the US EPA;

- Department of Defense Sites (DOD) which includes federally owned or administered lands, administered by the Department of Defense, that have an area equal to or greater than 640 acres of the United States, Puerto Rico, and the US Virgin Islands;

- Formerly Used Defense Sites (FUDS) which includes formerly used defense site properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions;

- Brownfields Sites (US BROWNFIELDS) which includes properties addressed by Cooperative Agreement Recipients and Targeted Brownfields Assessments;

- Facility Index System (FINDS) which includes facility information and "pointers" to other sources that contain more detail. The following databases are included in FINDS: Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); Enforcement Dockets (DOCKET); Federal Underground Injection Control (FURS); Criminal Docket System (C-Docket); Federal Facilities Information System (FFIS); State Environmental Laws and Statutes (STATE); and PCB Activity Database System (PADS);

- PCB Activity Database System (PADS) which includes generators, transporters, commercial storers, and/or brokers and disposers of PCBs who are required to notify the USEPA of such activities;

- Toxic Substances Control Act (TSCA) list which includes manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list;

- Federal Insecticide, Fungicide, and Rodenticide Act/TSCA (FTTS) list which includes administrative cases and pesticide enforcement actions and compliance actions related to the Federal Insecticide, Fungicide, and Rodenticide Act;

- Federal Insecticide, Fungicide, and Rodenticide Act/TSCA (FTTS INSP) list which includes inspection information for cases regulated under the Federal Insecticide, Fungicide, and Rodenticide Act;

- Section 7 Tracking Systems (SSTS) which includes pesticide-producing establishments that are registered with the USEPA in accordance with the requirements of Section 7 of the Federal Insecticide, Fungicide, and Rodenticide Act;

- The Material Licensing Tracking System (MLTS) which includes sites that possess or use radioactive materials which are subject to Nuclear Regulatory Commission licensing requirements;

- Underground Storage Tanks on Indian Land (Indian UST) which includes sites with underground storage tanks (USTs) that are located on Indian owned land;

- Leaking Underground Storage Tanks on Indian Land (INDIAN LUST) which includes leaking underground storage tanks on Indian land in Arizona, California, New Mexico, and Nevada;

- Indian Reservations (INDIAN RESERV) which includes Indian administered lands of the United States that have an area equal to or greater than 640 acres;

- Mines Master Index File (MINES) which includes properties that have been involved in mining including coal mining, quarrying, or sand and gravel operations;

- Uranium Mill Tailings Sites (UMTRA) which includes former uranium ore mining sites where large piles of mill tailings remained after the uranium had been extracted from the ore; and

- Open Dump Inventory (ODI) which is defined as a disposal facility that does not comply with one or more parts of Title 40 of the Federal Code of Regulations, Parts 257 or 258.

State Regulatory Databases

Regulatory databases to track the status of permitted hazardous materials uses, environmental cases, and spill sites are also maintained by several state agencies. The state databases reviewed are summarized in Table 4C-2. They include:

- The Annual Work Plan (AWP), formerly known as the Bond Expenditure Plan, identifies hazardous substance sites targeted for cleanup;
- The California Bond Expenditure Plan (CA BOND EXP PLAN) includes sites for which a site-specific expenditure plan has been prepared for the appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. This list is no longer updated;
- List of Deed Restrictions (DEED) which lists sites which have been issued deed restrictions because of the presence of hazardous substances;
- The Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing (SLIC Reg5) which include various sites within the jurisdiction of the San Francisco Bay Region RWQCB;
- Statewide SLIC Cases (SLIC) which is maintained by the State Water Resources Control Board and includes a statewide list of SLIC cases;
- Calsites (CAL-SITES), which was previously referred to as the Abandoned Sites Program Information System (ASPIS), identifies potential hazardous waste sites, which are then screened by the DTSC for further action. Sites on this list which are designated for no further action by the DTSC were removed from this list in 1996;
- Voluntary Cleanup Program Properties (VCP) which includes low threat level properties with either confirmed or unconfirmed releases and the project proponents have requested that the DTSC oversee investigation and/or cleanup activities;
- Properties Needing Further Evaluation (NFE) which includes properties that are suspected of being contaminated, but contamination has not been confirmed. These sites would be assessed using the DTSC Preliminary Endangerment Assessment process;
- The Leaking Underground Storage Tank Information System (LUST) which is an inventory of sites with reported leaking underground storage tank incidents maintained by the State Water Resources Control Board;
- The Fuel Leak List (LUST Reg5) which tracks remediation status of known leaking underground tanks within the jurisdiction of the Central Valley RWQCB;
- The Solid Waste Information System (SWF/LF) which includes a list of active, inactive or closed solid waste disposal sites, transfer facilities, or open dumps, as legislated under the Solid Waste Management and Resource Recovery Act of 1972;

TABLE 4C-2

STATE AND LOCAL REGULATORY DATABASES REVIEWED

Name of List	Responsible Agency	Acronym	Date of List
Annual Work Plan	DTSC	AWP	11/9/04
California Bond Expenditure Plan	DHS	CA BOND EXP PLAN	1/1/89
List of Deed Restrictions	DTSC	DEED	10/4/04
Spills, Leaks, Investigation, and Cleanup Cost Recovery Listing	RWQCB	SLIC Reg2	9/30/04
Statewide SLIC Cases	SWRCB	SLIC	10/13/04
Calsites	DTSC	CAL-SITES	11/9/04
Voluntary Cleanup Program Properties	DTSC	VCP	10/5/04
Properties Needing Further Evaluation	DTSC	NFE	11/9/04
Leaking Underground Storage Tank Information System	SWRCB	LUST	10/13/04
Fuel Leak List	RWQCB	LUST Reg2	9/30/04
Solid Waste Information System	Cal IWMB	SWF/LF	9/13/04
Waste Management Unit Database	SWRCB	WMUDS/SWAT	4/1/00
Cortese Hazardous Waste and Substances Sites List	Cal EPA	CORTESE	4/1/01
Toxic Pits Cleanup Act Sites	SWRCB	TOXIC PITS	7/1/95
Waste Discharge System	SWRCB	CA WDS	10/11/04
Proposition 65 Records	SWRCB	NOTIFY 65	10/21/93
No Further Action Determination	DTSC	NFA	10/5/04
Unconfirmed Properties Referred to Another Agency	DTSC	REF	10/5/04
School Property Evaluation Program	DTSC	SCH	10/5/04
California Hazardous Material Incident Report System	Cal OES	CHMIRS	12/31/03
Hazardous Waste Information System	Cal EPA	HAZNET	12/31/02
Active UST Facilities	SWRCB	CA UST	10/13/04
Facility Inventory Database	Cal EPA	CA FID UST	10/31/94
Hazardous Substance Storage Container Database	SWRCB	HIST UST	10/15/90
Aboveground Petroleum Storage Tank Facilities	SWRCB	AST	12/1/03
Cleaner Facilities	DTSC	CLEANERS	11/29/04
Emissions Inventory Data	CARB	EMI	12/31/02
Local Oversight Facilities	SFDPH	LOP	9/15/04
Underground Storage Tank Information	SFDPH	SF UST	9/15/04

SOURCE: Environmental Data Resources, 2005

- The Waste Management Unit Discharge System (WMUDS/SWAT) which tracks waste management units. The list contains sites identified in the following databases: Facility Information; Scheduled Inspections Information; Waste Management Unit Information; SWAT Program Information; SWAT Report Summary Information; Chapter 15 Information; Chapter 15 Monitoring Parameters; TPCA Program Information; RCRA Program Information; Closure Information; and Interested Parties Information;

- Cortese Hazardous Waste and Substances Sites List (CORTESE) which includes sites designated be the State Water Resources Control Board (LUST cases), Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (CAL-SITES);

- Toxic Pits Cleanup Act Sites (TOXIC PITS) which includes sites suspected of containing hazardous substances where cleanup has not yet been completed;

- The Waste Discharge System (CA WDS) which lists sites which have been issued waste discharge requirements;

- Proposition 65 Records (NOTIFY 65) which includes facility notifications about any release which could threaten drinking water and thereby expose the public to a potential health risk;

- No Further Action Determination (NFA) which includes properties at which the DTSC has made a clear determination that the property does not pose a problem to the environment or to public health;

- Unconfirmed Properties Referred to Another Agency (REF) which includes properties where contamination has been confirmed and which were determined not to require direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local agency;

- School Property Evaluation Program (SCH) which includes proposed and existing school sites that are being evaluated by DTSC for possible hazardous material contamination. In some cases, these properties may be listed in the Cal-Sites category depending on the level of threat they pose to public health and safety or to the environment;

- California Hazardous Materials Incident Reporting System (CHMIRS) which includes reported hazardous materials accidental releases or spills;

- The Hazardous Waste Information System (HAZNET) which includes facility and manifest data for sites that file hazardous waste manifests with the DTSC. The information contained in the database is based on manifests submitted without correction, and therefore may contain some invalid information;

- The Active UST Facilities list (CA UST) which lists registered USTs.

- The Facility Inventory Database (CA FID UST) which is a historical listing of active and inactive underground storage tank locations. Local records should contain more current information;

- The Hazardous Substance Storage Container Database (HIST UST) which is a historical listing of UST sites. Local records should contain more specific information;

- The Aboveground Petroleum Storage Tank Facilities database (AST) which lists registered ASTs;
- The Cleaner Facilities database (CLEANERS) which lists drycleaner related facilities that have EPA identification numbers; and
- Emissions Inventory Data (EMI) which includes sites for which the California Air Resources Board and local air pollution control agencies have collected toxic and criteria pollutant emission data.

Local Regulatory Databases

The San Francisco Department of Public Health also maintains two regulatory databases that were reviewed. These include the Local Oversight Facilities list (LOP) which includes leaking underground storage tank sites under the jurisdiction of this agency and the Underground Storage Tank Information list (SF UST) which includes sites with permitted underground storage tanks. These databases are also listed in Table 4C-2.

References

Environmental Data Resources, Inc. 2005. The EDR Radius Map Report, Ocean Beach-Great Highway Project. Inquiry number 01345339.1r. January 19.

APPENDIX 5

APPENDIX 5A
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APPENDIX 5B

Ocean Beach – Great Highway Afternoon Workshop Discussion

Problem Statement: *Infrastructure (parking lots, wastewater facilities and roadway) and sensitive natural features (bluff and beach) lie within the dynamic shore zone affected by natural cycles, and are threatened by periodic storms at Ocean Beach, south of Sloat Boulevard.*

The purpose of the OB-GH Agency workshop was to discuss the alternatives in light of updated information on coastal processes, agency policies and management practices, and environmental constraints to identify long-term protection measures that could address diverse needs, provide multiple benefits within the existing regulatory framework, and be responsive to the public's financial capabilities. This document captures the afternoon workshop discussion that took place addressing storm damage protection alternatives, funding constraints and opportunities, and future planning efforts. In this document, an original topic is followed by indented dialogue and discussion.

Zoo: (We need to build) a connection between Ocean Beach and the Zoo and develop a long term vision for this area of the City, specifically regarding enhancing the recreational opportunities therein

- Are the roads in the right places? Facilities in the right places?
- How can this process inform other decision-making?

SFDPW: Can look to Western Shoreline Element (area ranging from Cliff House to the Fort Funston bluffs); Local Coastal Program can potentially look at facilities upgrade issues; SF Planning should be involved.

GGNRA: Anything that doesn't assume parking needs to consider long-term solutions, multi-use paths; there are many more dimensions with respect to recreational enhancements (with respect to both CCSF and GGNRA)

Cal Boating: What about parking?

GGNRA: While popular, there are other locations (that would suffice); can look outside GGNRA area; willing to relocate parking (e.g. within Great Highway right of way, move lanes).

OBTF Chairperson: What are the opportunities for involvement? Specifically, what are the opportunities to bring in bigger holistic vision into multi-agency process? Hopefully, City's preferred alternative would incorporate these big-picture issues, broader vision.

SF ENVR: Alternative 5 (Facilitated Retreat) - Maintain portion for cycling/jogging/bike racks?

USACE: Primary Purpose of Shoreline Protection is economically driven; Cost-sharing differs, depending on which project features are included (i.e., those features that go above and beyond

shoreline protection would be considered a "betterment" and would be paid for by the local sponsor).

OBTF Chairperson: As local sponsors, can the City assume responsibilities for betterments in addition to Storm Protection?

SFDPW: Funding for roadway issues looked at as Transportation Corridor issue. Betterments must relate to transportation;

- Funding Focus: need to refer to the problem statement. ½ cent sales tax funds- some discretion to evaluate roadway relocation alternatives.
- SFDPW can work with Transportation Authority to define alternatives and improvements. This project can protect for future/planned improvements- the area (space) left over after addressing primary problem can be considered for future best use.

USACE: (In the project, we) can relocate parking, but consideration of other amenities (bike trails, showers) is outside the purview.

OBTF Chairperson: If move forward with process of shoreline protection; only addressing transportation, this could eliminate opportunities for betterments.

GGNRA: If an alternative selected has an array of impacts; look to mitigation to help replace loss of facilities.

GGNRA: When USACE addresses Storm Protection, how defined? What falls within the premise?

USACE: Reducing Storm Damage; protecting investment of public infrastructure; everything driven by the Civil Works Process and;

- Need to establish that benefits are greater than or equal to costs; otherwise, would just let shoreline retreat. Acknowledge that some facilities were built further out than should have been- but that is now the existing condition;
- USACE can only cost-share on studies with a local jurisdiction. It is only under special circumstances that another federal agency be brought into a cost-sharing partnership. For example, USACE is coordinating with GGNRA on this project because GGNRA is a federal landowner at the project site. Coordination will include their participation on the (EIS/EIR) study team. While agency coordination and participation is permitted because of GGNRA's relationship to the project site, as a general rule, USACE does not cost-share on studies with other Federal agencies.

OBTF Chairperson: Did City and USACE develop problem statement together?

SFDPW: Team developed

OBTF Chairperson: Who's bringing the environment into the problem statement?

SFDPW: We looked at all activities within the dynamic shore zone- roadway, beach, and sensitive environmental areas.

OBTF Chairperson: If local sponsor wants to protect a resource, will USACE consider that action, even if not best cost/benefit analysis result?

GGNRA: (Referring to the problem statement) Threatened? (GGRNA sees it the problem statement in a different light, specifically to: Preserve and protect natural processes; don't want with Cost-Benefit Analysis for protecting infrastructure to be weighted against preserving and

protecting natural processes from (storm-related) damage; must balance interference with all other benefits; protecting beach and bluff is not in same category.

DRP: Existing research on implemented alts? Comparative analyses? It would be good to have data from other studies on similar actions elsewhere. How to balance?

USACE: Yes, this exists on a national scale- Imperial Beach, etc.

GGNRA: Storms are part of natural processes.

CAL BOATING: Not a natural area anymore; humans have had an impact.

GGNRA: We now have a strand of beach/bluff between ocean and infrastructure.

USACE: Could see rubble as threatening natural beach and bluff; there are differences between cost-benefit analysis and trade-off analysis. For example, USACE will not simply look at benefit/cost ratio in this process. We will compare alternatives to one another to see how well each alternative meets the planning objectives that define the project. Thus, we could recommend an alternative that doesn't necessarily have the highest benefit/cost ratio, but one the meets the majority of the planning objectives. Also, it is important to determine how to define natural processes when the system is so changed by dredging practices, infrastructure, etc.

GGNRA: Need to be realistic, flexible; not ignore natural process- accommodate to extent practicable. Natural processes are preferred over intervention.

GGNRA proposes modification to problem statement: accommodates the natural process to the extent possible;

USACE: but (natural processes have been) modified by human action; the extent possible is affected by alternative selected

GGNRA clarifies: *maximum* extent

CCC: feasible; need to play out analysis of Beach Replenishment alternative, and continue studies to understand "extent" in relation to nearshore placement. Optimistic about positive altering of shoreline processes.

SFDPW: It is a challenge in determining the range of the dynamic shore zone; can determine where to place sand; do geologic studies, borings of Colma formation.

CAL BOATING: We don't know where dynamic zone is- it is not an exact science.

OBTF Chairperson: Holistic vision should be represented; would like it better combined.

CCC: Optimistic about Alt 6 being effective; could be a combination of 6, 5, 2c, 3b, 1. (Nearshore Sand placement; facilitated retreat; Hard structures further inland (remove rubble); Soft Structures (remove rubble); No Action

VISION: some of Alt 5 (modified parking); relocating sewer transport not feasible; continue to dispose of sand, build up dune area; avoid exposure of hard structure

OBTF Chairperson: Can we name the California Coastal Commission's suggested alternative?

USACE: Sand placement nearshore is long-term process; it may take years to see results.

OBTF Chairperson: When does the preferred alternative get defined?

SFDPW: (need to) refine objectives, captured in report; conclusions from workshop.

OBTF Chairperson: Task Force had "Managed Retreat" (3b/5 combo) with engineered dunes; this is not on the list; (I see) enhanced beach vs. "retreated area."

USACE: It is a great opportunity to bring in the zoo and other interests into the planning process.

RPD: Probably would be Rec-Park initiative: Ocean Beach, Great Highway, and Zoo; SF planning would have a stake. RPD, SF Environment as well; RPD is owner (for CCSF) could explore long term planning.

CCC: LCP = City's Local Coastal Plan; CCSF would need to get Board of Supervisors Resolution to adopt changes to land use plan; long process.

Any changes to Land Use planning or coastal zoning would have to be approved by CCC. Resolution by Board of Supervisors, adopt these changes and submit to CCC for certification. Joint planning effort, General Plan is in need of update, this could be driver; CCC can't require updates to LCP; CCC used to have grant program to help fund these efforts.

USACE: Community groups can spur process.[1]

OBTF Chairperson: CCC has said ball is in City's court to make these things happen; LCP is 1.5 pages; hasn't been updated in years.

CCC: Any action approved by local government has to be consistent with LCP.

RPD: No requirement to update Open Space Plan (unlike Housing Element)

CCC: Alt 6 (nearshore sand placement) could be part of any other option; locations that require soft structure; Alt 6 is a red herring; need aggressive beach nourishment and nearshore placement.

GGNRA explains two-color dots: acknowledge the possibility that analysis could show alternative might be less damaging than hard structures

CAL BOATING: How many alts (will ultimately be examined)?

USACE: Reasonable array to address problem; Also have to examine indirect and cumulative impacts- e.g. if relocate parking, need to look at environmental impacts associated with new parking location. Would like to get agency issues into final report if possible, to ensure these are considered in planning process going forward.[2]

NEXT STEPS:

Comments incorporated; report finalized and distributed by June 1st
USACE EA (will circulate to agencies soon; dredging to occur in June)
USGS beach surveys
Fed Budget- USACE funding
This pre-scoping will inform scoping
USACE funding engineering studies/surveys
Budget Resolutions
Winter '06 funding NEPA/CEQA process, 933 studies to begin soon

[1] Post-workshop, USACE clarified this comment, stating that the actions being discussed in this vignette are primarily the responsibility of the local sponsors (who represent local concerns). As such, USACE would not necessarily participate in (but would encourage) such discussions.

[2] Comments on draft report were accepted until April 25th to Frank Filice, and April 29th to Peter Mull.