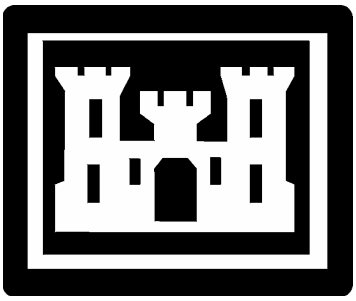
Imperial Beach Shore Protection Project

Final
Environmental Impact Statement/
Environmental Impact Report

San Diego County, California



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Final
Environmental Impact Statement/Environmental Impact Report (EIS/EIR)
Proposed Imperial Beach Shore Protection Project
Imperial Beach, San Diego County, California

The Federal Lead Agency for compliance with the National Environmental Policy Act (NEPA) is the U.S. Army Corps of Engineers, Los Angeles District

The State Lead Agency for compliance with the California Environmental Quality Act (CEQA) is the City of Imperial Beach, San Diego County, California, Community Development Department.

Abstract: The Final Feasibility Study Report for the Imperial Beach Shore Protection Project (project) resulted in the selection of a final array of non-structural alternatives to protect the beach and beachfront properties of the City of Imperial Beach (City). This Final EIS/EIR specifically addresses the No Action Alternative and Alternatives 1B, 2B, 3B, and 4B. These alternatives would provide for additional protection from beach erosion and storm damage for a fifty-year period. These alternatives would protect a 2,164 meter (m) (7,100 feet [ft]) swath of shoreline that extends southward from the northern-most groin of the City's beach. These alternatives additionally include two offshore borrow areas for beach fill (nourishment/renourishment); they are located approximately 1.9 kilometers (1.2 miles) north and 4.5 kilometers (2.8 miles) south of the City's pier. Alternative 1B, the National Economic Development (NED) Plan and Environmentally Superior Alternative, is considered the Recommended Plan and includes: a base beach fill of 450,000cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in minimum beach width of 12m (39ft); an additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years for the life of the project. Alternative 1B is additionally considered the Least Environmentally Damaging Practicable Alternative. Alternative 2B would consist of 925,000 cubic meters (cm) (1,209,000 cubic yards [cy]) plus an additional 764,000cm (999,312cy) of fill that would result in a minimum beach width of 25m (82ft); an additional 764,000cm (999,312cy) of renourishment would then be placed on the beach every ten years over the project's lifetime (50 years). Alternative 2B consists of an initial base beach fill of 925,000 cm (1, 209,900 cy), followed by 764.000 cm (999,312 cy) replenishment every ten years. Alternative 3B would consist of 1,250,000cm (1,635,000cy), plus an additional 764,000cm (999,312cy), resulting in a minimum beach width of 34m (115ft); an additional 764,000cm (999,312cy) of renourishment would then be placed on the beach every ten years for the life of the project. Alternative 4B would have an initial base beach fill of 2,000,000cm (2,616,000cy), plus an additional 764,000cm (999,312cy) of fill, thereby resulting in a minimum beach width of 54m (177ft); the beach would then be renourished with 764,000cm (999,312cy) every ten years for the life of the project. Alternatives 1B through 4B would all utilize the two offshore borrow areas referenced above for onshore fill. To minimize environmental impacts associated with the Proposed Action and its alternatives, mitigation measures and environmental commitments have been incorporated into this Final EIS/EIR. Mitigation measures and environmental commitments include topography and geography, cultural resources, biological resources, noise, air quality (Alternative 4B only), transportation, and recreation; they are summarized in Section 10 of this Final EIS/EIR. Mitigation measures would be similar for all of the alternatives evaluated. Alternatives 1B through 4B would not result in any potentially significant impacts that cannot be mitigated to a level of less than significant. Additionally, Alternatives 1B through 4B would be in compliance with all applicable Federal and State regulations.

Under the No Action Alternative, the existing beach and beachfront properties would be subject to continued erosion and storm damage.

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NOTE: Information, displays, and maps discussed in the Draft Feasibility Study Report for the Imperial Beach Shore Protection Project are incorporated by reference in this EIS/EIR.

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The U.S. Army Corps of Engineers (USACE) prepared this Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) to assess the environmental impacts of project alternatives designed to protect the beach and beachfront properties at Imperial Beach, City of Imperial Beach, California. Beach erosion has been a persistent problem at Imperial Beach since 1937. This document is written in compliance with both National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). In addition, the document is also in compliance with all applicable Federal, State, and local environmental regulations. Changes to the beach shoreline caused by erosion have exposed local residences and commercial structures to storm damage. In 1988, a major storm resulted in expenditures in excess of $265,000. Structural measures (i.e., sea walls constructed by individual property owners and two stone groins constructed by the USACE) have been constructed to address beach erosion damage; however, beach erosion continues to be a problem. This EIS/EIR examines four action alternatives that were identified as potential solutions to erosion at Imperial Beach.

The Draft EIS/EIR was released for the 45-day public review during June 2002. Comments received on the Draft EIS/EIR are incorporated in the Final EIS/EIR. Text has been modified in appropriate sections. Comment letters and responses are located in Appendix A.

Subsequent to the release of the Draft EIS/EIR, it has been determined that Alternative 2B does not meet the cost benefit ratio required for Federal government interest for project construction. Per the projects revised calculations, Alternative 1B is the National Economic Development (NED) Plan and Recommended Plan. Please refer to Chapter 5 of the Main Report for details on the NED and Recommended Plan. A summary of these two alternatives, as well as the alternatives considered for in-depth evaluation, is provided in Section 3.3 of this document.

The USACE has prepared numerous studies for the project area. Some of these studies are summarized below:

- **Final Environmental Impact Statement for the Imperial Beach Erosion Control Project** was completed by the USACE in September 1978. This document evaluated the construction of a 5,000-foot-long submerged breakwater along the minus 10-foot contour, and the extension or construction of two rock groins at either end of the breakwater.
- **Environmental Evaluation for the Silver Strand Shoreline Protection Project** prepared by the USACE in February 1995. This report includes the U.S. Fish & Wildlife Service Planning Aid Letter, November 29, 1994.
- **Silver Strand Shoreline Reconnaissance Study Final Report** prepared by the Coastal Resources Branch of the USACE in December 1995.
- **Silver Strand Shoreline, Imperial Beach, CA: General Reevaluation Report F3 Conference Submittal** was prepared by the USACE to reformulate alternatives that are economically feasible, have viable engineering, and provide for protection of the study area. The report included a Preliminary Draft EIS/EIR dated April 2000.

Project Location. The project would involve 2,164 meters (m) (7,100 feet [ft]) of shoreline in the City of Imperial Beach. The City of Imperial Beach, which is approximately 4.5 square miles, is located in San Diego County immediately north of the United States/Mexico border. The study area includes both on and off shore components. The onshore component includes 2,164 m (7,100 ft) of shoreline within an area known as Silver Strand. The offshore component includes two borrow areas that are approximately 1.9 kilometers (1.2 miles) north and 4.5 kilometers (2.8 miles) south of the Imperial Beach pier.

Project Alternatives. Numerous structural and non-structural alternatives (e.g., nearshore sand mound, detached breakwater, groins, and revetments) have been considered as potential solutions to address future erosion and storm damage. This EIS/EIR evaluates non-structural alternatives (i.e. beach nourishment) since these solutions or alternatives best met the project objectives. Structural alternatives (i.e. groins, revetments, etc.) were considered but eliminated from further consideration because these alternatives did not meet the project criteria of efficiency and public acceptability. Section 3.1 of this EIS/EIR details the structural alternatives that have been eliminated from in depth evaluation. The non-structural beach nourishment alternatives and the No Action Alternative evaluated in this report are summarized below.

- **No Action Alternative**. Under this alternative the properties and structures along the beachfront would be susceptible to continued damages caused by inundation, wave attack, and erosion.
- **Alternative 1B - NED/Recommended Plan.** This alternative would consist of beach nourishment along a 2,164 m (7,100 ft) stretch of the shoreline. The initial base beach fill would consist of 450,000 cubic meters (cm) (588,600 cubic yards [cy]) plus an additional 764,000 cm (999,312 cy) of fill that would result in a 12 m (39 ft) beach width. The shoreline would be renourished every ten years with 764,000 cm (999,312 cy) of fill to maintain the 12 m (39 ft) beach width. This alternative would include the initial replenishment followed by four replenishment cycles over a 50-year evaluation period.
- **Alternative 2B.** This alternative would cover the same 2,164 m (7,100 ft) shoreline as Alternative 1B. Under this alternative, the beach would be renourished with an initial base fill of 925,000 cm (1,209,000 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 25 m (82 ft). An additional 764,000 cm (999, 312 cy) of fill would be placed on the beach every ten years over a 50-year evaluation period. This alternative would include the initial replenishment followed by four renourishment events.
- **Alternative 3B.** This alternative would cover the same 2,164 m (7,100 ft) shoreline as Alternative 1B. Under this alternative, the beach would be renourished with an initial base fill of 1,250,000 cm (1,635,000 cy) plus an additional 1,146,000 cm (1,498,968 cy) of fill that would result in a minimum beach width of 34 m (115.5 ft). An additional 1,146,000 cm (1,498,968 cy) of fill would be placed on the beach every ten years over a 50-year evaluation period. This alternative would include the initial replenishment followed by four renourishment events.
- **Alternative 4B.** This alternative would cover the same 2,164 m (7,100 ft) shoreline as Alternative 1B. Under this alternative, the beach would be renourished with an initial base fill of 2,000,000 cm (2,616,000 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 54 m (177 ft). An additional 764,000 cm (999,312 cy) of fill would be placed on the beach every ten years over a 50-year evaluation period. This alternative would include the initial replenishment followed by four renourishment events.

This EIS/EIR determined that these project alternatives all provide benefits over the No Action Alternative. This Final EIS/EIR concludes that Alternative 1B is the Environmentally Superior Alternative. Alternative 1B is also the National Economic Development (NED) Plan Alternative, the Recommended Plan Alternative, and the Least Environmentally Damaging Practicable Alternative.

Environmental Impacts. The EIS/EIR evaluated the environmental impacts associated with the implementation of the No Action Alternative, Alternative 1B, Alternative 2B, Alternative 3B, and Alternative 4B. Alternative 1B, the Recommended Plan Alternative, would not result in significant environmental impacts; however, some issue areas require mitigation to reduce impacts to a less than significant level. Table ES-1 summarizes the impacts associated with the implementation of Alternative 1B, mitigation measures or environmental commitments identified to reduce impacts, the residual impact after mitigation, implementation phase, and responsibility.

Public Concerns/Areas of Controversy. The USACE has worked with local and State agencies during development of this project. To date, the key concern expressed by the public has been the desire to have only non-structural solutions for beach protection and enhancement. Additional comments submitted during the 45-day public review period on the Draft EIS/EIR are evaluated in this Final EIS/EIR.

Summary of EIS/EIR Content. Information regarding the project's background, need, and objectives is provided in Sections 1 and 2. A description of the historic and current project alternatives evaluated for the project is provided in Section 3. The project area's existing environmental condition is provided, resource by resource, in Section 4. Section 4 additionally contains information regarding applicable plans, policies, and regulations. Section 5 provides, resource by resource, the environmental consequences (impacts) of the project's alternatives, including the No Action Alternative. Section 6 evaluates energy requirements and conservation potential of the project's alternatives. Sections 7, 8, and 9 evaluate unavoidable significant, growth inducing, and cumulative impact analyses, respectively. Section 10 describes the environmental commitments. Section 11 provides compliance consistency with environmental regulations and requirements. The document additionally includes eleven issue/resource-specific technical appendices.

Unresolved Issues. At the time of publication of this report, there were no unresolved issues associated with the project.

Relationship to Environmental Protection Statutes. In each resource/issue area discussion, the EIS/EIR presents applicable environmental laws and regulations. Section 11 of this report provides a discussion of the project alternative's consistency with applicable environmental laws and regulations. As noted in Section 11, the alternatives would comply with all applicable Federal and State environmental regulations.

Table ES-1 Summary of Impacts and Proposed Mitigation

Environmental Resource Area	Level of Impact	Proposed Mitigation	Residual Impact	Implementation Phase	Responsibility
Topography and Geography	Class II – soil contamination Class IV - topography	**G-1** Preparation of a Spill Prevention, Containment, and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include: • On- and offshore activities and use and refueling of equipment • Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site • Immediate control, containment, and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment • An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. A monitoring program will be implemented to ensure that the plans are followed throughout the period of construction.	No residual impact.	Prior to construction.	USACE
Coastal Processes	Class III – sand distribution Class IV – shore protection	No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.
Water Quality	Class III – beach and borrow areas	To minimize potential impacts from turbidity, training dikes are part of the project description. No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.
Essential Fish Habitat	Class III – habitat, turbidity, water quality	To minimize potential impacts from turbidity, training dikes are part of the project description. No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.

Environmental Resource Area	Level of Impact	Proposed Mitigation	Residual Impact	Implementation Phase	Responsibility
Biological Resources	Class III and IV – near shore, shoreline, Tijuana River Estuary	**B-1** During construction a qualified biologist will regularly monitor off- and onshore activities to ensure that potential impacts to biological resources that may be associated with turbidity and nourishment/ renourishment deposition are minimized to the extent feasible. Specific monitoring activities/protocol will be reviewed with appropriate state and federal agencies prior to implementation.	No residual impact.	Prior to and during construction.	USACE and City.
Cultural Resources	Class II – underwater archeological resources	**C-1** Prior to final approval for construction of the project, an underwater archeological and remote sensing survey of proposed borrow site Areas A and B will be performed. The findings of the survey shall be subsequently used to identify and implement any mitigation measures that may be necessary to minimize offshore impacts to a level of less than significant.	No residual impact.	Prior to construction.	USACE
Aesthetics	Class III and IV – visual quality	No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.
Air Quality	Class III – construction and operation	No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.
Noise	Class II – construction noise Class III - operation	**N-1** Staging areas shall be located away from sensitive receptors (schools, hospitals, residential areas, etc.) to avoid noise impacts. **N-2** Conduct all onshore construction activities involving motorized equipment between the hours of 7 a.m. and 7 p.m. Monday through Saturday. **N-3** Maintain properly functioning mufflers on all internal combustion and vehicle engines used in construction and direct muffler exhaust away from sensitive receptor locations to reduce noise levels at the receptor locations to the maximum extent feasible. **N-4** Construction contractor shall provide advance notice by mail to all residents and property owners on the west side of Seacoast Drive between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than seven days occur, an additional notice shall be made either in person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The contractor shall also publish a notice of the impending construction in local newspapers, stating when and where construction will occur.	No residual impact.	Prior to and during construction.	USACE and City of Imperial Beach

Environmental Resource Area	Level of Impact	Proposed Mitigation	Residual Impact	Implementation Phase	Responsibility
		N-5 Construction contractor shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise disturbance. Construction contractor shall also establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for promptly responding to callers and recording the disposition of calls. Procedures for reaching the public liaison officer via telephone or in person shall be included in the notices distributed to the public in accordance with Mitigation Measure N-4. If construction noise complaints are received, temporary noise curtains or shields shall be employed to reduce construction noise to levels that would not cause disturbances to anyone working or residing in the area, per Section 9.32.020 of the City of Imperial Beach General Plan.			
Socioeconomics	Class II –Commercial Fishing Class IV – temporary construction jobs	**S-1** Thirty days prior to the start of construction the local Imperial Beach commercial fishermen's association shall be provided with written notification of the intended start date of off-shore construction and its duration. Noticing shall include a point of contact throughout the entire construction phase to respond to concerns regarding interference and/or other issues associated with local commercial fishing operations.	No residual impact.	Prior to construction, construction.	USACE and City of Imperial Beach
Transportation	Class II – public safety Class III – traffic	**T-1** Standard construction practices and safety precautions shall be incorporated into the design of the project staging area(s). Construction staging areas shall be clearly marked and appropriately guarded to ensure public safety.	No residual impact.	Prior to and during construction.	USACE and City of Imperial Beach
Land Use	Class III – construction Class IV – land use goals	No mitigation measures are necessary.	No residual impact.	Not applicable.	Not applicable.
Recreation	Class II – sand quality/ swimming area Class III – fishing/wave formation	**R-1** Periodically remove shell fragments from beach using a sand sweeper or other mechanical separation device. **R-2** Extend lifeguard services south of Imperial Beach Boulevard to the end of Seacoast Drive during construction of shore protection measures. **R-3** Post signs to announce construction and maintenance activities two to three weeks prior to their inception. Maintain postings within the duration period of the activity. (This mitigation measure may be combined with Mitigation Measure N-5.)	No residual impact.	Construction and operation.	City of Imperial Beach

Notes: Class I: Significant impact that cannot be mitigated to a level that is not significant.
Class II: Significant impact that can be mitigated to a level that is not significant.
Class III: Potential impact but not significant.
Class IV: Beneficial Impact.

Appendix I contains the Mitigation Monitoring Plan (MMP) for the Imperial Beach Shore Protection Project.

1. INTRODUCTION

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was prepared to assess the environmental impacts of project alternatives designed to protect the beach and beachfront properties at Imperial Beach, City of Imperial Beach, California. Beach erosion has been a persistent problem at Imperial Beach since 1937. Changes to the beach shoreline caused by erosion have exposed local residences and commercial structures to storm damage. Structural measures (i.e., sea walls constructed by individual property owners and two stone groins constructed by the U.S. Army Corps of Engineers [USACE]) have been constructed to address beach erosion and related damage; however, beach erosion continues to be a problem. While shore protection actions in the past have included primarily structural projects, the solutions that are now considered to be feasible focus on nonstructural beach nourishment (sand replenishment). Structural alternatives were not evaluated further because they did not meet the project objectives of efficiency and acceptability (see Section 3.1). This EIS/EIR examines alternatives that were identified as potential nonstructural solutions to erosion at Imperial Beach.

Before a decision on the project is made, the Proposed Action and alternatives must undergo both the National Environmental Policy Act (NEPA) (Federal) and California Environmental Quality Act (CEQA) (State) environmental review processes. NEPA review is triggered by the direct involvement of a Federal agency in a project or by the use of Federal funds. CEQA review is triggered by the involvement of a State or local agency (in this case, the City of Imperial Beach, as Local Sponsor). The two environmental review processes are similar and typically are undertaken jointly for projects that require both NEPA and CEQA review. This document is a combined EIS/EIR that has been prepared to satisfy the environmental review requirements of both NEPA and CEQA. The purpose of the EIS/EIR is to identify and disclose information about the potentially significant environmental effects of the Proposed Action and the various alternatives to the Proposed Action.

1.1 MODIFICATION IN RECOMMENDED AND NATIONAL ECONOMIC DEVELOPMENT PLAN ALTERNATIVES

The primary difference between the Draft and Final EIS/EIR is that the Proposed Action (the National Economic Development (NED) Alternative, Recommended Plan Alternative, Environmentally Superior Alternative and Environmentally Least Damaging Alternative has changed from Alternative 2B to Alternative 1B. The Draft EIS/EIR evaluates detailed environmental analysis for Alternatives 1B through 4B and the No Project Alternative. Subsequent to release of the Draft EIS/EIR, the USACE reverified the economic analysis for the project's viable alternatives. It has been determined that Alternative 2B does not meet the cost benefit ratio required for Federal government interest for project construction. Per the projects revised calculations, Alternative 1B is the National Economic Development (NED) Plan and Recommended Plan. Please refer to Chapter 5 of the Main Report for details on the NED and Recommended Plan. A summary of these two alternatives, as well as the alternatives considered for in-depth evaluation, is provided in Section 3.3 of this document.

The Draft EIS/EIR notes in Sections 3.4 and 3.5 that the issue/resource-specific impacts associated with Alternatives 1B through 4B are not substantially different from each other, and that the differences between them are generally considered to be negligible. The key difference between the alternatives is a change in the magnitude (or duration) of impacts due to changes in beach width. The Draft EIS/EIR concludes that no clearly superior alternative can be identified. Alternative 1B does not have any environmental impacts that are substantially different from Alternative 2B, and does not require any additional mitigation. Additionally, there would be a slight benefit associated with implementation of Alternative 2B due to reduced shallow water effects; the smaller beach width associated with Alternative 1B, in comparison to 2B, would reduce effects associated with shore and near-shore burial due to nourishment/renourishment activities. The Draft EIS/EIR assessment for biological resources concluded that the progressively increased beach widths associated with Alternatives 1B through 4B would provide for increased nesting and foraging habitat for the California least tern and snowy plover, thereby creating an incrementally greater beneficial impact. However, in its review of the Draft EIS/EIR, the United States Fish and Wildlife Service concluded that these increased benefits would not likely be realized because the project area is heavily used for recreational purposes (please refer to Section 1.7 for additional information on these impacts). Consequently, Alternative 1B is now considered to be the Environmentally Superior Alternative.

Under the National Environmental Policy Act, the Federal Lead Agency, in this case the USACE, must factor several project-related issues into its alternatives analysis. Alternatives chosen for in-depth review are those that must be feasibly implemented based upon technical, economic, practicable, and environmental issues. Federally and Federally-assisted water and related planning activities attempt to achieve increases in the NED while preserving environmental resources consistent with established law and policy. Planning criteria for the proposed project includes: completeness; effectiveness; efficiency; and, acceptability. Alternative 1B most fully meets these criteria and is additionally the most practicable alternative; therefore, it is considered the Least Environmentally Damaging Practicable Alternative.

Changes between the Draft EIS/EIR and Final EIS/EIR that reflect changes regarding the Proposed Action are noted throughout this document with a vertical line in the right-hand margin of the text.

In addition to the above, comments on the Draft EIS/EIR were presented during the public scoping meeting held in Imperial Beach on July 24, 2002, and additionally received via written and electronic correspondence. As a result of these comments, additional changes have been made between the Draft and Final EIS/EIR. As above, all changes in this Final EIS/EIR that resulted as a function of these comments are indicated throughout the document by a vertical line in the right-hand margin of the text.

Finalization of this EIS/EIR included the addition of two new mitigation measures and a new environmental commitment to reduce potential impacts associated with construction-related activities. Mitigation Measure B-1 provides for biological monitoring during construction to help ensure that project-related impacts associated with turbidity and nourishment/renourishment activities (deposition) do not create significant adverse impacts to biological resources. To help ensure that future off-shore

construction related activities do not adversely affect kelp beds, an additional environmental commitment to provide appropriate regulatory agencies with the plans and specifications for offshore activities has been proposed. To reduce potential short-term impacts to local commercial fishermen during off-shore construction activities, Mitigation Measure S-1 has been proposed to provide them with written notification of planned construction, as well as a point of contact for any questions or concerns. Section 10 of this Final EIS/EIR provides a summary of all of the mitigation measures and environmental commitments associated with the proposed project.

The USACE and local sponsor will hold a public meeting on September 18, 2002 to inform the public of the change in the NED and Recommended Plan. Public noticing of the meeting was provided. Formally and informally concerned resource agencies were notified of this change as well.

1.2 PROJECT AUTHORIZATION

The project was originally authorized under the River and Harbor Act of 1958, Public Law 85-500. The authorization was for the construction of stone groins at Imperial Beach. The groins were ineffective and the project was deferred. The Chief of Engineers approved a Post Authorization Change Report in 1979 for the construction of a breakwater. However, the breakwater was never constructed because of a lawsuit. Because the project described in this EIS/EIR is significantly different than the one identified in the original authorization, a new authorization would be required under the Water Resources Development Act prior to implementation.

1.3 RELEVANT SITE HISTORY AND FEDERAL INVOLVEMENT

Site History

The City of Imperial Beach, first known as South San Diego, was incorporated in 1956. The beachfront is currently built out to the City's 1982 General and Coastal Plan restrictions, primarily including residential housing, with some light commercial use. There are 88 residential structures, two commercial structures, and 21 vacant lots (USACE, 2000) along the beachfront. Future development is expected to include new construction, upgrades, and re-use of occupied parcels.

Changes to the beach at Imperial Beach have been noted since 1956, and since 1937 there has been a persistent retreat of the beach, primarily south of the municipal pier. During the winter of 1952-53, the shoreline receded to such an extent that local residents suffered damages estimated at $15,000 to $25,000 (USACE, 1978). To protect against additional damage, some property owners have constructed protective structures such as concrete seawalls, placement of large boulders, and placement of concrete riprap. In January of 1988, a major storm coincident with a 2.3 m (7.5 ft) high tide resulted in waves as high as 6 m (20 ft) against the shore, flooding oceanfront homes as well as streets and low-lying structures up to three blocks from the ocean. Clean-up cost was $100,000 and damage to buildings was estimated at $165,000 (USACE, 1995a).

The municipal pier has been damaged and repaired in storms of 1980, 1983, and 1988, after which it was replaced by a longer and higher structure (USACE 1995a).

In April, May, and June of 1977 about 841,010 cubic meters (cm) (1.1 million cubic yards [cy]) of dredged sand were deposited on Imperial Beach as part of the San Diego Harbor dredging project. This sand resulted in a 46 m (150 ft) wide, 1,524 m (5,000 ft) long beach (USACE, 1978).

In 1996-97, an additional 152,910 cm (200,000 cy) of sand was deposited offshore of Imperial Beach.

In June 2000, the San Diego Association of Governments (SANDAG) and the U.S. Department of the Navy prepared an Environmental Impact Report/Environmental Assessment (EIR/EA) for the San Diego Regional Beach Sand Project. This document evaluated the dredging and placement of 1,529,110 cm (2 million cy) of sand on a maximum of 13 receiver sites in the San Diego Region; Imperial Beach was included as one of the receiver sites. SANDAG completed the beach replenishment project evaluated in the EIR/EA in September 2001. At Imperial Beach, SANDAG placed 137,620 cm (180,000 cy) of sand. SANDAG is now in the monitoring phase and will conduct onshore and offshore monitoring in the Spring and Fall. These surveys or monitoring will be conducted for four years (Rundle, 2002).

Federal Involvement

Federal involvement in the beach erosion problem at Imperial Beach began with the passage of Public Law 85-500, the River and Harbor Act of 1958. This law resulted in the 1959 Congressional report entitled "Beach Erosion Control Study for Oceanside, Ocean Beach, Imperial Beach, and Coronado," which called for the construction of five stone groins to protect the beach at Imperial Beach. The first groin was completed to a length of 182 m (600 ft) in September 1959 and extended to 225 m (740 ft) in July 1963; the second groin was completed to 122 m (400 ft) in January 1961. Because littoral transport of sand did not result in filling of the space between the groins, construction of the remaining groins was deferred while new alternatives were investigated (USACE, 1978).

In September of 1978 USACE completed an EIS to evaluate impacts of the construction of a submerged breakwater to protect Imperial Beach (USACE, 1978). The purpose of the breakwater was to prevent future beach erosion and property damage, and to preserve the sand deposited in 1977. The breakwater was approved by the Chief of Engineers in 1979, and a construction contract was awarded in 1985. Prior to the start of construction, the Federal District Court enjoined the project on the basis that significant changes had occurred since the EIS was completed in 1978, and a lawsuit was brought by the Surfrider Foundation against the City of Imperial Beach (USACE, 1995b). A main concern raised by opponents of the project was that the EIS did not evaluate the impacts of constructing the project in phases over time, including the potential impacts if one or more phases of the proposed project could not be completed (USACE, 2000). The project was subsequently re-classified to a deferred category in 1993.

In May of 1991 a Reconnaissance Study was authorized by resolution of the House of Representatives Committee of Public Works and Transportation. The resulting 1995 Reconnaissance Study evaluated preliminary construction designs and costs involving restoration and maintenance of protective beaches. Alternative solutions that were reviewed included beach nourishment, beach nourishment with a nearshore sand mound, breakwater, groins, and revetment. Two alternatives were found to have a benefit-to-cost ratio of equal to or greater than one: both of these alternatives focused on beach nourishment. The project costs of these plans ranged from about $10 million to $13 million, plus an average annual periodic nourishment cost ranging from $269,000 to $609,000.

1.4 STUDY PROCESS

Several planning steps were undertaken by the USACE to determine the nature of the problem, identify alternative courses of action, and select a preferred alternative. The initial phase in this process, referred to as the reconnaissance phase, was completed in 1995. During the reconnaissance phase, the USACE investigated the beach erosion problem and evaluated potential solutions. In December of 1995 a Reconnaissance Study was published (USACE, 1995a) that presented and evaluated alternative solutions, and considered their compliance with Federal criteria for economic feasibility and public acceptability. Two alternatives were found to meet the USACE's economic criteria (USACE, 1997a).

Because a Federal interest was identified during the reconnaissance phase, the USACE planning process moved into the feasibility phase, during which alternatives are evaluated and a Proposed Action is defined. Based on the findings in the Reconnaissance Report, funds were appropriated by Congress to initiate a General Reevaluation Report Study (GRR) at Imperial Beach. The study was initiated in March 1997 and completed in April 2000. This study, more detailed than the 1995 Reconnaissance Study, determined if the alternatives identified in the reconnaissance phase study were feasible in terms of engineering, economic and environmental factors.

1.5 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

The Proposed Action and its alternatives have been designed to be consistent with Federal, State, and local environmental laws and regulations. Applicable laws are presented in the discussion of individual environmental issue areas in Section 4 of this report. Section 11 of this report includes a listing of these regulations and discusses how the project meets each of the applicable regulations. See Section 11 for more information on this topic.

1.6 PUBLIC INVOLVEMENT

The USACE published a Notice of Intent (NOI) to Prepare an EIS for the Shore Protection Study for the City of Imperial Beach, San Diego County, California in the Federal Register on April 22, 1997 (Volume 62, Number 77, Page 19558). This notice announced a public workshop, which was held on May 1, 1997 at 7:30 p.m. at the Imperial Beach City Hall. This meeting was announced by mail, to parties who had indicated an interest in the project, and in the local newspaper. These announcements

requested that individuals and agencies come to the meeting to offer information or data relevant to the environmental or socioeconomic impacts. The NOI, public notice, and related compliance documents are located in Appendices H and K.

At the meeting, USACE personnel described the history of the storm damage and shore protection measures in Imperial Beach and the studies that have been completed. The public was invited to present their views, comments, and suggestions related to the ongoing project. Local residents expressed their desire to focus on beach nourishment alternatives that re-create the natural processes of the beach rather than on hard structures such as groins or breakwaters. Local residents felt that given the ineffectiveness of the existing groins and the opposition of special interest groups to a previously proposed breakwater plan, sand replenishment alternatives would be preferred.

The Draft EIS/EIR notice of availability was published in the Federal Register on June 28, 2002. The document was circulated for public review from June 17, 2002 through August 12, 2002. During the review period, comments could be submitted to the U.S. Army Corps of Engineers (USACE) in the form of either a letter, facsimile (fax), or electronic mail (e-mail). A public scoping meeting on the Draft EIS/EIR was held July 24, 2002 at 6 pm in the City of Imperial Beach. Questions and comments on the Draft EIS/EIR that were presented at the workshop were answered at that time. A transcript of the workshop is provided in Appendix A. Written comments provided during the public comment period are included in Appendix A. All changes in the Final EIS/EIR that resulted as a function of these comments are indicated throughout the document by a vertical line in the right-hand margin of its text. Overall, the public supports the proposed replenishment project. Some questions and concerns regarding cost sharing and cost benefit analysis were raised. Additional questions were raised regarding design, the project's off-shore borrow areas and impacts to biological resources. Responses to these comments and questions are provided in Appendix A.

An additional public meeting is scheduled to take place on September 18, 2002 at 7:00 p.m. The meeting will be held at the City of Imperial Beach Council Chamber located at 825 Imperial Beach Boulevard, Imperial Beach, California.

1.7 AGENCY COORDINATION

The USACE has coordinated with several state and federal agencies in the development of this project. Both telephone and written communication has been conducted to provide information on the project and to obtain input from these agencies. The following agencies were contacted by phone to discuss the project and obtain comment:

- National Marine Fisheries Service, Bob Hoffman
- California Department of Fish and Game, Marilyn Fluharty
- California Coastal Commission, Larry Simone
- California Regional Water Quality Control Board, Dat Quach

- San Diego Air Pollution Control District, Ernie Davis
- California Department of Parks and Recreation, San Diego Coastal District, Ed Navarro
- City of Imperial Beach, Greg Wade, Director of Community Development.

Three agencies were contacted formally to discuss the project. These agencies, and the coordination conducted to date, are summarized below.

U.S. Fish and Wildlife Service (USFWS). The USFWS responded to the NOI on the project by providing a letter dated May 27, 1997 where they provided their initial comments on the project. The USACE has maintained informal coordination with the USFWS, Carlsbad Office, since February 2001. In compliance with the Fish and Wildlife Coordination Act, the USACE provided funding, as well as a Scope of Work, for a Draft and Final Coordination Act Report (CAR) in February 2001. A copy of the project's Draft EIS/EIR was provided to the USFWS, Carlsbad Office, on June 17, 2002. Field reconnaissance of the project area has been completed by the USFWS (Carlsbad Office); USFWS personnel have not expressed any adverse concerns to date.

The Draft EIS/EIR analyzed project related impacts to biological resources within the project area and concluded that the proposed project would not have adverse impacts on any Federally listed species. Consequently, a formal Section 7 consultation is not required. The USACE has thus requested an informal consultation with the USFWS to satisfy the requirements of the Endangered Species Act (per 50 C.F.R. Section 402.13). The request was submitted to the USFWS on August 29, 2002; a request for an USFWS response within 30 days of the submittal was requested. A copy of the request is provided in Appendix J of this Final EIS/EIR.

On September 3, 2002 the USFWS provided the USACE with a Draft CAR for the originally Proposed Action (Alternative 2B). The Draft CAR is included in Appendix D of this document. Following receipt of the Draft CAR, the USACE contacted the USFWS and informed it of the identified change in the Proposed Action (Alternative 1B). The USACE has continued its coordination with the USFWS since this notification to address the change in the Proposed Action. A Final CAR is currently anticipated to be submitted by the USFWS prior to the close of the public and agency review period of this Final EIS/EIR.

The Draft CAR recommends that the USACE formally consult with the USFWS, pursuant to Section 7 of the Endangered Species Act, for the brown pelican, California least tern, and western snowy plover in the event that project construction extends past March 1 of any given year.

The USFWS has indicated that it will incorporate changes into the Final CAR to reflect changes regarding Alternative 1B as the NED and Recommended Plan. The USFWS has not expressed any concerns regarding this change. Conditions identified in the Final CAR will be followed during project construction.

California State Historic Preservation Officer. A previous Imperial Beach erosion project was coordinated with the California State Historic Preservation Officer (SHPO) in 1978. The SHPO concurred with the Corps' determination of no effect. The current project as proposed will be re-coordinated with the California SHPO in accordance with the National Historic Preservation Act. Results of the previous archival studies and archeological surveys (in addition to the 1994 survey), along with the Corps' determination of effect, will be sent to the California SHPO for review and comment. The contact at SHPO has been Knox Mellon.

In accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act, a records search and an archeological survey of the land portion of the study area have been performed. An archival search has been performed regarding the proposed borrow sites. An archeological and remote sensing survey is required. Until the underwater surveys have been completed, the USACE cannot make determinations of National Register eligibility and effect as required by the Act.

California Coastal Commission (CCC). The USACE submitted a Coastal Consistency Determination for the original Proposed Action (Alternative 2B) to the CCC on June 12, 2002. This was filed by the CCC on June 26, 2002 and approved on August 6, 2002 at the CCC hearings in San Luis Obispo.

Following the USACE's recognition of the change in the Proposed Action to Alternative 1B, contact was made with CCC staff to address the issue. CCC staff has indicated to the USACE that the change in the Proposed Action is considered to be negligible, and that additional approvals by the CCC itself would not be required. The Proposed Action can be approved for consistency with the California Coastal Act at a staff level, and would be in compliance with all applicable Federal and State laws regarding the California Coastal Zone. A copy of the coastal Consistency Determination is provided in Appendix E, along with the Coastal Commission's staff findings.

Regional Water Quality Control Board (RWQCB). The USACE submitted a letter to the RWQCB for Section 401 State Water Quality Certification on June 12, 2002 (Appendix J). In response to the change in the NED Alternative between the Draft and Final EIS/EIR, the USACE submitted a new letter requesting Section 401 State Water Quality Certification in September 2002. Project construction will not commence until after Section 401 State Water Quality Certification is obtained. Response from the RWQCB has not yet been received. The USACE will resubmit the request letter for the Section 401 Water Certification for Alternative 1B to inform RWQCB of the change in the NED/Recommended Plan. The USACE will continually coordinate with the RWQCB on the proposed project.

In addition to the above referenced formal consultation, multiple Federal, State, and local agencies were provided with notification and copies of the project's Draft EIS/EIR. Comments received on the Draft EIS/EIR by these agencies are included in Appendix A of the Final EIS/EIR. These agencies will be provided copies of the Final EIS/EIR. Agencies provided with copies of these documents can be found in Appendix K.

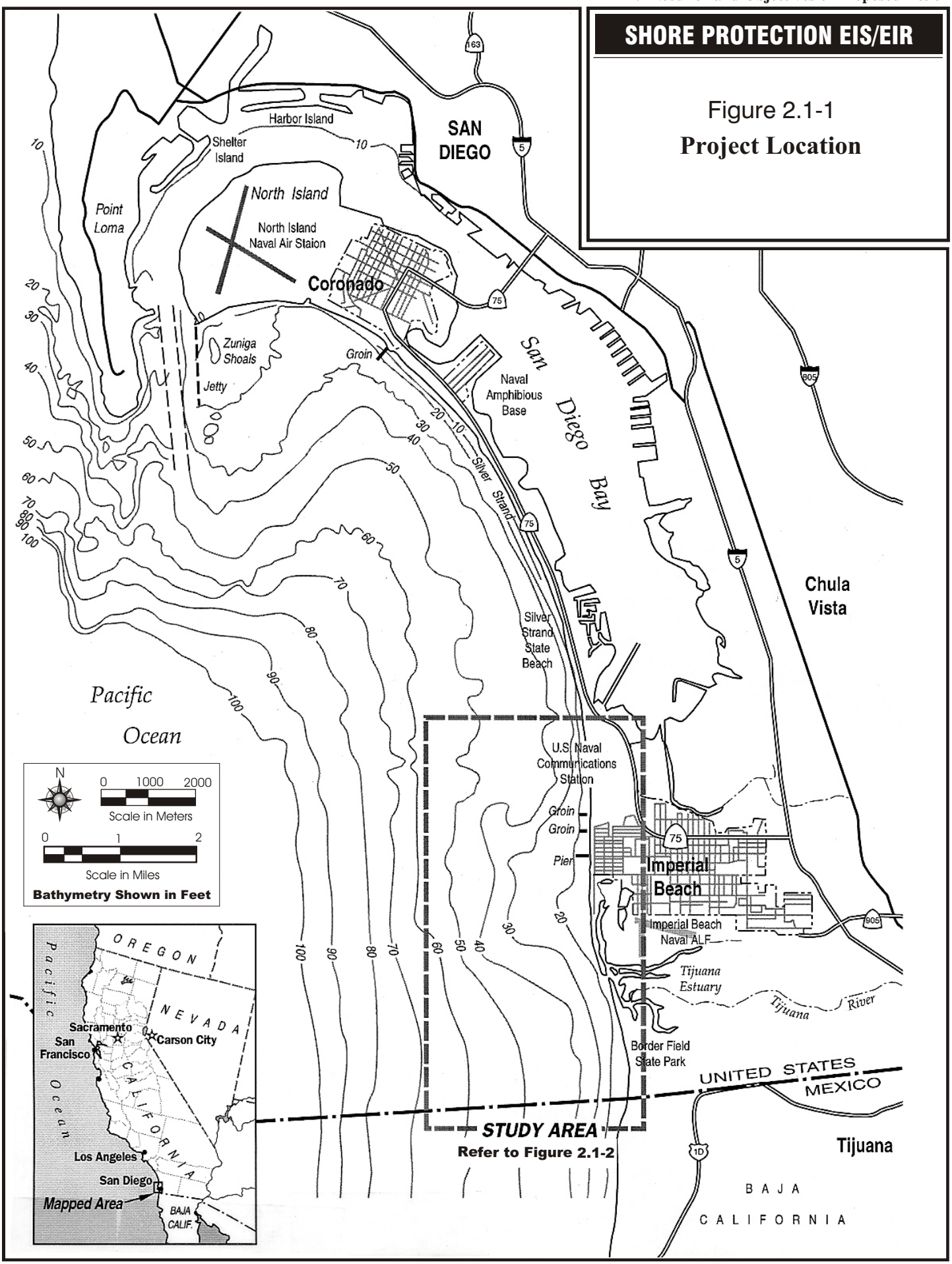
2.1 DESCRIPTION OF PROPOSED ACTION

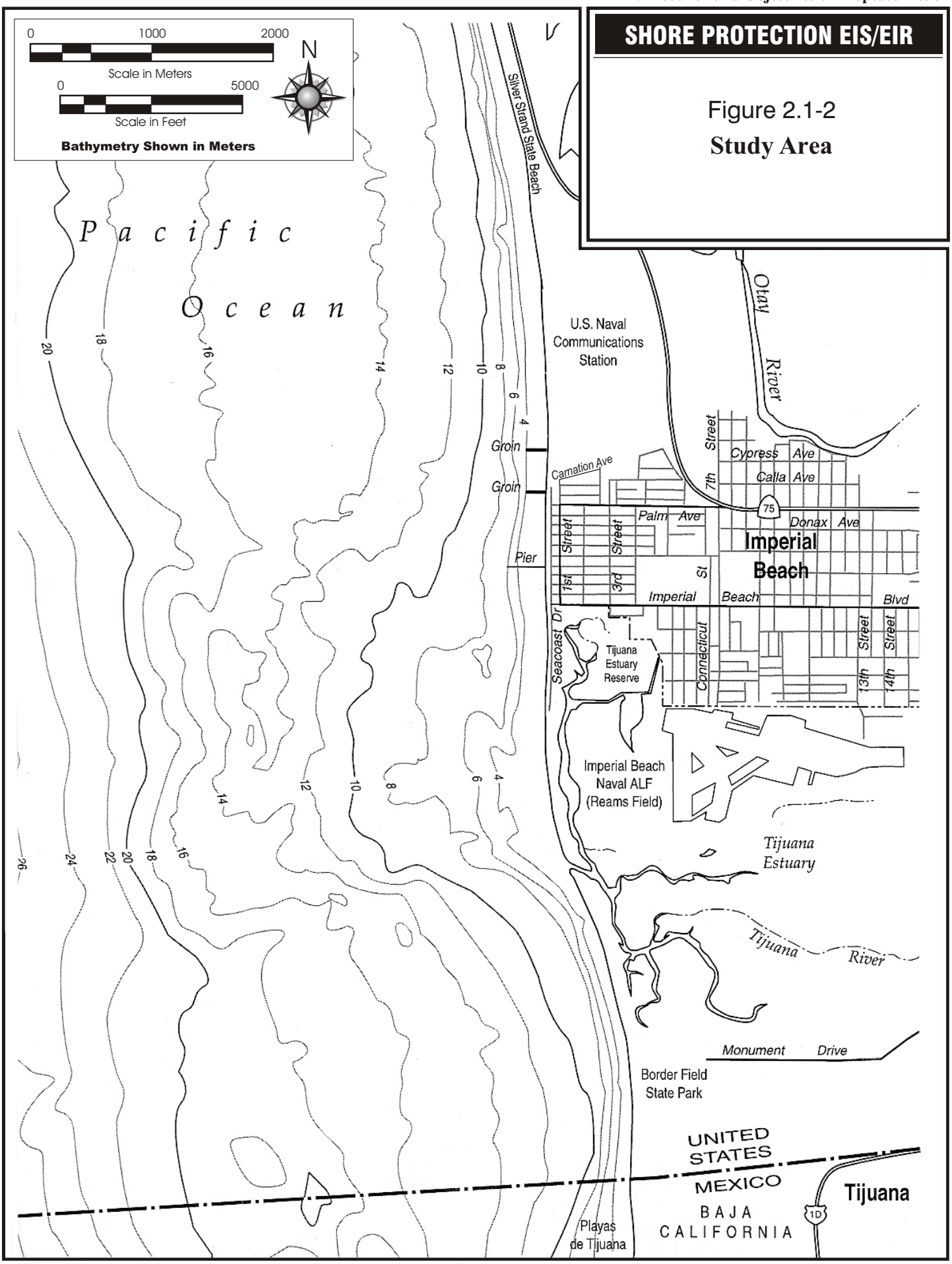
The proposed project and its alternatives are located within the City of Imperial Beach, San Diego County, California. The City of Imperial Beach is approximately 4.5 square miles in area, and is located immediately north of the United States (U.S.)/Mexico international boundary, as depicted in Figure 2.1-1. The specific beach area under evaluation is located within Silver Strand, a relatively narrow sand spit that extends northward from the Tijuana River inlet to a landmass at the entrance of San Diego Bay. It separates San Diego Bay from the Pacific Ocean, and includes, from north to south, the shorelines of the U.S. North Island Naval Air Station, the City of Coronado, the U.S. Navy Amphibious Base, Silver Strand State Beach, the U.S. Naval Communications Station, and the City of Imperial Beach. The study area for this EIS/EIR is located along the southernmost stretch of the Silver Strand shoreline that corresponds with the corporate boundary of the City of Imperial Beach, which extends from the U.S. Naval Communications Station approximately 5.8 kilometers (3.6 miles) to the U.S./Mexico border.

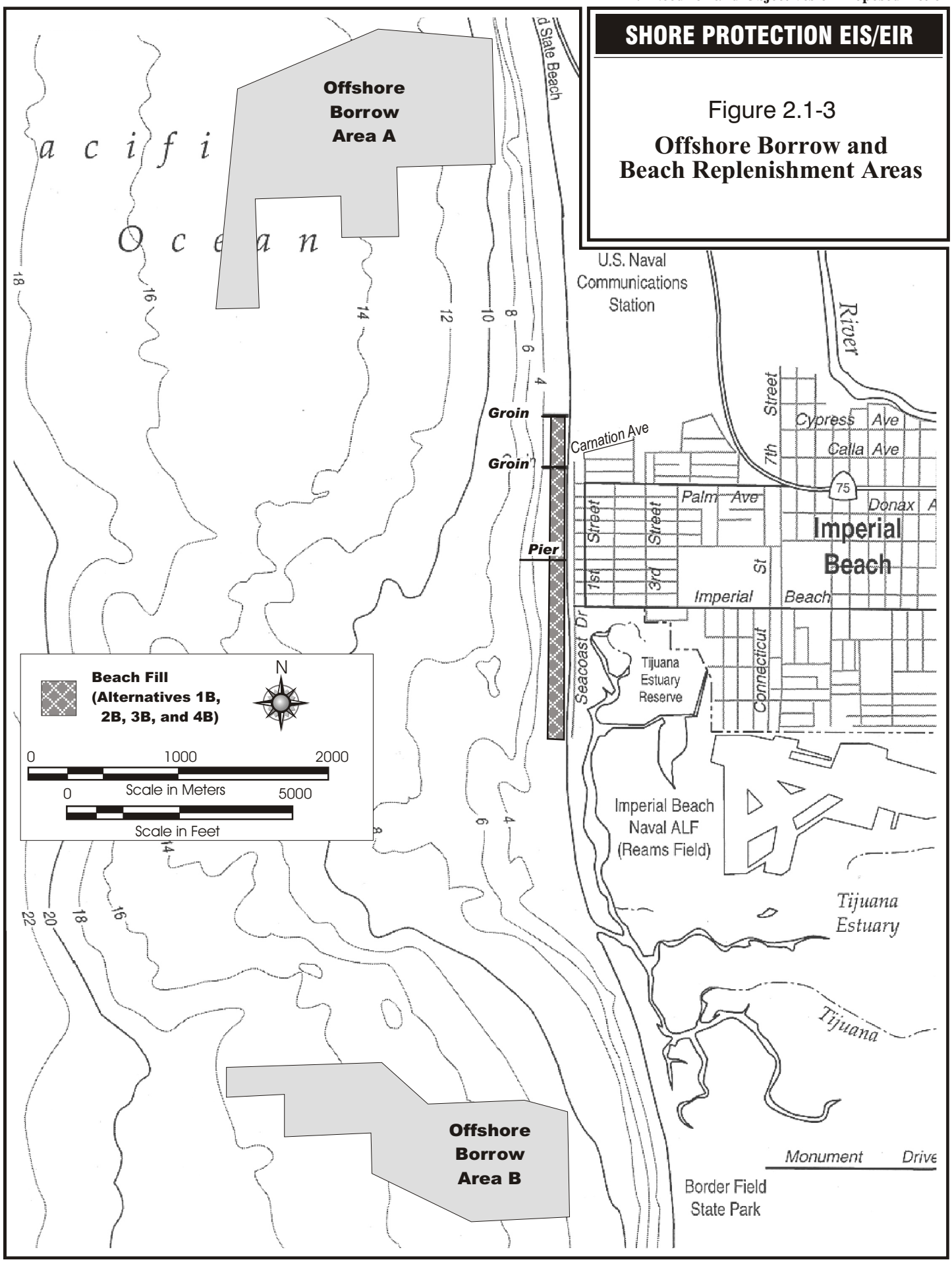
The study area consists of both off- and onshore components. The onshore component of the study area is centered around 2,164 m (7,100 ft) of shoreline that extends southward from the northern-most groin of the beach (Figure 2.1-2). The offshore component of the project is centered around two offshore borrow areas that are located approximately 1.9 kilometers (1.2 miles) north and 4.5 kilometers (2.8 miles) south of the Imperial Beach pier (Figure 2.1-3).

The Proposed Action Alternative is comprised of beach nourishment along a 2,164 m (7,100 ft) stretch of shoreline as shown in Figure 2.1-3. The initial base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in minimum beach width of 12 m (39 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12 m (39 ft). Following initial construction, this alternative would have four replenishment cycles (years 11, 21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach of the project's lifetime. The two offshore borrow sites would be used for fill material; they are referenced as "Area A" and "Area B" on Figure 2.1-3. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem. Fill from the offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a hopper dredge.

Since the borrow sites are offshore, there would be essentially no haul truck trips associated with the Proposed Action. Onshore, approximately four bulldozers would operate on the beach to manipulate the fill material received from offshore. The only onshore truck trips would result from the delivery and pick-up of bulldozers, and the daily commutes of construction crews.


SHORE PROTECTION EIS/EIR
Figure 2.1-1
Project Location
Harbor Island
Shelter Island
SAN DIEGO
North Island
Point Loma
North Island Naval Air Staion
Coronado
Zuniga Shoals
Jetty
Groin
Naval Amphibious Base
San Diego Bay
Silver Strand
Silver Strand State Beach
Chula Vista
Pacific Ocean
U.S. Naval Communications Station
Groin
Groin
Pier
Imperial Beach
Imperial Beach Naval ALF
Tijuana Estuary
Tijuana River
Border Field State Park
UNITED STATES
MEXICO
Tijuana
BAJA CALIFORNIA
STUDY AREA
Refer to Figure 2.1-2
N
0 1000 2000
Scale in Meters
0 1 2
Scale in Miles
Bathymetry Shown in Feet
OREGON
NEVADA
CALIFORNIA
Pacific Ocean
Sacramento
San Francisco
Carson City
Los Angeles
San Diego
Mapped Area
BAJA CALIF.


SHORE PROTECTION EIS/EIR
Figure 2.1-2
Study Area
0
1000
2000
Scale in Meters
0
5000
Scale in Feet
N
Bathymetry Shown in Meters
Pacific Ocean
Silver Strand State Beach
U.S. Naval Communications Station
Otay River
Groin
Groin
Pier
Carnation Ave
Cypress Ave
Calla Ave
Palm Ave
Donax Ave
7th Street
1st Street
3rd Street
Imperial Beach
Imperial Beach Blvd
Seacoast Dr
Connecticut St
13th Street
14th Street
75
Tijuana Estuary Reserve
Imperial Beach Naval ALF (Reams Field)
Tijuana Estuary
Tijuana River
Monument Drive
Border Field State Park
UNITED STATES
MEXICO
BAJA CALIFORNIA
Tijuana
1D
Playas de Tijuana


SHORE PROTECTION EIS/EIR
Figure 2.1-3
Offshore Borrow and Beach Replenishment Areas
Offshore Borrow Area A
Offshore Borrow Area B
Groin
Groin
Pier
U.S. Naval Communications Station
River
Carnation Ave
Cypress Ave
Calla Ave
Palm Ave
Donax A
Imperial Beach
Imperial Beach
Seacoast Dr
Tijuana Estuary Reserve
Connecticut
Imperial Beach Naval ALF (Reams Field)
Tijuana Estuary
Tijuana
Monument Drive
Border Field State Park
Beach Fill (Alternatives 1B, 2B, 3B, and 4B)
N
0 1000 2000
Scale in Meters
0 5000
Scale in Feet

As discussed in Section 3, the Proposed Action is Alternative 1B, which is the Environmentally Superior Alternative pursuant to CEQA. This alternative is also the National Economic Development (NED) Plan Alternative, the Recommended Plan Alternative, and the Least Environmentally Damaging Practicable Alternative, pursuant to Section 404 (b)(1) of the Federal Water Pollution Control Act, as amended.

2.2 PURPOSE AND NEED

The purpose of the Imperial Beach Shore Protection Project is to provide shore protection to the City of Imperial Beach and to prevent storm damage to adjacent beachfront structures, U.S. Naval Communications Station facilities, and public utilities. Shore protection includes developing and maintaining the beach and is intended to prevent the severe beach erosion that results from winter storms.

During the winter of 1952/1953, storm waves caused the shoreline within the project area to recede, and local residents suffered damages estimated to be as much as $25,000 (1953 dollars) to private and public property. In 1980, and again in 1983, waves damaged the City of Imperial Beach's municipal pier. The pier was again damaged in 1988 due to a severe storm event, and has since been replaced with a longer, higher design.

In January 1988, a significant storm event attacked the coast with high waves and winds. As referenced in Chapter 3 of the Main Report, a 2.3 meter (7.5 feet) high tide plus 97 kilometers per hour (60 miles per hour) winds generated waves as high as 6.1 meters (20 feet) against the shore, hurling water, sand, and seaweed between and through oceanfront homes. The event flooded streets, cars and low-lying structures behind the beach for up to three blocks from the ocean. Clean-up costs, as estimated by the Imperial Beach Times (February, 1988), were $100,000; damages to buildings were estimated to be $165,000.

The sediment budget indicates that approximately 76,000 cm (100,000 cy) per year is expected to erode from Imperial Beach. An estimated 15,200 cm (20,000 cy) per year is expected to erode from Silver Strand State Beach, while Coronado Beach is expected to accrete 38,000 cm (50,000 cy) per year. In essence, Imperial Beach is highly erosive, Silver Strand Beach is negligibly erosive, and Coronado Beach is accretional. The shoreline of the City of Imperial Beach is severely impacted by this erosion. Several private property owners have constructed stone revetments or vertical seawalls to protect their property, but these non-continuous protection structures do not solve all of the area's erosion issues, and may fail if the beach recedes. Interim measures to reduce beach nourishment have included intermittent beach fills.

The most critical area of the Silver Strand Shoreline in terms of present-day erosion is the six-kilometer (four mile) stretch of beach from the Tijuana River north to the northern boundary of the City of Imperial Beach. As detailed in Chapter 3 of the Main Report, along the project area's southern reach, it is assumed that the existing shoreline will erode to the rubble-mound revetment by 2007 without implementation of the Proposed Action. After this, it is anticipated that the revetment will stabilize and fix the position of the shoreline. As a consequence, structural damages due to the direct loss of

undermining are not anticipated. Nuisance flooding along Seacoast Drive, located immediately adjacent to this stretch of beach, during high tides will become more frequent and structures behind the revetment will be at a much greater risk of damages from overtopping waves and inundation.

Along the project's northern reach, without implementation of the Proposed Action the shoreline is expected to erode at a rate of 2 meters (6.6 feet) per year until 2007. At that point, it is estimated that the shoreline will be positioned at the boundary representing the first row of coastal development. These structures will be at a great risk of wave impact and inundation damages during strong coastal storm events. As the shoreline continues to erode at a predicted rate of 1 meter (3.3 feet) per year from 2007 forward, some structures fronting the shoreline are anticipated to be undermined, condemned, or destroyed. Chapter 3 of the Main Report provides additional detail regarding anticipated conditions of the project area without implementation of the Proposed Action.

In addition to the above, the loss of sand at the beach would have a negative impact on beach recreation that supports the local economy, and reduce environmental functions of the sand beach/littoral zone ecology. Recreational damages within the study area are directly related to the loss of beach width over time without implementation of the Proposed Action. As described in Chapter 3 of the Main Report, without the Proposed Action the recreational capacity of the project area is anticipated to decline from 10,900 users (assuming 9.3 meters [100 square feet] per person and no turnover) in 1997 to 1,622 users in 2020, and no users in 2030.

2.3 PROJECT OBJECTIVE

As reviewed in Chapter 4 of the Main Report, the primary objective of the Imperial Beach Shore Protection Project is to protect beachfront and adjacent properties from storm damage resulting from beach erosion. Reducing the potential for damages to residential commercial and public facilities resulting from storm events and tidal waves is a major objective of any hurricane and storm damage reduction plan. The parameters used to measure the contribution of each alternative to this objective were reduction of erosion, wave force, and inundation damages.

This action will also allow development and maintenance of a sandy beach for recreational use, as well as the preservation or improvement of environmental resources, along the length of City of Imperial Beach's beachfront for about 2,164 m (7,100 ft) from Carnation Avenue at the northern city limit to the last city residence at the southern end of Seacoast Drive. Another key objective of the Imperial Beach Shore Protection Project is to minimize impacts to environmental resources through implementation of a non-structural alternative. Structural alternatives such as breakwaters, groins and seawalls that were eliminated from further study are summarized in Section 3.1.

2.4 STUDY AUTHORITY

In March 1997, the Committee of Energy and Water Development of the House of Representatives authorized a study to re-evaluate the Federal interest in solutions to problems associated with the shoreline erosion and storm damage along the City of Imperial Beach shoreline (USACE, 1997c). That

authorization resulted in the development of the final array of alternatives that are evaluated in this environmental review document and its associated feasibility study analysis.

For a detailed discussion of planning objectives for developing alternatives, see Chapter 4 of the Main Report.

3.1 ALTERNATIVES ELIMINATED FROM FURTHER STUDY

Numerous alternatives to nourish the beach or protect it from future erosion and storm damage have been evaluated since Federal funding for this project began in 1958. These alternatives have included both structural and non-structural (i.e., beach nourishment) proposals. Other measures such as artificial reef and kelp bed enhancement were not evaluated due to a lack of available detailed design or performance information.

In developing alternatives that meet the project's objectives, five basic planning criteria had to be met, including:

- Engineering: The alternatives developed should be complete and sound, and in sufficient detail such that environmental and economic investigation could be completed.
- Economics: Any alternative that is in the Federal interest must display feasibility by satisfying established benefit-cost ratio. In general, this ratio must be greater than one to allow Federal participation in continued studies or any proposed project.
- Financial: The Local Sponsor, in this case the City of Imperial Beach, must show the ability and willingness to fund its share of any recommended project as required by the USACE's Principals and Guidelines.
- Environmental: Applicable environmental requirements and acceptability must be ascertained. Additionally, adverse impacts should be avoided if possible and minimized to the maximum extent feasible if avoidance is not possible.
- Public Input: Alternatives should be acceptable to local residents, organizations, the Local Sponsor, and interested State and Federal regulatory agencies.

Based upon not meeting these criteria, as well as the public's strong objection to structural alternatives, the following alternatives were not carried forward for in-depth environmental review.

3.1.1 Breakwaters with Beach Nourishment

Under this alternative a series of five offshore detached breakwaters would be constructed. The breakwaters would each be 336 m (1,100 ft) long, with a crest height of +1.5 m (5 ft) mean lower low water (MLLW), side slopes of 2:1, and the base at -4.6 m (-15 ft) MLLW. Using the guidance of the Shore Protection Manual (SPM), a 16 ton armor stone would be used. A 2 ton underlayer stone and a bedding layer of quarry run would additionally be used.

The 925,000 cm (1,239,000 cy) of beach fill would be 2,165 m (7,100 ft) long extending from the north groin to the southern limit of development. The beach fill would extend along the beach approximately 25 m (82 ft) seaward at a berm elevation of +4.0 m (+13 ft) MLLW. The offshore breakwaters would retain the wider beach throughout the project life.

This alternative would provide storm protection by significantly reducing the wave energy that is transmitted to the shoreline, as well as a protective buffer of sand between the storm waves and upland development. Erosion would be reduced in the project area behind the structures. Any environmental benefits provided by the existing beach could be enhanced with this alternative. This alternative would also provide additional recreation benefits, although these benefits are considered incidental to the overall project purpose of storm damage protection. This alternative would provide no greater storm damage protection than afforded by the proposed beach nourishment alternatives. However, the cost of this alternative is significantly higher. In addition, offshore breakwaters proposed in the past at Imperial Beach have been met with significant public opposition. The area is a popular surfing area and reducing the wave energy with a breakwater could significantly impact the surfing conditions. This alternative meets the planning objectives but does not meet the planning criteria of efficiency and public acceptability. For these reasons, this alternative was not considered for further analysis.

3.1.2 Groins with Beach Nourishment

This alternative would consist of construction of seven new groins and extension of the two existing groins. The full length of the groins would be approximately 244 m (800 ft), at a crest elevation of +5.5 m (+18 ft) MLLW, side slopes of 2:1, extending to approximately the -3.7 m (-12 ft) MLLW contour. A 12 ton armor stone and a 2 ton underlayer stone and a bedding layer of quarry run would be used.

The 925,000 cm (1,239,000 cy) of beach fill would be 2,165 m (7,100 ft) long extending from the north groin to the southern limit of development. The beach fill would extend along the beach approximately 25 m (80 ft) seaward at a berm elevation of +4.0 m (+13 ft) MLLW.

This alternative provides similar storm protection to the proposed nourishment alternatives by providing a protective buffer beach between the storm waves and the upland development. The placement of groins would likely reduce the rate of erosion in the project area. Any environmental benefits provided by the existing beach could be enhanced with this alternative. This alternative would also provide additional recreation benefits, although these benefits are considered incidental to the overall project purpose of storm damage protection. However, this alternative may cause increased erosion downdrift in the project area. In addition, this alternative is significantly more costly than the beach nourishment alternative. This alternative meets the planning objectives but does not meet the planning criteria of efficiency and public acceptability. For these reasons, this alternative was not considered for further analysis.

3.1.3 New Revetment

This alternative consists of a 945 m (3,100 ft) revetment that would extend from the northern groin at Palm Avenue to the existing revetment near Imperial Beach Blvd. The revetment crest would be at +6.1 m (+20 ft) MLLW, and the toe would be at -0.6 m (-2 ft) MLLW, which would match the existing revetment located near Imperial Beach Blvd. Common construction practice would dictate the use of graded armor

stone and filter fabric. In order to replicate the existing revetment south of Imperial Beach Boulevard, two layers of 5 ton stone would be used at a 1.5H:1V slope.

This alternative would provide storm protection to the north reach of the project area by providing a protective armor layer between the storm waves and upland development. The new revetment would be tied into the south reach revetment to provide a continuous protective structure. However, the City of Imperial Beach's General Plan prohibits the construction of any new revetment north of Imperial Beach Boulevard in favor of vertical seawalls. In addition, the California Coastal Commission would likely strongly recommend the incorporation of beach nourishment seaward of the structure to protect against encroachment seaward of the mean high tide line prior to their approval of any revetment alternative. The cost of this alternative, with the additional cost of beach nourishment, would exceed the cost of beach nourishment alone. This alternative would provide less storm protection benefits than the proposed beach nourishment alternatives because it would only provide additional protection to the northern reach of the study area. Environmental resources would not be preserved nor improved by this alternative. This alternative would neither sufficiently fulfill planning objectives nor meet the criteria of efficiency and public acceptability. For these reasons, this alternative was not considered for further analysis.

3.1.4 New and Raised Revetment

This alternative would involve 945 m (3,100 ft) of new revetment extending from the northern groin located at Palm Avenue to the existing revetment near Imperial Beach Boulevard. The revetment crest would be at +7.3 m (+24 ft) MLLW. In addition 1,220 m (4,000 ft) of existing revetment would have its crest raised from +6.1 m (+20 ft) MLLW to +7.3 m (+24 ft) MLLW.

This alternative would provide similar protection to the proposed beach nourishment alternatives. However, the same policy issues would apply to this alternative as to the New Sewall Alternative, as discussed below (Section 3.1.5). Furthermore, the cost to construct the revetment by itself (not including the added cost of beach nourishment) is significantly greater than the beach nourishment alternative. This alternative would not fulfill the planning objective of preserving or improving the environmental resources, nor does it meet the criteria of efficiency and public acceptability. For these reasons, this alternative was not considered for further analysis.

3.1.5 New Seawall

Under this alternative a 945 m (3,100 ft) steel/concrete seawall would extend from the northern groin at Palm Avenue to the existing revetment near Imperial Beach Boulevard. The seawall would consist of steel sheet pile and a concrete cap. The seawall crest elevation would be at +6.1 m (+20 ft) MLLW. Common construction practice would dictate the use of filter fabric on the landward side and armor stone to protect the toe from scour.

This alternative would provide storm protection to the north reach of the study area by providing a protective armor wall barrier between the storm waves and upland development. The seawall would extend to the northern limit of the south reach revetment to provide a continuous protective structure at +6.1 m (+20 ft) MLLW over the full length of the project area. Under this alternative, it is presumed that the shoreline would continue to erode to the vertical seawall, after which no further shoreline translation would occur. The seawall would stabilize and fix the shoreline. This alternative would comply with the City of Imperial Beach's General Plan. However, due in part to the geotechnical conditions of the area, the cost to construct a vertical seawall is much greater than the revetment alternatives described above (Sections 3.1.3 and 3.1.4). In addition, similar to the two revetment alternatives, the California Coastal Commission would likely strongly recommend the incorporation of beach nourishment seaward of the structure to protect against encroachment seaward of the mean high tide line. The cost of this alternative would exceed the cost of the proposed beach nourishment alternatives. This alternative would provide less storm protection benefits as afforded by the beach nourishment alternatives because it would only provide protection to the northern reach of the study area. This alternative neither sufficiently fulfills the planning objectives nor meets the criteria of efficiency and public acceptability. For these reasons, this alternative was not considered for further analysis.

3.2 THE NO ACTION (FUTURE WITHOUT PROJECT) ALTERNATIVE

Under the No Action Alternative the properties and structures along the beachfront would be susceptible to continued damages caused by inundation, wave attack, and erosion. In addition, the recreational value of the beach would diminish over time as beach erosion continues.

Structural damage associated with the No Action Alternative is detailed in the project's General Reevaluation Report (GRR) (USACE, 2000). Structures along the project's northern reach would be susceptible to inundation and wave attack; additionally, long-term erosion would eventually cause structures to be condemned, undermined, or completely destroyed. Structures along the southern reach would be susceptible to inundation and wave attack.

Based upon the analysis provided in the project's GRR (USACE, 2000), under the No Action Alternative it is estimated that average annual storm-related structural damage in the study area would be $931,000. Average annual losses in recreational use due to beach depletion would be approximately $2,065,000. Landscaping and storm clean-up costs would be approximately $12,000 per year. Total annual damages would be approximately $2,996,600.

In addition to the fiscal impacts associated with the No Action Alternative, continued storm damage and beach erosion would progressively damage the study area's existing environmental and habitat quality.

3.3 ALTERNATIVES CONSIDERED FOR IN-DEPTH EVALUATION

In evaluating alternatives that meet the need and objectives of the project, an array of 20 possible alternatives (Alternatives 1A through 4E) was initially developed. These alternatives identified various

beach widths and timing elements for nourishment. They included maintaining beach widths of 12 m (39 ft), 25 m (82 ft), 34 m (115 ft), and 54 m (177 ft) with beach replenishment cycles of 5, 10, 15, 22 and 50 years for various initial beach fill and replenishment (fill) volumes. Table 3.3-1 summarizes the preliminary array of 20 alternatives.

As reviewed in the project's Feasibility Study Report, a number of these alternatives are not considered viable due to practicability, economics, and the relative degree of shore protection achieved. These non-viable alternatives include Alternatives 1A through 4A, 1C through 4C, 1D through 4D, and 1E through 4E. Alternatives 1B through 4B are considered to most fully meet the intent of the project. Consequently, these are the alternatives that have been carried forward for detailed environmental review.

3.3.1 Alternative 1B (The NED Plan and Recommended Plan)

Alternative 1B is comprised of beach nourishment along a 2,164 m (7,100 ft) stretch of shoreline as shown in Figure 2.1-3. The initial base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in minimum beach width of 12 m (39 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12 m (39 ft). Following initial construction, this alternative would have four replenishment cycles (years 11, 21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach of the project's lifetime. The Draft EIS/EIR identified Alternative 2B as the NED Alternative, Recommended Plan Alternative, Environmentally Superior Alternative and Environmentally Least Damaging Alternative. However, subsequent to release of the Draft EIS/EIR, the USACE reverified the economic analysis for the projects viable alternatives. It has been determined that Alternative 2B does not meet the cost benefit ratio required for Federal government interest for project construction. Per the projects revised calculations, Alternative 1B is the National Economic Development (NED) Plan and Recommended Plan. Please refer to Section 5 of the main report for details on the NED and Recommended Plan. Alternative 1B does not have any environmental impacts that are substantially different from Alternative 2B, and does not require any additional mitigation.

Borrow Sites

Two offshore borrow sites have been identified for fill material, referenced as "Area A" and "Area B" on Figure 2.1-3. Area A is located approximately 2 kilometers (1.2 miles) north of the Imperial Beach pier; Area B is located approximately 4.5 kilometers (2.8 miles) south of the pier. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem.

Fill from the two offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a hopper dredge. The stationary pipeline dredge would be located on a barge type floating apparatus that would be located directly over the borrow site locations. The

Table 3.3-1 Preliminary Alternatives Evaluated

Replenishment Cycles	Beach Widths			
	Alternative 1 12m (39ft) Width	Alternative 2 25m (82ft) Width	Alternative 3 34m (115ft) Width	Alternative 4 54m (177ft) Width
Alternative A 5 Years	*Alternative 1A* 450,000cm (588,600cy) initial base beach fill plus 382,000cm (499,656cy) fill, followed by 382,000cm (499,656cy) replenishment (fill) every 5 years.	*Alternative 2A* 925,000cm (1,209,900cy) initial base beach fill plus 382,000cm (499,656cy) fill, followed by 382,000cm (499,656cy) replenishment every 5 years.	*Alternative 3A* 1,250,000cm (1,635,000cy) initial base beach fill plus 382,000cm (499,656cy) fill, followed by 382,000cm (499,656cy) replenishment every 5 years.	*Alternative 4A* 2,000,000cm (2,616,000cy) initial base beach fill plus 382,000cm (499,656cy) fill, followed by 382,000cm (499,656cy) replenishment every 5 years.
Alternative B* 10 Years	***Alternative 1B*** 450,000cm (588,600cy) initial base beach fill plus 764,000cm (999,312cy) fill, followed by 764,000cm (999,312cy) replenishment every 10 years.	***Alternative 2B*** 925,000cm (1,209,900cy) initial base beach fill plus 764,000cm (999,312cy) fill, followed by 764,000cm (999,312cy) replenishment every 10 years.	***Alternative 3B*** 1,250,000cm (1,635,000cy) initial base beach fill plus 764,000cm (999,312cy) fill, followed by 764,000cm (999,312cy) replenishment every 10 years.	***Alternative 4B*** 2,000,000cm (2,616,000cy) initial base beach fill plus 764,000cm (999,312cy) fill, followed by 764,000cm (999,312cy) replenishment every 10 years.
Alternative C 15 Years	*Alternative 1C* 450,000cm (588,600cy) initial base beach fill plus 1,146,000cm (1,498,968cy) fill, followed by 1,146,000cm (1,498,968cy) replenishment every 15 years.	*Alternative 2C* 925,000cm (1,209,900cy) initial base beach fill plus 1,146,000cm (1,498,968cy) fill, followed by 1,146,000cm (1,498,968cy)) replenishment every 15 years.	*Alternative 3C* 1,250,000cm (1,635,000cy) initial base beach fill plus 1,146,000cm (1,498,968cy) fill, followed by 1,146,000cm (1,498,968cy) replenishment every 15 years.	*Alternative 4C* 2,000,000cm (2,616,000cy) initial base beach fill plus 1,146,000cm (1,498,968cy) fill, followed by 1,146,000cm (1,498,968cy) replenishment every 15 years.
Alternative D 22 Years	*Alternative 1D* 450,000cm (588,600cy) initial base beach fill plus 1,681,000cm (2,198,748cy) fill, followed by 1,681,000cm (2,198,748cy) replenishment every 22 years.	*Alternative 2D* 925,000cm (1,209,900cy) initial base beach fill plus 1,681,000cm (2,198,748cy) fill, followed by 1,681,000cm (2,198,748cy) replenishment every 22 years.	*Alternative 3D* 1,250,000cm (1,635,000cy) initial base beach fill plus 1,681,000cm (2,198,748cy) fill, followed by 1,681,000cm (2,198,748cy) replenishment every 22 years.	*Alternative 4D* 2,000,000cm (2,616,000cy) initial base beach fill plus 1,681,000cm (2,198,748cy) fill, followed by 1,681,000cm (2,198,748cy) replenishment every 22 years.
Alternative E 50 Years	*Alternative 1E* 450,000cm (588,600cy) initial base beach fill plus 3,820,000cm (4,996,560cy) fill.	*Alternative 2E* 925,000 cm (1,209,900 cy) initial base beach fill plus 3,820,000cm (4,996,560cy) fill.	*Alternative 3E* 1,250,000 cm (1,635,000 cy) initial base beach fill plus 3,820,000cm (4,996,560cy) fill.	*Alternative 4E* 2,000,000 cm (2,616,000 cy) initial base beach fill plus 3,820,000cm (4,996,560cy) fill.

* Alternatives 1B through 4B, which include four different beach widths with 10 year replenishment cycles, are the alternatives that have been carried forward for environmental review in this EIS/EIR.

pipeline would discharge directly onshore. Two tugboats would accompany the dredge to move it to different locations on the borrow sites, and bring the dredge into the harbor if the threat of bad weather or high seas exist.

The hopper dredge is a boat that has dragarms and dragheads that extend from each side of the ship's hull. The dragheads would be lowered to the ocean bottom and would slowly be pulled over the area. Pumps would create suction in the dragarm and the sand would be drawn up through the arms and deposited in the hopper bins in the vessel's midsection. When the bins are full, the dredge would move to the designated disposal area and empty the dredged material through large hopper doors in the bottom of the hull for offshore deposition. To deposit the material on the beach, the boat would go as close as possible to the shore, and a pipeline would be connected to the hopper bins and extended to the onshore replenishment site.

Construction

Since the borrow sites are located offshore, there would be essentially no haul truck trips associated with the project. Onshore, approximately four bulldozers would operate on the beach to manipulate the fill material received from offshore. The only onshore truck trips would result from the delivery and pick-up of bulldozers, and the daily commutes of construction crews. Operations on the beach would likely be limited to the hours of 7 a.m. to 7 p.m., six days per week, for an estimated period of four to six months, including site mobilization and demobilization. Subsequent onshore renourishments are anticipated to require the same length of time, and operational (workers and equipment) parameters.

For initial construction, Alternative 1B would require the hopper dredge to operate continuously for an estimated period of four to six months. An estimated 29 workers would typically operate 24 hours per day, seven days per week. Subsequent renourishments would require the hopper dredge to operate under the same scenario.

3.3.2 Alternative 2B

Alternative 2B is comprised of beach nourishment along the same 2,164 m (7,100 ft) stretch of shoreline as described for Alternative 1B. The base beach fill would consist of 925,000 cm (1,209,000 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 25 m (82 ft) from the backshore limit to the foreshore berm. Alternative 2B would have a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of renourishment would then be placed on the beach every ten years over the project's lifetime, as described for Alternative 1B. In total, 4,745,000 cm (6,206,460 cy) of fill would be placed on the beach over the 50-year evaluation period.

On- and offshore construction/operations for Alternative 2B would be the same as for Alternative 1B, as described above.

Additional discussion regarding Alternative 2B is provided in Section 3.5.

3.3.3 Alternative 3B

Alternative 3B is comprised of an initial base beach fill of 1,250,000 cm (1,635,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline. This alternative would result in a minimum beach width of 34 m (115.52 ft) from the backshore limit to the foreshore berm. This alternative would have a crest elevation of +4 m (+13 ft). Under this scenario, the shoreline would then be renourished with an additional 764,000 cm (999,312 cy) every ten years to maintain the minimum beach width of 34 m (115 ft). The total volume of nourishment/renourishment for this alternative over the 50-year project lifetime would be 5,070,000 cm (6,631,560 cy).

On- and offshore construction/operations for Alternative 3B would be the same as for Alternative 1B, as described above.

3.3.4 Alternative 4B

Alternative 4B is comprised of an initial base beach replenishment fill of 2,000,000 cm (2,616,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline, thereby resulting in a minimum beach width of 54 m (177 ft) from the backshore limit to the foreshore berm. Alternative 4B would have a crest elevation of +4 m (+13 ft). The beach would then be renourished with 764,000 cm (999,312 cy) every ten years. The total volume of nourishment/renourishment for Alternative 4B would be 5,820,000 cm (6,906240 cy).

On- and offshore construction/operations for Alternative 4B would be the same as for Alternative 1B, as described above.

3.4 COMPARATIVE IMPACTS OF ALTERNATIVES

Table 3.4-1 presents a comparison of the environmental impacts associated with each of the project's alternatives. In essence, Alternatives 1B through 4B propose progressively larger quantities (volumes) of fill/replenishment, thereby creating progressively wider beaches. The impacts associated with these alternatives are very similar, and, in general, only shift slightly in magnitude in response to changes in the initial fill/replenishment volumes. Alternative 3B and 4B do not meet the cost benefit ratio required for Federal government interest for project construction.

The No Action Alternative is the only alternative that would create Class I impacts (significant impacts that cannot be mitigated to a level of less than significant). These impacts relate to resources associated with topography/geography, land use, and recreation and are primarily focused on the continued loss and damage of the beach and adjacent beach properties due to continued erosion. The No Action Alternative would not provide for any Class IV (beneficial) impacts.

Table 3.4-1 Comparison of Environmental Impacts among Alternatives

Environmental Issue Area	No Action Alternative					Alternative 1B					Alternative 2B					Alternative 3B					Alternative 4B				
Significance Category[1]	I	II	III	IV	NI	I	II	III	IV	NI	I	II	III	IV	NI	I	II	III	IV	NI	I	II	III	IV	NI
Topography/Geology	U						U					U					U					U			
Coastal Processes					U			U	U				U	U				U	U				U	U	
Water Resources					U			U					U					U					U		
Essential Fish Habitat					U					U					U					U					U
Biological Resources					U			U	U				U	U				U	U				U	U	
Cultural Resources					U		U					U					U					U			
Aesthetics			U					U	U				U	U				U	U				U	U	
Air Quality			U					U					U					U				U	U		
Noise		U					U					U					U					U			
Socioeconomics			U				U		U			U		U			U		U			U		U	
Transportation			U				U	U				U	U				U	U				U	U		
Land Use	U							U	U				U	U				U	U				U	U	
Recreation	U						U					U					U					U			

1. The significance categories are defined as follows:
   - Class I: Significant impact that cannot be mitigated to a level that is not significant
   - Class II: Significant impact that can be mitigated to a level that is not significant
   - Class III: Potential impact but not significant
   - Class IV: Beneficial impact
   - NI = No Impact.

Alternatives 1B through 4B would all create Class II through Class IV impacts; none of them would create Class I impacts. Out of these alternatives, only Alternative 4B creates an additional Class II impact (an impact that can be mitigated to a level of less than significant). This impact is related to air quality and is associated with construction-related nitrogen oxide (NOx) emissions generated by placing 2,764,000 cm (3,615,312 cy) of fill on the beach during the initial construction period.

From the perspective of air quality and noise, Alternative 1B is the preferred alternative, followed by Alternative 2B. This preference is a function of the shorter construction time needed for smaller initial fill volumes. From an air quality and noise perspective, Alternative 3B would be preferred over Alternative 4B for the same reason (the larger the initial fill volume, the longer the impacts associated with the initial construction period will continue).

From the perspective of biological resources, land use, and recreation, Alternative 4B would create the largest (widest) beachfront and thus would provide for greater recreation, and coastal use opportunities. For certain aspects of these resources, the wider the beach is made, the greater the benefits. Consequently, the sequence of preference for land use and recreation would be: 4B, 3B, 2B, 1B. However, the USFWS indicates that although a wider beach increases suitable nesting habitat for the California least tern and western snowy plover the proposed project area is a heavily used recreational beach. It is unlikely that any wildlife benefits would result from the new beach fill and wider beach width. Therefore, benefits to the California least tern, western snowy plover, and California grunion are not expected (see appendix D, USFWS Final Coordination Act Report). The change in magnitude between the impacts associated with Alternatives 1B through 4B is generally considered negligible, and no other resource/issue-specific alternative project preferences have been identified.

3.5 THE ENVIRONMENTALLY SUPERIOR ALTERNATIVE, THE NED PLAN, RECOMMENDED PLAN ALTERNATIVE, LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE, AND ECONOMICALLY FEASIBLE ALTERNATIVE

As summarized in Section 3.4, the resource/issue-specific impacts associated with Alternatives 1B through 4B are not substantially different from each other. For each of the alternatives, the overall nature of the resource/issue-specific impacts are the same. The key difference between the alternatives is a change in the magnitude (or duration) of the impacts due to changes in beach width. For the majority of these impacts, the change in magnitude is considered negligible, and no clearly superior alternative can be identified.

From an air quality and noise perspective Alternative 1B is the environmentally preferred alternative, followed by Alternative 2B. This preference is triggered by the fact that the narrower beach widths associated with Alternatives 1B and 2B require less initial beach fill, and therefore shorter construction periods. Noise and air emissions impacts due to construction-related activity are thus minimized. As discussed earlier, there would be no additional benefit to biological resources for any of the alternatives since increased beach area would result in heavier recreational use in the area.

From the perspective of coastal process, water resources, and biological resources, the wider beach width alternatives would temporarily disturb on- and offshore resources for greater periods of time than the narrower beach widths. Again, this is due to the longer initial construction periods needed for the wider beach widths. However, due to their temporary nature, none of the resource/issue-specific impacts are considered significant or require mitigation.

From the perspective of land use, recreation, and terrestrial biological resources, the incrementally wider beach alternatives provide some incrementally greater beneficial impacts. As the beachfront area increases, so do opportunities for shorebird resting areas and foraging habitat, recreation, coastal use and access and erosion (property) damage protection. However, as stated earlier, the USFWS does not see any increased benefit for biological resources due to the wider beaches. Therefore the potential benefit would apply only to recreation and land use and would have no beneficial impact on biological resources.

The No Action Alternative would create Class I impacts (impacts that cannot be mitigated to a level of less than significant) in the resource areas of topography/geography, land use, and recreation. This alternative additionally does not create any beneficial impacts (Class IV). Consequently, the No Action Alternative is not considered to be the environmentally superior alternative.

Alternative 4B creates one additional Class II air quality impact associated with construction-related NOx emissions. Because this alternative does not reduce potential impacts associated with the project, it is not considered to be the environmentally superior alternative.

Alternatives 1B and 2B have the shortest initial construction periods, whereas, between the three remaining candidate alternatives, Alternative 4B provides for the greatest beach width. Alternative 1B would reduce construction-related impacts associated with air quality, noise, and temporary on- and offshore disturbances to the greatest degree, but would also minimize the land use and recreational benefits of the project. Alternative 4B would maximize the benefits of a wider beach, but would additionally maximize air quality and noise impacts. Alternative 2B would: (1) reduce air quality and noise impacts in comparison to Alternatives 3B and 4B; but, would increase air quality and noise impacts in comparison to 1B, (2) provide for an increase in the public benefits, in terms of land use and recreation, of a wider beach in comparison to Alternative 1B. None of the alternatives provide a benefit to biological resources. Therefore, Alternative 1B is considered to be the environmentally superior alternative.

The NED Plan Alternative is the same as Alternative 1B, as described in Section 3.3.2. Table 3.5-1 presents a summary of the project costs for the NED Alternative.

The benefits of the NED Alternative include structural, recreational, and environmental benefits. Along the southern reach of the study area, the NED Alternative would provide a sandy beach fronting the revetment and would minimize any flooding to the southernmost end of Seacoast Drive. Along the northern reach of the study area, the project would provide protection for the existing coastal structures during coastal storms, thereby reducing the occurrence of properties being undermined, condemned, or destroyed.

Table 3.5-1 Project Costs of the NED Alternative

Year/Activity	Costs
Year 1	
Mobilization/Demobilization	$2,000,000
Dredging Costs	$5,717,940
Contingency 15%	$1,157,691
PED	$1,500,000
S&A	$864,289
Real Estate	$29,500
Interest During Construction	$84,054
Year 1 Total Costs	$11,353,474
Year 1 Net Present Value (NPV)	$11,353,474
Years 1 through 9	
Mobilization/Demobilization	$250,000
Total Monitoring Costs	$2,250,000
Project Monitoring NPV	$1,691,211
Years 11, 21, 31, 41	
Mobilization/Demobilization	$2,000,000
Construction Costs	$3,598,440
Contingency 15%	$839,766
PED	$832,000
S&A	$973,500
Total Costs	$8,243,706
Year 11 NPV	$4,549,309
Year 21 NPV	$2,510,547
Year 31 NPV	$1,385,452
Year 41 NPV	$764,565
Totals (rounded)	
Total NPV	$22,255,500
Annualized	$1,437,000

Recreational benefits arise from a wider beach. Under the No Action Alternative, significant transfer costs would be incurred as recreational users of the beach would be forced to travel to other beaches. The greater beach capacity would decrease these transfer costs.

Environmentally, the NED Alternative would provide adequate habitat for some marine species and birds, such as the grunion and least tern.

Table 3.5-2 presents the economic analysis for the NED Alternative based on a comparison of costs and benefits on an equivalent annual basis. The total annual cost of the project is $1,173,000, and the total annual benefits are $2,657,000. Therefore, the NED Alternative has a benefit-to-cost ratio of 2.26 to 1, with a total net benefit of $1,484,000.

Alternative 1B, as described in Section 3.3.2, is additionally considered the Recommended Plan Alternative, as detailed in the project's Feasibility Study Report.

Table 3.5-2 Economic Analysis of the NED Alternative (Total Annual Costs and Benefits)

Damages	No Action Alternative	NED Alternative
Erosion	$265,000	$0
Wave Attack	$476,000	$0
Inundation	$336,000	$12,000
Land Loss	$450,000	$0
Utility Relocation	$141,900	$0
Revetment O & M (South)	$90,000	$0
Revetment O&M (North)	$0	$70,000
Clean-up Costs	$34,000	$1,000
Total Storm Damages	**$1,792,900**	**$83,000**
Recreation	**$987,000**	**$40,000**
Total Damages	**$2,779,900**	**$123,000**
Total Annual Benefits		**$2,657,000**
Total Annual Cost		**$1,173,000**
Benefit-to-Cost Ratio		**2.26**
Net Benefit		**$1,484,000**

This section provides the physical, or baseline, environmental setting wherein the project would be located. The baseline used for the impact analysis (Section 5) reflects the actual conditions of the study area at the time of preparation of this EIS/EIR.

4.1 TOPOGRAPHY AND GEOGRAPHY

The City of Imperial Beach occupies 4.5 square miles, with a coastal setting and Mediterranean climate. It has more than 5,364 m (17,600 ft) of coastline, of which approximately 68 percent is publicly owned or has direct access. This includes 1,829 linear m (6,000 linear ft) of beach owned fee simple by the State of California within the Border Field State Park in the extreme southwest corner of the City.

Imperial Beach is located within the coastal plain geomorphic subprovince of the Peninsular Range province. It occupies a portion of the rectangular-shaped coastal plain, characterized by a series of wave-cut terraces that extend inland for approximately 16 kilometers (10 miles) (U.S. EPA, 1996). Like most of the South Bay area of the San Diego region, Imperial Beach is underlain by the San Diego Formation, a tertiary shallow water marine deposit of Pliocene Age. This formation consists of dense, easily pulverized, silty, very finely bedded sandstones (Imperial Beach, 1994). The more recent Quaternary deposits include three general types of material:

- Beach deposits, whose deposition is caused by ocean currents and wave action
- Recent marine mud of the Baypoint formation, underlying the urbanized area of the City
- Alluvial material of the Tijuana River Estuary, consisting of layers of sand and gravel.

Applicable Plans, Policies, and Regulations

Hazardous Waste Requirements. The Federal Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the U.S. Environmental Protection Agency (U.S. EPA) for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle to grave" system of regulating hazardous wastes (tracking hazardous waste from its generation to its disposal). The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA.

Individual states may implement hazardous waste programs under RCRA with U.S. EPA approval. California has not yet received this EPA approval; instead, the California Hazardous Waste Control Law (HWCL) is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes. While the HWCL is generally more stringent than RCRA, until the EPA approves the California program, both the State and Federal laws apply in California.

The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

Hazardous Material Worker Safety. The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than Federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warning.

4.2 COASTAL PROCESSES (OCEANOGRAPHY)

4.2.1 Silver Strand Littoral Cell

The study area is situated within the Silver Strand Littoral Cell (SSLC). A littoral cell is a coastal compartment that contains a complete cycle of littoral (beach) sedimentation including sources, transport pathways, and sediment sinks. The SSLC extends for approximately 31.5 kilometers (17 miles) from Point Loma to the U.S./Mexico boundary (see Figure 2.1-1), and continues south along the coast of Baja California Sur, Mexico to the southern end of Playas de Tijuana. A major shoreline feature within the littoral cell is the Tijuana River Delta. The sources of sand for the beaches within the littoral cell are the delta, erosion of the Playas de Tijuana sea cliffs, and beach nourishment projects. The sand moves along the shoreline predominantly to the north, with occasional reversals. The primary sink for beach sands is the shoal off the southern Zuniga Jetty at the entrance to San Diego Bay.

The SSLC and the study area have been the subject of many shoreline studies since the early 1960s. Many of the more recent reports were produced by the USACE as part of the "Coast of California Storm and Tidal Wave Study" (Inman et al., 1986; USACE, 1985, 1987, 1989). The studies reveal that the advance and retreat of the shoreline has varied greatly over the last several decades, primarily as a result of beach nourishment projects and erosion from waves. Erosion problems are most noticeable south of Coronado, at Imperial Beach and at Playas de Tijuana. Comparison of historical surveys and photographs reveal average annual erosion rates on the order of a meter per year.

4.2.2 Sea Level and Nearshore Waves

The level of the ocean (sea level) plays an important role in shoreline erosion. As the sea level rises, the shoreline moves further towards land; this enables waves to erode the shoreline. Sea level is primarily influenced by the tides (sun/moon gravitational effect). The tides along this section of coastline are semi-diurnal: two high tides and two low tides per day. The mean tide range is about 1.1 m (37 feet) with the lowest annual tide at about -0.6 m (-2 ft) MLLW, and the highest annual tide is

about 1.6 m (5.4 ft) MLLW (USACE, 1989). Table 4.2-1 shows the relationship of the tidal datums and the extreme observed water levels.

Table 4.2-1 Water Levels at Imperial Beach

Water Levels	DATUM MLLW (m)
Highest Observed Water Level (Jan 27, 1983)	2.54
Mean Higher High Water (MHHW)	1.64
Mean High Water (MHW)	1.41
Mean Sea Level (MSL)	0.84
National Geodetic Vertical Datum (NGVD)	0.78
Lowest Observed Water Level (Dec 11, 1933)	-0.79

Source: USACE, 1989

Sea level in the study area is also influenced by winds, waves, low pressure systems, and short and long-term climatic events. Strong winds and high waves can pile water up along the shoreline resulting in rises in sea level. Extreme low pressure systems such as hurricanes (chubascos) can also result in a rise in sea level. The combined effects of wind, waves, and low pressure can, in rare cases, raise sea level about 0.3 m (1 ft). However, this rise in sea level is over a relatively short period of time, such as a few hours. During short-term climatic events, such as the El Nino in 1982-83, sea level was about 0.22 m (0.75 ft) higher than normal for the duration of the event (USACE, 1989). Sea level is expected to rise as a result of long-term climate effects, such as global warming, about 0.06 m (0.2 ft) over the next 25 years (USACE, 1989).

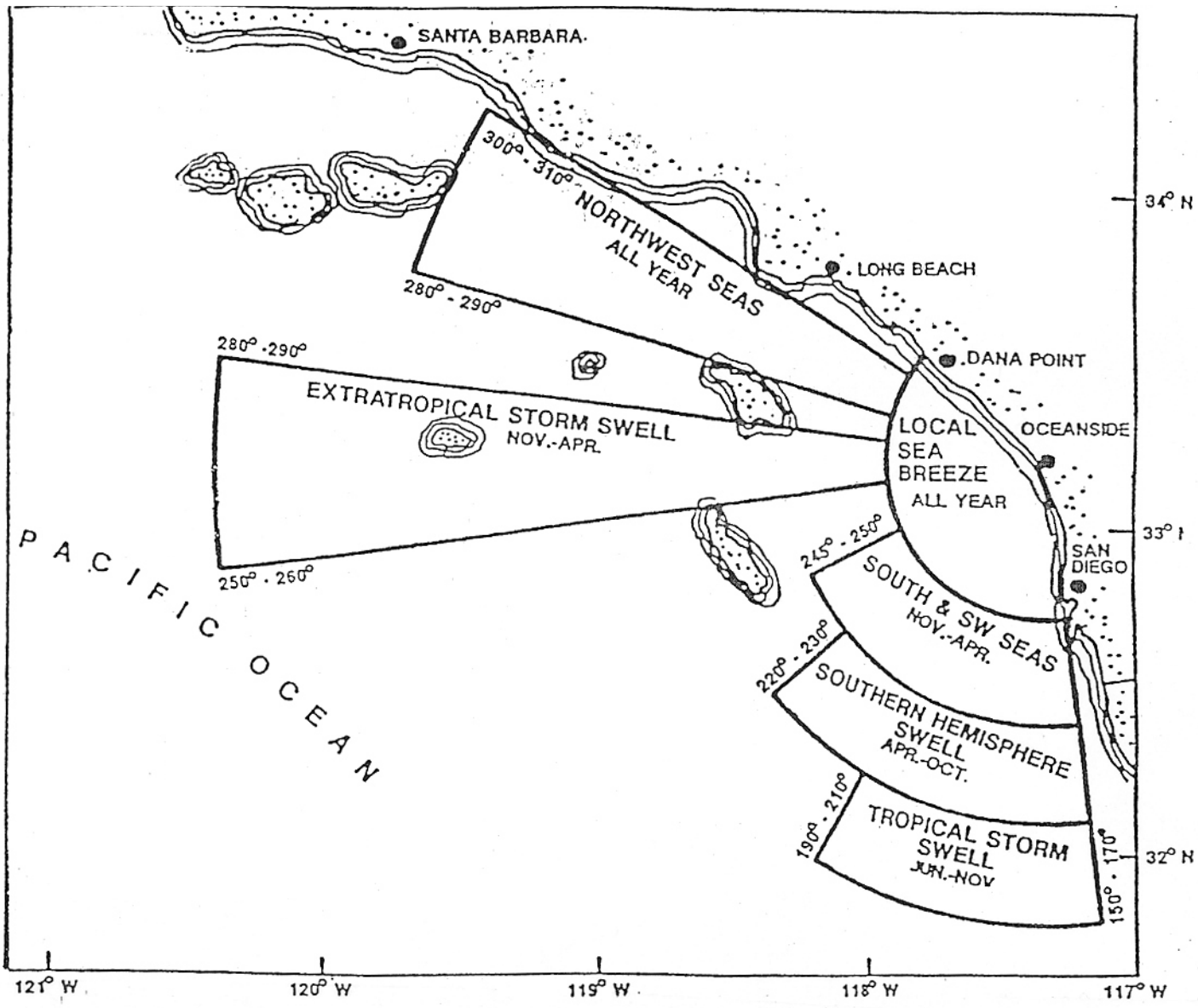
Waves provide the primary energy that is responsible for eroding the shoreline. There are two classifications of waves, “sea” and “swell,” that reach the study area. Sea waves are generated by local winds and have a short period (less than 7 seconds between successive waves) and a low height (usually less than 1 m). Swell waves are generated by distant storms and travel hundreds to thousands of kilometers before reaching the study area. The period of swell waves is longer (7 to 20 seconds) with swell wave heights ranging from 0.3 to 6 m (1 to 20 ft). Swell waves tend to have the greatest impact on the shoreline by providing the majority of the energy to move the beach sands.

Swell waves approach the study area from different directions and vary in size and period. Figure 4.2-1 shows the wave windows for the San Diego region. Northwesterly waves occur throughout the year but are largest during winter. Point Loma effectively blocks most of the northwesterly wave energy from reaching the study area. Waves from the southern hemisphere swell can occur from April through October. Tropical storm swells also approach the study area from the south from June through November. Waves from extra-tropical Pacific storms occur from November through April and approach the study area from the west. As waves approach the shoreline from any direction they are influenced by the nearshore bathymetry. Depending upon the contours of the nearshore sea floor, incoming wave energy is focused and de-focused along the shoreline by a process called wave refraction. The Tijuana River Delta is a major nearshore feature and plays a significant role in the distribution of wave energy in the study area. Wave energy tends to concentrate on the delta resulting in significantly higher waves at the delta than at the adjacent sections of shoreline.

SHORE PROTECTION EIS/EIR

Figure 4.2-1

Wave Windows for the San Diego Region



Source: USACE, 1995

Breaking waves in the study area normally range from 0.6 to 1.2 m (2 to 4 ft), although waves of 1.8 to 3 m (6 to 10 ft) are not uncommon. Wave heights exceed 1.5 m (5 ft) about 90 days a year (USACE, 1989). Large waves can impact the study area year round and usually last about three to four days. Extreme event waves, waves in excess of 4 m (13 ft) in height, during times of high sea level, are responsible for the majority of the shoreline erosion. Table 4.2-2 presents the significant wave height for extreme nearshore waves versus return period at Imperial Beach.

Table 4.2-2 Significant Wave Height Versus Return Period

Return Period (Years)	Significant Wave Height (m)
2	4.2
5	4.8
10	5.3
25	6.1
50	6.2
100	6.2

Source: USACE, 1989

4.2.3 Nearshore Currents

Nearshore currents move sand into and out of the study area. There are three primary sources for nearshore currents: (1) wave driven currents; (2) wind driven surface currents moving approximately in the direction of the wind; and, (3) tidal currents that trend parallel to shore and switch direction with the falling or rising tide.

Currents in the waters offshore of the surfzone are primarily tidal driven and weak (moving at a speed of a few centimeters per second) compared to typical surfzone currents. Typical wind driven surface currents are also small when compared to the wave driven currents. Waves are the primary source of energy to drive currents within the surf zone: the larger the waves, the stronger the currents. There are two types of surf zone currents: on-offshore currents and longshore currents. The first type moves sands in the on-offshore direction. The most familiar on-offshore current is a rip current. Rip currents commonly occur in the study area and under large wave conditions can travel in excess of 1 foot per second (ft/sec) (30 cm/sec) (Inman et al., 1986). The pier and two groin structures within the study area are preferential locations for the formation of rip currents. The pier pilings allow for a permanent rip current beneath the pier. The strength of the rip current varies with the incoming wave height.

Longshore currents move sands along the shoreline. Longshore currents in the study area generally move from south to north and occasionally from north to south (USACE, 1995b). The strength of the longshore current increases with wave height. Under large wave conditions, longshore currents can be up to 1.6 feet/sec (50 cm/sec) or greater (Inman et al., 1986).

4.2.4 Beach Sediment Sources

Beach sands in the study area are a product of the erosion of the land within the littoral cell. These sands are delivered to the shoreline both naturally, by the Tijuana River and by erosion of the coastal cliffs south of the U.S./Mexico boundary at Playas de Tijuana, and unnaturally, by means of beach nourishment (USACE, 1987). Dams and other flow obstructions on the Tijuana River have reduced the amount of sand reaching the beach. The reduction in the amount of sand reaching the Tijuana River Delta has resulted in the retreat of the shoreline within the study area.

Historically the primary source of sediment for the beaches within the SSLC was the Tijuana River. The Tijuana River has the largest drainage basin of any river in Southern California. Damming of the river has resulted in about a 70 percent reduction of the available beach sand supply. Current estimates of the river sediment load discharged to the coast vary from 13,000 cm (17,003 cy) to over 107,000 cm (139,950 cy) annually. The average annual sediment discharge to the Tijuana River Delta is about 54,000 cm (70,629 cy). However, due to the effects of the delta bathymetry on waves this material often moves to the south and not north into the study area (USACE, 1995b).

Beach nourishment has been the main source of beach sands for the SSLC for the last several decades. The beach building projects have shaped most of the shoreline within the SSLC. Over 23 million cm of sand have been deposited on beaches within the SSLC since 1940. These sands came from dredging projects within San Diego Bay and were placed primarily along the Silver Strand and Coronado beaches. However, less than 10 percent of this sand was deposited directly on beaches in the study area (Shaw, 1980). Most of the sand deposited to the north traveled to the north and was of little benefit to the study area.

4.2.5 Shoreline Characteristics and Beach Sediment Transport

Waves and wave driven currents are responsible for eroding the shoreline in the study area. Sand transport within the SSLC, and the study area, is predominantly from the south to the north. Wave driven currents not only move sand up and down the coast but also on and offshore. Transport perpendicular to the shoreline is termed cross-shore transport. Cross-shore transport is responsible for the seasonal changes in the width of the beach. The beaches within the study area are characterized by a relatively flat back shore, steeper beach face, and a gentle offshore slope. Most of the back shore region is stabilized by quarry stone revetments (rip rap) or other shore protection structures. The other coastal structures in the study area are two rock groins and the Imperial Beach Municipal Pier, as shown in Figure 2.1-2. The bulge in the nearshore contours as a result of the Tijuana River Delta is also clearly shown in Figure 2.1-2.

The beach material in the study area consists of cobbles and medium to fine grain sands. The mean diameter of the cobbles is about five inches. During the summer months, the beach builds out and is composed primarily of sand. During the more energetic, high wave, winter months the beach erodes, exposing the cobbles. Cobble beaches tend to be much steeper in general than beaches composed entirely of sand. The cobble beaches are more prevalent in the southern portion of Seacoast Drive

within the study area. Beach sands are moved along the shore in the direction of the longshore current and are also moved offshore forming sand bars. The cobbles are moved by wave driven currents but at rates that are significantly less than the rate of movement of beach sands. After the high energy winter months, the beach sands that were in the offshore bars are transported under low wave energy back to the beach. The beach sand covers most of the exposed cobble until they are exposed during the next winter wave season.

Because of seasonal changes in wave direction, there are seasonal changes in longshore sediment transport rates and direction. The daily rate at which sand moves across the study area can range from small to over 2,600 cm (3,400 cy), either to the north or to the south (USACE, 1987). The annual sediment transport rate within the study area depends upon the wave climate, and is on the order of 76,000 cm (99,404 cy) to the north.

The cross-shore transport rates change seasonally due to the seasonal variation in wave energy reaching the shoreline. During winter months sand is transported offshore. This results in a narrow sand beach and sometimes a cobble beach within the study area. Large waves portions of the beach within the study area only exist at low tide. During summer months with smaller waves, the sand is transported on shore resulting in a wider beach. The depth of water at which the beach profile does not change is about 10 m below mean sea level (MSL).

Several USACE reports presented detailed analyses of the historical shoreline changes within the SSLC and study area (USACE, 1987, 1991, 1995). Winter erosion of the Imperial Beach shoreline is reported to be about 130 cm (170 cy) per meter of beach. Summer accretion is less than 130 cm (170 cy) per meter of beach. This inequality is verified by the net annual erosion of the shoreline. Currently, the section of shoreline from the Tijuana River delta to the north end of Imperial Beach is eroding at a rate of about 1.5 m (5 ft) per year. Based on the current erosion trend, within 25 years the beach will consist only of hard pan material and cobbles (USACE, 1995b).

4.2.6 Beach Sediment Sinks

Coastal structures within the SSLC and the study area help determine to some extent the configuration of the shoreline and beach profile. As the sand moves along the shoreline, it ultimately ends up at a location where it cannot return to the littoral cell. This location is called a sediment sink. In the SSLC, the primary sink is the Zuniga shoal located just south of the entrance to San Diego Bay. The shoal is formed by the south Zuniga Jetty, which blocks the northward transport of sand. The Coronado Submarine Canyon, located 22 kilometers (12 miles) offshore of the U.S./Mexico border, is too far offshore to be a sink for sands.

There are two groins in the northern section of the study area (shown on Figure 2.1-2). The function of a groin is to slow down the longshore current, thereby reducing the amount of sand transported away from the area. Groins can serve as a temporary sink since they cause sand deposition within the compartment between the groins. These two groins were completed in the early 1960s as part of a

proposed five groin project, but the project was halted after it was determined that the two groins were ineffective in retaining sand (USACE, 1995b).

4.2.7 Sediment Budget

Sediment budgets are used to quantify the combined influence of sediment sources, sediment transport, and sediment sinks that are likely to cause a change in shoreline position. Sediment budgets are also used to forecast net future changes in the shoreline. The USACE completed a detailed analysis of a sediment budget in 1987 as part of the "Coast of California Storm and Tidal Waves Study." They concluded that since the damming of the Tijuana River, less sand reaches the Imperial Beach area shoreline than is eroded from the shoreline by waves. The imbalance is presently about 15,000 cm (19,619 cy) per year and is likely to increase in the future.

4.3 WATER RESOURCES

4.3.1 Water Quality

The following sections describe the water quality characteristics of nearshore ocean waters within the project region defined in Figure 2.1-2.

4.3.1.1 *Nearshore Area*

Although no site-specific water quality data were collected, adequate information for characterizing general conditions within the nearshore portions of the study area is available from previous projects and from recent measurements within adjacent areas.

Temperature/Salinity

Temperature and salinity are important properties of seawater because they affect the layering and mixing of many water quality parameters, particularly in offshore areas.

Ocean water temperatures vary seasonally, with minimum temperatures of approximately 57°F (14°C) in winter and maximum temperatures of 71°F (22°C) in summer (USACE, 1978). Depth-related differences in water temperatures occur during summer, with surface water temperatures up to 50°F (10°C) warmer than those in deeper waters. A thermocline, or rapid change in temperature with depth, occurs within water depths of 10 to 20 m (30 to 65 ft) (Largier, 1995). The City of San Diego (1996) reported temperatures of 57 to 71°F (14 to 22°C) and 51 to 57°F (11 to 14°C) in surface and bottom waters, respectively, at the 30 m (100 ft) depth contour offshore from Imperial Beach during July 1995 through June 1996. Similar temperatures were observed during the summer of 1994 Southern California Bight Pilot Project (SCBPP; SCCWRP, 1999).

Salinity values for the nearshore waters are generally uniform, ranging from around 33 to 34 parts-per-thousand. Seasonal decreases in salinities within nearshore, surface waters adjacent to the mouth of the Tijuana River may occur following storm-related discharges of freshwater and/or intermittent historical discharges of sewage released into the river. Salinity values from 33.4 to 33.8 parts-per-thousand were

measured by the City of San Diego (1996) in offshore waters along the 30 m (100 ft) bottom contour, and similar values were obtained during the SCBPP at two sites along the 20 m (65 ft) bottom contour (SCCWRP, 1999).

Dissolved Oxygen

Dissolved oxygen represents the concentration of oxygen present in seawater. It is controlled by combined effects of oxygen production by attached and planktonic plants, biological respiration, gas exchange with the atmosphere, and oxidation of organic matter.

Concentrations of dissolved oxygen typically are within the range of 6.5 to 10 milligrams per liter (mg/L), but levels may drop below 5 mg/L at depths of 60 m (200 ft) (USACE, 1978, 1995a). Measurements conducted by the City of San Diego (1996) offshore from Imperial Beach showed decreasing concentrations with increasing water depth and distance from shore, and mean values were highest during the summer and early fall. At the 30 m (100-ft) depth contour, mean values in summer ranged from 7.7 mg/L in July to 8.9 mg/L in October (USIBWC, 1998). Dissolved oxygen values declined in winter and increased again in the spring, with the exception of a low value of 6.9 mg/L in April that coincided with an upwelling event. Concentrations measured at two sites along the 20 m (65 ft) bottom contour during the SCBPP ranged from 6.5 to 10.9 mg/L (SCCWRP, 1999).

Clarity/Turbidity

Water clarity is important to the transmittance of light, which is needed to support photosynthesis by attached and planktonic plants. Light transmittance is affected by the amount of particles, including biological (e.g., plankton) and non-biological (e.g., suspended sediments), and dissolved organic matter present in seawater. Water clarity in nearshore waters is affected by wave and current-induced resuspension of sediments and by stormwater runoff and river discharges following rainfall events, as well as the presence of planktonic algae (e.g., diatoms and dinoflagellates).

Sampling conducted by the City of San Diego (1996) indicated values for light transmittance from 75 to 87 percent, with some general reductions associated with storm activity, particularly in shallower, nearshore waters. As mentioned, turbidity levels in nearshore and surfzone waters are expected to be relatively higher than those in offshore waters due to the presence of greater amounts of suspended sediments. Light transmittance values measured during the SCBPP survey ranged from 59 to 84 percent at two sites along the 18 m (60 ft) bottom contour (SCCWRP, 1999).

Nutrients

Nutrients such as nitrates and phosphates are important for supporting the growth of attached and planktonic plants. Discharges from the Tijuana River and Estuary likely represent an important seasonal source of nutrients to nearshore waters within the study area. Upwelling events also contribute nutrients to surface waters. No nutrient data were collected during the City of San Diego baseline monitoring program for the International Wastewater Treatment Plant or during the SCBPP. Regardless, nutrient

concentrations in waters off Imperial Beach are expected to be similar to levels reported elsewhere in the Southern California Bight: nitrates at 5 to 200 nanomoles per liter; phosphates at 100 to 500 nanomoles per liter; and ammonium at 300 nanomoles per liter (Eganhouse and Venkatesan, 1993).

Chemical and Bacterial Contaminants

Bacterial and chemical contaminants are components of discharges from stormwater, wastewater and industrial treatment, and other point and non-point sources to the ocean, including rivers discharging to the ocean. These contaminants potentially have adverse impacts on water and sediment quality.

Historically, bacterial levels in nearshore surface waters of the study area have been affected by episodic discharges of domestic sewage carried by the Tijuana River and flowing north along the coast. In addition, bacterial levels within study site waters are affected during periods of strong northward currents by discharges to the ocean of untreated wastewater from the San Antonio de los Buenos wastewater treatment plant at Punta Bandera, located approximately 9 km (5.6 miles) south of the international border (USIBWC, 1998). These releases have resulted in beach closures for periods up to several days following reduction or elimination of these sources (USACE, 1995b). Diversions of flows from Mexico to the Tijuana River have reduced the frequency of these events, although facility problems resulting in discharges of untreated sewage to the river still occur occasionally. Recent monitoring results show that the San Antonio de los Buenos discharge site affects bacterial densities off Mexican waters and just north of the international border within nearshore waters of the study site (USIBWC, 1998).

The City of San Diego conducted shoreline and offshore monitoring for total coliforms during July 1995 through June 1996. Mean annual coliform concentrations at shoreline stations between the U.S./Mexico border and Coronado ranged from 20 to 791 colony forming units (CFU) per 100 milliliters. The magnitude of coliform concentrations generally decreased in a south to north direction, and exhibited appreciable increases in response to rainfall events. For comparison, the mean annual coliform density near San Antonio de los Buenos was 2,513 CFU per 100 milliliters between July 1995 and June 1996. Coliform concentrations in offshore waters typically decreased with distance from shore, ranging from 5 to 96 CFU per 100 milliliters at the 10 m (30 ft) stations offshore from Imperial Beach to 14 CFU per 100 milliliters at the 40 m (130 ft) station.

No site-specific data are available to characterize concentrations of chemical contaminants in marine waters within the study area. Limited measurements of selected metals and organic compounds were performed as part of NPDES monitoring of the dewatering discharge during construction of the land phase of the outfall pipeline construction for the International Wastewater Treatment Plant (USIBWC unpublished data). Due to the relatively small discharge volume, low contaminant concentrations, and limited discharge period, the magnitude of this input source is considered negligible. In contrast, runoff from the Tijuana River reportedly contains the highest concentrations of suspended solids, metals (cadmium, chromium, copper, nickel, lead, and zinc), and total polychlorinated biphenyls (PCBs), and the second highest concentrations of bichlorophnyl trichlororthane (DDT), among the eight largest

creeks and rivers in southern California (Zeng and Vista, 1997). Thus, periodic discharges from the Tijuana River likely have a short-term effect on water quality within the study area. The magnitude of the effect will depend on the volume of water and mass of suspended solids discharged from the river to the ocean. Nevertheless, Zeng and Vista (1997) estimated that river runoff contributed approximately 2.2 kilograms of total polycyclic aromatic hydrocarbons (PAHs) annually, based on an annual mean flow of 4.29×10^{10} liters, to coastal waters off the mouth of the river. In addition, the USIBWC (1998) sampled marine surface waters at 11 stations along four transects off Baja California and found that stations located along the US-Mexico border and near Punta Bandera had elevated trace metal concentrations compared with more southern sampling sites. Trace metal concentrations showed both onshore and longshore gradients associated with high salinity and high nutrient concentrations. Nearshore stations were relatively enriched with trace metals compared with southern sites, but values were consistent with previously reported levels for upwelled waters of the northeast Pacific. This suggests that although the study area may receive high loading of trace metals through wastewater discharges, this loading may not be the predominant factor affecting trace metals distribution. The USIBWC (1998) study estimated that 1 percent of cadmium, 9 percent of zinc, and 29 percent of lead concentrations in marine surface waters in the study area vicinity originated from point source discharges. This estimate of the relative contribution of trace elements into the California Current system by human activities is restricted to contributions from the study vicinity and does not include contributions from non-point sources, or human contributions from point sources, outside the Southern California Bight.

The National Oceanic and Atmospheric Administration (NOAA) Mussel Watch program has monitored chemical contaminants in seawater at a site on the Imperial Beach north jetty since 1986 by collecting and analyzing the tissues of filter-feeding mussels, which are used as a sentinel organism for marine water quality. Results from 1986 through 1993 showed significant declines in concentrations of mercury, selenium, total chlordane, and total PCBs, but significant increases in total PAHs. Total DDT concentrations in mussel tissues were characterized as high (i.e., concentrations greater than the national mean plus one standard deviation for the log-normal distribution) during each of four years and total dieldrin concentrations were considered high during one of four years (O'Connor and Beliaeff, 1995). These trends likely reflect changes over time in the magnitudes of regional input sources.

4.3.1.2 *Borrow Areas*

No measurements of water quality conditions have been conducted at the offshore borrow areas. Existing water quality at the borrow areas is expected to be comparable to conditions throughout the area immediately offshore from Imperial Beach, with the exception that water clarity is expected to be greater in offshore waters than in surfzone areas affected by wave-induced sediment resuspension and runoff.

4.3.2 Sediment Quality

The following sections describe the physical and chemical characteristics of bottom sediments within the study area. Descriptions of grain size characteristics are based on results from previous studies of beach nourishment projects within the study area, as well as results from recent studies associated with the International Wastewater Treatment Plant and regional monitoring programs. Chemical characteristics of beach sediments and bottom sediments at the potential borrow areas are based primarily on data collected in 1997 (USACE, 1997a), as well as data collected from adjacent areas for other, unrelated projects.

4.3.2.1 *Nearshore Area*

Grain Size

Grain size is an important characteristic of bottom sediments because many biological organisms have preferences for specific sediment textures, and distributions and fate of chemical contaminants are strongly affected by grain size differences.

Beach sands sampled by USACE (1997) consist of a mixture of fine-grained silty sands to well graded and poorly graded medium grade sands with fines contents from 1 to 5 percent.

Organic Carbon

Similar to grain size properties, concentrations of organic carbon in bottom sediments have a strong influence on the characteristics of the biological communities and concentrations and distributions of chemical contaminants.

Sediments from the proposed receiving beach have a low organic matter content, as indicated by low concentrations of total organic carbon (less than 0.1%; i.e., detection limit), as well as low total volatile solids (0.7%) and sulfides (<0.1 parts per million) concentrations (USACE, 1997a).

Chemical Contaminants

Many of the more persistent and potentially toxic chemical contaminants have strong affinities for fine-grained sediments. Accumulations of contaminants in bottom sediments represent potentials for acute and/or chronic toxicity to marine organisms, as well as a source for biological uptake and accumulation in tissues.

Metal concentrations in sediments from the proposed receiving beach are listed in Table 4.3-1. Concentrations of individual metals were consistently low, as expected for coarse-grained sediments with low organic contents. These sediment metal data do not indicate any appreciable effects from discharges from the Tijuana River or other possible regional contaminant sources.

Table 4.3-1 Concentrations (parts per million) of Metals in Sediments from Imperial Beach

	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
Receiving Beach	1.1	nd	8.0	1.6	1.7	nd	1.9	nd	nd	13

nd = not detected;
Source: USACE, 1997a

Concentrations of chlorinated pesticides and polychlorinated biphenyls, polycyclic aromatic hydrocarbons, phenols, organotins, and most phthalate ester in sediments from the proposed receiving beach collected by USACE (1997) were below analytical detection limits, with the exception of trace amounts of two phthalate esters (which are common laboratory contaminants).

4.3.2.2 *Borrow Area*

Grain Size

Sediments sampled at the borrow pit north of the Imperial Beach study site contained approximately 80 to 90 percent sands, while sediments collected at the borrow pit south of the project site were approximately 85 to 90 percent sands. Sediments on the shelf off Imperial Beach have been characterized as 8.8 percent rock, 76.4 percent sand, and 14.6 percent silt (USACE, 1995b). Dominant grain sizes range from 150 to 300 microns, corresponding to very fine to medium sands. Generally coarser grained and better sorted sediments occur at locations closer to the Tijuana River delta (USACE, 1995b). Parr et al. (1978) reported that sediment grain size at Imperial Beach decreased with increasing water depths. Median grain sizes at depths of 0 m (0 ft), 3 m (10 ft), and 7 m (20 ft) were 210 to 250, 125 to 165, and 84 to 110 microns, respectively. These values were comparable to those reported earlier by Dexter (1977).

Sediments collected from bottom depths of 20 to 22 m (65 to 70 ft) by City of San Diego (1996) were characterized as coarse with greater than 80 percent sand-sized materials. In depths from 26 to 30 m (80 to 100 ft), sediments were slightly finer and contained approximately 20 percent silts. Similarly, sediments collected during the SCBPP (SCCWRP, 1999) at two sites along the 20 m (60 ft) bottom contour contained approximately 80 to 90 percent sands. These values were comparable to grain size results reported by the USACE (1997) for sediments collected at the two borrow areas designated for the project.

Organic Carbon

Sediments from the northern and southern borrow areas have a low organic matter content, as indicated by low concentrations of total organic carbon, ranging from less than 0.1 percent (detection limit) to 0.18 percent, as well as low total volatile solids (0.94 to 1.4 percent) and sulfides (0.21 to 3.9 parts per million) concentrations (USACE, 1997a).

Parr et al. (1978) reported concentrations of organic carbon from 0.02 to 0.08 percent in Imperial Beach sediments. Sediments analyzed by City of San Diego (1996) from depth ranges of 20 to 22 m (65 to 70 ft), 26 to 30 m (85 to 100 ft), and 33 to 43 m (110 to 140 ft) all contained average concentrations

of total organic carbon (TOC) of 0.1 percent. Concentrations measured in sediments from two 20 m (65 ft) sites during the SCBPP ranged from 0.12 to 0.13 percent (SCCWRP, 1999). These low TOC concentrations are consistent with the generally coarse grained characteristics of bottom sediments within the study area.

Chemical Contaminants

Metal concentrations in sediments collected from the borrow areas by USACE (1997) are summarized in Table 4.3-2, along with sediment metal concentrations during the International Wastewater Treatment Plant baseline monitoring (City of San Diego, 1996) and SCBPP (SCCWRP, 1999) projects. Concentrations of individual metals were consistently low, as expected for coarse-grained sediments with low organic contents. These sediment metal data do not indicate any appreciable effects from discharges from the Tijuana River or other possible regional contaminant sources.

Table 4.3-2 Concentrations (parts per million) of Metals in Bottom Sediments off Imperial Beach

Metal	CHEM 2	CHEM 3	CHEM 4	CHEM 5	SCBPP Sta. 1867	SCBPP Sta. 1944	Mean: 60-65 ft Stations	Mean: 80-100 ft Stations
Arsenic	0.93	1.3	1.3	1.4	1.6	2.3	1.8	1.8
Cadmium	nd	nd	nd	nd	0.06	0.11	nd	nd
Chromium	12	10	14	7.8	7.92	11.5	10.3	10.7
Copper	6.0	3.3	4.0	2.3	2.78	4.29	1.9	1.6
Lead	2.5	2.0	2.2	1.4	3.45	3.45	0.9	0.1
Mercury	nd	nd	nd	nd	0.05	nd	nd	nd
Nickel	5.1	3.3	4.2	2.5	2.32	3.68	2.3	2.1
Silver	nd	nd	nd	nd	<0.04	0.06	nd	nd
Zinc	36	20	25	16	14.8	19.6	15.1	14.3

nd = not detected;
Sources: USACE, 1997a; SCBPP – SCWWRP (1999); City of San Diego (1996)

Concentrations of oil and grease and individual PAH compounds in sediments from the northern and southern potential borrow areas collected by USACE (1997) were below analytical detection limits.

Sediments offshore from the mouth of the Tijuana River contained low total PAH concentrations (16.5 parts per billion and nondetectable) during January and June 1994 (Zeng and Vista, 1997). The samples with detectable PAH concentrations contained relatively greater proportions of higher molecular weight compounds (43 percent fluoranthene plus pyrene) than lower molecular weight compounds (13 percent two- and three-ring), indicating a predominance of combustion-derived PAHs, which appeared to be unaffected by the Tijuana River runoff source. Macias-Zamora (1996) also reported relatively low PAH concentrations (140 parts per billion) in sediments from a 29 m (95 ft) site located directly offshore from Tijuana, and southwest of the Imperial Beach study area.

Concentrations of chlorinated pesticides and polychlorinated biphenyls in sediments from the northern and southern potential borrow areas collected by USACE (1997) were below analytical detection limits, with the exception of 46 parts per billion of the pesticide derivative, hexachlorocyclohexane, and 14

parts per billion of DDT and derivatives, in one each of the four composite sediment samples. The presence of hexachlorocyclohexane in these sediment samples is unusual, particularly because another recent study (Fairey et al., 1996) did not detect this contaminant in sediments from San Diego Bay. Thus, the source of this compound to the potential borrow area sediment is not apparent.

Concentrations of the pesticide DDT and associated metabolites measured by the City of San Diego (1996) in sediments offshore from Imperial Beach were also low, ranging from 0.4 to 4.6 parts per billion. Similar to sediment PAH concentrations, DDT levels do not indicate a significant impact from Tijuana River discharges.

Finally, concentrations of organotins and base/neutral/acid organic compounds were below detection in sediments from the northern and southern borrow areas analyzed by USACE (1997), with the exception of trace amounts of three phthalate esters (which are also common laboratory contaminants).

4.4 ESSENTIAL FISH HABITAT

As detailed in Appendix B, the proposed project is located within an area designated as EFH for two Fishery Management Plans (FMP): Pacific Groundfish and Coastal Pelagics FMPs (PFMC 1998a and 1998b, respectively). Of the 86 fish species that are federally managed under these two plans, approximately 32 likely occur in the vicinity of Imperial Beach and could be affected by the proposed project (see Appendix B, Table B-1).

4.5 BIOLOGICAL RESOURCES

Biological resources in the study area are described in the following subsections:

- 4.5.1 Imperial Beach Shoreline
- 4.5.2 Nearshore Marine Environment
- 4.5.3 Tijuana River Estuary
- 4.5.4 Threatened and Endangered Species and Species of Concern.

4.5.1 Imperial Beach Shoreline

4.5.1.1 *Upland Habitats*

Vegetation. The project study area is within the Imperial reach of the Silver Strand Littoral Cell (SSLC). Within the SSLC, the Tijuana River delta is the primary source of sand, which is transported northward by prevailing littoral currents (see Section 4.2.5 for additional discussion). The Imperial reach of the SSLC extends from Playas de Tijuana (south of the border) northward to Silver Strand State Beach. North and south subreaches can be distinguished, the boundary being just south of the municipal pier near Ebony Avenue (USACE, 1995a,b). Along area beaches there is a seasonal cycle of spring-summer accumulation and fall-winter erosion. As a result of dams on the Tijuana River, however, the input of sand to the SSLC has diminished relative to historic levels, reducing the summer

accumulation of sand, exacerbating erosion during fall-winter storms, and resulting in a net annual loss of sand across the Imperial subreach.

The loss of sand is most severe in the southern Imperial subreach and, in combination with beachfront development, has resulted in the elimination of vegetated foredunes. Within the city limits, a narrow beach is backed by a massive riprap wall, composed of 4 to 7 ton stones in front of multi-family residences. Winter storms completely erode the intertidal sand beach, exposing a steep, cobble substrate that is unstable and unvegetated. The riprap fronting the residences is reached by high tides and winter surf and is also unvegetated, apart from ornamental vegetation (e.g., iceplant [*Carpobrotus edulis]*) behind the rocks. South of the developed area the beach widens and appears less exposed to the surf as a result of offshore bars and reefs that generally moderate the wave force. A few clumps of surfgrass (*Phyllospadix torreyi*), presumably attached to underlying rock, were observed protruding from the sand during a January 2001 site visit. A high sand berm, unvegetated on the seaward side, separates the Oneonta Slough of the Tijuana River Estuary from the ocean. The lee of the berm is vegetated with coastal dune vegetation that intergrades with well-developed salt marsh vegetation of the slough (Zedler et al., 1992; Lissner and Dungan, 2001). This ecologically important area is discussed in more detail in Section 4.5.3 below.

The northern subreach within the city limits, extending from south of the pier to just beyond the northern groin, has a gently sloping sandy beach about 30 to 60 m (100 to 200 ft) wide, with rubble-mound revetment in front of a few of the beachfront buildings. Some of the newer residential developments have constructed seawalls; a few have light, timber pile seawalls, but many have no protection. The sand beach in this area is also subject to erosion down to the underlying cobbles, although judging from observations in January 2001, the beach is more stable and erosion is less severe in the northern subreach than to the south. The beach area is heavily used for recreation, and upland vegetation is limited to ornamentals and a few patches of vegetation associated with the groins and shoreline structures. The vegetation is typified by common non-native coastal species such as iceplant, sea rocket (*Cakile maritima*), Australian saltbush (*Atriplex semibaccata*), Bermuda grass (Cynodon dactylon), and New Zealand spinach (*Tetragonia tetragonioides*). Isolated native plants, including pickleweed (*Salicornia virginica*), seablite (*Suaeda esteroa*), and beach saltbush (*Atriplex leucophylla*), were found near the northern groin in January 2001, but throughout this area, as elsewhere, much of the native coastal dune vegetation that once typified coastal southern California has disappeared because of shoreline development and heavy recreational use.

Proceeding northward past the groins and beyond the city limits, the beach widens and coastal dunes above the limit of the tides are increasingly well developed. The beach itself is gently sloping and up to 60 m (200 ft) wide in this area. The dunes front low-lying salt marsh and disturbed habitats that are on the U.S. Naval Communications Facility bordering San Diego Bay. The dunes are as much as 60 to 90 m (200 to 300 ft) wide between the intertidal sandy beach and the government property. Well-vegetated coastal dunes occurring along this stretch between Imperial Beach and the Silver Strand, and continuing northward to Coronado, are rare and considered extremely sensitive in southern California. This area

supports many native coastal dune, coastal scrub, and transitional salt marsh species (USDN, 1992). Prevalent native species observed in January 2001 included beach saltbush, beachbur (*Ambrosia chamissonis*), red sand verbena (*Abronia maritima*), purple sand verbena (*Abronia umbellata*), beach primrose (*Camissonia cheiranthifolia*), beach morning glory (*Convolvulus soldanella*), and saltgrass (*Distichlis spicata*). Less common but noteworthy native species include Nuttall's lotus (*Lotus nuttallianus*) in disturbed, compacted sand in front of the Naval facility; shoregrass (*Monanthochloe littoralis*) on a few dune hummocks; and southwestern spiny rush (*Juncus acutus sphaerocarpus*) in the back dune areas at the southern end of Silver Strand State Beach. Although extensive stands of non-native vegetation dominated by iceplant, Australian saltbush, and crystalline iceplant (*Gasoul crystallinum*) also occur, especially in the disturbed backdune areas along the fenceline seaward of the Naval facility, these areas appear to have been the subject of recent weed eradication efforts.

Wildlife. The United States Fish and Wildlife Service (USFWS) (1994b) provides information on wildlife that may occur in the general area of the Silver Strand. Additional observations of wildlife species and habitats in the study area were made in January 2001.

Within the city limits, the relatively narrow extent of the beach, the scarcity of vegetation and cover, the seasonal instability of the intertidal substrate, and heavy recreational use limit the abundance of wildlife. A variety of gulls and shorebirds use the beach, but otherwise, wildlife use of the area is likely dominated by common species that are associated with disturbed habitats and may inhabit the riprap, such as side-blotched lizards (*Uta stansburiana*), house finches (*Carpodacus mexicanus*), house mice (*Mus musculus*), and ground squirrels (*Spermophilus beechyi*). Relatively small numbers of a few common gull and shorebird species were present in January 2001, including western, herring, and Heermann's gulls; and sanderlings, willets, whimbrels, and marbled godwits.

South of the developed shoreline area, a great diversity and abundance of wildlife, including several threatened or endangered species, are associated with the Tijuana River Estuary and its bordering salt marsh, coastal scrub and dune habitats (Zedler et al., 1992). As described previously, a high berm separates the estuary's habitats from the open sandy beach, and vegetation for the most part is lacking on the ocean side of the berm. Gull and shorebird use of the beach is expected to be heavier than occurs within the city limits where the beach experiences heavier recreational use.

North of the city limits, the vegetated dunes and coastal scrub habitat also support a greater abundance and diversity of wildlife (USDN, 1992). In addition to the gulls and shorebirds noted above, species observed in January 2001 included mixed flocks of house finches and horned larks, several black phoebes, a single raven, and a San Diego black-tailed jackrabbit (*Lepus californicus bennetti*). Coyotes (*Canis latrans*) are undoubtedly present at least on a transient basis.

4.5.1.2 *Intertidal Habitats*

Intertidal sand beaches are among the most extensive of coastal habitats, including most shoreline portions of the study area (Dexter, 1977; USIBWC, 1998; SANDAG and USDN, 2000). Sand beaches,

and the organisms that utilize them, are subjected to a wide variety of physical instability, causing this habitat to generally be less diverse than other environments, including rocky intertidal areas (Dexter, 1977; USIBWC, 1998; SANDAG and USDN, 2000). Organisms occupying intertidal sand beaches are usually limited by abiotic factors such as tidal height and exposure to wave action, as well as sediment types. This section presents a general description of those organisms that occupy intertidal habitats in the study area, including sand beaches and substrate intertidal, represented mostly in the study area by human-constructed structures (groins and the municipal pier).

Sandy Beach

Invertebrates. Dexter (1977) collected a total of 697 individual invertebrates, representing 15 species. Dominant taxa included the amphipod, *Synchelidium* spp., polychaetes (*Nerine cirratulus* and *Euzonus mucronata*), and the isopod, *Excirolana chiltoni*. Similar results were obtained by Parr et al. (1978), with crustaceans and polychaetes comprising 49 percent and 36 percent of the species collected in soft bottom intertidal areas, respectively. Zonation patterns for intertidal sand beach assemblages are less distinct than rocky intertidal communities (Thompson et al., 1993). General zonation patterns for this habitat are presented in Figure 4.5-1. Results of Dexter (1977) are supported by Thompson et al. (1993) and indicated high tide areas were dominated by *E. chiltoni* and *E. mucronata*, mid-tide was dominated by *N. cirratulus*, while the low tide areas were dominated by the polychaete, *Nephtys californiensis,* and *Synchelidium* spp. A recent field reconnaissance of the study area (Lissner and Dungan, 2001) indicated that bean clam (*Donax* sp.) and Pismo clam (*Tivela stultorum*) were the most common large invertebrate species in the soft-bottom intertidal zone. Small beach hoppers (*Orchestoidea* sp.) and kelp flies (*Coelopa vanduzeei*) were also abundant in clumps of drift bull kelp (*Nereocystis leutkiana*) and giant kelp (*Macrocystis pyrifera*) cast up on the beach at the high tide line.

Fishes. Fishes associated with exposed beaches usually move between the surf zone and deeper subtidal areas and are generally more localized in their movements than offshore species (Moyle and Cech, 1988; USIBWC, 1998). Dominant fishes in this area likely include small active plankton feeders such as northern anchovy (*Engraulis mordax*) and topsmelt (*Atherinops affinis*), roving substrate feeders such as the blackeye goby (*Coryphopterus nicholsii*), flatfishes such as speckled sanddab (*Citharichthys stigmaeus*) and juvenile California halibut (*Paralichthys californicus*), fishes that migrate through the surfzone such as mullets (*Mugil* spp.), and beach spawners such as California grunion (*Leuresthes tenuis*) (Moyle and Cech, 1988; Love, 1996; USIBWC, 1998).

Birds. The beach provides foraging and resting habitat for shore- and waterbirds. Shorebirds expected to occur along the Imperial Beach shoreline include sanderling, marbled godwit, western sandpiper, willet, whimbrel, black-bellied plover, ruddy turnstone, and several species of gulls (USDN, 1992, 1995; USACE, 1995b). Willets, ring-billed gulls, whimbrel, and Western gulls were observed foraging within the intertidal zone of the study area during a recent field reconnaissance (Lissner and Dungan, 2001). Black phoebes, which feed on kelp flies and other flying insects, were also common on the beach within the study area.

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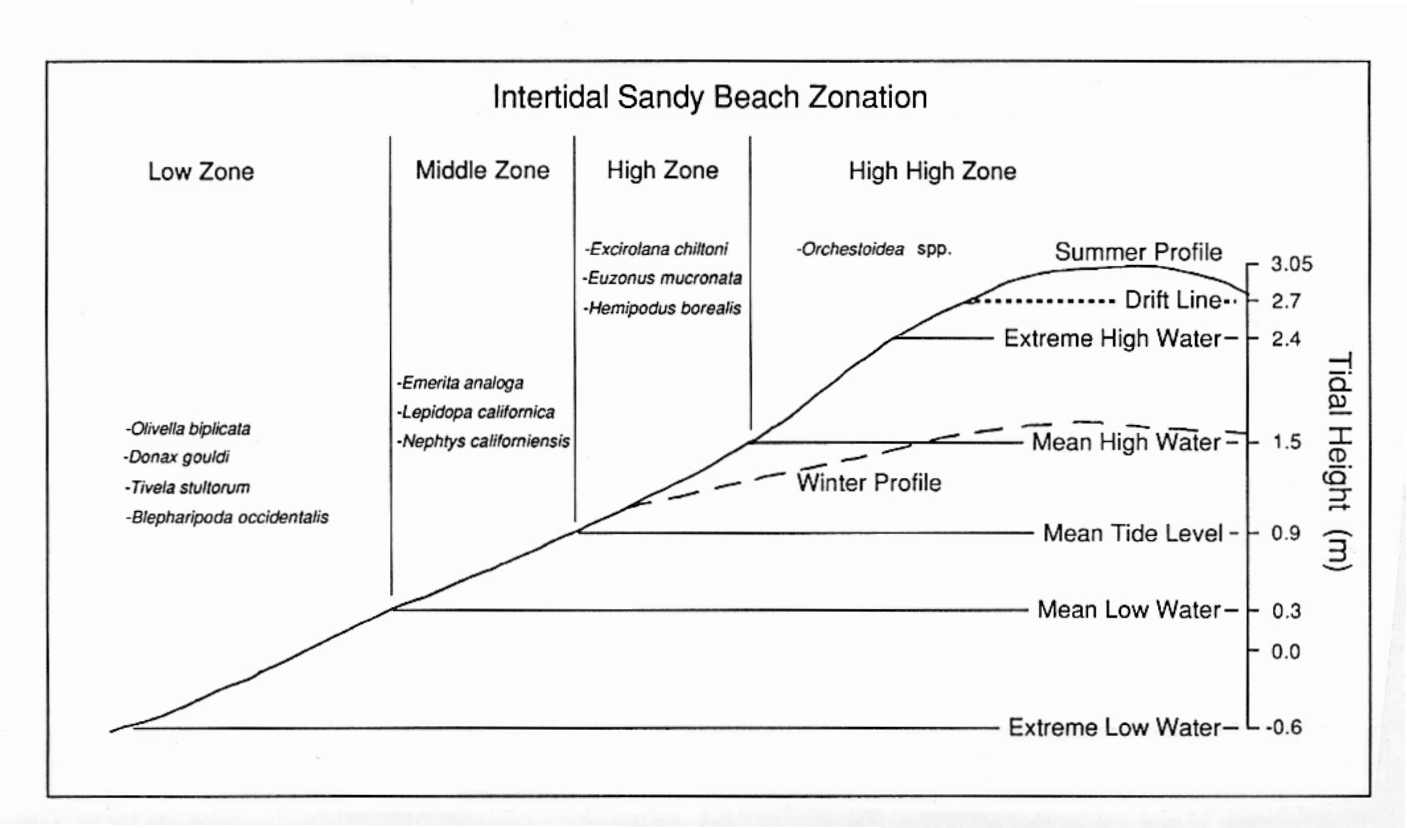
Figure 4.5-1

Intertidal Zonation of a Sandy Beach in Southern California



Source: Thompson et al., 1993

Rocky Shore

Invertebrates. Hard substrate intertidal invertebrates occur primarily on two rock groins north of the Imperial Beach pier, as well as the pier itself. Dexter (1977) described a total of 18 invertebrate species on rock groins and 28 species from pier pilings. The rock groins were dominated by barnacles (*Chthamalus fissus* and *Balanus gladula*) and anemones (*Anthopleura elegantissima*). Invertebrate species common on pier pilings included *C. fissus*, *B. gladula*, *A. elegantissima*, the limpet *Lottia gigantea*, mussels (*Mytilus californianus*), seastars (*Pisaster ochraceus*), and the crab, *Pugettia producta*.

A recent reconnaissance of the study area (Lissner and Dungan, 2001) revealed that the rock groins support typical southern California rocky intertidal assemblages of algae and macroinvertebrates. Observed species included the Califonia mussel (*Mytilus californianus*), goose neck barnacle (*Pollicipes* polymerus.), barnacles (*C. fissus, Tetraclita,* and *Balanus* sp.), anemones *Anthopleura* (both solitary and aggregate species), shore crab *Pachygrapsus*, limpets (*Acmaea* and *Lottia)*, turban snails (*Tegula* spp.), sand tubeworms (*Phragmatopoma californica*), coralline algae (encrusting and erect), green algae such as *Ulva*, feather boa (*Egregia menziesii*), and red algae such as *Gigartina*, depending on the tide zone (Lissner and Dungan, 2001).

Fishes. Dexter (1977) observed five fish species on or near subtidal pier pilings at the Imperial Beach pier, including topsmelt (*Atherinops affinis*), sculpin (*Clinocottus* spp.), walleyed surfperch (*Hyperprosopon argenteum*), barred surfperch (*Amphistichus argenteus*), and C-O turbot (*Pleuronichthys coenosus*). Other common fish species taken off the Imperial Beach pier include northern anchovy (*Engraulis mordax*), bat rays (*Myliobatis californica*), shovelnose guitarfish (*Rhinobatos productus*), Pacific barracuda (*Sphyraena argentea*), Pacific bonito (*Sarda chiliensis*), chub mackerel (*Scomber japonicus*), white croaker (*Genyonemus lineatus*), and several surfperches (Embiotocidae) (City of Imperial Beach Webpage, 1997; USIBWC, 1998).

Birds. Intertidal riprap, pier pilings, and other manmade structures provide resting habitat for shore- and waterbirds, especially pelicans, cormorants, gulls, and terns (USDN, 1995). These structures also provide limited foraging habitat for a few shorebirds, such as spotted sandpiper and black oystercatcher.

4.5.2 Nearshore Marine Environment

Nearshore subtidal marine habitats in the vicinity of Imperial Beach consist of both soft- and hard-bottom areas. Species composition for vegetation, invertebrates, and fishes are generally different, although some overlap occurs among these habitats. The following sections describe the subtidal benthic habitats, including kelp beds, dominant epifauna, and common fish species, and open water (pelagic) habitats.

4.5.2.1 *Subtidal Benthic Habitats*

Plants. In California waters, there are over 50 species of green algae (Chlorophyta), over 100 browns (Phaeophyta), and hundreds of reds (Rhodophyta) (Abbott and Hollenberg, 1987). One of the most visible algal species in southern California is the giant kelp, *Macrocystis pyrifera,* that can form large beds in many principally hard bottom habitats (Elwany and Flick, 1996). Giant kelp plants in many areas are several years old and can reach heights of over 50 m (164 ft) (Elwany and Flick, 1996). Small kelp beds occur within the Imperial Beach area and are generally restricted to areas of subtidal rocks, boulders, and cobble within the photic zone (depths of 6 to 18 m [20 to 60 feet]) (USIBWC, 1998). Historically, the Imperial Beach kelp bed extended from approximately 600 m (0.3 mile) to 2,700 m (1.5 miles) offshore and approximately 1,600 m (0.9 mile) north and 2,400 m (1.3 miles) south of Imperial Beach Pier. The 1997-98 El Nino resulted in a regional decline in kelp beds, such that a 1998 survey indicated no kelp canopies off Imperial Beach. However, recent surveys (North and MBC, 2001) indicated the beds were returning as very small canopies in 2000 (see Figure 4.5-2). High variability in the Imperial Beach kelp bed has been indicated historically by the apparent lack of older plants (i.e., >4 years) and the consequent dominance by younger plants (1 to 2 years), suggesting a lack of kelp bed persistence. Historically, kelp bed persistence has been relatively low to moderate off Imperial Beach (SANDAG and USDN, 2000). The ephemeral nature of the bed also may be due to relatively high turbidity from the Tijuana River Estuary (MEC, 1993). Increases in kelp persistence are more likely during periods of drought, where river outflow and sediment supply to offshore areas are reduced. North et al. (1993) found that kelp canopy area off Imperial Beach fluctuated between a low of approximately 50 square meters (m^2) x 10^3 in 1981 to a high of 651 m^2 x 10^3 in 1990 (see Figure 4.5-3). These values are extremely low compared to the extensive kelp beds off Point Loma. This likely is due to the occurrence of relatively few hard-bottom features off Imperial Beach so that kelp plants may be attached to old holdfasts or other solid objects such as hardened clay, cobbles, scattered rocks, and discarded debris (Feder et al., 1974; USIBWC, 1998). These substrates are less resistant than rock reefs to erosion or movement by strong currents and waves so the plants may be swept away, forming less permanent beds.

Because few hard-bottom features occur in the subtidal areas off Imperial Beach (except for Imperial Beach pier and two rock jetties), few species of subtidal understory algae are likely present. Dexter (1977) surveyed small rocks and cobblestone near the mouth of the Tijuana River Estuary and identified a total of 27 algal species (and angiosperms). Algae included the reds *Bossiella orbigniana*, *Corallina chilensis*, *C. gracila*, two species of *Gelidium*, four species of *Gigartina*, *Microcladia coulteri*, and *Rhodomenia pacifica*; the brown *Desmarestia herbacea*; and two species of the green algae (*Ulva)*.

Invertebrates. Dexter (1977) surveyed subtidal areas of cobblestone boulders near the mouth of the Tijuana River Estuary and identified 12 invertebrate species. The most common species were barnacles (*Balanus nubilis*), batstars (*Asterina miniata*), and four decapod crustaceans (*Holopagurus* spp., *Mimulus foliatus*, *Panulirus interrruptus*, and *Pugettia producta*). Recent trawl surveys over soft-

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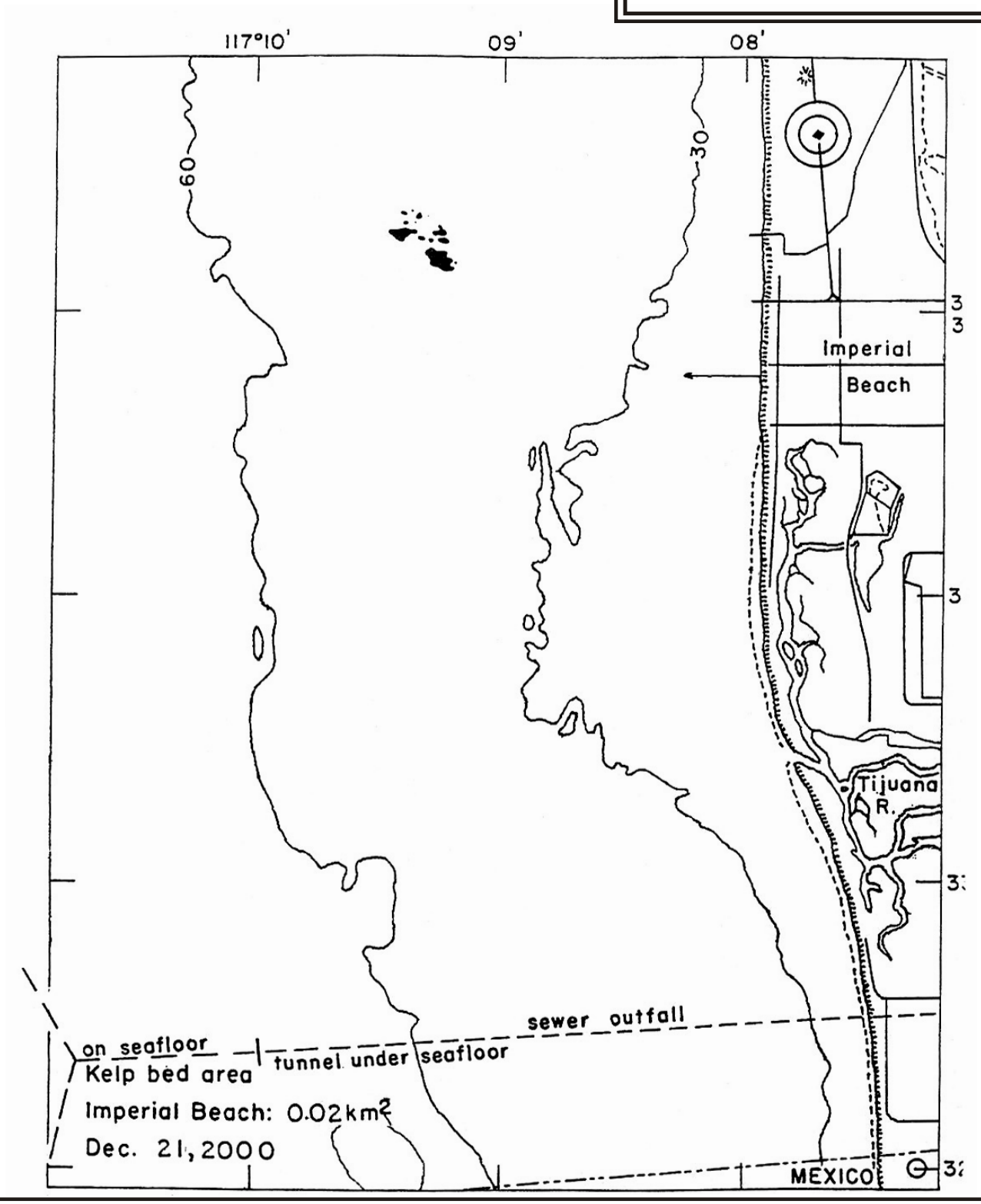
Figure 4.5-2

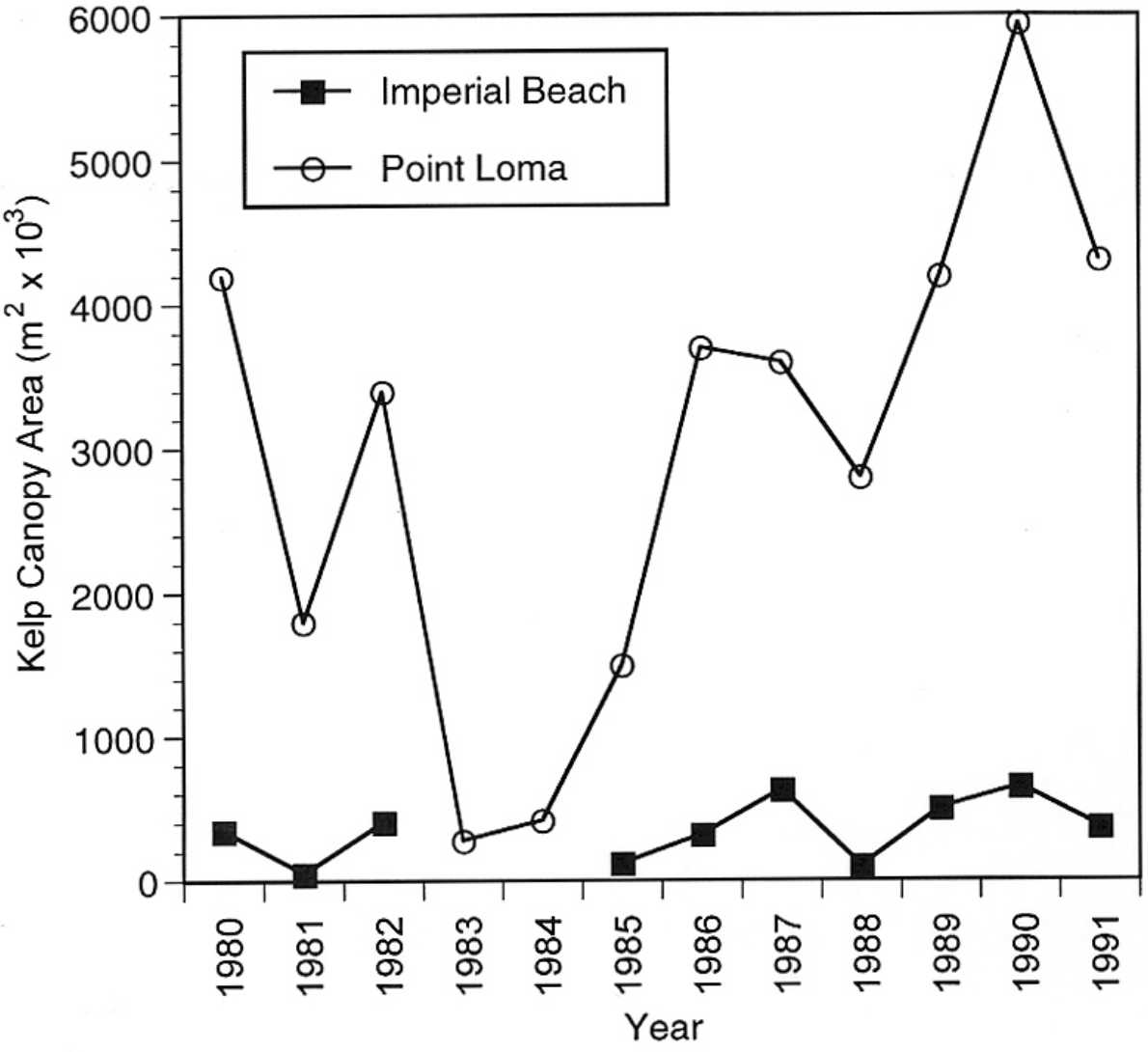
Kelp Canopy Persistence (Years) Off Imperial Beach, California



SHORE PROTECTION EIS/EIR

Figure 4.5-3

Trends in Kelp Canopy Area Off Imperial Beach Compared to Point Loma, California



Source: North et al., 1993

bottom habitat in the vicinity of the study area collected 25 invertebrate species (San Diego, 1999). The most abundant species collected included white sea urchin (*Lytechinus pictus*), seastar (*Astropectin verrilli*), and shrimp (*Crangon nigromaculata* and *Sicyonia ingentis*).

Fishes. Over 100 fish species have been documented in southern California kelp beds (Feder et al., 1974), while Quast (1971) described almost 60 species. Some of the most common inhabitants of kelp forests in the region likely include senorita (*Oxyjulis californica*), kelp surfperch (*Brachyistius frenatus*), blacksmith (*Chromis punctipinnis*), rockfishes (*Sebastes* spp.), kelp bass (*Paralabrax clathratus*), Garibaldi (*Hypsypops rubicundus*), and sheephead (*Semicossyphus pulcher*). Similar fish species occur in the Imperial Beach kelp beds, also including leopard sharks (*Triakis semifasciatus*), opaleye (*Girella nigricans*), halfmoon (*Medialuna californiensis*), giant kelpfishes (*Heterostichus rostratus*), and several surfperch species (Embiotocidae) (USIBWC, 1998).

Recent trawl surveys along the 65-foot (20 m) depth contour in the vicinity of the study area reported between 3 and 18 fish species (SCCWRP, 1999). Commonly collected species included barred sand bass (*Paralabrax nebulifer*), yellowchin sculpin (*Icelinus quadriseriatus*), speckled sanddab (*Citharichthys stigmaeus*), Pacific sanddab (*C. sordidus*), and California halibut (*Paralichthys californicus*). Similarly, the City of San Diego collected 25 demersal fish species at trawl stations along the 100-foot (30 m) isobath near the study area (San Diego, 1999). Flatfishes predominated trawl samples, including Pacific sanddab, longfin sanddab (*C. xanthostigma*), English sole (*Pleuronectes vetulus*), and California tonguefish (*Symphurus atricauda*).

4.5.2.2 *Open Water Habitats*

Plankton. Many phytoplankton species inhabit the Southern California Bight (SCB), with their relative abundance, biomass, and production varying greatly both spatially and temporally (Hardy, 1993). The two most abundant and important components of the phytoplankton community are generally diatoms (bacillariophytes) and dinoflagellates (pyrrophytes).

Similar to phytoplankton communities, zooplankton abundances are extremely variable both spatially and temporally. Dominant zooplankton species in the study area likely include calanoid and harpacticoid copepods, larvae of benthic polychaetes and molluscs and several ichthyoplankton species, including northern anchovy (*Engraulis mordax*) and several rockfish species (*Sebastes* spp.).

Fishes. Pelagic (open water) fishes are species that spend little or no time in contact with the bottom. Common pelagic species likely to occur in the study area include schooling fishes such as northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), chub mackerel (*Scomber japonicus*), topsmelt (*Atherinops affinis*), jacksmelt (*Atherinopsis californiensis*), and Pacific butterfish (*Peprilus simillimus*) (USIBWC, 1998; SANDAG and USDN, 2000). Other species include blue sharks (*Prionace glauca*), Pacific barracuda (*Sphyraena argentea*), white seabass (*Atractoscion nobilis*) and several rockfish species (*Sebastes* spp.). Some species may move in and out of the study area such as yellowtail

(*Seriola lalandi*), yellowfin tuna (*Thunnus albacares*), and Pacific bonito (*Sarda chiliensis*) (USIBWC, 1998).

Birds. Birds that commonly forage in nearshore waters along the Silver Strand include California brown pelicans, numerous species of gulls, terns, loons, and grebes (USDN, 1992, 1995; USFWS, 1994b). The gulls, including western, ring-billed, California, and Heermann's, are generalist feeders taking a variety of prey items at the water surface. Brown pelicans and Forster's, Caspian, royal, common, elegant, and California least terns are all common in the region. These birds forage aerially, diving for fishes. Several species of loons and grebes also occur; these birds dive from the surface to pursue fish and crustaceans underwater.

Marine Mammals. Mammals most likely to be observed in the study area include two pinniped species (California sea lion, *Zalophus californianus*, and harbor seal, *Phoca vitulina richardsi*); dolphins, including common dolphin (*Delphinus delphis*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), bottlenose dolphin (*Tursiops* sp.) and Risso's dolphin (*Grampus griseus*); and, during seasonal migrations, California gray whales (*Eschrichtius robustus*) (Bonnell and Dailey, 1993). Other species that may occur uncommonly in offshore areas of the general project region include minke whales (*Balaenoptera acutotostrata*), pilot whales (*Globicephala* sp.), killer whales (*Orcinus orca*), and beaked whales (e.g., *Mesoplodon* spp.), among others. The San Diego Basin is used as a foraging area by pinniped species associated with the Los Coronados Islands rookery and may be part of their migratory route from Mexican colonies moving to and from the islands of the Southern California Bight (USIBWC, 1998).

However, with the exception of some pinnipeds, most marine mammal species are commonly observed further offshore (e.g., deeper than 100 feet or 30 m) and are not expected to be resident in the immediate study area. Additional details on the species of most likely occurrence are presented below.

California sea lions are found from British Columbia south to Tres Marias Islands off Mexico (Hanan and Sisson, 1992). This species breeds in June and early July from the Channel Islands south into Mexico. California sea lions feed on a variety of prey, including squid, octopus, and a variety of fishes (e.g., anchovy, mackerel, herring, rockfishes, and hake), often in or adjacent to kelp beds.

Harbor seals range from Alaska to Cedros Island, Baja California (Hanan and Sisson, 1992). Harbor seals have been divided into three stocks, including a California group. Harbor seals are abundant along the entire California coast, typically occupying bays, harbors, and river mouths preying on epibenthic and benthic species (Ainley and Allen, 1992).

Several species of dolphin are very abundant in southern California coastal waters, feeding primarily on schooling fish. Dolphin school sizes can often range up to hundreds of individuals, with evidence of substantial movements sometimes occurring between different parts of the population range.

The California gray whale, recently removed from the Federal endangered species list, spends summers in the Bering and Chukchi seas, off Alaska, and migrates to feeding grounds in winter along the west coast of Baja California, Mexico (Lagomarsino, 1992). Gray whales differ from other baleen whales primarily in their feeding behavior. Gray whales are bottom feeders, taking up mouthfuls of sediment and then straining out water and mud, swallowing the benthic invertebrates. Gray whales are expected to occur off the Imperial Beach coast during their seasonal migrations, southbound typically in December and January, and northbound from as early as January through June (Bonnell and Dailey, 1993).

4.5.2.3 *Borrow Areas*

Two borrow areas will be used for the proposed project, Areas A and B. Both borrow areas are located in water depths between 12 and 16 m (40 and 53 ft) (SANDAG and USDN, 2000) and are comprised of the same type of sandy sediments. In addition, the sediments at the borrow areas contain materials compatible with the receiving beach (USACE, 1997a). Because of similarities in sediment composition between the two borrow areas, biological resources at each area is expected to be similar. The most common and abundant infaunal organism at the borrow areas are likely to be polychaete worms. Dominant species in this area are typical of other soft bottom areas at similar depths throughout southern California. The most common polychaetes in the Point Loma area are the terebellid *Lanassa* sp D, the spionid *Spiophanes duplex*, and the pectinarid *Pectinaria californiensis* (San Diego, 1999). Other dominant infauna includes brittlestars (Ophiuridae) and gastropod *Caecum crebricinctum*.

Similar to infauna, macroinvertebrate species will be typical of those described above for soft-bottom subtidal areas, and found in similar depths in southern California. The most common species in the borrow area are likely white sea urchins (*Lytechinus pictus*), seastars (*Astropectin verrilli*), and shrimp (*Crangon nigromaculata* and *Sicyonia ingentis*). Other common epifaunal invertebrates include sea cucumber (*Parastichopus californicus*) and sea pen (*Acanthoptilum* sp.).

Fish species likely to occur in the borrow areas would also be similar to those described above for nearshore subtidal areas. The most common species would include barred sand bass, yellowchin sculpin, and flatfishes such as California tonguefish, Pacific sanddab, longfin sanddab, English sole, and California halibut.

Birds expected in the open marine waters in the vicinity of the borrow sites feed primarily on small fishes and crustaceans and include several ecological groups (Small, 1974; USDN, 1994c and 1995):

- Plunge divers that forage aerially and dive for prey, including the California brown pelican and California least tern (both of which are endangered species), and several other species of terns that nest around San Diego Bay or are summer visitors
- Water column divers that forage while on the water surface and actively pursue prey by swimming underwater. This group includes loons, grebes, cormorants, and alcids (e.g., auklets, murrelets).
- Generalist feeders (primarily gulls) that opportunistically pick food from the water surface, includes carrion.

Marine mammals in the vicinity of the borrow areas are the same as those described above for the nearshore and offshore parts of the study area. The most common marine mammal species include California sea lions, harbor seals, common dolphin, Pacific white-sided dolphin, bottlenose dolphin, Risso's dolphin, and during seasonal migrations, California gray whales (Bonnell and Dailey, 1993).

4.5.3 Tijuana River Estuary

The Tijuana River Estuary is located in the extreme southern portion of the study area (as shown on Figure 2.1-2). Nonetheless, general characterizations of the biota are presented in the following sections.

4.5.3.1 *Vegetation*

Vegetation of the Tijuana River Estuary in the areas adjacent to Imperial Beach is as described for the estuary as a whole by Zedler et al. (1992). Along the Imperial Beach shoreline, habitats of the estuary are separated from the open ocean by a wide, sandy beach and a high berm that is unvegetated on its seaward face. Habitats on the inner side of the berm, descending to the Oneonta Slough portion of the estuary, are as described by Zedler et al. (1992). Coastal dune and transitional coastal scrub vegetation are present in backdune areas above tidal influence. Within the tidally influenced portion of the estuary, there are distinct zones of low, middle, and high marsh vegetation/habitat types, reflecting plant species' responses to the tidal regime. The low marsh typically occurs above unvegetated mudflats and is dominated by Pacific cordgrass (*Spartina foliosa)*. The low marsh zone is characterized by a regular alternation of inundation at high tide and exposure at low tide. Middle marsh, dominated by pickleweed (*Salicornia virginica*), is regularly inundated by the higher high tides but is otherwise exposed. The high marsh zone is usually exposed, being inundated only during the highest (spring) tides. High marsh vegetation is diverse, including perennial glasswort (*Salicornia subterminalis*), shoregrass (*Monanthochloe littoralis*), sea lavender (*Limonium californicum*), alkali heath (*Frankenia salina*), saltbush (*Atriplex* spp.), pickleweed, and other species. Progressing higher, wetland-upland transition and coastal sage scrub vegetation/habitats occur. An additional vegetation type/habitat is the "salt panne," represented by seasonally flooded and sparsely vegetated flats and shallow basins to slightly above the normal upper limit of tidal influence (Zedler et al., 1992).

4.5.3.2 *Invertebrates*

Marine and terrestrial invertebrates that occur in the Tijuana River Estuary and adjacent habitats are discussed by Zedler et al. (1992). Invertebrate communities are extremely sensitive to episodes of drought, heavy freshwater inflow, and closure of the mouth of the estuary due to drought and sand migration, all of which have caused significant changes in the past (Zedler et al., 1992). Overall, the estuary supports a rich invertebrate fauna. Some of the characteristic species associated with various habitats include the following:

- The shallow subtidal channels support a variety of clams and worms, gastropod mollusks, abundant ghost shrimp (*Neotrypaea* [original reference as *Callianassa*] *gigas*), and sand dollar (*Dendraster excentricus*) beds, the latter being highly variable in distribution and abundance (Zedler et al., 1992)
- Intertidal channels, flats, and marsh sediments support abundant shorecrabs (*Pachygrapsus* spp.), California horn snails (*Cerithidea californica*), a variety of other snails, amphipods, and hermit crabs
- Salt pannes support a distinctive assemblage of insects, including rove and tiger beetles (*Bledius* spp., *Cicindela* spp.) and a variety of bugs (Hemiptera). Tiger beetles also occur in the dunes at the mouth of the estuary.

4.5.3.3 *Fishes*

Fishes of the Tijuana River Estuary have been summarized by Zedler et al. (1992). Previous studies have found up to 43 species in the estuary (Ford et al., 1971; USIBWC, 1976; and Nordby, 1982). Species composition and abundances in the estuary are highly variable due to dramatic and sometime catastrophic changes in the habitat from floods and conversely with hypersaline conditions. For example, prior to a 1978 flood, 29 fish species, including California killifish (*Fundulus parvipinnis*), striped mullet (*Mugil cephalus*), and longjaw mudsucker (*Gillichthys mirabilis*), were found in the estuary and considered to be common residents. Severe flooding and subsequent lowering of the salinity caused shifts in dominance, with topsmelt (*Atherinops affinis*) and striped mullet becoming most common (Zedler et al., 1992). Similarly, when the mouth of the estuary was closed for six months in 1984, salinity rose to over 60 parts per thousand and fish assemblages were dominated by topsmelt, killifish, and longjaw mudsucker.

Estuaries are important habitats for spawning and nursery grounds for many fish species (Zedler et al., 1992). Ichthyoplankton (larval fish) surveys in the Tijuana River Estuary by Nordby (1982) and Zedler and Nordby (1986) found 28 taxa of larval fishes, representing 19 families and more than 27 genera. The most common larval taxa included longjaw mudsucker and topsmelt in tidal creeks, gobies (*Clevlandia ios*, *Quietula y-cauda*, and *Ilypnus gilbertis*) near the estuary mouth, and queenfish (*Seriphus politus*), white croaker (*Genyonemus lineatus*), and northern anchovy in nearshore environments outside of the estuary. Tidal flushing is most likely the determining factor in distributing ichthyoplankton to various areas of the estuary.

4.5.3.4 *Wildlife*

Wildlife that inhabit the Tijuana River Estuary and adjacent habitats are discussed by Zedler et al. (1992). The diversity of habitats including coastal scrub and adjacent salt panne, tidal marsh, and mudflats support a high diversity of wildlife, including several sensitive species (see Section 4.5.4, Threatened and Endangered Species). Invertebrates and fishes were discussed previously. Some of the characteristic terrestrial vertebrates are as follow:

- Mammals include both wetland and upland species, many of which are associated with coastal dune and scrub habitats that have become increasingly rare and/or disturbed as a result of human activities in southern California. Small mammals trapped in upland and transition habitats surrounding the estuary include at least five species of mice, agile kangaroo rat (*Dipodomys agilis*) and dusky footed woodrat (*Neotoma fuscipes*).

Medium- to large-sized mammals that are present include California jackrabbit, desert cottontail (*Sylvilagus auduboni*), opossum, California ground squirrel, long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*).

- Numerous resident and migratory birds utilize the estuary. Data on waterbird use of the estuary are summarized in Zedler et al. (1992). Particularly noteworthy is the occurrence of at least four threatened or endangered bird species (see Table 4.5-1 below): western snowy plover and California least tern, both of which nest in the dunes at the mouth; light-footed clapper rail, which nest in the low marsh zone; and Belding's savannah sparrow, which nest in the middle marsh (pickleweed) zone. Another endangered species, least Bell's vireo, occurs in willow-riparian habitats in the upstream areas of the estuary.
- Common snakes and lizards inhabiting upland and upland-wetland transition habitats around the estuary include California kingsnake (*Lampropeltus getulus*), San Diego gopher snake (*Pituophus melanoleucus*), side-botched lizard, and Great Basin fence lizard (*Sceloporus occidentalis biseriatus*). Two sensitive reptiles, the San Diego horned lizard (*Phrynosoma coronatum blainvillei*) and silvery legless lizard (*Anniella pulchra pulchra*) also inhabit the dunes at the mouth.

4.5.4 Threatened and Endangered Species, Species of Concern

Table 4.5-1 lists State and federally recognized threatened and endangered species, and Table 4.5-2 lists species of concern that may occur in the general vicinity of the Imperial Beach study area, encompassing the Silver Strand, the lower part of the Tijuana River estuary, southern San Diego Bay, and adjacent areas.

Table 4.5-1 Rare, Threatened, and Endangered Species Potentially Occurring in the Vicinity of Imperial Beach

Common Name (Scientific Name)	Status[1]	Occurrence (Reference)
PLANTS		
Coastal dunes milk vetch (Astragalus tener var. titi)	FE, SE	Occurs north of Silver Strand Bayside campground; possible in coastal dunes north and south of Imperial Beach. Flowers March-May (Beauchamp 1986; USDN 1992).
Salt marsh bird's beak (Cordylanthus maritimus ssp. maritimus)	FE, SE	Upper salt marsh communities, Tijuana River estuary, also at Sweetwater Marsh. Flowers May-October (Beauchamp 1986; Zedler et al. 1992).
BIRDS		
Marbled murrelet (Brachyramphus marmoratus)	FT, CSC	Extremely rare visitor, photographed at Imperial Beach pier in 1979 (Unitt 1984).
Western snowy plover (Charadruis alexandrinus nivosus)	FT, CSC	Several nesting locations around San Diego Bay, Silver Strand, and North Island; uncommon migrant, winter visitor (Unitt 1984; USDN 1994); forages on beaches. Undeveloped shoreline areas north and south of the city of Imperial Beach are included in designated critical habitat for the species (USFWS 1999).
American peregrine falcon (Falco peregrinus anatum)	FE, SE	Occasionally seen foraging in San Diego Bay, associated with shorebirds, waterfowl (e.g., Copper and Patton 1992). Nests on Coronado Bridge (USDN 1994); possible foraging in study area.
Belding's savannah sparrow (Passerculus sandwichensis beldingi)	FSC, SE	Nests in pickleweed salt marshes, including those of the Tijuana River estuary; forages in marshes, coastal strand habitats (MBA 1990; USDN 1992; Zedler et al. 1992).
California brown pelican (Pelecanus occidentalis californicus)	SE, FE	Frequent foraging in open water habitats throughout study area and resting along shoreline (e.g., Unitt 1984;USDN 1994).
Light-footed clapper rail (Rallus longirostris levipes);	FE, SE	Resident of cordgrass-dominated low to middle salt marsh, with important nesting areas in Tijuana River estuary, San Diego Bay tidal marshes (Unitt 1984; MBA 1990; USDN 1992; Zedler et al. 1992).

Common Name (Scientific Name)	Status[1]	Occurrence (Reference)
California least tern (Sterna antillarum browni)	FE, SE	Nesting locations in open habitats with sandy substratum around San Diego Bay on dunes and flats, partially developed shoreline areas; nests on NTC, North Island airfield, Delta Beach, Coronado Cays, and Tijuana River mouth; forages in nearshore waters (Unitt 1984; USDN 1992; Zedler et al. 1992; USDN 1994; Stadtlander 1995).
MAMMALS		
Pacific pocket mouse (Perognathus longimembris pacificus)	FE, CSC	Historically present in open coastal scrub along immediate coast of southern California, recently rediscovered (Dana Point, Camp Pendleton) (USFWS 1994a); possible in coastal grassland and scrub habitats along the immediate coast.

Notes: 1. FE = Federally listed as endangered
FT = Federally listed as threatened
FSC = Federal Species of Concern
SE = State listed as endangered
ST = State listed as threatened
CSC = State listed Species of Special Concern

Table 4.5-2 Candidate/Special Concern Species Potentially Occurring in the Vicinity of Imperial Beach

Common Name (*Scientific Name*)	Status[1]	Occurrence (Reference)
PLANTS		
Ahanisma (*Aphanisma blitoides*)	FSC, CNPS 1B	Records from coastal alkaline areas around San Diego Bay, including Imperial Beach. Flowers April-May (Beauchamp 1986).
Orcutt's bird's beak (*Cordylanthus orcuttianus)*	FSC, CNPS 2	Coastal scrub, on coastal slopes, Otay area, Tijuana Hills. Flowers March-Sept (Beauchamp 1986)
Coastal wallflower *(Erysimum ammophilum)*	FSC	Occurred historically along the Silver Strand but not observed in recent years; flowers February-May (Beauchamp 1986; USDN 1992).
Coulter's saltmarsh daisy *(Lasthenia glabrata ssp. coulteri*)	FSC, CNPS 1B	Saline flats, known from Tijuana River estuary; flowers February-May (Beauchamp 1986; Zedler et al. 1992).
Nuttall's lotus (*Lotus nuttallianus)*	FSC, CNPS 1B	Occasional in coastal dunes, old fill sites around San Diego Bay including Border Field State Park, Naval Amphibious Base, Coronado, Sweetwater Marsh, Naval Radio Receiving Marsh, and north and south Delta Beach. Observed in back dunes north of Imperial Beach (this study). Flowers March-June (USDN 1992).
Coast woolly heads *(Nemacaulis denudata var. denudata*)	CNPS 2	Coastal dune habitats, with Nuttall's lotus. Flowers April-September (USDN 1995).
Beach broom rape (*Orobanche parishii ssp. brachyloba*)	FSC, CNPS 1B	On sandy beaches; parasitic, known hosts include *Atriplex californica* and *Isocoma veneta*. Flowers May-September (Beauchamp 1986).
INVERTEBRATES		
Peninsular Range shoulderband snail *(Hemlinthoglypta traski coelata)*	FSC	Possible along beach fronts, sandy hummocks in study area (USFWS 1994b).
California brackish water snail *(mimic tryonia)* (Tryonia imitator)	FSC	Possible in brackish areas of Tijuana River estuary (USFWS 1994b)
Saltmarsh wandering skipper butterfly *(Panoquina errans*)	FSC	Larvae develop on saltgrass (moist, saline soils), occurs in salt marsh of Tijuana River estuary (Zedler et al. 1992).
Barrier beach tiger beetle (*Cicindela hirticolis gravida)*	FSC	Found on clean, dry light-colored sand; possible on the Silver Strand (USDN 1992).
Oblivious tiger beetle *(Cicindela latesignata obliviosa)*	FSC	Sandy intertidal flats; cited by USFWS (1994b) as occurring in project region, but unconfirmed by other sources (Nagano 1982; Zedler et al. 1992).
Globose dune beetle (*Coelus globosus)*	FSC	Found under dune vegetation, likely in vegetated dunes in study area (USDN 1992).

Common Name (*Scientific Name*)	Status[1]	Occurrence (Reference)
REPTILES		
Silvery legless lizard (*Anniella pulchra pulchra*)	FSC, CSC	Associated with dune plant root systems; known from Tijuana River estuary (Zedler et al. 1992). Also possible in dunes north of Imperial Beach.
Orange-throated whiptail (*Cnemidophorus hyperythrus)*	FSC, CSC	Coastal scrub, chaparral habitats (Shaw 1950), possible in study area (USFWS 1994b), most likely in backdune coastal scrub habitats at north end of study area (Silver Strand State Beach) and at Tijuana River estuary.
Coastal western whiptail (*Cnemidophorus tigris multiscutatus*)	FSC	Coastal scrub, widely distributed in southern California, possible in vegetated dune and coastal scrub habitats in study area (USFWS 1994b).
San Diego banded gecko (*Coleonyx variegatus abbotti*)	FSC	Coastal foothills (Shaw 1950), possible in study area (USFWS 1994b).
Northern red diamond rattlesnake (*Crotalus ruber ruber)*	FSC, CSC	Widespread in San Diego County (Perkins 1949), possible in study area (USFWS 1994b), most likely in backdune coastal scrub habitats.
San Diego ringneck snake (*Diadophis punctatus similis)*	FSC	Moist places throughout San Diego County (Perkins 1949), possible in study area (USFWS 1994b)
Coronado skink (*Eumeces skiltonianus interparietalis*)	FSC, CSC	Silver strand endemic, possible in study area (USFWS 1994b).
Coastal rosy boa (*Lichanura trivirgata rosafusca*)	FSC	Widespread in rocky chaparral habitats of San Diego County (Perkins 1949), cited by USFWS (1994b) as possible in study area.
San Diego horned lizard (*Phyronsoma coronatum blainvillii*)	FSC, CSC	Inhabits sandy soils, feeds on wood ants, harvester ants. Known from backdune habitats on the Silver Strand (USDN 1992).
Coast patch-nosed snake (*Salvadora hexalepis virgultea*)	FSC, CSC	Scrub habitats, widespread in San Diego County (Perkins 1949), possible in study area (USFWS 1994b).
BIRDS		
Cooper's hawk (*Accipiter cooperi)*	CSC	Fall migrant at Point Loma, possible transient elsewhere (Unitt 1984).
Sharp-shinned hawk (*Accipiter striatus*)	CSC	Occasionally seen during winter migration; fall migrants at Point Loma (USDN 1992).
Tricolored blackbird (*Agelaius tricolor)*	FSC, CSC	Freshwater marshes (Unitt 1984); doubtful in study area given lack of habitat.
Short-eared owl (*Asio flammeus*)	CSC (nesting only)	Winter visitor to salt marshes, e.g., Sweetwater Marsh (Unitt 1984; MBA 1990).
Western burrowing owl (*Athene cunicularia hypugea*)	FSC, CSC	Occupies ground squirrel burrows in coastal dune areas; large colony on North Island (USDN 1992); also possible on riprap.
Black tern (*Chlidonias niger*)	FSC, CSC	Uncommon migrant, summer visitor, San Diego Bay, Tijuana River estuary (Unitt 1984).
Northern harrier (*Circus cyaneus*)	CSC (nesting only)	Occasional migrant, reported from south San Diego Bay (USDN 1992), Tijuana River estuary (Zedler et al. 1992).
Reddish egret (*Egretta rufescens*)	FSC, CSC	Rare visitor to San Diego Bay, occurs in salt marshes, shorelines of sloughs and river channels (USDN 1992).
California horned lark (*Eremophila alpestris actia*)	CSC	Nesting population around San Diego Bay, also a common migrant (Unitt 1984); possible along Silver Strand, Tijuana River estuary.
Merlin (*Falco columbarius*)	CSC	Rare winter and early spring migrant, predatory on shorebirds (USDN 1992); likely as an occasional forager in study area.
Prairie falcon (*Falco mexicanus*)	CSC (nesting only)	Rare to uncommon migrant, winter visitor; occurs in fields, grassland (USDN 1992); doubtful in study area.
Common loon (*Gavia immer*)	CSC (breeding only)	In San Diego Bay, uncommon to fairly common migrant and winter visitor, rare to uncommon in summer (USDN 1994); expected less frequently in open ocean, Tijuana River estuary.

Common Name (*Scientific Name*)	Status[1]	Occurrence (Reference)
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Resident of beach and upland areas around San Diego Bay (MBA 1990); expected along Silver Strand and around Tijuana River estuary.
California gull *(Larus californicus)*	CSC (nesting colony only)	Abundant fall-through-spring resident in shoreline habitats, throughout San Diego Bay (USDN 1992).
Long-billed curlew (*Numenius americanus*)	CSC (breeding only)	Common during migration, winter, occasional as a summer visitor; occurs on mudflats, salt marshes, fields (USDN 1992; USDN 1994).
Osprey *(Pandion haliaatus carolinensis*)	CSC (nesting only)	Uncommon visitor (non-breeding) occasionally along North Island shoreline (USDN 1994); observed feeding on fish in Oneonta Slough, January 2001 (this study).
Large-billed savannah sparrow *(Passerculus sandwishensis rostratus*)	FSC, CSC	Formerly a winter visitor, not seen recently (Unitt 1984); possible at Tijuana River.
Double-crested cormorant (*Phalacrocorax auritus)*	CSC (rookery only)	Common non-breeding visitor, rookery at Saltworks in south San Diego Bay; expected along shoreline of North Island (USDN 1994) and along Silver Strand.
White-faced Ibis *(Plegadis chihi*)	FSC, CSC	Uncommon migrant, rare winter visitor; reported from Tijuana River mouth (Unitt 1984).
Black skimmer (*Rynchops niger*)	CSC (nesting colony only)	Common resident, breeding in south San Diego Bay; likely in nearshore habitats on North Island and elsewhere (USDN 1994).
Elegant tern (*Sterna elegans*)	FSC, CSC (nesting colony only)	Nesting colony in south San Diego Bay; common on beaches, mudflats, open water, and resting on shoreline structures (USDN 1994); likely along Silver Strand.
Gull-billed tern *(Sterna nilotica*)	CSC (nesting colony only)	Nests at Saltworks in south San Diego Bay, most sightings also in south bay (USDN 1994); possible foraging along Silver Strand.
MAMMALS		
San Diego black-tailed jackrabbit (*Lepus californicus bennetti*)	FSC, CSC	Locally common along Silver Strand (USDN 1992, 1995); observed at Silver Strand State Beach, January 2001 (this study).
Dulzura California pocket mouse *(Perognathus californicus femoralis*)	FSC, CSC	Open scrub habitats, Santa Margarita River mouth, southward into Baja California (Hall 1981).
Northwestern San Diego pocket mouse (*Perognathus fallax fallax*)	FSC, CSC	Open scrub habitats, western San Diego County and Baja California (Hall 1981).

Notes: 1. FSC = Federal Species of Concern SE = State listed as endangered
ST = State listed as threatened CSC = State listed Species of Special Concern
CNPS 1B = California Native Plant Society List 1B, rare and endangered throughout range
CNPS 2 = California Native Plant Society List 1B, rare and endangered in California but not elsewhere.

There are no threatened and endangered fish species that occur in the study area.

Several species of threatened and endangered marine mammals (such as blue, fin, sei, humpback, and sperm whales) may occur in deep offshore areas off the San Diego County coast, but none are expected in the nearshore study area.

4.5.4.1 *Threatened and Endangered Species*

State and Federally Listed Species

State or federally listed threatened and endangered species that likely occur in the vicinity of the study area, or are otherwise of high concern because of status and vulnerability, include the following:

- ***Salt marsh bird's beak***: This State- and federally listed endangered plant occurs in upper intertidal estuarine salt marsh habitats, often in wetland-upland transition zones. The Tijuana River Estuary is one of only five locations where this plant occurs (Zedler et al., 1992).
- ***California brown pelican***: This State- and federally listed endangered species nests on offshore islands but is a common visitor and seasonal resident in the study area, foraging in nearshore waters and resting on piers and other shoreline structures. It is one of the most common waterbirds in San Diego Bay (see recent data on abundance in USDN 1995].
- ***Light-footed clapper rail***: This State- and federally listed endangered species nests in cordgrass marshes bordering channel-mudflat habitats in the Tijuana River Estuary, especially in the central and northern parts of the estuary (Zedler et al., 1992; USACE, 1995a).
- ***Western snowy plover***: This federally listed threatened species (also a State species of special concern) nests on sandy beaches and open flats, foraging along adjacent shorelines. Known nesting sites include dikes in the Salt Works in southern San Diego Bay (Stadtlander, 1993), dunes at the mouth of the Tijuana River (Zedler et al., 1992), and beaches on the outer coast of North Island and the Silver Strand (USDN, 1993; 1995). Wintering and migratory birds are also present, foraging and resting on beaches of the region (USFWS, 1993). Area beaches north and south of the city of Imperial Beach are designated Critical Habitat for this species (USFWS, 1999).
- ***California least tern***: This State- and federally listed endangered species nests in the beach and dunes fronting the Tijuana River estuary and forages in nearshore waters of the estuary, open ocean, and San Diego Bay. Nesting also occurs at other sites around San Diego Bay. The total breeding population in this region averages 150-300 pairs (Stadtlander, 1995). This species is present in the region from early spring through late summer, wintering in Mexico.
- ***Belding's savannah sparrow***: This State-listed endangered species (also a Federal species of concern) is a resident of the Tijuana River estuary, inhabiting pickleweed marsh of middle- to upper-intertidal elevations. As of 1990, roughly 300 pairs nested in the estuary, accounting for at least 10 percent of the State's population (Zedler et al., 1992).
- ***Pacific pocket mouse***: This federally listed endangered species (also a states special concern species) appears closely associated with fine sandy soils supporting open coastal scrub, coastal strand, or salt marsh vegetation. It is endemic to the immediate coast of southern California and was known historically from the margins of the Tijuana River estuary, but was not found there in a recent intensive trapping effort (USFWS, 1994a).

Proposed and Candidate Species

There are no proposed or candidate species likely to occur in areas affected by the project.

4.5.4.2 *State and Federal Species of Concern*

Vegetated coastal dunes north and south of Imperial Beach support a variety of State- and federally recognized species of concern (Table 4.5-2). Several species of concern are reasonably likely on intertidal beaches and manmade structures, or offshore. They include those described below.

- ***Nuttall's Lotus***: This species is known from several sites, including disturbed areas of compacted sand and weedy vegetation on the Silver Strand and around San Diego Bay. A population exists in the disturbed backdune habitat seaward of the Naval Communications Facility fenceline.
- ***Barrier beach tiger beetle***: This species occurs on sandy beaches and is described as sensitive to contact with humans (Nagano, 1982). As such it would not be expected along Imperial Beach due to relatively high beach

use by humans, but would be possible to the north, and likely at Border Field State Park to the south (Zedler et al., 1992).

- ***Common loon, double-crested cormorant, California gull, black skimmer, and elegant tern***: These waterbirds are likely to occur along area beaches and piers, or foraging in nearshore waters (Unitt, 1984; USDN, 1993).

4.6 CULTURAL RESOURCES

4.6.1 Cultural History

The study area has been witness to human activity for over 12,000 years. The prehistory of San Diego County is divided into three broad temporal periods: Paleoindian, Archaic, and Late Prehistoric. The Paleoindian Period (12,000-8,000 year B.P. [before present]) is characterized by primarily hunting cultures in the study area that are referred to by archeologists as San Dieguito. The artifact assemblage is dominated by flaked stone tools and is marked by a paucity of plant processing artifacts. The Archaic Period (8,000 to 2,000 years B.P.) exhibits milling technology needed for plant processing indicating a shift of focus from hunting to food collecting. Subsistence strategies diversified during the Late Prehistoric Period (post 2,000 years B.P.). In ethno-linguistic terms, the study area is the ancestral home of the Kumeyaay. Within this culture group there are several dialects and the indigenous inhabitants of the study area are called, by some, the Tipai, which means “people” (Luomala 1978). The Tipai are part the Yuman language stock and were called the Diegueno by European-Americans in reference to San Diego Mission. The current population is localized on reservation lands in the mountains east and northeast of the study area.

The first European presence in the study area was the Spanish in 1542 with the exploration directed by Cabrillo. The next exploration to the area was Vizcaino in 1603 with three vessels and 200 men (Pettus, 1985). Spanish settlement did not commence until 1769 when a presidio and mission were dedicated overlooking San Diego Bay. The first non-Indian settlers in Imperial Beach arrived in the 1880s. Many were former residents of Imperial Valley, hence the name Imperial Beach. Imperial Beach is bordered to the north and southeast by military installations that were created during World War II. The Silver Strand area to the north was used for amphibious landing training.

4.6.2 Cultural Resources Setting

The terrestrial portion of the project's area of potential effects (APE [study area]) was surveyed in 1973 by an archeologist from San Diego State University with negative results (Ezell, 1973). A survey of the beach portions of the project was performed again in 1994 by an archeologist from the USACE. No cultural resources of any significance were observed. The buildings along the beach, and the Imperial Beach pier are all less than 50 years in age. The absence of archeological remains can be attributed to erosional and depositional processes. The land-based deposits within the APE are derived primarily from the Tijuana River downcast, as well as dredge materials from San Diego Bay.

The marine portion of the APE (study area) however, has not been completely surveyed. Proposed borrow site Area A has been the subject of an archival search, including a review of remote sensing surveys in the area (Pettus and Hildebrand, 2000). The report recommends the collection of side-scan sonar data along with direct examination of all sonar targets. There is high potential for prehistoric and historic cultural resources. Proposed borrow site Area B has not been the subject of any marine cultural resources study. There is potential for the presence of prehistoric and cultural resources.

Based upon USACE consultation with the State of California, Department of Parks and Recreation, review of Department of Interior, Minerals Management Service archeological site and shipwreck data (Pierson, 1987), along with two shipwreck publications entitled *Shipwrecks of Southern California* (Cardone and Smith, 1989) and *California Shipwrecks, Footsteps in the Sea* (Marshall, 1978), six underwater resources are potentially located within the project's APE. The six resources involve the following:

Resource type	Name	Date of Loss
Barge	Sea Products	1931
?	Y C #689	1943
Submarine	S-37	1945
Bomb Target	?	?
Destroyer	USS Hogan	?
Military Aircraft	S2F Tracker	?

The submarine S-37 (SS-142) was launched in 1919 and earned five battle stars during World War II (U.S. Naval Historical Center, 1976). S-37 was decommissioned in 1945 and was sunk off Imperial Beach to be used as a target for aerial bombing. The submarine is potentially eligible for listing in the National Register of Historic Places.

4.6.3 Applicable Plans, Policies and Regulations

The Federal government has developed laws and regulations designed to protect cultural resources that may be affected by actions undertaken, regulated, or funded by Federal agencies. The National Historic Preservation Act (NHPA) of 1966 established the Advisory Council on Historic Preservation (ACHP) and State Historic Preservation Officers (SHPO) to assist Federal and State officials regarding matters related to historic preservation. Section 106 of the Act requires Federal agencies to consider the effects of an action on cultural resources in or eligible for listing in the National Register of Historic Places (NRHP). The administering agency, the ACHP, has authored regulations implementing Section 106 located in 36 CFR Part 800, *Protection of Historic Properties* (recently revised, effective December 12, 2000).

The proposed project and its alternatives are considered an undertaking, and therefore must comply with the NHPA. The NHPA provides detailed procedures called the Section 106 process by which the

assessment of impacts on archaeological and historical resources, as required by the Act, is implemented.

According to NHPA, three steps are required for compliance: 1) identification of significant resources that may be affected by an undertaking; 2) assessment of project impacts on those resources; and 3) development and implementation of mitigation measures to offset or eliminate adverse impacts.

Identification and National Register Historic Places Evaluation

36 CFR Part 800.3 discusses the consultation process. Section 800.4 sets outlines the steps the agency must follow to identify historic properties. 36 CFR 800.4(c)(1) sets out the process for National Register of Historic Places (NRHP) eligibility determinations.

The Historic Sites, Buildings and Antiquities Act of 1935 established the NRHP and gives the responsibility for carrying out this policy to the U.S. Department of the Interior, National Park Service (NPS). Per NPS regulations 36 CFR 60.4 and guidance published by the NPS, "National Register Bulletin, Number 15, How to Apply the National Register Criteria for Evaluation", different types of values embodied in districts, sites, buildings, structures, and objects are recognized. These values fall into the following categories:

- **Associate Value (Criteria a and b):** Properties significant for their association or linkage to events (Criterion a) or persons (Criterion b) important in the past.
- **Design or Construction Value (Criterion c):** Properties significant as representatives of the manmade expression of culture or technology.
- **Information Value (Criterion d):** Properties significant for their ability to yield important information about prehistory or history.

Cultural resources that are determined eligible for listing in the NRHP, along with SHPO concurrence, are termed "historic properties" under Section 106, and are afforded the same protection as sites listed in the NRHP.

Results of Identification and Evaluation

Results of literature searches, field surveys and tribal consultation are coordinated with the SHPO staff. 36 CFR Part 800.4(d) stipulates that when an agency finds that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them, then the agency will make a "no historic properties affected" determination. If the agency finds that there are historic properties that may be affected by the undertaking, the agency will make a "historic properties affected" determination.

4.7 AESTHETICS

Aesthetic considerations associated with the project focus on views of and from the coastal section of Imperial Beach. For detailed description of land uses and recreational activities in Imperial Beach see Sections 4.12 (Land Use) and 4.13 (Recreation).

The study area boundaries for aesthetic considerations include:

- Coronado/Imperial Beach boundary on the north
- Pacific Ocean on the west, where views from the beach on clear days can extend many miles offshore
- 5.6 kilometers (3.5 miles) of beach extending south from the Coronado/Imperial Beach Boundary to the U.S.-Mexico border
- Residential, recreational, and commercial beachfront properties on the west side of Seacoast Drive
- Beachfront portions of the Tijuana River National Estuarine Research Reserve and Border Field State Park.

With the exception of Pacific Ocean views, the northern portion of the study area is generally disturbed and is not of high scenic quality. Conversely, the southern portion of the study area, which includes the beach frontage areas of the Tijuana River Estuary and Border Field State Park, is generally devoid of human development and consists mainly of natural views. However, views to the south from Border Field State Park toward Mexico include the densely populated and highly urbanized City of Tijuana. Views to the west of the entire study area are of the Pacific Ocean.

In the northern portion of the study area, starting at the Coronado/Imperial Beach boundary, long range views from the beach, looking to the south include sandy beaches, and a string of beachfront condominiums and apartments, combined with general background views of the rolling hills and sand dunes of the Tijuana River Estuary. Foreground views to the south and east consist of more predominant views of individual residential land uses, many of which have protective structures such as concrete seawalls, large boulders, and concrete riprap on the beachfront portions of properties to protect against storm damage.

Views eastward from the beach are usually impeded by residential properties along the beachfront, which in this area range from one to four stories in height and therefore impede views of Seacoast Drive from most places on the beach. Other views to the east include the recreational facilities associated with Pier Plaza and Dunes Park. In general, views of the Pacific Ocean to the west are not impeded by man-made objects with the exception of the Imperial Beach Fishing Pier, two groins made of large boulders, and scattered boats on the water. There is a bait and tackle/snack shop located at the end of the Fishing Pier. The beaches of Imperial Beach in some areas are very narrow due to the depletion of sand. The width of the beach changes depending on the time of the year and related tide conditions.

In the southern portion of the study area, long-range views to the south and west include the continuation of the beach and the Pacific Ocean. Views to the east predominantly consist of the Tijuana

River Estuary. Vistas consist of riparian habitat, coastal sage scrub, agricultural land, sand dunes, mudflats, and wetlands. From the beachfront area looking east, foreground views mainly consist of sand dunes and sparse vegetation. Upon closer approach to the U.S./Mexico border, Border Field State Park, located at the top of the bluff at the coast, comes into view. Views of this park include landscaped areas with occasional trees and picnic tables. Because of its proximity to the Mexican border and unimpeded views to the south, the U.S. Border Patrol uses this park for surveillance purposes. From the park, long-range views to south and east include the border fence and land uses in Mexico such as a bullring, a lighthouse, large single-family homes on the hillsides, smaller beachfront properties such as apartments, and commercial uses such as small shops and restaurants. Views to the south and west include the Pacific Ocean and portions of the border fence that continue into the ocean. The border fence is a solid metal fence, approximately ten feet high, and therefore impedes the majority of short-range views to the south from the beach. The bullring and lighthouse dominate short-range views to the southeast. In general, views to the south into Mexico are of poor scenic quality due to the proximity of the border fence and the poor condition of many properties.

4.8 AIR QUALITY

4.8.1 Climate and Meteorology

The proposed action is located within San Diego Air Basin (SDAB), which has the same boundaries as the County of San Diego. The SDAB has a Mediterranean climate characterized by mild winters, when most rainfall occurs, and warm, dry summers. The most important climatic and meteorological characteristics influencing air quality in the study area are the following: the presence of a semi-permanent high pressure center over the Pacific Ocean, persistent temperature inversions, mountain ridge and valley topography, and prevalent sunlight.

Monthly climate summaries for a monitoring station (Chula Vista) located in the vicinity of the study area were selected to characterize the climate of the study area. As described in Table 4.8-1, summer mean high and low temperatures (August) at the study area are 75.2EF (24.0EC) and 64.7EF (18.2EC), respectively. Winter mean high and low temperatures (January) are 64.7EF (18.2EC) and 44.8EF (7.1EC), respectively. Rainfall averages approximately 24 cm (9 inches) per year. Most of the annual rainfall comes from the fringes of mid-latitude storms from November to March, with summers often completely dry except for occasional widely scattered thundershowers.

Monthly average wind speeds at Imperial Beach range from 5 miles per hour (mph) to 7 mph. The wind speed averages 5 mph from August to November, 6 mph from December to March, and 7 mph from April to May. The average prevailing wind direction is from the west between March and September, and from the east between November and February (National Weather Service, 1995).

Table 4.8-1 Monthly Temperature and Precipitation Averages in the Study Area

Month	Temperature				Precipitation	
	Maximum		Minimum			
	EC	EF	EC	EF	cm	inches
January	18.2	64.7	7.1	44.8	4.95	1.95
February	18.6	65.4	7.9	46.3	4.09	1.61
March	18.4	65.2	9.5	49.1	4.57	1.80
April	19.3	66.8	11.2	52.1	1.93	0.76
May	19.8	67.6	13.5	56.3	0.43	0.17
June	20.9	69.6	15.3	59.5	0.18	0.07
July	22.9	73.3	17.5	63.5	0.05	0.02
August	24.0	75.2	18.2	64.7	0.18	0.07
September	24.1	75.3	17.1	62.7	0.43	0.17
October	22.8	73.0	13.7	56.7	0.84	0.33
November	20.8	69.4	9.7	49.5	3.05	1.20
December	18.5	65.3	7.0	44.6	3.02	1.19

Note: Period of record is from July 1, 1948 to July 31, 2000.
Source: WRCC, 2000.

4.8.2 Existing Air Quality

Criteria Pollutants. The quality of the surface air (air quality) is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. The degree of air quality degradation is then compared to the *ambient air quality standards* (AAQS). The air pollutants that are regulated by these standards are called "criteria pollutants." The current California and National Ambient Air Quality Standards (CAAQS and NAAQS) are listed in Table 4.8-2. As described in Table 4.8-2, the CAAQS are generally more stringent than the corresponding NAAQS.

A summary of the air quality status in the SDAB, relative to the AAQS, is provided in Table 4.8-3. Nonattainment is a term used to indicate the violation of a particular AAQS. Air quality in the SDAB regularly exceeds the CAAQS and NAAQS for ozone (O_3) and CAAQS for fine particulate matter (PM_{10}). As a result, the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have classified the SDAB as nonattainment of the NAAQS and CAAQS for O_3, and CAAQS for PM_{10}.

Annual ambient air quality monitoring is conducted at three locations (i.e., Chula Vista, Otay Mesa, and the City of San Diego [12th Street]) in the vicinity of the project. Between 1996 and 1998, all three monitoring station recorded air pollutant concentration for O_3, NO_X, PM_{10}, and CO. Table 4.8-4 presents the results from these monitoring stations for the years 1996 through 1998.

Table 4.8-2 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]	National Standards[2]
Ozone (O_3)	8-hour	NS	0.08 ppm[3]
	1-hour	0.09 ppm	0.12 ppm
Carbon Monoxide (CO)	8-hour	9.0 ppm	9.0 ppm
	1-hour	20 ppm	35 pm
Nitrogen Dioxide (NOx)	Annual Average	NS	NS
	1-hour	0.25 ppm	0.053 ppm
Sulfur Dioxide (SOx)	Annual Average	NS	0.03 ppm
	24-hour	0.05 ppm	0.14 ppm
	1-hour	0.25 ppm	NS
Fine Particulate Matter (PM_{10})	Annual Arithmetic Mean	NS	50 µg/m³
	Annual Geometric Mean	30 : g/m³	NS
	24-hour	50 : g/m³	150 µg/m³
Fine Particulate Matter (PM2.5)[3]	Annual Arithmetic Mean	NS	15 µg/m³
	24-hour	NS	65 µg/m³

Notes: ppm=parts per million; $\mu g/m^3$; NS=no standard

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, and PM_{10} are values that are not to be excluded. If the standard is for a 1-hour, 8-hour, or 24-hour average, then some measurements may be excluded. In particular, measurements are excluded that California Air Resources Board determines would occur less than once per year on the average.
2. National standards other than for ozone and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. For example, the ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one.
3. In 1997, U.S. EPA established an 8-hour standard for ozone, and annual and 24-hour standards for very fine particulate matter (PM2.5). However, the U.S. EPA's new standards were challenged in court, and as of December 2000, their status was uncertain.

Table 4.8-3 Attainment Status of San Diego Air Basin

Air Basin	O_3		CO		NO_2		SO_2		PM_{10}	
	State	Federal	State	Federal	State	Federal	State	Federal	State	Federal
San Diego	N	N	A	U/A	A	A	A	A	N	U

Notes: A = Attainment of Standards; N = Non-Attainment of Standards; U/A = Unclassified/Attainment; U = Unclassified

Sources: U.S. EPA, 2000; CARB, 2000; SDCAPCD, 2001.

Table 4.8-4 Air Quality Summary[a]

Standards	Monitoring Stations								
	San Diego (12th Street)			Chula Vista			Otay Mesa		
	1996	1997	1998	1996	1997	1998	1996	1997	1998
OZONE (1-Hour) STANDARD									
Maximum Concentration (ppm)	0.11	0.12	0.10	0.10	0.12	0.10	0.11	0.12	0.09
Days > CAAQS (0.09 ppm)	1	5	1	1	10	2	6	7	0
Days > NAAQS (0.12 ppm)	0	0	0	0	0	0	0	0	0
NO_2 (1-Hour) STANDARD									
Maximum Concentration (ppm)	0.11	0.14	0.09	0.08	0.11	0.10	0.12	0.11	0.13
Days > CAAQS (0.25 ppm)	0	0	0	0	0	0	0	0	0
PM_{10} (24-Hour) STANDARD									
Maximum Concentration (µg/m³)	92	74	48	62	58	39	93	125	89
Days > CAAQS (50 µg/m³)[b]	1/59	3/60	0/56	2/60	2/60	0/59	15/54	21/61	18/61
Days > NAAQS (150 µg/m³)[b]	0/59	0/60	0/56	0/60	0/60	0/59	0/54	0/61	0/61
CO (8-Hour) STANDARD									
Maximum Concentration (ppm)	5.4	5.4	4.8	3.4	3.8	2.7	5.8	4.6	4.0
Days > CAAQS (9.0 ppm)	0	0	0	0	0	0	0	0	0
Days > NAAQS (9.0 ppm)	0	0	0	0	0	0	0	0	0

Notes: ppm=parts per million; $\mu g/m^3$=micrograms per cubic meter; NM = not monitored

[a] *Source: CARB, Summary of 1993, 1994, and 1995 Air Quality Data, Gaseous and Particulate Pollutants*

[b] "Days" for PM_{10} are given as exceedances/number of annual measurements.

As indicated in Table 4.8-4, the monitoring stations recorded maximum 1-hour concentrations ranging from 0.09 ppm to 0.12 ppm. The Otay Mesa station recorded the most days (13 days) during the period from 1996 to 1998 that exceeded the ozone CAAQS, while the San Diego station recorded the least amount of days (7 days) that exceeded the CAAQS. There were no violations of the ozone NAAQS from 1996 to 1998. With regard to fine particulate matter (PM_{10}), the San Diego and Chula Vista stations each recorded 4 days that exceeded the PM_{10} CAAQS for ozone between the period of 1996 and 1998, while the Otay Mesa Station recorded 54 days that exceeded of the CAAQS for ozone between the period of 1996 and 1998. The stations did not record violations of the NAAQS for PM_{10} during the three-year sample period. There were no State or Federal violations recorded for nitrogen dioxide or carbon monoxide.

Air Toxic Contaminants. In addition to criteria pollutants, other regulated pollutants include toxic air contaminants (TACs), which are suspected or known to cause cancer, genetic mutations, birth defects, or other serious illnesses in exposed people. TACs are not regulated by the NAAQS or CAAQS, but are addressed by the National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Title III of the 1990 Clean Air Act Amendments.

The concentrations of toxic pollutants are determined by the level of emissions at the source and the meteorological conditions encountered as these pollutants are transported away from the source. Thus, impacts from toxic pollutant emissions tend to be site specific and their intensity is subject to constantly changing meteorological conditions. The worst meteorological conditions that affect short-term impacts (low wind speed, highly stable air mass, and constant wind direction) occur relatively infrequently.

4.8.3 Applicable Plans, Policies, and Regulations

Federal and State Regulations. Federal, State, and regional agencies have established standards and regulations that affect proposed projects. The following Federal and State regulatory considerations may apply to the project and to the alternatives.

Federal Regulations and Standards

- The Federal Clean Air Act of 1970 directs the attainment and maintenance of National Ambient Air Quality Standards (NAAQS). The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and fuel reformulation (Title II), hazardous air pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII).
- The U.S. Environmental Protection Agency (U.S. EPA) implements New Source Review (NSR) and Prevention of Significant Deterioration (PSD). PSD applies to major sources with annual emissions exceeding either 100 or 250 tons per year (TPY) depending on the source, or that cause or contribute adverse impacts to any Federally classified Class I area.
- The U.S. EPA implements the NAAQS and determines attainment of Federal air quality standards on a short- and long-term basis.
- The Proposed Action would involve Federal funding, which requires evaluation for general conformity with the State Implementation Plan (SIP) as required by the 1990 Clean Air Act Amendments. Under 40 CFR (Code of Federal Regulations) Section 93.153 (Applicability), if the total estimated direct and indirect

emissions from the Proposed Action are below the reactive organic compounds and nitrogen oxide general conformity *de minimis* emission thresholds of 50 tons per year, the Proposed Action would be exempt from performing a comprehensive Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP. PM_{10} emissions are not evaluated under general conformity requirements because the study area is located within an undefined area with respect to the NAAQS.

State Regulations and Laws

- The California Air Resources Board (CARB) has established the California Ambient Air Quality Standards (CAAQS) and determines attainment status for criteria air pollutants.
- The California Clean Air Act (CCAA) went into effect on January 1, 1989 and was amended in 1992. The CCAA mandates achieving the health-based CAAQS at the earliest practicable date.
- Assembly Bill No. 531 was signed into law on October 12, 1995. This law authorizes CARB to establish an optional program for the registration and regulation of portable internal combustion engines, defined as those capable of being carried or moved from one location to another and does not remain at a single location for more than 12 consecutive months. In 1996, additional legislation (Assembly Bill 2635 and Senate Bill 1880) included associated equipment in the Statewide Registration Program. Engines and associated equipment registered under this program are allowed to operate throughout the State without having to obtain authorization or permits from air quality management and air pollution control districts.
- The California Health and Safety Code, Division 26 Air Resources, Part 6 Air Toxics Hot Spots Information and Assessment, Section 44300, requires an inventory of air toxics emissions from individual existing facilities, an assessment of health risk, and notification of potential significant health risk when found to be present.
- California Health and Safety Code, Division 26 Air Resources, Chapter 6 Facility Toxic Air Contaminant Risk Reduction Audit and Plan, Section 44390, provides guidelines to identify a more realistic health risk, requires high risk facilities to submit an air toxic emission reduction plan, holds air districts accountable for ensuring that the plans will achieve their objectives and that high risk facilities will be required to achieve their planned emission reduction.
- California Health and Safety Code, Division 26 Air Resources, Chapter 3.5 Toxic Air Contaminants, Article 2.5 Coordination with the Federal Act, Section 39656, sets forth provisions to implement the Federal program for hazardous air pollutants.
- California Health and Safety Code, Division 26 Air Resources, Part 4 Nonvehicular Air Pollution Control, Chapter 4 Enforcement, Section 42301.6, requires new or modified sources of air contaminants located within 1,000 ft. from the outer boundary of a school to give public notice to the parents of school children before an air pollution permit is granted.
- Section 21151.4 of the California Public Resources Code, Division 13 Environmental Quality, Chapter 4 Local Agencies, addresses Hazardous Air Pollutant releases within one-fourth mile of a school site.

Regional and Local Regulations. The Imperial Beach Shore Protection Project would be located within the SDAB. Emissions that would result from the construction and operation of the project are subject to the rules and regulations of the San Diego County Air Pollution Control District. Rules and regulations of this agency are designed to achieve defined air quality standards that are protective of public health. To that purpose they limit the emissions and the permissible impacts of emissions from projects, and specify emission controls and control technologies for each type of emitting source in order to ultimately achieve the air quality standards.

4.9 NOISE

This section describes the existing noise environment as it relates to the implementation of shore protection measures at Imperial Beach, California. Specifically, Section 4.9.1 describes the existing environmental baseline conditions, while Section 4.9.2 describes the regulatory baseline.

4.9.1 Environmental Baseline

4.9.1.1 *General Noise Information*

A noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft overflight to virtually continuous noise from traffic on an adjacent street.

To describe noise environments and to assess impact on noise sensitive areas, a frequency weighting measure that approximates human perception is customarily used. It has been found that *A-weighting* of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is the one cited in most noise criteria. Table 4.9-1 lists typical sound levels measured in the environment and characterizes the subjective human response to various intensities of noise.

Table 4.9-1 Typical Sound Levels Measured in the Environment

Common Sounds	A-Weighted Sound Level in Decibels	Subjective Impression
Oxygen Torch	120	Extremely Loud
Rock Band	110	
707 Landing at 370 feet 707 Takeoff at 1000 feet	100	Very Loud
Diesel at 50 feet	90	
Garbage Disposal	80	Moderately Loud
Vacuum Cleaner at 10 feet	70	
Air Conditioner at 100 feet	60	
Quiet Urban Daytime	50	Quiet
Quiet Urban Nighttime	40	
Bedroom at Night	30	
Recording Studio	20	Just Audible
Threshold of Hearing	10 0	Not audible

Source: Aviation Planning Associates. 1978 and 1979.

Several standards or "metrics" are used in the assessment of noise impacts. These include the median level, the day-night average, and the Community Noise Equivalent Level (CNEL). The median is the decibel level exceeded 50 percent of the time (and commonly designated by "L_{50}"). The interval can be the day, night, or 24-hour period. The day-night average (L_{dn}) is a 24-hour weighted average, wherein 10 dBA is added to noise measured from 10 p.m. to 7 a.m. The CNEL is also a weighted average, wherein 5 dBA is also added to measured noise between 7 p.m. and 10 p.m. The “peak” noise level is

often computed by L_{10}, the noise level exceeded 10 percent of the time. The background level is often computed in terms of L_{90}.

4.9.1.2 *Physical Environment*

Three major sources of noise exist in Imperial Beach: vehicular traffic along major arterial roadways, helicopter noise from the Imperial Beach Naval Outlying Landing Field (Ream Field), and temporary construction activities. A description of the noise generated from each source category is described below in the following paragraphs.

Motor Vehicle Traffic Along City Streets and Highways. Vehicular traffic noise is noticeable particularly when trucks are using arterial roadways near noise-sensitive land uses. According to the Noise Impact Study, General Plan Update EIR (Imperial Beach, 1994), roadways in Imperial Beach that currently have the potential to cause noise problems because of traffic are:

- SR 75/Palm Avenue
- Imperial Beach Boulevard
- Elm Avenue
- 9th Street
- 13th Street
- 1st Street.

The Noise Impact Study also presents Noise Monitoring Summary data (Table 1 of that report) for a variety of sensitive receptors throughout the City of Imperial Beach.

Helicopter Operations. The City of Imperial Beach includes the Imperial Beach Naval Outlying Landing Field, a helicopter training facility located south of Tower Road and east of the Tijuana Slough National Wildlife Refuge. This facility serves as an outlying field for the North Island Naval Air Station, and the activity level varies from day to day. Studies completed in 1989 and 1992, as referenced in the General Plan Update Noise Impact Study, show that portions of adjacent residential neighborhoods north and northwest of the facility could experience noise levels between 60 and 70 CNEL.

Temporary Construction Activities. These activities, which can include pavement demolition, earth moving, and finish construction, can range from 72 to 90 dBA at 50 feet from the source. Table 4.9-2 lists noise intensities of various pieces of construction equipment from varying distances.

4.9.1.3 *Sensitive Receptors*

Noise-sensitive receptors are facilities or areas (residential areas, hospitals, schools, offices, parks) where excessive noise may cause annoyance or loss of business. Sensitive noise receptors in the vicinity of the study area are generally residences, commercial facilities, and recreational areas along Seacoast Drive, which can be as close as 15 m (50 ft) from the beach fill location. It is estimated that ambient noise levels at the receptor locations vary from approximately 55 dBA to 60 dBA. Sensitive receptors in the study area include:

Table 4.9-2 Equipment and Associated Noise Intensity

Equipment Type	Engine Type	Power Rating (hp)	Noise Intensity (dBA)[1]			
			15m	122m	244m	488m
Dozer	Diesel	250	89	71	65	59
Grader	Diesel	250	89	71	65	59
Backhoe	Diesel	100	86	68	62	56
Dump Truck	Diesel	200	77	59	53	47
Fuel Truck	Diesel	100	77	59	53	47
Water Truck	Diesel	100	77	59	53	47
Pickup Truck	Diesel	100	77	59	53	47
Air Compressor	Diesel	50	86	68	62	56

[1] Data are adopted from U.S. EPA NTID 300.1, 1972, pg.2-108, and other sources (levels are in dBA at 15.25 meter reference distance). These values are based on a range of equipment and operating conditions and that doubling the distance between the source and receptor reduces noise at the receiver by 6 dBA. Values are intended to reflect noise levels from equipment in good condition, with well-fitted mufflers, air intake silencers, etc., operating at near-peak level. In addition, these values assume some averaging of sound level over all directions from the listed piece of equipment.

- From the Coronado/Imperial Beach Border to Imperial Beach Boulevard, and between Seacoast Drive and the Pacific Ocean are oceanfront condominiums and apartments, restaurants, supermarkets, specialty shops, Pier Plaza, the Imperial Beach Fishing Pier, and Dunes Park
- From Imperial Beach Boulevard to the southern terminus of Seacoast Drive are oceanfront condominiums and apartments on the west side of Seacoast Drive
- From the end of Seacoast Drive to the U.S./Mexico Border is the Tijuana River National Estuarine Research Reserve, which includes Border Field State Park
- Recreational beach users.

4.9.2 Applicable Plans, Policies, and Regulations

4.9.2.1 *Federal and State Standards and Regulations*

There are no Federal noise standards that directly regulate environmental noise. Federal regulations safeguard the hearing of workers exposed to occupational noise, enforced by the Office of Safety and Health Administration (OSHA). Further, the U.S. Environmental Protection Agency (U.S. EPA) has developed guidelines on recommended maximum noise levels to protect public health and welfare (U.S. EPA, 1974). For example, 55 dBA is the maximum for the annual average day-night level in outdoor areas (U.S. EPA, 1978).

California encourages each local government entity to perform noise studies and implement a noise element as part of their general plan. Standards and implementation are administered by the California Office of Noise Control. California Administrative Code, Title 4, has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The standards for the City of Imperial Beach are similar to the State compatibility standards, and are described below.

4.9.2.2 *Local Regulations and Standards*

The General Plan and Coastal Plan of the City of Imperial Beach (adopted October 19, 1994) includes a Noise Element that includes the following Noise Policies:

- **N-1 Noise Ordinance:** Develop and adopt an ordinance to control noise and set forth unacceptable noise levels. The City of Imperial Beach has a specific code that regulates noise levels from the construction and operation of a project. Under Section 9.32.020 of Chapter 9.32 it is stated that it is prohibited to use any tools or power machinery so as to cause noise disturbances to anyone working or residing in the vicinity, or in excess of 75 decibels, between the hours of 10 p.m. 7 a.m.
- **N-2 Commercial Vehicles:** Limit the routes, speeds, and operating hours of vehicles generating noise nuisance such as trucks and buses; limit trucks over 5000 lbs load capacity to Highway 75 unless they are making deliveries.
- **N-3 Public Events:** Require permits for public events that use noise-producing activities.
- **N-4 Complaint Center:** Create a center to handle noise complaints; advertise noise ordinance and complaints process periodically.
- **N-5 Land Use Compatibility - Transportation:** Require all new development to meet exterior noise requirements of the compatibility guidelines shown in Table 4.9-3. For areas where the noise environment is conditionally acceptable for a particular land use, development shall be allowed only after noise mitigation has been incorporated into the design of the project to reduce noise levels (Imperial Beach, 1994). For areas where the noise environment is unacceptable for the development of a given use, development is usually not appropriate and shall be allowed only upon the completion of an environmental impact report and the adoption of a statement of overriding social-economic impact.
- **N-6 Technical Reference Manual:** Adopts the Noise Impact Study as part of the Noise Element.

Table 4.9-3 Land Use Compatibility Guidelines for Noise Exposure in Imperial Beach

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE - Ldn or CNEL (db)													
	50		55		60		65		70		75		80	
Residential, Theaters, Auditoriums, Music Halls, Meeting Halls, Churches														
Transient Lodging - Motels, Hotels														
Schools, Libraries, Churches, Hospitals, Nursing Homes														
Playgrounds, Neighborhood Parks														
Office Buildings, Business Commercial and Professional														

Normally Acceptable. Specified land use is satisfactory. No noise mitigation measures are required.

Conditionally Acceptable. Use should be permitted only after careful study and inclusion of protective measures as needed to satisfy the policies of the Noise Element.

Unacceptable. Development is usually nit feasible in accordance with the goals of the Noise Element.

Source: City of Imperial Beach, General Plan and Coastal Plan, 1994.

4.10 SOCIOECONOMICS

This section provides information on population, housing, and employment. The study area for the analysis of potential impacts on socioeconomics is the San Diego Region, as a regional setting, and the City of Imperial Beach, as a local setting.

4.10.1 Socioeconomic Setting

Imperial Beach, first known as South San Diego, was incorporated in 1956 with a population of 12,000. From 1956 to 1990, the City's population growth was as follows: 17,773 in 1960; 20,244 in 1970; 22,689 in 1980; and 26,512 in 1990 (Imperial Beach, 1994). This represents an average growth of approximately 14 percent per decade. The City of Imperial Beach estimates that its ultimate build out population will be about 29,500.

Approximately 80 percent of residents in Imperial Beach have low to moderate income. The mean household size in 1990 was 2.85 and is expected to decline to 2.68 by 2010 (Imperial Beach, 1994). The housing vacancy rate in 1990 was 4.7 percent (Census, 1994).

Imperial Beach serves as a bedroom community to San Diego and from a commercial and employment perspective is relatively isolated (Imperial Beach, 1994). Employment opportunities are predominantly found outside of the City limits. The 1990 unemployment rate for Imperial Beach was 9.9 percent (Census, 1994).

Table 4.10-1 presents current and projected population, housing, and employment data for the San Diego region and the City of Imperial Beach.

Table 4.10-1 Population, Housing, and Employment

Jurisdiction	1990	2000	2005	2015	% Change 1990-2015	Avg. Annual Change 1990-2015
Population						
Imperial Beach	26,512	30,065	31,220	33,273	25.5%	0.9%
San Diego Region	2,498,016	3,004,434	3,267,254	3,763,253	50.6%	1.7%
Housing Units						
Imperial Beach	9,525	10,053	10,529	11,498	20.7%	0.8%
San Diego Region	946,240	1,054,734	1,158,559	1,371,971	45.0%	1.5%
Employment						
Imperial Beach	3,751	3,935	4,446	5,067	35.1%	1.2%
San Diego Region	1,198,265	1,251,962	1,380,067	1,561,394	30.3%	1.1%

Source: San Diego Association of Governments (SANDAG), Interim Forecast, 1995

4.10.2 Applicable Plans, Policies, and Regulations

Executive Order 12898. On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This Order is designed to focus Federal attention on environmental and human health conditions in minority communities and low-income communities. The Order is further intended to

promote non-discrimination in Federal Programs substantially affecting human health and the environment and to provide for information access and public participation relating to such matters.

City of Imperial Beach General Plan/Coastal Plan. Local jurisdictions are required by the State of California to prepare General Plans identifying goals and policies that will guide development within their respective jurisdictions. The Imperial Beach General Plan/Local Coastal Plan is the City's constitution for physical development and change within the City and governs both private and public actions. Goal 11 of the General Plan states:

The overriding goal for Imperial Beach is the retention of the quality of life and atmosphere of a small beach-oriented town:

- A town that is not over crowded or exclusive like many other California beach communities
- A town with a human scale and a relaxed pace of life (Imperial Beach, 1994).

4.11 TRANSPORTATION

This section describes the transportation baseline conditions for the roadways and rail network in the vicinity of the study area. Specifically, Section 4.11.1 describes the existing environmental baseline conditions within the subject study area, while Section 4.11.2 describes the applicable regulatory setting.

4.11.1 Environmental Baseline

Within the study area (which includes the westernmost portion of the City of Imperial Beach), there are several larger arterials and interstate highways. Figures 2.1-1 and 2.1-2 (study area) illustrate the major roadways in the vicinity of the study area.

- **State Route 75**: Silver Strand Boulevard (basically a north-south highway in the City of Coronado, becomes Palm Avenue (an east-west highway) in Imperial Beach. It functions as a six-lane prime arterial in the vicinity of Imperial Beach. 1999 Average Annual Daily Traffic (AADT) along State Route 75 was 49,000 east of 13th Street, and 20,300 between Delaware Street and 7th Street (Caltrans, 2000).
- **Interstate 5**: East of the Imperial Beach city limit, this is California's only continuous north-south highway, ending at the U.S.-Mexico International Border just southeast of Imperial Beach. Interstate 5 is an eight-lane highway with two full diamond lanes. Exits into Imperial Beach include Coronado Avenue (which becomes Imperial Beach Boulevard), State Route 75, and Interstate 905 (east only). The 1999 AADT along Interstate 5 was 102,000 between Coronado Avenue and Interstate 905, and 115,000 between Coronado Avenue and State Route 75 (Caltrans, 2000).
- **Interstate 905:** Interstate 905 is a major east/west facility located two miles north of the US-Mexico International Border. Interstate 905 is currently a four-lane freeway between Interstate 5 and Interstate 805 transitioning to an at-grade arterial facility further east through Otay Mesa in an industrial area in the City of San Diego. The 1999 AADT along Interstate 905 was 35,000 between Interstate 5 and Beyer Boulevard (Caltrans, 2000). It should be noted Caltrans has proposed a six-lane freeway between Interstate 805 and the Otay Mesa Border crossing. The environmental process for this project is scheduled to be complete by early 2002 (Caltrans, 2001).

In addition to the larger arterials and interstate highways, there are several smaller streets immediately adjacent to the shore that may be used to access the proposed study area. Table 4.11-1 presents traffic volume data for the subject roadways in the City of Imperial Beach.

Table 4.11-1 Existing Traffic Volumes Along Local Roads in the City of Imperial Beach

Roadway	Location	Average Daily Traffic (ADT)	Year
Palm Avenue	Seacoast Drive to Delaware Street	12,600	1999
	Delaware Street to 9th Street	23,600	1999
Imperial Beach Boulevard	Seacoast Drive to 9th Street	8,300	1999
	13th Street to 15th Street	19,900	1999
Seacoast Drive	Palm Avenue to Elm Avenue	6,200	1996
	Elm Avenue to Imperial Beach Blvd.	4,900	1999
3rd Street	Palm Avenue to Elm Avenue	1,300	1999
	Elm Avenue to Imperial Beach Blvd.	2,100	1999

Source: SANDAG, 2001.

Airports. There are no public airport facilities in the City of Imperial Beach. However, the Imperial Beach Naval Auxiliary Landing Field, a helicopter training facility, is located south of the Tower Road and east of the Tijuana Slough National Wildlife Refuge.

Transit Service. The San Diego Trolley San Ysidro South Line is located approximately 1.25 miles from the eastern City limits and runs just east of Interstate 5 through the City of San Diego (Imperial Beach, 1994). This line connects downtown San Diego to the U.S.-Mexico border. The City of Imperial Beach is also served by several bus routes that provide local and regional connections, all provided by the Metropolitan Transit Development Board Contract Services:

- Local bus service by route 933/934, which runs through the City along Seacoast Drive. During FY 1992-93, approximately 370,000 revenue miles and carried 1,000,000 total passengers
- Regional bus route 901 serves downtown San Diego, the City of Coronado, and the City of Imperial Beach. Additional service is provided by routes 902/903 with connections from downtown San Diego to the City of Coronado and NAS North Island. During FY 1992-93, these regional routes operated approximately 620,000 revenue miles, and carried 1.2 million total passengers.

Bicycle Facilities. The City of Imperial Beach provides a regional bicycle route connecting from Palm Avenue at the eastern City limits to the City of Coronado at the State Route 75. A portion of the Bayshore Bikeway, a 23-mile network of bike paths and lanes, extends from downtown San Diego, south through National City and Chula Vista, west through northern Otay Mesa and Imperial Beach, and north along State Route 75/Silver Strand Boulevard to the City of Coronado.

4.11.2 Applicable Plans, Policies, and Regulations

Implementation of the proposed shoreline protection project could potentially affect roadway conditions, access, traffic flow, and parking on public streets and highways. As a result, it may be necessary to obtain encroachment permits or similar legal agreements from the public agencies responsible for each

affected roadway. Such permits would be needed for any location where an activity would occur physically within the right-of-way of a public road. These encroachment permits may be issued by the California Department of Transportation (Caltrans), San Diego County, City of Imperial Beach, or the City of San Diego, depending upon which roadways are affected.

Table 4.11-2 lists the General Plan Policies related to traffic and circulation for the City of Imperial Beach.

Table 4.11-2 Imperial Beach Circulation Policies

Policy	Description	Policy	Description
C-1	Street classification plan, design standards, dedication requirements	C-12	Transit facilities provided by new developments
C-2	Street design and access	C-13	Promote ridesharing
C-3	Ream Field access	C-14	Cooperate in SANDAG transportation programs
C-4	Imperial Beach Boulevard identification (re-naming of Coronado Avenue)	C-15	Locate and classify bikeways
C-5	Street improvements to handle increased traffic	C-16	Establish Ecoroute Bikeway
C-6	Traffic signal timing	C-17	Encourage construction of Bayshore Bikeway Extension
C-7	Truck route designation; Oversize load highway system	C-18	Designate sidewalk bike route
C-8	Reduction of 80-foot right of ways	C-19	Encourage bikeways; install bicycle storage facilities
C-9	Support availability of transit services	C-20	Request elimination of SANDAG Bikeway Plans
C-10	Support light rail service to Imperial Beach	C-21	Require/use techniques to create a pleasant walking experience
C-11	Use of bus stops and transfer points	C-22	Provide parking for residents and visitors

4.12 LAND USE

This section presents information on the existing land use patterns in the study area and summarizes the land use regulatory environment. The study area boundary for analysis of impacts on land use is the City of Imperial Beach, including the Tijuana River National Estuarine Research Reserve and Border Field State Park. It should be noted that information on recreational land uses are discussed in detail in Section 4.13 (Recreation).

4.12.1 Characteristics of the Study Area

Imperial Beach is a beach community located north of the U.S./Mexico Border, south of the City of Coronado, and west of the City of San Diego. The study area is generally characterized by a mixture of land uses including residential, open space, recreational, and commercial. Table 4.12-1 lists examples of common land uses categorized according to general land use classifications.

Table 4.12-1 Land Use Classifications

Classification	Examples of Land Uses
Residential	Single or Multi-Family Residential; Condominium or Apartment; Townhouse; Mobile Home Park; Hillside Management Area
Recreational	State, County, City Park; State, County, City Beach or Vista Point; Recreation Facility; Cultural Center, Museum; Campground; Fairgrounds; RV Park Near Recreation Site; Zoo; Golf Course; Drive-In Theater/Nature Conservancy
Open Space	Significant Ecological Area; Environmentally Sensitive Habitat; Wildlife Refuge/Preserve; River, Stream or Floodplain; Coastal Bluffs or Non-Recreational Area; Vacant Urban Land
Institutional	Governmental, public and quasi-public and community-owned facilities; Public and private schools from kindergarten to college/university levels and their support facilities; Post Offices; Libraries; Museums; Places of worship; Day care centers; Police Stations; Government Buildings; Non-profit Housing
Commercial	Store; Business Park; Shopping Center; Retail Plant Nursery; Professional Office
Agricultural	Farm Field; Ranch; Orchard; Wholesale Nursery
Industrial	Oil Well; Oil Refinery; Tank Farm; Substation; Gravel Pit; Concrete Plant; Landfill; Sewer Plant; Transmission Line; Pipeline; Utilities

The study area is comprised of the following land uses (Imperial Beach, 1997):

- Residential = 45 percent
- Parks and Recreation = 40 percent
- Commercial = 7 percent
- Educational = 7 percent
- Industrial = 1 percent.

The northern half of the study area is predominantly residential, while the southern half is open space. It should be noted that since the purpose of this study is to provide shoreline protection in Imperial Beach, this section focuses on land uses in the coastal section of Imperial Beach. Currently, the beachfront area is built out to the City's 1982 General Plan and Coastal Plan. Future development is planned to take place through new construction, up-grade, and re-use of existing parcels (Imperial Beach, 1994). The west side of Seacoast Drive (adjacent to the beach) mainly consists of residential housing (88 structures), vacant lots (21 lots), and some light commercial uses (two structures) (USACE, 2000). The land use and zoning designation for the beach area of Imperial Beach is almost entirely Open Space (OS). From north to south, between Seacoast Drive and the beach, land use and zoning designations include Residential (R-1500), Public Facility (PF), and Seacoast Commercial (C-2) (Imperial Beach, 1994).

4.12.2 Land Uses of the Study Area

Land uses of the beachfront area, from north to south, are as follows:

- From the Coronado/Imperial Beach Border to Imperial Beach Boulevard, between Seacoast Drive and the Pacific Ocean: Oceanfront condominiums and apartments; commercial enterprises such as restaurants and specialty shops primarily aimed at serving the tourist population, and small local serving uses such as supermarkets; and Pier Plaza, the Imperial Beach Fishing Pier, and Dunes Park (described in Section 4.13, Recreation). It should be noted that the San Diego Unified Port District has assumed financial responsibility for Pier Plaza and the City Beach (Imperial Beach, 1994)

- From Imperial Beach Boulevard to the southern terminus of Seacoast Drive: Oceanfront condominiums and apartments on the west side of Seacoast Drive
- From the end of Seacoast Drive to the U.S./Mexico Border: Tijuana River National Estuarine Research Reserve, which includes Border Field State Park. In 1982 the Tijuana Estuary was designated a National Estuarine Sanctuary under the Coastal Zone Management Act of 1972. The Tijuana River National Estuarine Research Reserve, as it is now known, is made up of 2,531 acres of land (Imperial Beach, 1997). Property owners within the Reserve include the U.S. Fish and Wildlife Service, U.S. Navy, California Department of Parks and Recreation (which administers Border Field State Park), County of San Diego, City of San Diego, and several private owners.

4.12.3 Sensitive Land Uses

Sensitive land uses are considered to be those land uses where substantial numbers of the public are grouped together or where uses are particularly sensitive to potential project-related disturbances. Sensitive land uses are identified as such because they may require unique mitigation measures to reduce or avoid impacts. In general, sensitive land uses include residences, recreation areas, and open space.

Sensitive receptors are individuals, species, or groups that are considered to be particularly sensitive to project related disturbances. Examples of sensitive receptors within the study area include the Tijuana River National Estuarine Research Reserve (due to habitat sensitivity and recreational use), recreational users of the beachfront areas in Imperial Beach, and residences.

4.12.4 Applicable Plans, Policies, and Regulations

Land use plans, policies, and regulations applicable to the Proposed Action are described below. For policies specific to recreational uses see Section 4.13 (Recreation).

Federal Coastal Zone Management Act of 1972. The study area lies within the coastal zone. This zone extends from the State of California's three-mile seaward limit to an average of approximately 1,000 yards inland from the mean high tide of the sea. The California Coastal Commission (CCC), pursuant to the California Coastal Act of 1976, carries out the State's Coastal Zone Management Program. The CCC has responsibility for approving developments and issuing permits for projects in the coastal zone (CCA, 1976).

City of Imperial Beach General Plan/Coastal Plan. Local jurisdictions are required by the State of California to prepare general plans identifying goals and policies that will guide development within their respective jurisdictions. The California Coastal Act of 1976 also requires coastal cities to develop a Local Coastal Plan by the California Coastal Commission. The Imperial Beach General Plan/Local Coastal Plan is the City's constitution for physical development and change within the City and governs both private and public actions (Imperial Beach, 1994). Table 4.12-2 lists applicable land use policies from the City's General Plan/Coastal Plan.

Table 4.12-2 Land Use Policies

Policy	Description
L-6	Imperial Beach should provide, enhance and expand tourist commercial uses to the extent they can be compatible with the small beach oriented town character of the City
S-2	Developers should be required to leave potentially hazardous areas undeveloped and to leave sufficient open space adjacent thereto to insure public health and safety
S-10	The City should regulate shoreline land use and development by: a) Minimizing construction on beaches and in front of seacliffs; b) Require setbacks from beaches and low lying coastal areas; and c) Regulate sand mining if some were to occur
S-11	Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, shoreline protection devices and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing principal structures or public beaches in danger of erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Prior to completion of a comprehensive shoreline protection plan designed for the area, interim protection devices may be allowed provided such devices do not encroach seaward of a string line of similar devices. Public improvements shall be designed to avoid shoreline protection, if possible. Any necessary protection shall be the minimum necessary and shall not extend onto the beach further seaward than the authorized vertical shoreline protection, the alignment cannot extend further seaward than the inland extent of Ocean Boulevard right-a-way. An exception may be made for necessary protection associated with public improvements at the Palm Avenue street end, which may extend seaward a sufficient distance to accommodate a transition to the existing groin. All improvements shall be designed to minimize impacts to shoreline sand supply. [Amended April 5, 2000 by Resolution No. 2000-5212; LCPA/GPA 99-02] The City should protect property by working in coordination with SANDAG and other coastal cities in developing a regional beach replenishment program and continuing to implement the adopted "Shoreline Preservation Strategy for the San Diego Region.

4.13 RECREATION

This section presents information on recreational activities and opportunities within Imperial Beach, and summarizes the regulatory setting. The study area boundary for analysis of impacts on recreation is the city limits of the City of Imperial Beach, which includes the Tijuana River National Estuarine Research Reserve and Border Field State Park. Since the purpose of this study is to provide shoreline protection in Imperial Beach, this section focuses on land uses in the coastal section of Imperial Beach. As described in Section 4.12 (Land Use), residential uses and open space (including recreation) are the predominant land uses within the study area.

4.13.1 Recreational Activities

In general, the study area is of high recreational value. Common recreational activities include surfing (short- and long-board), bodyboarding, bodysurfing, sun bathing, swimming, jogging, sightseeing, bird watching, horseback riding, picnicking, bicycling, hiking/walking, various types of fishing (e.g., pier, boat, beach, bow/arrow), and various organized activities that attract thousands of visitors annually (described below).

Beach Use. Beaches within the study area experience high recreational use. Table 4.13-1 shows current and projected use of the beach.

According to a recent report, the annual beach usage in 1996 was about 1.8 million. Recreational users of Imperial Beach include residents of Imperial Beach, the City of San Diego, and the 18 surrounding communities (USACE, 2000)

Table 4.13-1 Beach Visitation

Year	Estimated Visitation
1990	1 million
2001	1.1 million
2010	1.2 million
2040 & 2050	1.5 million

Source: USACE, 1995b (from SANDAG)

Surfing. Imperial Beach is the southernmost surfing area in California (USACE, 1978 and 1995b). Surfing is the most popular recreational activity in the study area. Surf spots vary daily, weekly, monthly, seasonally and so on, depending on tidal and climatic conditions. Surf spots associated with structures are quasi-permanent and provide fairly consistent waves. They are susceptible to seasonal variations to a lesser degree than surf areas not associated with structures. Surf spots not associated with structures are dependent on climatic, geologic and bathymetric conditions that influence sand bar formation.

The average number of daily users is approximately 200 to 300 surfers intermittently throughout the day. When wave and weather conditions are optimal, 400 surfers per day visit popular surf spots in Imperial Beach (Barber, 2001), including the following spots where wave formation is associated with offshore structures:

- North Groin. Both sides of the North Groin break seasonally
- South Groin. Both sides of the South Groin break seasonally
- Imperial Beach Pier. A permanent rip current underneath the pier provides fairly consistent waves on both sides of the pier, which break seasonally. The bathymetric contours associated with the pier depth and adjacent shallower areas form submerged bars that produce waves desirable to surfers [Section 4.2 Coastal Processes]
- Boca Rio (Delta) Point (end of Seacoast Drive). A point break characterizes the surf at the end of Seacoast Drive, with year round breakers a half-mile offshore
- Mouth of the Tijuana River. A cobblestone reef forms a surf spot at the mouth of the Tijuana River that characterizes a "big wave break".

Surfing conditions and the level of use are as follows (from north to south):

- From the southern groin to the Imperial Beach Pier, surfing quality is rated as "fair" with medium to heavy surfing use
- From the Imperial Beach Pier to the mouth of the Tijuana River, surfing quality is "good." Although the area near the Tijuana River mouth is considered a "classic" surfing location, the surfing use is very light in this area due to beach closures associated with contaminated water from stormwater runoff, wastewater and industrial treatment and other non-point sources to the ocean (USACE, 2000).

Surfing supports two retail surfing shops in the City of Imperial Beach. The next closest surfing use occurs at the beaches of Coronado located north of the study area. However, surfing in Coronado is less consistent than at Imperial Beach.

Swimming. Three quarters of a mile of the beach between Palm Avenue to the north and Imperial Beach Boulevard to the south is designated as a "guarded swim area" (Imperial Beach, 2000). Lifeguard services are not provided in areas south of Imperial Beach Boulevard and north of Palm Avenue.

Running. Imperial Beach is one of three official courses for local high school cross-country teams. Triathlons, 10 kilometer runs and training events occur frequently in the study area.

Volleyball. Imperial Beach is the official site of the Junior Olympics Volleyball competition that is held annually.

Fishing. The study area provides opportunities for recreational fishing through pier, beach, and nearby offshore boat fishing. Imperial Beach is the only beach in California that allows bow and arrow fishing and provides training courses (Barber, 2001). Pier fishing is an important aspect of recreational fishing. Compared to other modes of fishing, pier fishing is most accessible and affordable. During weekdays in non-summer months, the Imperial Beach pier attracts 50 to 75 anglers. On weekends and during summer months the number of anglers increases to several hundred per day (U.S. EPA, 1996). Beach fishing is also accessible and affordable but less common than pier fishing, because the beach in the study area is being utilized by other recreational activities. The number of beach anglers is estimated at 8,000 per year (U.S. EPA, 1996). Private boat anglers and commercial fishing vessels use the area immediately offshore of Imperial Beach, especially during the spring and summer months. It is estimated that approximately 400 annual boat trips accounting for about 10,000 angler trips using the fishing grounds that extend the shoreline between Imperial Beach and the Mexican Border (U.S. EPA, 1996).

4.13.2 Recreational Facilities

Imperial Beach has a total of 5.6 kilometers (3.5 miles) of beach frontage. The Imperial Beach Fishing Pier (2.56-acre Pier and Pier Plaza) and the City Beach (9.8 acres) account for 12.36 acres of recreational area within the City limits (Imperial Beach, 1994). Dunes Park, a beachfront park, is located four blocks north of Pier Plaza between the beach and Seacoast Drive and includes playground equipment, a volleyball area, and picnic tables (Imperial Beach, 1997).

YMCA Camp Surf is located in the northern portion of Imperial Beach. The camp operates all year and offers environmental education classes for school children during the spring and fall school seasons. These classes utilize the beach, and during the summer months, the camp offers additional recreational activities such as pier fishing, surfing, and arts and crafts (U.S. EPA, 1996).

Other recreational facilities within the City of Imperial Beach include the Boys and Girls Club (1.7 acres), Mar Vista Park (6.7 acres), Sports Park (7.8 acres), Reams Park (0.72 acres), the Imperial Beach Skate Park and the playing fields of elementary and high schools (Imperial Beach, 1994). These facilities do not offer beach-related recreational facilities because they are located within the inland portions of the City.

The Tijuana Estuary, located in the southern portion of Imperial Beach, is about three miles long and extends one and one-half miles east starting from the ocean/beach boundary (2.531 acres) (Imperial Beach, 1997). Located at the northern edge of the Estuary, the Wildlife Refuge and Visitor Center provide four miles of trails, an exhibit hall, library, theater, bookstore, and educational classes (Imperial Beach, 1994 and 1997).

Border Field State Park is part of the Tijuana River National Estuarine Reserve and is located at the westernmost end of the Tijuana River valley, at the southwest corner of the continental United States, adjacent to the U.S./Mexico Border. Border Field State Park is one of the few remaining beaches in the nation that allows horseback riding, which is a popular form of recreation in the park (U.S. EPA, 1996). Other activities include hiking, beachfront walking, ocean swimming, nature viewing, and picnicking. The park is open for day use only, and due to the surveillance activities of the U.S. Border Patrol the park's vehicular access is occasionally closed to the public. The only vehicular public access point to this park is via Monument Road through the City of San Diego (Imperial Beach, 1994). Pedestrian access via the beach is not restricted.

4.13.3 Annual Events

Imperial Beach is the site of various annual recreational events that attract thousands of visitors to the area. These events are described below.

- The U.S. Open Sandcastle Competition is a three-day annual event held on July 26, 27, and 28 at Pier Plaza and along a one-mile stretch of Imperial Beach. According to the Imperial Beach Chamber of Commerce, the sand castle event has an estimated attendance of 250,000 (SEIS, IWTP, 1996). The Sandcastle Competition is in its twentieth consecutive year. Activities include the sandcastle building competition, the Mayor's Community Breakfast, an outdoor dance, vendors' booths, a two-hour long parade on Seacoast Drive, and fireworks show.
- The Imperial Beach 1 kilometer Pier Swim/5K Run & Walk is held annually at the end of July. Activities include a rough water swim, a road race, volleyball tournament, surf contest, junior lifeguard competition, and surf rescue demonstrations.
- The Multi-Sport Championships, held annually in about mid-July, include a biathlon and duathlon, open water swim, surfing and volleyball contests, and a fishing derby.
- The Chili Cook-off and Jazz Festival held annually the second week in May at Pier Plaza attracts an estimated 15,000 people.
- Symphony by the Sand, or Symphony by the Sea, is an evening-long event held annually in September at Pier Plaza and features performances by the San Diego Chamber Orchestra.

4.13.4 Applicable Plans, Policies, and Regulations

For plans, policies, and regulations applicable to all land uses within the project study area see Section 4.12 (Land Use).

City of Imperial Beach General Plan/Coastal Plan. Local jurisdictions are required by the State of California to prepare General Plans identifying goals and policies that will guide development within their respective jurisdictions. The California Coastal Act of 1976 also requires beach cities to develop a

Local Coastal Plan by the California Coastal Commission. The Imperial Beach General Plan/Local Coastal Plan is the City's constitution for physical development and change within the City and governs both private and public actions (Imperial Beach, 1994). Table 4.13-2 presents policies from the City's General Plan/Coastal Plan applicable to recreation.

Table 4.13-2 Recreation Policies

Policy	Description
P-1	To fully utilize the natural advantages of Imperial Beach's location and climate, a variety of park and recreational opportunities for residents and visitors shall be provided for all ages, incomes and life styles. This means that: (1) the beach shall be free to the public, (2) recreational needs of children, teens, adults, persons with disabilities, elderly, visitors and others shall be accommodated to the extent resources and feasibility permit, (3) City residents need mini-parks, neighborhood parks, community parks, activity centers, special use and all-purpose parks, and (4) The City should pursue increased recreational opportunities for the general public in the Tijuana Estuary, Border Field State Park, the beach and the South San Diego Bayfront.
P-2	The ocean, beach and their environment are, and should continue to be, the principal recreation and visitor-serving feature. Oceanfront land shall be used for recreational and recreation-related uses whenever feasible
P-8	The City shall pursue the creation of a linear park along the entire City Bayfront. Said park shall consider facilities like walkways, bike trails, grass areas, rest areas with benches and tables.

5. ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

Environmental effects are determined by carefully evaluating the most probable future condition, based on ongoing as well as anticipated development, without a Federal project in place. The with-project and without-project (No Action Alternative) scenarios are compared for each alternative and the differences are noted for each significant resource identified in Section 3.4. The differences are also evaluated as to whether they are beneficial or detrimental to the resources. These differences are considered to be the environmental effects, or consequences, of the project. If these impacts are found to be detrimental to the resource, appropriate avoidance or mitigation measures are identified to offset the impact.

Environmental effects evaluated for each resource have been classified according to the following:

- Class I: Significant impact that cannot be mitigated to a level that is not significant
- Class II: Significant impact that can be mitigated to a level that is not significant
- Class III: Potential impact but not significant
- Class IV: Beneficial impact.

Growth inducing effects of the Proposed Action and its alternatives are evaluated in Section 8. Potential cumulative impacts associated with the Proposed Action and its alternatives are evaluated in Section 9 of this EIS/EIR.

The goals of this impact evaluation are to: (1) disclose impacts associated with each alternative; (2) develop mitigation options; and (3) provide information for the selection of the preferred alternative. The preferred alternative will ultimately be selected by the Federal government, State and local agencies, and public interest groups on the basis of environmental, engineering, and economic criteria.

The environmentally preferable alternative would be the one that maintains the natural environment to the greatest extent feasible while achieving the goal of the project. The goal of the project is to prevent further beach erosion and beachfront property damage while identifying opportunities for environmental habitat restoration.

The following sections provide for each alternative, by resource/issue area: (1) the significance criteria used for the environmental consequences evaluation; (2) the environmental consequences and identified mitigation measures; and, (3) a summary of unavoidable significant impacts (Class I) where identified.

5.1 TOPOGRAPHY AND GEOGRAPHY

5.1.1 Impact Significance Criteria

The determination of significance for topography and geography considers the project's impact to geography and landforms, and the potential for environmental contamination. The project would have a significant effect if it:

- Substantially altered the site topography beyond that which would result from natural erosion and deposition
- Resulted in soil contamination that exceeds Federal and State hazardous waste limits established by 40 CFR Part 261 and Title 22.

5.1.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, topographic and geographic conditions within the study area would continue to degrade via the erosion process during winter storms. As of 1995, the summer beach condition at Imperial Beach was approximately 16 m (50 ft) wide; the annual erosion rate at the study area is approximately 76,455 cm (100,000 cy). Beachfront structures such as residential structures, public utilities, and U.S. Naval Communications Station facilities would be damaged because of continued beach erosion. In addition, the loss of sand at the beach would have a negative impact on various beach recreation activities. Continued erosion associated with the No Action Alternative would ultimately lead to geotechnical failures of the slope upon which the beachfront properties are located, resulting in significant impacts that could not be mitigated to a level that is less than significant (**Class I**).

5.1.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Topography

This alternative involves beach nourishment consisting of an estimated 450,000 cm (588,600 cy) of beach fill (sand) plus an additional 764,000 cm (999,312 cy) of fill. The fill would be approximately 2,164 m (7,100 ft) long and 12 m (39 ft) seaward (wide) to an elevation of +4 m (+13 ft) MLLW. Once the beach has been replenished, it would need to be maintained every 10 years through the addition of approximately 764,000 cm (999,312 cy) of fill. The beach renourishment process would occur four times throughout the 50-year evaluation period. Although the current topography of the study area would be altered by the addition of beach fill, the additional fill material would prevent damage to beachfront structures via erosion and geotechnical failures and would enhance recreational opportunities. Therefore, this alternative is considered a beneficial impact (**Class IV**).

Environmental Contamination

The additional fill for beach nourishment would consist of an estimated 450,000 cm (588,600 cy) of beach fill (sand) plus an additional 764,000 cm (999,312 cy) of fill. The fill would be approximately 2,164 m (7,100 ft) long and 12 m (39 ft) seaward (wide) to an elevation of 4 m (+13 ft) MLLW. Because the project requires operation of dredging and grading equipment for an estimated four to six months every 10 years, spills or leaks of fuels, lubricants, etc. could occur. Some leaks, spills, or accidental releases may be significant enough to substantially contaminate the soil (**Class II**). Implementation of Mitigation Measure G-1, described below, would minimize the potential for adverse affects from accidental spills or leaks.

Potential on- and offshore exposure to pollutants and other contaminants due to dredge and fill operations are not expected to create significant impacts to biota, or pose a human health hazard. These issues are addressed in Section 5.3.3.

Mitigation Measure

Impact: Chronic or large leaks and spills from construction equipment could contaminate soil and water. To address this potential impact, the following mitigation measure is proposed.

G-1 Preparation of a Spill Prevention, Containment and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include:

- On- and offshore activities and use and refueling of equipment
- Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site
- Immediate control, containment, and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment
- An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. A monitoring program will be implemented to ensure that the plans are followed throughout the period of construction.

5.1.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Topography

This alternative involves initial beach fill of 925,000 cm (1,209,900 cy) plus an additional 764,000 cm (999,312 cy) of fill for the 2,164 m (7,100 ft) span of shoreline. The minimum beach width from the backshore to the foreshore berm would be approximately 25 m (82 ft) and an elevation similar to Alternative 1B. Once the beach has been replenished, it would need to be renourished every 10 years through the addition of approximately 764,000 cm (999,312 cy) of fill. Although the current topography of the study area would be altered by the addition of beach fill, the additional fill material would prevent damage to beachfront structures via erosion and geotechnical failures and would enhance recreational opportunities. Therefore, this alternative is considered a beneficial impact (**Class IV**).

Environmental Contamination

This alternative consists of initial beach fill of 925,000 cm (1,209,900 cy) plus additional beach fill as specified in Alternative 1B. Because this alternative requires operation of dredging and grading equipment for an estimated four to six months every 10 years, spills or leaks of fuels, lubricants, etc. could occur. Some leaks, spills, or accidental releases may be significant enough to substantially contaminate the soil (**Class II**). Implementation of Mitigation Measure G-1, presented in Section 5.1.3, would minimize the potential for adverse affects from spills, leaks, or accidental spills.

Potential on- and offshore exposure to pollutants and other contaminants due to dredge and fill operations are not expected to create significant impacts to biota, or pose a human health hazard. These issues are addressed in Section 5.3.

5.1.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Topography

This alternative consists of initial beach fill of 1,250,000 cm (1,635,000 cy) plus an additional 1,146,000 cm (1,498,968 cy) of fill spanning 2,164 m (7,100 ft) of shoreline. The minimum width from backshore to the foreshore berm would be approximately 34 m (115.52 ft) with an elevation similar to the one discussed in Alternative 1B. The beach would then be renourished with 1,146,000 cm (1,498,968 cy) of fill every 10 years. Although the current topography of the study area would be altered by the addition of beach fill, the additional fill material would prevent damage to beachfront structures via erosion and geotechnical failures and would enhance recreational opportunities. Therefore, this alternative is considered a beneficial impact (**Class IV**).

Environmental Contamination

This alternative consists of initial beach fill of 1,250,000 cm (1,635,000 cy) plus 1,146,000 cm (1,498,968 cy) of additional fill. Because this alternative requires operation of dredging and grading equipment for an estimated four to six months every 10 years, spills or leaks of fuels, lubricants, etc. could occur. Some leaks, spills, or accidental releases may be significant enough to substantially contaminate the soil (**Class II**). Implementation of Mitigation Measure G-1, presented in Section 5.1.3, would minimize the potential for adverse affects from spills, leaks, or accidental spills.

Potential on and offshore exposure to pollutants and other contaminants due to dredge and fill operations would not create significant impacts to biota, or pose a human health hazard. These issues are addressed in Section 5.3.

5.1.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Topography

This alternative would consist of initial fill of 2,000,000 cm (2,616,000 cy) plus additional fill as specified in Alternative 1B spanning 2,164 m (7,100 ft) of shoreline. The minimum width from backshore to the foreshore berm would be approximately 54 m (177 ft) with an elevation similar to Alternative 1B. The beach would be renourished every 10 years with approximately 764,000 cm (999,312 cy) of fill. Although the current topography of the study area would be altered by the addition of beach fill, the additional fill material would prevent damage to beachfront structures via erosion and geotechnical failures and would enhance recreational opportunities. Therefore, this alternative is considered a beneficial impact (**Class IV**).

Environmental Contamination

This alternative consists of initial beach fill plus additional fill and renourishment every 10 years. Because this alternative requires operation of dredging and grading equipment for an estimated four to six months very 10 years, spills or leaks of fuels, lubricants, etc. could occur. Some leaks, spills, or accidental releases may be significant enough to substantially contaminate the soil (**Class II**). Implementation of Mitigation Measure G-1, presented in Section 5.1.3, would minimize the potential for adverse affects from spills, leaks, or accidental spills.

Potential on- and offshore exposure to pollutants and other contaminants due to dredge and fill operations would not create significant impacts to biota, or pose a human health hazard. These issues are addressed in Section 5.3.3.

5.1.7 Summary of Unavoidable Significant Impacts

Continued erosion associated with the No Action Alternative would ultimately lead to erosive and geotechnical failures of the slope upon which the beachfront properties are located, resulting in significant impacts that could not be mitigated to a level that is less than significant (**Class I**).

No unavoidable significant impacts to topography and geography have been identified for Alternatives 1B, 2B, 3B, and 4B.

5.2 COASTAL PROCESSES (OCEANOGRAPHY)

5.2.1 Impact Significance Criteria

Impacts of the proposed project on the coastal environment would be considered significant if:

- Alterations in nearshore currents are produced that substantially increase the erosion rate of beach sediments, modify beach or nearshore bottom topography, or increase risks of damages to coastal structures.

5.2.2 Environmental Consequences of the No Action Alternative

The No Action Alternative would not alter the nearshore currents and, therefore, would not alter the erosion rate of beach sediments. In addition, the No Action Alternative would not modify the natural beach or nearshore topography or increase existing risks to coastal structures.

Because no project-related impacts to coastal processes would occur, no mitigation would be required.

5.2.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Alternative 1B would not significantly alter nearshore currents. The sources of nearshore currents are waves, winds, and tides, which would not be affected by this alternative. In addition, Alternative 1B would not alter the incoming wave energy, which drives the dominant nearshore currents. Therefore, since this alternative would not alter any of these nearshore current sources, there would be no impacts to coastal processes, and beach nourishment within the study area would not increase risks of damages to coastal structures in other coastal locations outside the study area. Alternative 1B would result in an increase in the width of the beach, although this change is within the recent historical (last few decades) beach widths. The increase in beach width would benefit shoreline development by decreasing the risk of wave attack to coastal structures (**Class IV**). This alternative would introduce a large volume of sand to the back beach area over a short period of time, which is different than the natural sediment deposition mechanisms. However, this material would be subject to natural coastal processes and redistributed within the littoral system over time so no significant impact requiring mitigation would occur (**Class III**). The formation of small nearshore bathymetric features (sand bars) as a result of the redistribution of the nourishment sands would be substantially similar to that which occurs naturally; consequently, no significant impact requiring mitigation would occur (**Class III**).

Because no significant impacts would occur to coastal processes from Alternative 1B, no mitigation measures would be required.

5.2.4 Environmental Consequences and Mitigation Measures for Alternative 2B

The impacts of Alternative 2B on coastal processes would be essentially the same as noted for Alternative 1B **(Class III and IV)** (Section 5.2.3), although the base width and corresponding volume of fill would be 2.1 times greater compared to Alternative 1B. Similarly, the volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of sediment removal at the dredging site. However, impacts would still be temporary and less than significant (**Class III**) since they are much smaller than natural coastal processes within the region. As noted for Alternative 1B, the beach would be allowed to erode back to the base (25-m) condition established by initial nourishment, and be subsequently replenished on a 10-year cycle. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. Notwithstanding, these volumes are well within the range of natural processes. Similar to Alternative 1B, the increase in beach width would benefit shoreline development by decreasing the risk of wave attack to coastal structures (**Class IV**).

Because no significant impacts would occur to coastal processes from Alternative 2B, no mitigation measures would be required.

5.2.5 Environmental Consequences and Mitigation Measures for Alternative 3B

The impacts of Alternative 3B on coastal processes would be similar to, but incrementally greater than, those described above for Alternatives 1B and 2B, but would still be less than significant (**Class III**) in the short term, and beneficial (**Class IV**) in the long term. For this alternative, the beach width (34 m) is 2.8 times that of Alternative 1B, and 1.4 times as wide as Alternative 2B. The volume of material to be dredged for the initial beach nourishment would also be correspondingly greater, with a greater area (and/or depth) of change at the dredging site. However, impacts would still be temporary and less than significant (**Class III**) since the changes are much smaller than natural coastal processes within the region. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. Notwithstanding, these volumes are well within the range of natural processes. Similar to the other alternatives, the increase in beach width would benefit shoreline development by decreasing the risk of wave attack to coastal structures (**Class IV**).

Because no significant impacts would occur to coastal processes from Alternative 3B, no mitigation measures would be required.

5.2.6 Environmental Consequences and Mitigation Measures for Alternative 4B

The impacts of Alternative 4B on coastal processes would be similar to, but incrementally greater than, those described above for Alternatives 1B, 2B, and 3B but would still be less than significant (**Class III**) in the short term, and beneficial (**Class IV**) in the long term. For this alternative, beach width (54 m) is 4.5 times that of Alternative 1B, 2.1 times that of Alternative 2B, and 1.6 times that of Alternative 3B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, the impact would still be temporary and less than significant (**Class III**) since the changes are much smaller than natural coastal processes within the region. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. Notwithstanding, these volumes are well within the range of natural processes. Similar to the other alternatives, the increase in beach width would benefit shoreline development by decreasing the risk of wave attack to coastal structures (**Class IV**).

Because no significant impacts would occur to coastal processes from Alternative 4B, no mitigation measures would be required.

5.2.7 Summary of Unavoidable Significant Impacts

There would be no significant impacts to coastal processes as a result of the Alternatives 1B through 4B or the No Project Alternative (**Class III**).

5.3 WATER RESOURCES

5.3.1 Impact Significance Criteria

Impacts to water and sediment quality from the proposed project would be considered significant if:

- Pollutants are generated or released to the environment that are in violation of applicable Federal or State standards, hazardous to human health, or deleterious to biological communities
- Dredging and beach placement of sediments result in substantial or persistent adverse changes to water or sediment quality, and cause substantial toxicity or bioaccumulation of contaminants in aquatic biota or decline in wildlife habitat
- Conditions exceeded water quality criteria and/or limits specified in dredging permits or Waste Discharge Requirements (WDR).

Impacts to water and sediment quality from the project are expected to be similar to those for other beach nourishment projects in San Diego County evaluated and described in the EIR/Environmental Assessment (EA) for the recent "Regional Beach Sand Project" (SANDAG, 2000). Where appropriate, this EIS/EIR uses results and conclusions concerning possible impacts to water and sediment quality developed for the "Regional Beach Sand Project."

5.3.2 Environmental Consequences of the No Action Alternative

The No Action Alternative would not alter present water or sediment quality conditions because no dredging or placement of sediments would occur at the study site. Consequently, the No Action Alternative would not result in either any significant adverse or beneficial impacts to existing water or sediment quality conditions within the study area.

Because no project-related impacts to water resources would occur, no mitigation would be required.

5.3.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Possible impacts to water and sediment quality associated with Alternative 1B are described separately for the receiving beach and the offshore borrow areas.

Receiving Beach

Potential impacts to existing water quality and sediment conditions near the receiving beach would reflect, to a large extent, the quality of sediments dredged from the borrow areas. Information characterizing sediment quality at the borrow areas is presented in Section 4.3. A chemical analysis was performed for the sediment to be moved on the beach. In brief, existing data indicate low organic (organic carbon and sulfides) and contaminant (trace metals and hydrocarbons) levels in borrow area sediments. Further, because the borrow area sediments largely comprise coarse-grained sands, bacteria levels associated with dredged materials are expected to be low. Thus, placement of sediments from the borrow areas on the beach would not release pollutants, cause substantial toxicity or bioaccumulation of contaminants in biota, or pose a human health hazard.

The primary impact to water quality would be temporary and localized increases in turbidity levels in the immediate vicinity of the receiving beach (**Class III**). Increased turbidity would occur along the shore as a result of pumping a mixture of dredged sediments and water directly onto the beach. Drainage water associated with the dredged sediments, containing fine-grained suspended particles, would flow into the surf zone and spread along the shore near the study area. Training dikes constructed before sediments are placed on the beach could direct the water flow and allow a portion of the suspended sediments to settle out prior to release to the ocean, thereby minimizing suspended particle concentrations in the return flow and resulting turbidity effects.

Turbidity plumes have been monitored during similar, recent beach nourishment projects (SANDAG, 2000). The extent and concentration of turbidity plumes were directly proportional to the silt/clay content of the dredged sediments. When the silt/clay content ranged from 2.5 to 10.5 percent, turbidity plumes were visible from approximately 15.2 to 608 m (50 to 2,000 ft) downcurrent from the study area. The offshore extent of a turbidity plume typically is restricted within the surf zone; however, this is dependent on wave conditions, rip currents, and the speed and direction of longshore currents. Monitoring during beach nourishment projects also indicated that visible turbidity plumes did not extend in the offshore direction much beyond the surf zone when the silt/clay content of the beach nourishment materials was low (e.g., 10 percent or less). Even for beach nourishment materials with relatively high silt/clay contents, turbidity plumes typically did not extend beyond 304 m (1,000 ft) from shore (SANDAG, 2000).

Because the materials in the two borrow areas consist primarily of sand-sized sediments with a low proportion of fines, turbidity plumes associated with placement and operations are estimated to extend up to 912 m (3,000 ft) from the discharge location during maximum currents, and approximately 76 m (250 ft) from the discharge location under typical current conditions (SANDAG, 2000). The duration of elevated turbidity levels in nearshore waters would depend on the rates of runoff, mixing and dispersion by waves and longshore currents, and proportions of fines removed before the runoff reaches the ocean. If hopper dredges are used to dredge sediments from the borrow areas and transport materials to the receiving beach, impacts associated with turbidity would recur with a frequency that corresponds roughly to the cycle time of the dredge (i.e., the time required for the dredge to pick up a load of sediments from the borrow area, transit to a location where the dredged material will be offloaded, and transfer of the dredged sediments onto the beach), as well as with the retention time of waters behind the training dike. If a pipeline dredge is used, turbid conditions would persist for the duration of the initial nourishment and each of the subsequent replenishment cycles. The pulses of turbid runoff into the ocean would occur over an assumed period of four to six months (the duration of each beach renourishment cycle), every ten years.

The "California Ocean Plan" (Plan) defines numerical and descriptive limits for changes to receiving waters, outside of an initial mixing zone, associated with wastewater discharges to the ocean. The Plan contains specific limits for bacteria, pH, dissolved oxygen, sulfides, contaminants, and water clarity. None of the materials dredged and placed on the beach would exceed criteria in the Plan for bacteria,

dissolved oxygen, contaminants and sulfides, nutrients, or pH. As discussed above, placement of dredged sediments would reduce water clarity near the receiving beach, but this effect will be temporary and localized (**Class III**). Thus, Alternative 1B would be expected to comply with receiving water limits specified in the Plan. Additional requirements for discharges may be specified in a WDR issued by the Regional Water Quality Control Board, although WDR limits typically are similar to those specified in the California Ocean Plan. Appendix F of this EIS/EIR provides an evaluation of the project's effects of the discharge of dredged or fill materials into Water of the United States. The evaluation concludes that the project would be in compliance with applicable requirements. The USACE submitted a letter to the RWQCB for Section 401 State Water Quality Certification on June 12, 2002 (Appendix J). In response to the change in the NED Alternative between the Draft and Final EIS/EIR, the USACE submitted a new letter requesting Section 401 State Water Quality Certification in September 2002. Project construction will not commence until after Section 401 State Water Quality Certification is obtained. Commitments identified in the Water Quality Certification will be followed during construction. It is additionally noted that the California Coastal Commission has reviewed and approved the Proposed Action, and has determined that the project would be in compliance with the Coastal Zone Management Act and California Coastal Act. The change in NED Plan has been coordinated with the CCC.

Impacts to water and sediment quality at the receiving beach associated with Alternative 1B would be less than significant (**Class III**). Because impacts would be less than significant, mitigation measures for water and sediment quality are not appropriate. However, monitoring may be required to document compliance with California Ocean Plan and WDR limits. The construction contractor would obtain the required permits.

Additional impacts to water and/or sediment quality could occur as a result of a fuel spill from the hydraulic pipeline or hopper dredge and/or fuel or lubricant (e.g., hydraulic fluid) spills or leaks from onshore construction equipment used to redistribute sediments placed on the receiving beach. Onshore fuel spills of sufficient quantity to cause significant impacts to water or sediment quality within the study area can be mitigated to a level of less than significant through implementation of Mitigation Measure G-1 (see Section 5.1.3). For offshore construction, such events are considered unlikely; however, dredging permits and/or WDR could require preparation and implementation of an offshore Spill Prevention and Control Plan, designed to minimize the potential and possible impacts of accidental spills, prior to construction.

Borrow Areas

Possible impacts from Alternative 1B on water and sediment quality at the borrow areas would be associated with the physical disturbance of bottom sediments during dredging. Dredging with a hydraulic pipeline or hopper dredge would result in localized resuspension of bottom sediments. This would cause temporary and localized increases of suspended particle concentrations, with increased turbidity levels and reduced light transmission, in the immediate vicinity of the dredge. Effects would

be more pronounced in near-bottom waters, and may extend tens of meters above the bottom and up to several hundred meters from the dredging site, depending on the extent of the disturbance, sinking rates of suspended particles, and the strength of local currents that would transport and disperse suspended particles from the dredging site. Because sediments within the two borrow areas consist of sand-sized particles, suspended particles would settle rapidly to the bottom and dispersion to locations outside of the borrow areas would be limited. SANDAG (2000) estimated that dredging at an offshore borrow area could produce a turbidity plume that extended from less than 30 m (100 ft) to over 150 m (500 ft) from the dredging area under average current speeds. Under maximum current speeds, a visible plume may extend several thousand feet from the dredging area. However, some additional loss of sediments, from overflow or spills from the hopper dredge or during transfer from the hopper dredge to the onshore placement site, likely would occur, resulting in temporary and localized increases in suspended particle concentrations and turbidity levels. Sediments spilled from the dredge would rapidly disperse and would not cause persistent adverse changes to water quality.

Borrow area sediments have a low organic content and low concentrations of chemical contaminants. Sediment resuspension has negligible potential for releasing reduced or sulfide-containing materials or contaminants to site waters. Thus, dredging operations are not expected to reduce dissolved oxygen concentrations or alter the pH of site waters, or cause adverse biological effects (e.g., toxicity or contaminant bioaccumulation) due to contaminant release from resuspended sediment.

Dredging sediments from the borrow areas would not release pollutants or result in conditions considered deleterious to aquatic organisms or hazardous to human health. Similarly, dredging at the borrow areas would not be expected to expose or remobilize buried contaminated sediments. Changes to water quality would consist primarily of temporary and localized increases in suspended particle concentrations and turbidity levels, and these will not persist following completion of the dredging operations. These impacts to water and sediment quality at the borrow areas are considered less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

5.3.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Receiving Beach

Impacts to water and sediment quality near the receiving beach for Alternative 2B would be similar to those for Alternative 1B **(Class III)**. The primary difference between the alternatives would be the duration of impacts associated with elevated turbidity levels during the initial nourishment and subsequent replenishment periods. In particular, Alternative 2B would have a relatively greater duration of elevated turbidity levels than Alternative 1B because Alternative 2B requires a larger volume of beach nourishment material and, therefore, a proportionately longer period of time required for placement of dredged sediments on the beach. Similar to the other alternatives, water quality impacts would recur every ten years over the project lifetime, and the duration of water quality impacts

associated with the replenishment cycles would be similar to those of the other alternatives. Regardless, impacts to water and sediment quality associated with Alternative 2B would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

Borrow Areas

Impacts to water and sediment quality at the borrow areas for Alternative 2B would be similar to those for Alternative 1B. Similar to impacts at the receiving beach, the primary difference between these two alternatives would be the duration of impacts associated with elevated turbidity levels during the initial beach fill cycle. In particular, Alternative 2B would be anticipated to have relatively greater duration of elevated turbidity levels than Alternative 1B because Alternative 2B requires a larger volume of beach fill material and, therefore, a proportionately greater period of time required for dredging sediments at the borrow areas. The duration of impacts associated with additional fill and subsequent replenishment periods would be similar to those associated with the other alternatives. Regardless, impacts to water and sediment quality at the borrow areas associated with Alternative 2B would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

5.3.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Receiving Beach

Impacts to water and sediment quality near the receiving beach for Alternative 3B would be similar to those for Alternatives 1B and 2B **(Class III)**. The primary difference between these alternatives would be the duration of impacts associated with elevated turbidity levels during the initial beach fill cycles. In particular, Alternative 3B would be anticipated to have a relatively longer duration of elevated turbidity levels than Alternatives 1B and 2B because Alternative 3B requires approximately three times more beach fill material and, therefore, a proportionately longer period of time required for placement of dredged sediments on the beach. Similar to the other alternatives, water quality impacts would recur every ten years over the project lifetime, and the duration of water quality impacts associated with the replenishment cycles would be similar to those of the other alternatives. Regardless, impacts to water and sediment quality associated with Alternative 3B would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

Borrow Areas

Impacts to water and sediment quality at the borrow areas for Alternative 3B would be similar to those for Alternatives 1B and 2B. Similar to impacts at the receiving beach, the primary difference between these two alternatives would be the duration of impacts associated with elevated turbidity levels. In

particular, Alternative 3B would have relatively longer duration of elevated turbidity levels than Alternatives 1B and 2B because Alternative 3B requires a relatively larger volume of beach fill material and, therefore, a proportionately longer period of time required for dredging sediments at the borrow areas. Regardless, impacts to water and sediment quality at the borrow areas associated with Alternative 3B would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

5.3.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Receiving Beach

Impacts to water and sediment quality near the receiving beach for Alternative 4B would be similar to those for Alternatives 1B, 2B, and 3B **(Class III)**. The primary difference between these alternatives would be the duration of impacts associated with elevated turbidity levels due to the progressively longer periods of time needed to dredge fill. Regardless, impacts to water and sediment quality associated with Alternative 2D would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

Borrow Areas

Impacts to water and sediment quality at the borrow areas for Alternative 4B would be similar to those for Alternatives 1B through 3B. Similar to impacts at the receiving beach, the primary difference between these alternatives would be the duration of impacts associated with elevated turbidity levels during the initial beach fill phase. In particular, Alternative 4B would have relatively longer duration of elevated turbidity levels than Alternatives 1B through 3B because Alternative 4B requires a larger initial volume of beach nourishment material and, therefore, a proportionately longer period of time required for dredging sediments at the borrow areas. Regardless, impacts to water and sediment quality at the borrow areas associated with Alternative 4B would be less than significant (**Class III**). Because impacts would be less than significant, no mitigation measures are appropriate. However, monitoring may be required to document compliance with specific dredging permit conditions.

5.3.7 Summary of Unavoidable Significant Impacts

Alternatives 1B, 2B, 3B, and 4B would not cause unavoidable significant impacts to water or sediment quality. Impacts would consist primarily of localized and temporary increases in turbidity levels in nearshore ocean waters, and are considered less than significant (**Class III**).

5.4 ESSENTIAL FISH HABITAT

5.4.1 Impact Significance Criteria

Impacts to Essential Fish Habitat (EFH) would be considered significant if:

- Substantial adverse effects would occur to fish species or habitats listed in the Fishery Management Plans.

5.4.2 Environmental Consequences and Mitigation Measures for the No Action Alternative

Under the No Action Alternative, no dredging or beach replenishment activities would occur. The subsequent result would be continued natural erosion of the beaches within the study area, but no project-related impacts. EFH resources would still be affected by the natural seasonal changes in sand from this region.

Because no project-related impacts to biological resources would occur, no mitigation would be required.

5.4.3 Environmental Consequences and Mitigation Measures for Alternatives 1B, 2B, 3B, and 4B

As detailed in Appendix B, project activities potentially affecting Fishery Management Plan (FMP) species include dredging at the borrow areas and subsequent disposal/renourishment of sand along the beach. Because the replenishment and borrow areas proposed for this project are located a substantial distance away from any kelp beds at least 0.8 to 2.45 kilometers (0.3 to 1.5 miles), no significant impacts would occur to this EFH. Temporary impacts to groundfish FMP species could potentially occur by temporarily reducing foraging habitat, increasing turbidity, and decreasing water quality. However, due to the highly mobile nature of these species in the project area, impacts would be localized and/or transient. Therefore, potential impacts to groundfish FMP species would be less than significant.

Similarly, dredging and renourishment activities could impact pelagic species by temporarily decreasing visibility for foraging activities as a result of increased turbidity and decreasing water quality. Similar to groundfishes, impacts to coastal pelagic FMP species also would be temporary and localized. In contrast, some short-term benefits could occur as a result of dredging and renourishment activities. For example, increased prey availability due to resuspended material during dredging may attract some pelagic schooling fishes. Notwithstanding, potential adverse impacts to coastal pelagic FMP species would be less than significant.

Because no significant impacts would occur to EFH resources from this alternative, no mitigation measures would be required.

5.5 BIOLOGICAL RESOURCES

5.5.1 Impact Significance Criteria

Impacts to biological resources within the study area would be considered significant if:

- Substantial adverse effects would occur to individuals or the habitat of a rare, threatened, endangered species, or other special status species

- Substantial adverse effects would occur to a species, natural community, or habitat or that is specifically recognized as biologically significant in local, State, or Federal policies, statutes, or regulations
- Substantial adverse effects would occur to the migration of fish or wildlife populations
- Substantial adverse modification would occur to species diversity or ecosystem functions and values beyond the immediate vicinity of the study site
- Substantial conflict would occur with local, State, or Federal policies designed to protect biological resources.

5.5.2 Environmental Consequences and Mitigation Measures for the No Action Alternative

Under the No Action Alternative, no dredging or beach replenishment activities would occur. The subsequent result would be continued natural erosion of the beaches within the study area, but no project-related impacts. Biological resources would still be affected by the natural seasonal changes in sand from this region.

Because no project-related impacts to biological resources would occur, no mitigation would be required.

5.5.3 Environmental Consequences and Mitigation Measures for Alternative 1B

5.5.3.1 *Shoreline and Nearshore*

Upland Vegetation and Wildlife. The initial beach nourishment would generally cause a short-term loss of resident biota (see below), including infaunal and epifaunal invertebrates, which provide food resources for shorebirds; temporary noise and activity that may disrupt wildlife use of the area; and an alteration of the current beach profile, in which the area of upland habitat is increased, while the lower portion of the beach is steepened as wave action erodes the newly placed sediment (NRC 1995). Since local sand sources are being used, it is not expected that the physical composition (percent fines) of the beach would change substantially. The deposition area at Imperial Beach does not support sensitive dune vegetation or valuable wildlife habitat, with its ecological values being limited by the seasonal instability of the beach, the close proximity of residential development immediately above the zone of tidal and wave action, and high levels of recreational use. Hence the direct impacts of sand deposition on upland habitats would be less than significant (**Class III**).

Nearshore dredging and subsequent sand placement would not be expected to significantly affect wave action or erosion and sedimentation rates along the beaches north and south of the beach nourishment area (see Coastal Processes discussion, section 5.2). Hence, impacts on these areas, which include sensitive vegetation and wildlife habitat (see section 4.5), would be less than significant (**Class III**).

Subsequent renourishment cycles (every 10 years) would involve personnel and equipment on the beach for periods of 4-6 months while sand is replaced at the seaward edge of the beach. The upland portion of the beach would be stabilized by replenishment, allowing limited establishment and expansion of vegetation along the shoreline, and possibly increased use by wildlife (see discussion of *Shorebirds and Waterbirds* below), a beneficial impact (**Class IV**), although the beach would be relatively narrow, and

ongoing recreational use would continue to limit vegetation establishment and wildlife use. Short-term effects of disturbance during replenishment would be similar to those occurring during the initial beach nourishment and also less than significant (**Class III**).

Marine Plants. No marine plants, other than algae on the groins and pier, some surfgrass near the end of the groins, and sparse algae on scattered pebbles or cobble, occur within either the beach fill areas or the borrow areas. Historically, the closest kelp beds have been generally located about 0.8 to 2.4 kilometers (0.3 to 1.5 miles) offshore and 1.4 kilometers (0.9 mile) north and 2.1 kilometers (1.3 miles) south of the pier (Section 4.5.2.1). The 1997-98 El Nino event caused a decline in regional kelp beds, such that no kelp canopies were evident off Imperial Beach in 1998. However, recent surveys (North and MBC, 2001) indicated that very small canopies currently are observed in the project region. The distances of the beds offshore and upcoast/downcoast from the pier, as noted above, are sufficiently great that significant impacts to marine plants are unlikely due to Alternative 1B. Although impacts to kelp beds are considered to be less than significant (**Class III**), to ensure that initial nourishment activities, followed by subsequent renourishment activities do not create significant adverse impacts to known or future kelp beds within the project area, the USACE has committed to the environmental commitment presented below. Algae that might be covered on the groins and pier due to the initial fill and replenishment cycles are part of a community that only occurs in these locations due to the presence of these man-made structures, and represent common species in rocky intertidal areas throughout the region. Therefore, these impacts would be considered less than significant (**Class III**).

Environmental Commitment

Prior to construction, the USACE will provide a set of plans and specifications to the USFWS and CDFG to ensure that offshore activities do not create significant, adverse impacts to kelp beds that cannot be mitigated to less than significant.

***Infauna*.** Project activities such as dredging at the borrow areas or initial sand placement and renourishment cycles would temporarily impact the benthic community by disturbing and removing many organisms or burial and disturbance, respectively. However, recolonization would occur by larval recruitment and immigration of organisms from nearby unaffected areas that are common throughout coastal areas in the region. Recolonization of the community would be relatively rapid (likely within a year or less) following completion of dredging or initial sand placment/renourishment (USDN, 1994a; SANDAG and USDN, 2000). Therefore, these impacts would be less than significant since disturbances would be localized, short term, the species are common throughout the general region, the small percentage of habitat that would be affected, and any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes (**Class III**). Although impacts to the benthetic community are considered to be less than significant, it is noted that Mitigation Measure B-1, below, which provides for off- and onshore biological monitoring during nourishment/re-nourishment activities, would ensure that any potential impacts are minimized.

In addition to impacts from direct removal due to dredging or burial of organisms during beach replenishment, increased suspended sediments (turbidity) could also affect organisms in the vicinity of the dredge site or along the shoreline, particularly filter or suspension feeding organisms. As discussed in SANDAG (2000), turbidity would be expected to be localized to the discharge location (average 76 m [250 ft]) under average current conditions, and could extend up to 304 to 912 m (1,000 to 3,000 ft) down current under maximum current speeds at some sites. Plumes would be expected to be limited within 1,000 feet (304 m) from shore. Further, concentrations within the plume would not be expected to be higher than concentrations occurring naturally in nearshore waters under higher wave or storm conditions. Thus, the concentrations would not exceed those to which the organisms are exposed under natural episodic conditions. The suspended solids could clog gills and feeding appendages, reducing feeding ability, and consequently reducing survival, growth, and biomass of the organisms. However, studies by Peddicord et al. (1975) and O'Connor (1991) on the bivalves *Tapes japonica*, *Mytilus edulis*, and *Mytilus californianus* showed variable responses when exposed to 100,000 mg/L kaolin clay for 10 days, and demonstrated little mortality (*T. japonica*), 10 percent mortality (*M. edulis*), and 50 percent mortality (*M. californianus*). Total suspended solids levels during dredging operations are likely to be much lower than those used in the study (generally less than a few hundred mg/L). Therefore, impacts on benthic infauna associated with increased suspended solids in the water column would also be less than significant since any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes (**Class III**).

Epifauna. During dredging operations at the borrow areas, resident epifauna organisms would be disturbed and removed, as noted above for infauna. They also would potentially experience direct and indirect impacts due to increased turbidity that could cause clogging of feeding structures and reduced water quality. However, because of the transient nature of water column effects, no significant long-term impacts on epifauna would occur (**Class III**). In addition, some of these epifaunal species could by buried during beach replenishment. However, many mobile species would be able to migrate from affected areas, thereby escaping impacts. Eventual recolonization (months to about a year) would occur from nearby unaffected areas (e.g., USDN 1994a; SANDAG and USDN 2000). Therefore, impacts on epifauna would also be less than significant due to the localized nature of the disturbance, the species are common throughout the general region, the small percentage of habitat that would be affected, and any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes (**Class III**).

Some epifauna, particularly sessile species, such as mussels and barnacles that comprise the fouling communities on the groins and pier, might be covered due to the fill. However, as noted for plants, these communities only occur in these locations due to the presence of these man-made structures, and represent common species in rocky intertidal areas throughout the region. Therefore, these impacts would also be considered less than significant (**Class III**).

Fishes. Temporary impacts on the fish community from dredging operations at the borrow areas would occur as a result of the removal of some slow-moving or burrowing species such as gobies, or from

increased turbidity on pelagic species. Further, some species would be disturbed or potentially buried during beach nourishment activities. Types of effects noted by other studies can range from decreased visibility for foraging activities as a result of suspended sediments to impaired oxygen exchange due to clogged gills (U.S. EPA 1993), with the greatest impacts on fish eggs, larvae, and juveniles (USACE 1992). Peddicord et al. (1975) and Morgan et al. (1973) measured biological effects on fishes from suspended sediments. Delayed development of white perch and striped bass eggs was noted for concentrations greater than 1,500 mg/L. Hatching of demersal white perch eggs was delayed by one day at suspended sediment concentrations of 4,000 mg/L. Egg mortality occurred for striped bass at 3,400 mg/L and for white perch at 3,600 mg/L (Morgan et al. 1973, cited in O'Connor 1991). These studies demonstrate direct biological effects of suspended sediment caused by extremely high concentrations extending for long periods of time. However, increased total suspended solids (TSS) levels from dredging (e.g., a few hundred mg/L) would be well below the concentrations indicated above that cause significant effects on fishes.

California grunion (*Leuresthes tenuis*) spawn on sandy beaches in the San Diego region between March and August (Section 4.2), and have the potential to be affected by beach replenishment due to temporary disruption of habitat and increased turbidity. However, since dredging and disposal activities for all of the alternatives (except the No Project Alternative) would occur during winter (Chuck Mesa, USACE, pers. comm., January 2001), potential impacts would be avoided. (e.g., SANDAG and USDN, 2000). Furthermore, the long-term benefits from all of the project alternatives (except the No Project Alternative) could occur for grunion and other species typical of nearshore sand habitats due to the creation of additional habitat from beach widening. For example, south of the pier dense cobble and narrow beach width may limit spawning habitat under existing conditions.

In conclusion, since most fishes, particularly highly mobile pelagic schooling species, would be able to avoid the dredging and disposal areas, impacts from these activities, including potential impacts to EFH (Section 5.4 and Appendix B) would be less than significant due to the localized nature of the disturbance and the small percentage of available habitat that would be affected (**Class III**).

Shorebirds and Waterbirds. As noted above, the beach area that would be affected has limited value as feeding or resting habitat for shorebirds. As a result, the impacts of sediment placement during the initial nourishment and 10-year replenishment cycles, including short-term disruption of feeding and resting opportunities along this stretch of beach, are considered less than significant (**Class III**). Long-term impacts may be beneficial to the extent that beach nourishment lessens the seasonal disappearance of the beach during winter and provides an expanded area that can be utilized by shorebirds for resting and foraging (**Class IV)**. Any beneficial impact would be small, however, due to the narrow beach width associated with this alternative. No substantive changes in erosion, sedimentation, or wave patterns along beaches to the north or south are anticipated. Potential impacts on nearshore foraging and resting for waterbirds would be localized, temporary, and less than significant as well (**Class III**).

Marine Mammals. Alternative 1B would not significantly affect food or habitat resources for marine mammals, which do not regularly use or depend on the study area, particularly when compared to the large area of undisturbed water in the region. Therefore, potential effects in the vicinity of the study area would be localized, temporary, and less than significant, and would not result in injury or harassment of marine mammals (**Class III**). Temporary effects could result from turbidity caused by the dredging operations, disturbance from operation of dredging equipment, and effects on food resources such as fishes and invertebrates. Marine mammals such as California sea lions, harbor seals, dolphins, and whales are highly mobile species that could avoid the region during project operations. However, only low occurrences of these species are expected in the vicinity of the study area; as such, significant effects are unlikely due their generally low abundance and ability to avoid most project-related activities (**Class III**).

Threatened and Endangered Species. Dredging and beach nourishment activities are not likely to adversely affect any threatened, endangered or special status species. Areas of direct impact do not represent limited habitat for these species, whereas the more sensitive beach areas north and south of the study area are not expected to experience substantive changes in erosion, sedimentation, or wave action that might (if they were to occur) ultimately affect sensitive plant and animal species that occur in, or utilize, the beach and dune areas (see Tables 4.5-1 and 4.5-2). The increased beach width may allow more frequent (but still transient) use of the beach for foraging and resting by snowy plovers, a threatened species that nests north and south of the study area. This effect would be slight because the relatively narrow beach would still be subject to fairly concentrated use and disturbance associated with proximity to shoreline development. Localized, temporary increases in turbidity at the dredging and deposition sites are not expected to affect wide-ranging waterbird species such as the California brown pelican. Dredging and deposition areas are sufficiently far from nesting areas of California least terns such that this species is not likely to be affected (SANDAG and USDN 2000).

Although impacts to State and Federally recognized rare, threatened and endangered species are considered to be less than significant (**Class III**), to ensure that potential impacts related to construction activities do not have a significant adverse affect on biological resources, Mitigation Measure B-1 is proposed.

Mitigation Measures

B-1 During construction a qualified biologist will regularly monitor off- and onshore activities to ensure that potential impacts to biological resources that may be associated with turbidity and nourishment/renourishment deposition are minimized to the extent feasible. Specific monitoring activities/protocol will be reviewed with appropriate State and Federal agencies prior to implementation.

With implementation of Mitigation Measure B-1, and completion of the project's informal consultation with the USFWS (see Section 1.6), the proposed project is not likely to adversely affect biological resources.

5.5.3.2 *Tijuana River Estuary*

Vegetation and Wildlife Habitat. Project activities such as dredging at the borrow areas and beach nourishment/replenishment would not impact Tijuana River Estuary vegetation and wildlife habitats. This is due to the distance of the estuary from the study area. It is unlikely that suspended sediments from dredging operation at the borrow areas or replenishment activities would be deposited in the vicinity of the estuary. Therefore, potential impacts are considered less than significant (**Class III**).

Invertebrates (epifauna and infauna). No significant impacts would occur to infauna in the Tijuana River Estuary as a result of Alternative 1B. This is based primarily on the distance of the estuary from the study area, and the temporary and localized nature of suspended sediments during project activities, as noted for vegetation and wildlife habitat.

Fishes. No significant impacts would occur to fish species, including EFH (Section 5.4 and Appendix B), in the Tijuana River Estuary as a result of Alternative 1B. This is due to the same reasons as described above.

Shore- and Waterbirds. For the same reasons cited above, it is not anticipated that any shorebirds or waterbirds that occur in the Tijuana River Estuary would be adversely affected by the dredging or beach nourishment/replenishment activities of Alternative 1B. Shore- and waterbird populations that move between Imperial Beach and the estuary may benefit in the long term from the more persistent area of beach that would result from this alternative.

Marine Mammals. For the same reasons cited above, it is not anticipated that any marine mammal species that occur in the vicinity of the Tijuana River Estuary would be adversely affected by activities associated with Alternative 1B.

Threatened and Endangered Species. For the same reasons cited above, it is not anticipated that any of the special status species that occur in the Tijuana River Estuary would be adversely affected by activities associated with Alternative 1B.

Although impacts to these resources are considered to be less than significant (**Class III**), implementation of Mitigation Measure B-1 would provide additional assurance that construction related activities would not likely result in any adverse affect(s) to biological resources.

The USFWS has reviewed the project's EIS/EIR and has provided the USACE with a Final Coordination Act Report (CAR), as provided in Appendix D of this document. Conclusions of the Draft CAR indicate that there would be no significant, unmitigable impacts (**Class I**) associated with the

Proposed Action with implementation of the USFWS's recommendations. Construction would occur only between September and March 1 to avoid impacts to Federally listed species.

5.5.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Impacts to biological resources under Alternative 2B would be incrementally greater than for Alternative 1B, consistent with a base width and corresponding volume of fill that is 2.1 times greater compared to Alternative 1B. Similarly, the volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, impacts would still be temporary and less than significant (**Class III**) since recolonization of the community would be relatively rapid (likely within a year or less) (USDN, 1994a; SANDAG and USDN, 2000). The initial placement of sand would affect a correspondingly greater area of sandy intertidal habitat at the foot of the beach, but the impact would still be temporary and less than significant (**Class III**) as the resident organisms are adapted to unstable conditions and are expected to repopulate the affected area in less than one year by a combination of larval recruitment, immigration from adjacent areas, and by extracting themselves from burial. As noted for Alternative 1B, the beach would be allowed to erode back to the base (25 m [82 ft]) condition established by initial nourishment, and be subsequently replenished on a 10-year cycle. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. During each episode of nourishment/replenishment at the borrow areas, some infaunal and epifaunal organisms would experience removal, and some will be buried at the beach replenishment site. Burrowing fish species such as gobies could also be buried, while most pelagic and highly mobile demersal fish species (e.g., California halibut) would be able to move out of and subsequently return to affected areas. Sediment placement could cause some short-term disruption of feeding and resting opportunities along the beach for some shorebirds and waterbirds, as described above. However, these short-term impacts are considered less than significant given the relatively rapid recolonization that is expected following dredging and replenishment, (**Class III**). Long-term impacts due to a stabilized beach width of 25 m (82 ft)would remain beneficial (**Class IV**) and be somewhat greater than for Alternative 1B. For fishes and marine mammals, temporary effects during each cycle could result from turbidity caused by the dredging operations, disturbance from operation of dredging equipment, and could include effects on food resources such as fishes and invertebrates. However, as detailed for Alternative 1B, these impacts are also considered less than significant (**Class III**). Temporary impacts to known or future kelp beds due to offshore construction activities are considered to be less than significant (**Class III**). However to ensure that such activities do not create potentially adverse impacts, the USACE has committed to the environmental commitment described above for Alternative 1-B (Section 5.5.3).

In addition, although impacts to these resources are considered to be less than significant (**Class III**), implementation of Mitigation Measure B-1 would provide additional assurance that construction related activities would not likely result in any adverse affect(s) to biological resources.

5.5.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Impacts to biological resources under Alternative 3B would be similar to, but incrementally greater than, those described above for Alternatives 1B and 2B. Impacts would remain less than significant (**Class III**) in the short term, and beneficial (**Class IV**) in the long term for some resources such as shorebirds. For this alternative, the beach width (34 m [115 ft]) is 2.8 times that of Alternative 1B, and 1.4 times as wide as Alternative 2B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, impacts would still be temporary and less than significant (**Class III**) since recolonization of the community would be relatively rapid (likely within a year or less) (USDN, 1994a; SANDAG and USDN, 2000). The initial placement of sand would affect a correspondingly greater area of sandy intertidal habitat at the foot of the beach, extending the footprint of beach nourishment into the lower, more productive part of the intertidal zone. However, impacts would still be temporary and less than significant (**Class III**) as the resident organisms are adapted to unstable conditions and are expected to repopulate the affected area in less than one year by a combination of larval recruitment, immigration from adjacent areas, and extracting themselves from burial. The widened beach would provide a greater area of potential resting and foraging habitat for shorebirds (including the threatened snowy plover) than Alternatives 1B and 2B, so the beneficial impact (**Class IV**) would be greater for this alternative. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. As a result, impacts to biological resources during each replenishment cycle would be temporary and localized, and therefore less than significant (**Class III**) as noted for the preceding alternatives. Temporary impacts to known or future kelp beds due to offshore construction activities are considered to be less than significant (**Class III**). However to ensure that such activities do not create potentially adverse impacts, the USACE has committed to the environmental commitment described above for Alternative 1-B (Section 5.5.3).

In addition, although impacts to these resources are considered to be less than significant (**Class III**), implementation of Mitigation Measure B-1 would provide additional assurance that construction related activities would not likely result in any adverse affect(s) to biological resources.

5.5.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Impacts to biological resources under Alternative 4B would be similar to, but incrementally greater than those described above for Alternatives 1B through 3B. Impacts would remain less than significant in the short term (**Class III**), but beneficial in the long term for some resources such as shorebirds (**Class IV**). For this alternative, beach width (54 m [177 ft]) is 4.5 times that of Alternative 1B, 2.1 times that of Alternative 2B, and 1.6 times that of Alternative 3B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, the impact would still be temporary and less than significant (**Class III**) since recolonization of the community would be relatively rapid (likely within a year or less) (USDN 1994a; SANDAG and USDN 2000). The initial placement of sand would affect a correspondingly greater area of sandy intertidal habitat at the foot of the beach, extending the footprint

of beach nourishment into the lower, more productive part of the intertidal to the shallow subtidal zone. However, impacts would still be temporary and less than significant (**Class III**) as the resident organisms are adapted to unstable conditions and are expected to repopulate the affected area in less than one year by a combination of larval recruitment, immigration from adjacent areas, and by extracting themselves from burial. The widened beach would provide a greater area of potential resting and foraging habitat for shorebirds (including the threatened snowy plover) than the other alternatives, and hence the beneficial impact (**Class IV**) would be greater for this alternative. Replenishment activities and the volume of sand replaced at each 10-year replenishment cycle are the same for all the alternatives. As a result, impacts to biological resources during each replenishment cycle would be temporary and localized, and therefore less than significant (**Class III**), as noted for the preceding alternatives. Temporary impacts to known or future kelp beds due to offshore construction activities are considered to be less than significant (**Class III**). However to ensure that such activities do not create potentially adverse impacts, the USACE has committed to the environmental commitment described above for Alternative 1-B (Section 5.5.3).

In addition, although impacts to these resources are considered to be less than significant (**Class III**), implementation of Mitigation Measure B-1 would provide additional assurance that construction related activities would not likely result in any adverse affect(s) to biological resources.

5.5.7 Summary of Unavoidable Significant Impacts

No unavoidable significant impacts would result from implementation of Alternatives 1B, 2B, 3B, 4B, or the No Project Alternative. The removal and subsequent burial of infaunal and epifaunal organisms associated with Alternatives 1B through 4B can be considered unavoidable, thereby causing adverse effects. However, as discussed above, the short term and localized nature of the disturbance, coupled with recolonization that would occur from nearby unaffected areas, would represent a less than significant impact (**Class III**).

5.6 CULTURAL RESOURCES

5.6.1 Impacts Significance Criteria

In accordance with 36 CFR Part 800.5 of the ACHP's implementing regulations, criteria of adverse effect, impacts on cultural resources are considered significant if one or more of the following conditions would result from implementation of the proposed action:

- An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. For the purpose of determining the type of effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
- An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:
  - Physical destruction, damage, or alteration of all or part of the property

- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- Neglect of a property resulting in its deterioration or destruction
- Transfer, lease, or sale of the property.

5.6.2 Resolution of Adverse Effects

36 CFR Part 800.6 details provisions relating to Memoranda of Agreement. The negotiation of such a document evidences an agency's compliance with Section 106 of the NHPA and is obligated to follow its terms. An agreement document is prepared in consultation with the SHPO. The ACHP is notified regarding the project and may participate. Interested Native American tribes and other parties are provided the draft materials and are invited to be concurring or consulting parties to the agreement document. Mitigation measures defined in an agreement document may include data recovery excavations involving prehistoric sites, or photographic documentation and archival research for historic resources (standing buildings and structures).

5.6.3 Environmental Consequences of the No Action Alternative

The effect of continued beach erosion will be insignificant, in the short term. Over the long term, however, resources adjacent to the project area may be adversely affected by erosion if left unchecked. Impacts associated with continued erosion may or may not be mitigable to a level of less than significant, depending upon the type of resource affected and the degree of damage. The underwater portion of the project (borrow sites) may contain cultural resources eligible for the National Register. The sites would not be impacted if the project is not implemented.

5.6.4 Environmental Consequences of Alternatives 1B, 2B, 3B, and 4B

The identification of cultural resources in the project's area of potential effects (APE) has not been completed. Therefore, the potential exists for the presence of National Register eligible properties within the project's APE. Proposed borrow site Areas A and B require a marine cultural resources study. Until the identification phase is completed, and National Register evaluations are performed on any sites present, an impact assessment for Alternatives 1B, 2B, 3B, and 4B cannot be made. However, to ensure that potentially significant impacts are mitigated to a level of less than significant (**Class II**), Mitigation Measure C-1, below, is proposed. If National Register eligible properties are present, they may be avoidable.

Mitigation Measures

To address the potential impacts of Alternatives 1B, 2B, 3B, and 4B, the following mitigation measure is proposed:

C-1 Prior to final approval for construction of the project, an underwater archeological and remote sensing survey of proposed borrow site Areas A and B will be performed. The findings of the survey shall be subsequently used to identify and implement any mitigation measures that may be necessary to minimize offshore impacts to a level of less than significant.

5.6.5 Agency Coordination

A previous Imperial Beach erosion project was coordinated with the California SHPO in 1978. The SHPO concurred with the USACE's determination of no effect. Given changes to the design of the project, the current project and its alternatives, as proposed will be re-coordinated with the California SHPO in accordance with the National Historic Preservation Act. Results of the archival studies, the previous terrestrial archeological surveys, and the marine surveys of the borrow sites (when completed), along with the USACE's determinations of eligibility and effect, will be sent to the California SHPO for review and comment. All documentation will also be provided to interested Native American groups. If the USACE determines that the project and its alternatives will have an adverse effect on National Register eligible properties, and the SHPO concurs, the Advisory Council will be notified per 36 CFR 800.6.

5.6.6 National Historic Preservation Act of 1966 (36 CFR 800)

In accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act, a records search and an archeological survey of the land portion of the study area have been performed. An archival search has been performed regarding the proposed borrow sites. An archeological and remote sensing survey is required. Until the underwater surveys have been completed, the USACE cannot make determinations of National Register eligibility and effect as required by the Act.

5.7 AESTHETICS

5.7.1 Impact Significance Criteria

The factors considered in determining impacts on aesthetic resources typically include: (1) scenic quality of the study area; (2) viewing distance and degree to which the project would dominate the view of the observer; (3) resulting contrast of facilities related to the project with existing visual resources; and, (4) the level of public interest in the existing landscape characteristics and concern over potential changes.

The criteria used to assess the significance of impacts on aesthetic resources resulting from the project take into consideration the factors described above, as well as relevant local policies and guidelines pertaining to aesthetic resources. An impact is considered significant if it results in one or more of the following:

- Direct, permanent changes to important existing scenic characteristics of a landscape that is viewed by a large number of viewers and/or one or more residences
- The impairment of, or obstruction to, views from public gathering places of scenic resources identified in Federal, State, and local plans
- Changes that would add significantly to a cumulative visual alteration.

5.7.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the study area would continue to erode during winter storms. Continued erosion associated with the No Action Alternative would ultimately lead to a reduction of beach vantage points, resulting in potentially adverse, but insignificant impacts (**Class III**). In addition, current and proposed residential shoreline projects would impede views of Seacoast Drive from most places on the beach. However, views of the Pacific Ocean would not be impeded, nor would any of the natural views associated with the Tijuana Slough National Wildlife Refuge or the Border Field State Park. Long-range views from the Coronado/Imperial Beach boundary looking to the south would continue to be dominated by sandy beaches, residences, and background views of rolling hills and sand dunes of the Tijuana Slough.

5.7.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Under Alternative 1B, beach width would be maintained at a minimum of 12 m (39 feet) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). Maintenance of the beach area would provide the public with a continued vantage point from which to view surrounding areas. Since there are no structural improvements or visual obstructions associated with this Alternative 1B, the character of the area would be maintained, which would be considered a beneficial impact (**Class IV)**. After the initial renourishment, subsequent replenishments would occur every ten years over the 50-year evaluation period (four replenishments total). Dredging and renourishment activities would involve equipment on- and offshore for beach replenishment. Aesthetic qualities of the study area would be temporarily compromised due to equipment and machinery on and offshore during construction and maintenance activities. Impacts would be considered potentially adverse, but not significant (**Class III**) because of their temporary, periodic nature. Dredging and nourishment/ renourishment activities would also introduce sands, cobbles, and gravels that may differ in size and/or color from the existing beach. Impacts associated with such differences are anticipated to be potentially adverse, but less than significant (**Class III**) because: (1) periodic sweeping of the beach per Mitigation Measure R-1 would help blend the beach's sand/gravel composition; and, (2) continued wave and tidal action would additionally blend the beach's sand/gravel composition.

5.7.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Under Alternative 2B, the beach width would be maintained at a minimum of 25 m (82 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). Maintenance of the beach area would provide the public with a continued vantage point from which to view surrounding

areas. As of 1995, the summer beach condition of the study area was approximately 15.2 m (50 ft) wide; therefore, a minimum beach of 25 m (82 ft) could provide a greater number of vantage points, which would be considered a beneficial impact (**Class IV**). There are no structural improvements or visual obstructions associated with this Alternative 2B. Therefore, the character of the area would be maintained, which would be considered a beneficial impact (**Class IV)**. After the initial renourishment, subsequent replenishments would occur every ten years over the 50-year evaluation period (four replenishments total). Dredging and renourishment activities would involve equipment on- and offshore for beach replenishment. Aesthetic qualities of the study area would be temporarily compromised due to equipment and machinery on- and offshore during construction and maintenance activities. Impacts would be considered potentially adverse, but not significant (**Class III**) because of their temporary, periodic nature. Nourishment/renourshment activities would also introduce sands, cobbles and gravels that may differ in appearance (size and color) from the existing beach. However, impacts associated with such differences are considered potentially adverse, but less than significant for the same reasons as described for Alternative 1B above (Section 5.7.3).

5.7.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Under Alternative 3B, beach width would be maintained at a minimum of 34 m (115 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). Maintenance of the beach area would provide the public with a continued vantage point from which to view surrounding areas. As of 1995, the summer beach condition of the study area was approximately 15 m (50 ft) wide; therefore, a minimum beach of 34 m (115 ft) could provide a greater number of vantage points, which would be considered a beneficial impact (**Class IV**). There are no structural improvements or visual obstructions associated with this Alternative 3B. Therefore, the character of the area would be maintained, which would be considered a beneficial impact (**Class IV)**. After the initial renourishment, subsequent replenishments would occur every ten years over the 50-year evaluation period (four replenishments total). Dredging and renourishment activities would involve equipment on- and offshore for beach replenishment. Aesthetic qualities of the study area would be temporarily compromised due to equipment and machinery on- and offshore during construction and maintenance activities. Impacts would be considered potentially adverse, but not significant (**Class III**) because of their temporary, periodic nature. Nourishment/renourshment activities would also introduce sands, cobbles and gravels that may differ in appearance (size and color) from the existing beach. However, impacts associated with such differences are considered potentially adverse, but less than significant for the same reasons as described for Alternative 1B above (Section 5.7.3).

5.7.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Under Alternative 4B, beach width would be maintained at a minimum of 54 m (177 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). Maintenance of the beach area would provide the public with a continued vantage point from which to view surrounding areas. As of 1995, the summer beach condition of the study area was approximately 15 m (50 ft) wide; therefore, a minimum beach of 34 m (115 ft) could provide a greater number of vantage points, which

would be considered a beneficial impact (**Class IV**). There are no structural improvements or visual obstructions associated with this Alternative 4B. Therefore, the character of the area would be maintained, which would be considered a beneficial impact (**Class IV)**. After the initial renourishment, subsequent replenishments would occur every ten years over the 50-year evaluation period (four replenishments total). Dredging and renourishment activities would involve equipment on- and offshore for beach replenishment. Aesthetic qualities of the study area would be temporarily compromised due to equipment and machinery on- and offshore during construction and maintenance activities. Impacts would be considered potentially adverse, but not significant (**Class III**) because of their temporary, periodic nature. Nourishment/renourshment activities would also introduce sands, cobbles and gravels that may differ in appearance (size and color) from the existing beach. However, impacts associated with such differences are considered potentially adverse, but less than significant for the same reasons as described for Alternative 1B above (Section 5.7.3).

5.7.7 Summary of Unavoidable Significant Impacts

The non-structural solutions to beach erosion presented in Alternatives 1B through 4B would provide visual improvements to the beach (**Class IV**). There would be a visual obstruction during initial construction and beach replenishment years; however, these activities would be temporary in nature. Therefore, impacts are considered less than significant (**Class III**) for all alternatives. No unavoidable significant impacts to aesthetics have been identified for Alternatives 1B through 4B.

5.8 AIR QUALITY

Construction impacts would result from implementation of Alternatives 1B, 2B, 3B, and 4B of the Imperial Beach Shore Protection Project. In this section, the potential impacts associated with the alternatives are analyzed. Section 5.8.1 presents the project significance criteria, while impacts are presented in Sections 5.8.2 through 5.8.7.

5.8.1 Impact Significance Criteria

Each Air Quality Management District (AQMD) in California establishes its own significance criteria for environmental review of projects based on the specific conditions within each air basin. The San Diego County Air Pollution Control District (SDCAPCD) is responsible for establishing significance criteria for construction and operational activities within the San Diego Air Basin (SDAB). At this time, the SDCAPCD has not established significance criteria for such projects. However, the SDCAPCD accepts the General Conformity *de minimis* thresholds to identify the significance of a proposed action within the SDAB (SDCAPCD, 2002). Section 4.8.3 of this document provides the Federal, State and local regulations and laws for air quality standards within the project area. Alternatives 1B through 4B would be in compliance with these laws and regulations without the need for mitigation. Alternative 4B would create a potentially significant impact associated with NOx emissions, as described below in Section 5.8.6. However, with implementation of Mitigation Measure A-1, these impacts would be

considered less than significant; as such, Alternative 4B would be in compliance with all applicable Federal, State and local rules and regulations.

Under Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990, an Applicant must make a determination of whether a proposed action "conforms" with the State Implementation Plan (SIP). Conformity is defined in Section 176(c) of the CAAA as compliance with the SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards. However, if the total direct and indirect emissions from a proposed action are below the General Conformity Rule *de minimis* emission thresholds, the proposed action would be exempt from performing an Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP. Therefore, a project would be considered to have a significant adverse impact on the environment if it would exceed the General Conformity *de minimis* thresholds listed in Table 5.8-1.

Table 5.8-1 General Conformity *De Minimis* Threshold

Pollutant	Threshold (tons/yr)
VOCs	50
NOx	50

Source: U.S. EPA, 2001

5.8.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the project would not be constructed, thereby eliminating the construction exhaust emission impacts discussed below (Sections 5.8.3 through 5.8.7). However, the beach would continue to erode at its current rate, which could leave infrastructure and other development adjacent to the beach vulnerable to significant structural damage during high storm and tide conditions. Localized construction that would be necessary to repair such damage would create short-term exhaust emissions, causing adverse, but less than significant impacts similar to those discussed below (**Class III**).

5.8.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Construction Emissions

Construction emissions can be distinguished as either on site or off site. On-site air pollutant emissions associated with construction of the project would principally consist of exhaust emissions from heavy-duty diesel-powered construction equipment (i.e., bull dozers), as well as from the diesel-powered pump and propulsion engines associated with the offshore dredging activities at the borrow areas. Off-site exhaust emissions would be limited to workers commuting to and from the job site, as well as from trucks hauling equipment (e.g., bull dozers and other materials and supplies) to and from the construction site. A description of the assumptions used in quantifying the total emissions from these emission sources is described in the following paragraphs.

On-site Construction Emissions. Construction equipment emissions were calculated by assuming an estimated fleet of four diesel-powered bulldozers and two gasoline-powered utility trucks operating ten hours a day, six days a week, for the duration of the construction period, estimated to be approximately 12 weeks. In addition, this analysis assumes the use of a hopper dredge, which is a seagoing vessel that has two dragarms that extend from both sides of the ships hull. The dragarms lower to the borrow site and slowly pull over the area to be dredged. Pumps create suction in the dragarm, and the sand is drawn up through the arms and deposited in the hooper bins in the vessel's midsection. When the bins are full, the dredge would sail as close as possible to the shore, and a pipeline would be connected to the hopper bins and extended to the onshore replenishment site. It is anticipated that during the construction period, the dredge would operate in 14-day cycles. It would run continuously (24-hour days) for 12 days, followed by a 2-day period in the harbor for maintenance, and to refuel and load up on supplies. See Table C-1 in Appendix C for other assumptions related to the on-site emission estimates for Alternative 1B.

Table 5.8-2 presents the maximum project construction emissions from on-site exhaust sources that would be associated with Alternative 1B. It should be noted that the emissions presented in Table 5.8-2 represent the maximum worst-case emission levels.

Table 5.8-2 Construction Emissions Associated with Alternative 1B Compared to the General Conformity *De Minimis* Thresholds (tons/yr)

Annual Emission Level	VOC	NOx
On-site Construction Emissions	1.77	22.91
Off-site Construction Emissions	0.09	0.07
Total Construction Emissions	1.86	22.98
De minimis Threshold	50	50
Exceed the *de minimis* Threshold	NO	**NO**

Off-site Construction Emissions. As described above, off-site exhaust emissions would result from workers commuting to and from the project site, as well as from trucks hauling equipment (e.g., dozers) to and from the construction site. As proposed, Alternative 1B does not involve material (beach sand) haul trips on public roads. The replenishment sand would arrive to the proposed beach site via a pipeline connected to the offshore dredge. Assumptions were made to determine the amount of off-site vehicular "trips" that would be necessary to support the construction of Alternative 1B. It was assumed that 10 workers would commute to and from the job site on the beach, from Monday to Saturday for the duration of the construction period, which is estimated to be 12 weeks. In addition, it is estimated that 10 round trip diesel haul trips would be needed to deliver construction equipment and supplies to the project staging area. See Table C-2 in Appendix C for other assumptions related to the off-site emission estimates for Alternative 1B. Table 5.8-2 presents the maximum project construction emissions from off-site exhaust sources associated with Alternative 1B.

As listed in Table 5.8-2, the emissions estimated for Alternative 1B are below the General Conformity *de minimis* thresholds, and therefore, the project would be exempt from conducting a comprehensive Air Quality Conformity Analysis. In addition, the construction of Alternative 1B of the Imperial Beach Shore Protection Project would not contribute to any significant air quality impacts. Therefore, potential impacts are considered adverse, but less than significant (**Class III**) and no mitigation is required.

Operational Emissions

The Imperial Beach Shore Protection Project is essentially a construction related project that would not have any long-term operations related air emissions. However, the replenished beach would erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 1B. Construction emissions associated with the 10-year renourishments would generate approximately 63 percent of the emissions that would be generated by the initial nourishment of 1.21 million cm (1.59 million cy). These future emissions would also represent a less than significant impact (**Class III**).

Mitigation Measures

No significant impacts to air quality would occur from implementation of Alternative 1B. Therefore, mitigation measures are not required.

5.8.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Construction Emissions

On-site Construction Emissions. Construction equipment emissions were calculated by assuming an estimated fleet of four diesel-powered bulldozers and two gasoline-powered utility trucks operating ten hours a day, six days a week, for the duration of a 17-week construction period. This analysis assumes the use of a hopper dredge. It is anticipated that during the construction period, the dredge would operate in 14-day cycles. It would run continuously (24-hour days) for 12 days, followed by a 2-day period in the harbor for maintenance, and to refuel and load up on supplies. See Table C-3 in Appendix C for other assumptions related to the on-site emission estimates for Alternative 2B.

Table 5.8-3 presents the maximum project construction emissions from on-site exhaust sources that would be associated with Alternative 2B. It should be noted that the emissions presented in Table 5.8-3 represent the maximum worst-case emission levels.

Off-site Construction Emissions. As described above, off-site exhaust emissions would result from workers commuting to and from the job site, as well as from trucks hauling equipment (e.g., dozers) to and from the construction site. As proposed, Alternative 2B does not involve material (beach sand) haul trips on public roads. The replenishment sand would arrive to the proposed beach site via a pipeline connected to the offshore dredge. It was assumed that ten workers would commute to and from the job

site on the beach, from Monday to Saturday for the duration of the construction period, which is estimated to be approximately 17 weeks. In addition, it is estimated that ten round trip diesel haul trips would be needed to deliver construction equipment and supplies to the project staging area. See Table C-4 in Appendix C for other assumptions related to the off-site emission estimates for Alternative 2B. Table 5.8-3 presents the maximum project construction emissions from off-site exhaust sources associated with Alternative 2B.

Table 5.8-3 Construction Emissions Associated with Alternative 2B Compared to the General Conformity *De Minimis* Thresholds (tons/yr)

Annual Emission Level	VOC	NOx
On-site Construction Emissions	2.51	32.46
Off-site Construction Emissions	0.12	0.10
Total Construction Emissions	2.63	32.56
De minimis Threshold	50	50
Exceed the *de minimis* Threshold	NO	**NO**

As listed in Table 5.8-3, the emissions estimated for Alternative 2B are below the General Conformity *de minimis* thresholds, and therefore, the project would be exempt from conducting a comprehensive Air Quality Conformity Analysis. In addition, the construction associated with Alternative 2B would not contribute to any significant air quality impacts. Therefore, potential impacts are considered adverse, but less than significant (**Class III**) and no mitigation is required.

Operational Emissions

The proposed action is essentially a construction related project that would not have any long-term operations related air emissions. However, the replenished beach will erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 2B. Construction emissions associated with the 10-year renourishments would generate approximately 45 percent of the emissions that would be generated by the initial nourishment of 2.21 million cy (1.69 million cm). These future emissions would also represent a less than significant impact (**Class III**).

Mitigation Measures

No significant impacts to air quality would occur from implementation of Alternative 2B. Therefore, mitigation measures are not required.

5.8.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Construction Emissions

On-site Construction Emissions. Construction equipment emissions were calculated by assuming an estimated fleet of four diesel-powered bulldozers and two gasoline-powered utility trucks operating ten hours a day, six days a week, for the duration of a 20-week construction period. This analysis assumes

the use of a hopper dredge. It is anticipated that during the construction period, the dredge would operate in 14-day cycles. It would run continuously (24-hour days) for 12 days, followed by a 2-day period in the harbor for maintenance, and to refuel and load up on supplies. See Table C-5 in Appendix C for other assumptions related to the on-site emission estimates for Alternative 3B.

Table 5.8-4 presents the maximum project construction emissions from on-site exhaust sources that would be associated with Alternative 3B. It should be noted that the emissions presented in Table 5.8-4 represent the maximum worst-case emission levels.

Table 5.8-4 Construction Emissions Associated with Alternative 3B Compared to the General Conformity *De Minimis* Thresholds (tons/yr)

Annual Emission Level	VOC	NOx
On-site Construction Emissions	2.95	38.19
Off-site Construction Emissions	0.15	0.12
Total Construction Emissions	3.10	38.31
De minimis Threshold	50	50
Exceed the *de minimis* Threshold	NO	**NO**

Off-site Construction Emissions. As described above, off-site exhaust emissions would result from workers commuting to and from the job site, as well as from trucks hauling equipment (e.g., dozers) to and from the construction site. As proposed, Alternative 3B does not involve material (beach sand) haul trips on public roads. The replenishment sand would arrive to the proposed beach site via a pipeline connected to the offshore dredge. It was assumed that ten workers would commute to and from the job site on the beach, from Monday to Saturday for the duration of the construction period, which is estimated to be approximately 20 weeks. In addition, it is estimated that ten round trip diesel haul trips would be needed to deliver construction equipment and supplies to the project staging area. See Table C-6 in Appendix C for other assumptions related to the off-site emission estimates for Alternative 3B. Table 5.8-4 presents the maximum project construction emissions from off-site exhaust sources associated with Alternative 3B.

As listed in Table 5.8-4, the emissions associated with Alternative 3B are below the General Conformity *de minimis* thresholds, and therefore, the project would be exempt from conducting a comprehensive Air Quality Conformity Analysis. In addition, the construction associated with Alternative 3B of the Imperial Beach Shore Protection Project would not contribute to any significant air quality impacts. Therefore, potential impacts are considered adverse, but less than significant (**Class III**) and no mitigation is required.

Operational Emissions

The proposed action is essentially a construction related project that would not have any long-term operations related air emissions. However, the replenished beach will erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 3B.

Construction emissions associated with the 10-year renourishments would generate approximately 38 percent of the emissions that would be generated by the initial nourishment of 2.63 million cy (2.01 million cm). These future emissions would also represent a less than significant impact (**Class III**).

Mitigation Measures

No significant impacts to air quality would occur from implementation of Alternative 3B. Therefore, mitigation measures are not required.

5.8.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Construction Emissions

On-site Construction Emissions. Construction equipment emissions were calculated by assuming an estimated fleet of four diesel-powered bulldozers and two gasoline-powered utility trucks operating ten hours a day, six days a week, for the duration of a 28-week construction period. This analysis assumes the use of a hopper dredge. It is anticipated that during the construction period, the dredge would operate in 14-day cycles. It would run continuously (24-hour days) for 12 days, followed by a 2-day period in the harbor for maintenance, and to refuel and load up on supplies. See Table C-7 in Appendix C for other assumptions related to the on-site emission estimates for Alternative 4B.

Table 5.8-5 presents the maximum project construction emissions from on-site exhaust sources that would be associated with Alternative 4B. It should be noted that the emissions presented in Table 5.8-5 represent the maximum worst-case emission levels.

Table 5.8-5 Construction Emissions Associated with Alternative 4B Compared to the General Conformity *De Minimis* Thresholds (tons/yr)

Annual Emission Level	VOC	NOx
On-site Construction Emissions	4.13	53.46
Off-site Construction Emissions	0.20	0.17
Total Construction Emissions	4.33	53.63
De minimis Threshold	50	50
Exceed the *de minimis* Threshold	**NO**	**YES**

Off-site Construction Emissions. As described above, off-site exhaust emissions would result from workers commuting to and from the job site, as well as from trucks hauling equipment (e.g., dozers) to and from the construction site. As proposed, Alternative 4B does not involve material (beach sand) haul trips on public roads. The replenishment sand would arrive to the proposed beach site via a pipeline connected to the offshore dredge. It was assumed that ten workers would commute to and from the job site on the beach, from Monday to Saturday for the duration of the construction period, which is estimated to be approximately seven months. In addition, it is estimated that ten round trip diesel haul trips would be needed to deliver construction equipment and supplies to the project staging area. See

Table C-8 in Appendix C for other assumptions related to the off-site emission estimates for Alternative 4B. Table 5.8-5 presents the maximum project construction emissions from off-site exhaust sources associated with Alternative 4B.

As listed in Table 5.8-5, the emissions associated with Alternative 4B are above the General Conformity *de minimis* threshold for NOx, and therefore, this alternative would not be exempt from conducting a comprehensive Air Quality Conformity Analysis. In addition, the construction associated with Alternative 4B would generate significant air quality impacts. However, implementation of Mitigation Measure A-1, described below, would reduce potentially significant impacts to a level that is less than significant (**Class II**).

Operational Emissions

The proposed action is essentially a construction related project that would not have any long-term operations related air emissions. However, the replenished beach will erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 4B. Construction emissions associated with the 10-year renourishments would generate approximately 28 percent of the emissions that would be generated by the initial nourishment of 3.62 million cy (2.76 million cm). These future emissions would also represent a less than significant impact (**Class III**).

Mitigation Measures

To reduce construction emissions associated with Alternative 4B to below the General Conformity *de minimis* threshold for NOx, implementation of Mitigation Measure A-1 described below would be required.

A-1 The USACE (or its construction contractor) shall limit active dredge construction activities, as described in this air quality analysis, to 6 months per calendar year to reduce potential NOx emissions to below the *de minimis* threshold of 50 tons per year.

5.8.7 Summary of Unavoidable Significant Impacts

Implementation of Alternatives 1B, 2B, 3B, or 4B would not involve unavoidable significant impacts. It should be noted that Alternative 1B (followed by Alternative 2B) is the environmentally preferred alternative with respect to air quality.

Conformity Statement

Implementation of Alternative 1B, 2B, 3B, or 4B (with implementation of Mitigation Measure A-1) would not adversely affect the attainment of the SIP. Pursuant to Section 176(c) of the Clean Air Act, as amended in 1990, and the General Conformity Rule, Parts 51 and 93, the air quality analysis establishes that the emissions associated with the alternatives are below the *de minimis* levels, and are not regionally significant because they do not exceed ten percent of the San Diego Air Basin's total emission inventory for any criteria pollutants. Consequently, Alternatives 1B, 2B, 3B, or 4B (with

implementation of Mitigation Measure A-1) would be exempt from the conformity determination requirement of the General Conformity Rule. The Record of Non-Applicability (RONA) is included in Appendix G.

5.9 NOISE

Short-term and periodic construction impacts would result from implementation of the project. In this section, the potential noise impacts associated with the project's alternatives are analyzed. Section 5.9.1 presents the project significance criteria, while impacts and mitigation measures are presented in Sections 5.9.2 through 5.9.7.

5.9.1 Impact Significance Criteria

There are two criteria for assessing noise related impacts. First, noise levels projected for the proposed project must comply with the relevant Federal, State, and local standards or regulations. Mitigation of noise impacts on worker safety and health is enforced by OSHA (by CAL OSHA in California), but effectiveness depends on the vigilance of supervisors in seeing that workers use protective gear in high noise environments. Noise impacts on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints and subsequent investigation. There are no regulatory significance criteria applicable to the project during construction or operation, but it is assumed that existing regulations would be enforced.

The second measure of impact recognized by noise analysts is the increase in noise levels above the existing ambient level as a result of the introduction of a new source of noise. A change in noise level due to a new noise source can create an impact on people. The degree of impact is difficult to assess because of the highly subjective character of individuals' reactions to changes in noise. Empirical studies have shown people begin to notice changes in environmental noise levels of around five dBA (U.S. EPA, 1974). Thus, average changes in noise levels less than five dBA cannot be definitively considered as producing an adverse impact. For changes in noise levels above five dBA, it is difficult to quantify the impact beyond the obvious: the greater the noise level change, the greater the impact. A judgment commonly used in community noise impact analyses associates long-term noise increases of five to ten dBA with "some impact." Noise level increases of more than ten dBA are generally considered severe. In the case of short-term noise increases, such as those from construction, the ten dBA threshold between "some" and "severe" impact is often replaced with a criterion of 15 dBA. These noise-averaged thresholds are to be lowered when the noise level fluctuates, or the noise has an irritating character with considerable high frequency energy, or if it is accompanied by subsonic vibration. In these cases, the impact must be individually estimated.

For this analysis, noise related impacts are considered significant if:

- The adopted local standard Noise Element, or ordinance would be exceeded in noise level, timing, or duration

- An increase in noise levels of 15 dBA or more would occur over a period of at least one day at a sensitive receptor with any ambient noise level; permanent increases of five dBA would also be significant
- Long term noise would conflict with State or local guidelines, interior noise levels, and 24-hour averages, and specifically, noise levels exceeding a day-night average sound pressure level L_{dn} of 60 dBA at the nearest noise sensitive receptor (California Office of Noise Control)
- Noise increase increments to the ambient that are as low as five dBA would be significant if they occur during quieter hours at night (between 10 p.m. and 7 a.m.); there is no precise threshold as the character of the noise is also important.

5.9.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the project would not be constructed, thereby eliminating the construction noise impacts discussed in Sections 5.9.3 through 5.9.7. However, the beach would continue to erode at its current rate, which could leave the existing infrastructure and other development adjacent to the beach vulnerable to significant structural damage during high storm and tide conditions. Localized short-term construction that would be necessary to repair such damage could create significant noise impacts similar to those discussed below (**Class II**).

5.9.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Construction Noise Impacts

Construction impacts are generally short-term and periodic in nature and can be created from on-site and off-site sources. On-site noise sources would primarily consist of the operation of heavy-duty diesel-powered construction and dredge equipment. Off-site noise sources would include vehicles commuting to and from the job site, as well as from trucks transporting equipment to the staging or construction areas. These sources are described further in the following paragraphs.

On-site Noise Sources. Construction activities associated with dredge operations at the borrow areas would generate loud noise levels. The dredge would operate 24-hour days for the duration of the project, estimated to be approximately 12 weeks. However, because the borrow areas are approximately 6,560 feet (2,000 m) from the nearest sensitive receptors (see Figure 2.1-3), it is anticipated that these noise levels would be negligible at the receptor locations.

Construction of Alternative 1B would involve placement of approximately 1.59 million cy (1.21 million cm) of sand on the beach. It is estimated that four bulldozers would be required to manipulate the sand into the desired mounds as the sand is discharged from the dredge pipeline. As indicated in Table 4.9-2, a dozer emits a noise level of approximately 89 dBA at 50 feet (15 m). It should be noted that the rules of dBA addition used in community noise prediction are: if two sound levels are within one dBA of each other, their sum is the highest value plus three dBA; if two sound levels are within two to four dBA of each other, their sum is the highest value plus two dBA; and, if two sound levels are within five to nine dBA of each other, their sum is the highest value plus one dBA. In addition, noise levels are calculated based on the assumption that noise from a localized source is reduced by approximately six dBA with each doubling of distance from the source of noise. Using these rules, the worst-case peak

noise level associated with all four of the dozers operating in the same area simultaneously would be approximately 95 dBA at 50 feet (15 m).

The overall incremental increase in noise levels generated from Alternative 1B would result in temporary significant impacts in areas that are adjacent to active construction. Because the project area is 7,100 feet (2,164 m) long, and it is assumed that construction activities would start at one end of the site and progress to the other end over a period of approximately 12 weeks, it is anticipated that potentially significant, but mitigable impacts would occur at any given receptor location for a duration of approximately two weeks (**Class II**). Receptors at greater distances would be impacted to a lesser degree because noise levels typically fall off by approximately six dBA with each doubling of distance from the source of noise.

Off-site Noise Sources. Off-site noise construction would occur primarily from commuting workers and from various haul truck trips to and from the construction sites. It is estimated that approximately 10 construction workers would commute to the construction site each day. In addition, it is estimated that approximately 10 semi-truck trips would be required during the life of the project to haul construction equipment (e.g., dozers) and other materials to the construction site. The peak noise levels associated with passing trucks and commuting worker vehicles is estimated to be approximately 70 to 75 dBA at 50 feet. Given the relatively small amount of daily trips that would be associated with construction worker vehicles and haul trucks, potential impacts associated with offsite construction noise sources are anticipated to be less than significant.

Mitigation Measures

Short-term on-site construction noise impacts associated with Alternative 1B would be reduced to less than significant levels with implementation of Mitigation Measures N-1 through N-5, described below (**Class II**). Residual impacts would be reduced to non-significant levels.

N-1 Onshore staging areas shall be located away from sensitive receptors (schools, hospitals, residential areas, etc.) to avoid noise impacts.

N-2 Conduct all onshore construction activities involving motorized equipment between the hours of 7 a.m. and 7 p.m. Monday through Saturday.

N-3 Maintain properly functioning mufflers on all internal combustion and vehicle engines used in construction and direct muffler exhaust away from sensitive receptor locations to reduce noise levels at the receptor locations to the maximum extent feasible.

N-4 Construction contractor shall provide advance notice by mail to all residents and property owners on the west side of Seacoast Drive between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than seven days occur, an additional notice shall be made either in

person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The contractor shall also publish a notice of the impending construction in local newspapers, stating when and where construction will occur.

N-5 Construction contractor shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise disturbance. Construction contractor shall also establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for promptly responding to callers and recording the disposition of calls. Procedures for reaching the public liaison officer via telephone or in person shall be included in the notices distributed to the public in accordance with Mitigation Measure N-4. If construction noise complaints are received, temporary noise curtains or shields shall be employed to reduce construction noise to levels that would not cause disturbances to anyone working or residing in the area, per Section 9.32.020 of the City of Imperial Beach General Plan.

Operational Noise Impacts

The Imperial Beach Shore Protection Project is essentially a construction related project that would not have any long-term operations related noise. However, the replenished beach would erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 1B. It is estimated that the construction period associated with the 10-year renourishments would last for a total of approximately 8 weeks and that potentially significant, but mitigable impacts would occur at any given receptor location for a duration of approximately one week (**Class-II**). Implementation of Mitigation Measures N-1 through N-5 would apply to the 10-year renourishments as well.

5.9.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Construction Noise Impacts

The short-term construction noise impacts that would result from implementation of Alternative 2B are similar to those described for Alternative 1B (**Class II**), and are mitigable to less than significant with implementation of Mitigation Measures N-1 through N-5. The main difference between Alternative 1B and Alternative 2B with respect to noise impacts is that Alternative 2B involves placement of approximately 1.69 million cm (2.21 million cy) of sand along the 2,164 m (7,100 ft) stretch of shoreline adjacent to the sensitive receptors compared to 1.21 million cm (1.59 million cy) of sand that Alternative 1B would require. It is anticipated that this would result in approximately five additional weeks of project construction associated with Alternative 2B compared to Alternative 1B, which would result in a longer noise exposure period to the sensitive receptors. Compared to Alternative 1B, it is anticipated that Alternative 2B would result in a longer noise exposure period to sensitive receptors, which would prolong short-term significant, but mitigable impacts at adjacent receptor locations by a

few days (**Class II**). Implementation of Mitigation Measures N-1 through N-5 would apply to this alternative as well.

Operational Noise Impacts

Similar to what is described for Alternative 1B, the replenished beach would erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 2B. It is estimated that the construction period associated with the 10-year renourishments would last for a total of approximately 8 weeks and that potentially significant, but mitigable impacts would occur at any given receptor location for a duration of approximately one week (**Class II**). Implementation of Mitigation Measures N-1 through N-5 would apply to the 10-year renourishments as well.

5.9.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Construction Noise Impacts

The short-term construction noise impacts that would result from implementation of Alternative 3B are similar to those described for Alternatives 1B and 2B (**Class II**), and are mitigable to less than significant levels with implementation of Mitigation Measures N-1 through N-5. The main difference with respect to noise impacts is that Alternative 3B involves placement of approximately 2.63 million cy (2.01 million cm) of sand along the 7,100 feet stretch of shoreline adjacent to the sensitive receptors, compared to 1.59 million cy (1.21 million cm) and 2.21 million cy (1.69 million cm) of sand that Alternatives 1B and 2B would require, respectively. It is anticipated that this would result in approximately 8 additional weeks of project construction associated with Alternative 3B compared to Alternative 1B, and approximately three additional weeks of project construction associated with Alternative 3B compared to Alternative 2B. It is anticipated that this increase in construction time would result in a longer noise exposure period to adjacent sensitive receptors. Compared to Alternatives 1B and 2B, it is anticipated that Alternative 3B would result in a longer noise exposure period to sensitive receptors, which would prolong short-term significant, but mitigable impacts at adjacent receptor locations by a few days to approximately one week (**Class II**). Implementation of Mitigation Measures N-1 through N-5 would apply to this alternative as well.

Operational Noise Impacts

Similar to what is described for Alternatives 1B and 2B, the replenished beach would erode over time and would need to be renourished with about 1.00 million cy (764,000 cm) of fill every 10 years under Alternative 3B. It is estimated that the construction period associated with the 10-year renourishments would last for a total of approximately 8 weeks and that potentially significant, but mitigable impacts would occur at any given receptor location for a duration of approximately one week (**Class II**). Implementation of Mitigation Measures N-1 through N-5 would apply to the 10-year renourishments as well.

5.9.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Construction Noise Impacts

The short-term construction noise impacts that would result from implementation of Alternative 4B are similar to those described for the other alternatives (**Class II**), and are mitigable to less than significant levels with implementation of Mitigation Measures N-1 through N-5. The main difference with respect to noise impacts is that Alternative 4B involves placement of approximately 2.76 million cm (3.62 million cy) of sand along the 2,164 m (7,100 ft) stretch of shoreline adjacent to the sensitive receptors compared to 1.21 million cm (1.59 million cy), 1.69 million cm (2.21 million cy), and 2.01 million cm (2.63 million cy) of sand that Alternatives 1B, 2B, and 3B would require, respectively. It is anticipated that this would result in a construction period of approximately 7 months for Alternative 4B, which would equal a construction period of approximately 16, 11, and eight weeks longer than what would be expected under Alternatives 1B, 2B, and 3B, respectively. This increase in construction time would result in a longer noise exposure period to the sensitive receptors. Compared to Alternatives 1B, 2B, and 3B, it is anticipated that Alternative 4B would result in a longer noise exposure period to sensitive receptors, which would prolong short-term significant, but mitigable impacts at adjacent receptor locations by up to two weeks (**Class II**). Implementation of Mitigation Measures N-1 through N-5 would apply to this alternative as well.

Operational Noise Impacts

Similar to what is described for Alternatives 1B, 2B, and 3B, the replenished beach would erode over time and would need to be renourished with about 764,000 cm (1.00 million cy) of fill every 10 years under Alternative 4B. It is estimated that the construction period associated with the 10-year renourishments would last for a total of approximately 8 weeks and that potentially significant, but mitigable impacts would occur at any given receptor location for a duration of approximately one week (**Class-II**). Implementation of Mitigation Measures N-1 through N-5 would apply to the 10-year renourishments as well.

5.9.7 Summary of Unavoidable Significant Impacts

The No Action Alternative would cause only periodic noise associated with maintenance activities. Alternatives 1B, 2B, 3B, and 4B would generate short-term, periodic construction noise that would be mitigable to less than significant levels with implementation of Mitigation Measures N-1 through N-5, described in Section 5.9.3. Thus, none of the alternatives would result in unavoidable significant noise impacts. It should be noted that Alternative 1B (followed by Alternative 2B) is considered to be the environmentally superior alternative with respect to noise impacts.

5.10 SOCIOECONOMICS

5.10.1 Impact Significance Criteria

The criteria used to assess the significance of impacts associated with socioeconomics include impacts on housing and employment as a result of project-related population increases. The criteria for determining impact significance are:

- If demand for permanent housing generated by project-induced population growth results in increases in housing rent or prices, or decreased vacancy rates
- If the demand for permanent housing or commercial buildings and associated property value decreases
- If labor shortages result in a competition for labor that drives up wage rates or an influx of workers who compete for existing housing
- Disproportionately high and adverse impacts on minorities, low-income residents or children.

5.10.2 Environmental Consequences of the No Action Alternative

A primary goal of the City of Imperial Beach is to retain the quality of life and atmosphere of a small beach-oriented town, not overcrowded or elusive, and with a relaxed pace of activities. The study area is characterized by urbanized beach terrain and is not currently planned for significant growth. Since land is limited, new residential development is not expected to be significant. Regardless of the implementation of the proposed project, the study area is not expected to experience future growth and development. Proposed long-term effects of continued erosion in the study area might compromise beachfront residential projects, which would render the impacts of the No Action Alternative potentially adverse, but not significant (**Class III**).

Annual storm events would be adversely impact beachfront properties if shoreline protection measures were not implemented. The local economy depends on recreational events such as the U.S. Open Sandcastle Competition to attract numerous businesses and visitors to Imperial Beach. Impacts from continued erosion are potentially adverse to such events, but not significant (**Class III**).

5.10.3 Environmental Consequences and Mitigation Measures for Alternative 1B

The creation of jobs for the construction of shoreline protection improvements would be a beneficial impact to the study area (**Class IV**). Although the shoreline protection improvements would increase opportunities for development of the shoreline, the project alone would not increase the need for housing in the area, nor would it contribute to an environmental justice concern.

Implementation of Alternative 1A would not adversely affect the local/regional economy. Implementation of the beach replenishments at Imperial Beach is expected to result in net positive impacts to the local/regional economy. Improved shoreline conditions that improve structural stability of permanent housing and commercial buildings could potentially attract residential and commercial interests to the study area, which would result in a beneficial condition for socioeconomics (**Class IV)**.

Off-shore construction operations (vessel traffic and dredging) may have the potential to conflict with local commercial fishing operations during winter months. Such conflicts may include gear/equipment damage and the disruption of fishing locations. To reduce potentially significant impacts to a level of less than significant (**Class II**), Mitigation Measure S-1, below, is recommended. Residual impacts would be considered less than significant.

Executive Order 12898 requires that Federal projects consider a project's impact on minority and low-income populations. The study area, as described in Section 4.10, states that 80 percent of Imperial Beach residents have low to moderate income. This project would reduce structural property damage during winter storms, which could indirectly improve the desirability of the area for residential and commercial investment. Given City policies for maintaining the small town character of the area and the project's consistency with these policies, the project would not be expected to have any negative affect on minority or low-income populations. In addition, the expansion of the beach width would be a public improvement that would benefit all of Imperial Beach **(Class IV).**

Beach nourishment would occur every 10 years, which could increase the number of personnel needed to maintain the shore protection measures. Since there is no operational component to the project and minimal ongoing construction/maintenance effort, the project would not be expected to have any impact on future employment in the area.

Mitigation Measures

Short-term off-shore construction impacts to local commercial fishermen would be reduced to a level of less than significant with implementation of Mitigation Measure S-1, as described below.

S-1 Thirty days prior to the start of construction, the local Imperial Beach commercial fishermen's association shall be provided with written notification of the intended start date of off-shore construction and its duration. Noticing shall include a point of contact throughout the entire construction phase to respond to concerns regarding interference and/or other issues associated with local commercial fishing operations.

5.10.4 Environmental Consequences and Mitigation Measures for Alternative 2B

The environmental consequences for Alternative 2B are the same as those for Alternative 1B (**Class IV**). Overall, Alternative 2B would not be expected to have an impact on future employment, housing demand, property value increases or decreases, labor competition, or low-income residences in the study area.

As with Alternative 1B, off-shore construction operations (vessel traffic and dredging) may have the potential to conflict with local commercial fishing operations during winter months. Such conflicts may include gear/equipment damage and the disruption of fishing locations. To reduce potentially significant

impacts to a level of less than significant (**Class II**) implement Mitigation Measure S-1, as provided above (Section 5.10.3). Residual impacts would be considered less than significant.

5.10.5 Environmental Consequences and Mitigation Measures for Alternative 3B

The environmental consequences for Alternative 3B are the same as those for Alternative 1B (**Class IV**). Overall, Alternative 3B would not be expected to have an impact on future employment, housing demand, property value increases or decreases, labor competition, or low-income residences in the study area.

As with Alternative 1B, off-shore construction operations (vessel traffic and dredging) may have the potential to conflict with local commercial fishing operations during winter months. Such conflicts may include gear/equipment damage and the disruption of fishing locations. To reduce potentially significant impacts to a level of less than significant (**Class II**) implement Mitigation Measure S-1, as provided in Section 5.10.3. Residual impacts would be considered less than significant.

5.10.6 Environmental Consequences and Mitigation Measures for Alternative 4B

The environmental consequences for Alternative 4B are the same as those for Alternative 1B (**Class IV**). Overall, Alternative 4B would not be expected to have an impact on future employment, housing demand, property value increases or decreases, labor competition, or low-income residences in the study area.

As with Alternative 1B, off-shore construction operations (vessel traffic and dredging) may have the potential to conflict with local commercial fishing operations during winter months. Such conflicts may include gear/equipment damage and the disruption of fishing locations. To reduce potentially significant impacts to a level of less than significant (**Class II**) implement Mitigation Measure S-1, as provided in Section 5.10.3. Residual impacts would be considered less than significant.

5.10.7 Summary of Unavoidable Significant Impacts

No unavoidable significant impacts to socioeconomics have been identified for Alternatives 1B through 4B. The expected impacts are considered beneficial (**Class IV**).

The creation of jobs during construction of the proposed project is anticipated to create a beneficial impact to the study area (**Class IV**). The proposed project would additionally improve the structural stability of permanent housing and commercial buildings that could potentially attract residential and commercial interests in the study area, which would result in a beneficial impact (**Class IV**). Alternatives 1B through 4B may have the potential to conflict with local commercial fishing operations during off-shore construction in winter months. However, with implementation of Mitigation Measure S-1, these impacts would be considered less than significant (**Class II**).

5.11 TRANSPORTATION

Short-term construction impacts may result from implementation of the project. In this section, the potential impacts associated with the project are analyzed. Section 5.11.1 presents the project significance criteria, while impacts and mitigation measures are presented in Sections 5.11.2 through 5.11.7.

5.11.1 Impact Significance Criteria

The traffic/transportation impacts of the project would be considered significant if one or more of the following conditions were to occur:

- Construction activities would substantially impede pedestrian movements or bike trails in the area and there would be no suitable alternative pedestrian/bicycle access routes
- An unreasonable increase in roadway wear or damage in the vicinity of the site would occur as a result of heavy truck or construction equipment movements, resulting in noticeable deterioration of pavement or roadway surface without compensatory repairs being made
- Construction activities or operation of the project would result in safety problems for vehicular traffic, pedestrians, or transit operations
- Construction activities would require temporary closure of one or more lanes of traffic or require detours
- The project would conflict with planned transportation improvements in the area
- An increase in vehicle trips associated with additional commuter and truck trips would result in an unacceptable reduction in level of service (LOS) standards of local jurisdictions on roadways in the project vicinity.

5.11.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the project would not be constructed. Therefore, no direct or cumulative construction-related or operational transportation impacts would occur. However, the beach would continue to erode at its current pace, which could leave the infrastructure and other buildings adjacent to the beach vulnerable to significant structural damage during high storm and tide conditions. Future flooding and structural damage may result in temporary vehicular inaccessibility to Seacoast Drive and other local roads, causing potential short-term traffic impacts. In addition, repair of roadways would result in a temporary increase in traffic for area maintenance (**Class III**).

5.11.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Construction Impacts

As proposed, Alternative 1B does not involve material (beach sand) haul trips on public roads. The replenishment sand would arrive to the proposed beach site via a pipeline connected to the offshore dredge. However, there would be a small number of truck trips associated with transporting equipment, such as the bulldozers, to the construction site, as well as the daily commute of construction personnel to the work site. It is estimated that approximately ten construction personnel would be required at the beach construction site each day from approximately 7 a.m. to 7 p.m., Monday through Saturday for

the duration of the project (approximately 12 weeks). Traffic increases associated with equipment truck trips and daily commuting workers would be negligible relative to existing background levels of local traffic. Therefore, potential traffic related impacts associated with Alternative 1B are considered to be less than significant (**Class III**).

It is anticipated that the construction personal would park their private vehicles within a project-designated staging area. The staging area would also be used to store the heavy construction equipment and other project supplies. The storage of construction equipment within the public right-of-way could create temporary significant impacts in terms of access restrictions and safety. These impacts would be significant, but could be mitigated to a less-than-significant level (**Class II**).

Because project construction activities would primarily be limited to the beach and to the offshore dredging locations, it is anticipated that temporary road closures would not be required and pedestrian movements or bike trails in the area would not be impeded where there would be no suitable alternative pedestrian/bicycle access routes.

Mitigation Measures

Construction staging areas may impose access restrictions and safety problems. The implementation of the following mitigation measure would reduce the significance of this potential impact.

T-1 Standard construction practices and safety precautions shall be incorporated into the design of the project staging area(s). Construction staging areas shall be clearly marked and appropriately guarded to ensure public safety.

Operational Impacts

The proposed action is essentially a construction related project that would not have any long-term operations related noise. However, the replenished beach would erode over time and would need to be renourished with about 764,000 cm (1.00 million cy) of fill every 10 years under all of the action alternatives. It is estimated that the construction period associated with the 10-year renourishments would last for a total of approximately 8 weeks and that there would be less than significant impacts (**Class III)** associated with project generated traffic and significant access and safety related impacts that would be mitigable to less than significant (**Class II**) levels with implementation of Mitigation Measure T-1.

Because potential impacts associated with the 10-year renourishments are essentially the same for all of the alternatives, operational impacts will not be discussed for each of the other individual alternatives.

5.11.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Potential transportation related impacts associated with implementation of Alternative 2B would be essentially the same as those described above for Alterative 1B: less than significant impacts (**Class III)**

associated with project generated traffic and significant access and safety related impacts that would be mitigable to less than significant (**Class II**) levels with implementation of Mitigation Measure T-1. The main difference between Alternatives 1B and 2B is that Alternative 2B would involve approximately 17 weeks of construction compared to 12 weeks of construction associated with Alternative 1B.

5.11.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Potential transportation related impacts associated with implementation of Alternative 3B would be essentially the same as those described above for Alternatives 1B and 2B: less than significant impacts (**Class III)** associated with project generated traffic; and, significant access and safety related impacts that would be mitigable to less than significant (**Class II**) levels with implementation of Mitigation Measure T-1. The main difference between Alternatives 1B, 2B, and 3B is that Alternative 3B would involve approximately 20 weeks of construction compared to 12 and 17 weeks of construction associated with Alternatives 1B and 2B, respectively.

5.11.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Potential transportation related impacts associated with implementation of Alternative 4B would be essentially the same as those described above for Alternatives 1B, 2B, and 3B: less than significant impacts (**Class III)** associated with project generated traffic and significant access and safety related impacts that would be mitigable to less than significant (**Class II**) levels with implementation of Mitigation Measure T-1. The main difference between Alternatives 1B, 2B, 3B, and 4B is that Alternative 4B would involve approximately seven months (28 weeks) of construction compared to 12, 17, and 20 weeks of construction associated with Alternatives 1B, 2B, and 3B, respectively.

5.11.7 Summary of Unavoidable Significant Impacts

Less than significant and significant, but mitigable traffic impacts would result from construction activities associated with this project. However, the alternatives would not cause unavoidable significant transportation related impacts.

5.12 LAND USE

5.12.1 Impact Significance Criteria

There are two main components of the land use impact analysis: (1) determination of potential short- and long-term conflicts with surrounding land uses; and (2) identification of potential inconsistencies with land use policies, ordinances, and regulations. The criteria used to determine the significance of impacts on land use were based on the long-term compatibility of the project with existing and future land uses. The criteria for determining impact significance are:

- The creation of substantial incompatibilities between existing and planned land uses
- The creation of substantial land nonconformities

- Inconsistencies with the policies of the City of Imperial Beach General Plan and Coastal Plan or regulations of the City's zoning ordinance.

5.12.2 Environmental Consequences of the No Action Alternative

The No Action Alternative would mean that this shore protection project would not be constructed for Imperial Beach. Without sand replenishment the shoreline properties would be susceptible to damages from inundation, wave attack, and erosion. Many private homeowners along the beach have constructed stone revetments or vertical seawalls to protect their property; but these structures are not continuous and may be subject to failure as the beach recedes (USACE, 2000).

The City of Imperial Beach's General Plan Land Use Element has as one of its goals to "…respect, preserve, and enhance the most important natural resources of Imperial Beach, those being the ocean, beach, San Diego Bay and the Tijuana River Valley." The No Action Alternative would not provide for shoreline protection and would result in diminishing the aesthetic quality and practical use of the public beach. Land Use Element Policy L-6 also states that Imperial Beach should provide, enhance and expand tourist commercial uses to the extent they can be compatible with the town character. The potential for enhancement or expansion of tourist commercial uses could be limited by the lack of shoreline protection. No action with regard to shoreline protection measures would be inconsistent with the City's Land Use Goals and Policy L-6, which would be considered a significant, unavoidable impact (**Class I**) unless some other local, State, or Federal action is taken to meet the intent of the City's General Plan and Land Use Element.

5.12.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Alternative 1B would be consistent with and support existing land use plans and policies, thereby creating a net beneficial impact (**Class IV**). During the approximately four to six months of dredging activity there would be limited use of the beach for recreational activities. Due to the temporary nature of such restrictions, associated land use impacts would be less than significant (**Class III**). Dredging would ultimately result in an improvement to the study area, resulting in a net beneficial impact (**Class IV**). It would also provide for added protection of adjacent property and structures from inundation, wave attacks, and erosion. The beach width would be maintained at a minimum of 39.36 feet (12 m) from the backshore limit to the foreshore berm. Sand replenishment would meet the City's General Plan Policy S-11 that requires that all improvements be designed to minimize impacts to shoreline sand supply, and would therefore be consistent with City guidelines.

As noted above, Alternative 1B would involve offshore dredging. The borrow locations would be north and south of the project site and would be of a sufficient distance to eliminate the potential for any long term land use compatibility issues. In addition, the dredging would only occur over a four to six month period and be repeated every 10 years. Due to its temporary nature, dredging and replenishment activities are considered less than significant (**Class III**).

The proposed project has been reviewed and approved by the California Coastal Commission (CCC) and its staff; the CCC and staff have determined that the Proposed Action would be in compliance with the Federal Coastal Zone Management Act and California Coastal Act, and that no significant, unmitigable (**Class I**) impacts would occur. Appendix E provides CCC staff's findings on the originally Proposed Action (Alternative 2B). Alternative 1B does not have any environmental impacts that are substantially different from Alternative 2B, and does not require any additional mitigation. The USACE discussions with the CCC indicate that the commission does not have a problem with Alternative 1B. It is additionally noted that the City of Imperial Beach has reviewed the Proposed Action and that it supports the proposed project and finds it in compliance with its General Plan and Coastal Plan.

5.12.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Alternative 2B would have the same land use impacts as Alternative 1B (**Class III and IV**) since the beach shoreline would be maintained under both alternatives. The difference between Alternatives 1B and 2B is the beach width would be maintained at a minimum of 25 m (82 ft) from the backshore limit to the foreshore berm. The greater width of the beach shoreline would provide even more protection of adjacent property and structures from inundation, wave attacks, and erosion. Dredging and replenishment activities would be the same for Alternative 2B as for 1B. Due to its temporary nature, these construction activities are considered less than significant (**Class III**). Alternative 2B would also be consistent with and support the City's adopted land use policies and goals, which is considered a beneficial impact **(Class IV)**.

5.12.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Alternative 3B would have the same land use impacts as Alternatives 1B and 2B (**Class III and IV**) since the beach shoreline would be maintained under these alternatives. Alternative 3B's beach width would be maintained at a minimum of 34 m (115 ft) from the backshore limit to the foreshore berm. The greater width of the beach shoreline would provide even more protection of adjacent property and structures from inundation, wave attacks, and erosion. Dredging and replenishment activities would be the same for Alternatives 1B and 2B. Due to its temporary nature, these construction activities are considered less than significant (**Class III**). Alternative 3B would also be consistent with and support the City's adopted land use policies and goals, which is considered a beneficial impact **(Class IV)**.

5.12.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Alternative 4B would have the same land use impacts as Alternatives 1B, 2B, and 3B (**Class III and IV**) since the beach shoreline would be maintained under these alternatives. Alternative 4B's beach width would be maintained at a minimum of 54 m (177 ft) from the backshore limit to the foreshore berm. The greater width of the beach shoreline would provide even more protection of adjacent property and structures from inundation, wave attacks, and erosion. Dredging and replenishment activities would be the same for Alternatives 1B, 2B, and 3B. Due to its temporary nature, these construction activities are considered less than significant (**Class III**). Alternative 3B would also be

consistent with and support the City's adopted land use policies and goals, which is considered a beneficial impact **(Class IV)**.

5.12.7 Summary of Unavoidable Significant Impacts

Alternatives 1B through 4B are consistent with local policies and goals that require minimizing impacts to shoreline sand and to those that address the enhancement and protection of the shoreline. Additionally these alternatives would not conflict with existing or planned land uses in the study area or generate land use nonconformities. Thus, there are no unavoidable significant land use impacts, and no mitigation measures are required.

5.13 RECREATION

5.13.1 Impact Significance Criteria

Implementation of the project alternatives would be considered to have a significant impact on recreation in the study area if they would result in one of the following:

- Net loss of existing recreational opportunities
- Displacement of recreational uses
- Degradation of recreational value.

Thresholds of significance for evaluating these changes are based on the potential for the project to cause physical effects at adjacent recreational areas such as:

- Visual contrast with the surrounding landscape from views within established recreational areas
- Long-term disturbances that would diminish or change the quality and character of recreational opportunities
- Long-term loss or degradation of the recreational value of a major recreational resource or facility
- Conflict with Federal, State, county, or city land use plans, policies, or regulations
- Conflict with established recreational, educational, religious, or scientific uses of an area.

Implementation of shoreline protection improvements would be designed to comply with Federal, State, and local regulations and would be consistent with County and City land use plans, goals and policies. The local plans specify conservation and enhancement of recreational activities.

5.13.2 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, recreational opportunities associated with onshore use within the study area would continue to decline due to the erosion associated with winter storms and its associated reduction in beach width. As of 1995, the summer beach condition of the study area was approximately 15.2 m (50 ft) wide, and the expected annual erosion rate was approximately 850,000 cm (100,000 cy). The continued loss of sand at the beach would have a negative impact on various beach recreation

activities. Continued erosion associated with the No Action Alternative would ultimately lead to a loss of sandy beach that would restrict recreational uses, resulting in significant impacts that could not be mitigated to a level that is less than significant (**Class I**).

Offshore uses such as surfing, swimming, boat- and pier-fishing, kayaking, and jet skiing would not be adversely affected, unless access were restricted due to erosional impacts. Potentially adverse, but less than significant impacts (**Class III**) on offshore recreational activities would result.

5.13.3 Environmental Consequences and Mitigation Measures for Alternative 1B

Alternative 1B involves an initial beach nourishment consisting of 999,312 cys (764,000 cm) of beach fill along a 2,164 m (7,100 ft) stretch of the shoreline (Figure 2.1-3), plus an additional 764,000 cm (999,312 cy) of fill. After the initial renourishment, subsequent replenishments would occur every ten years (four replenishments total) with 764,000 cm (999,312 cy). The resulting beach width would be maintained at a minimum of 12 m (39 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). A total of 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach over the 50-year evaluation period. Maintaining the shoreline would enhance recreational uses associated with onshore activities such as running, jogging, picnicking and sunbathing (**Class IV**).

Other recreational impacts that should be considered are noted below.

Sand Quality. Fill material that contains shell fragments could adversely affect onshore users of the beach. Shell fragments could cause lesions in feet that would require medical attention and would impede recreational activities including volleyball, jogging, walking, and running. Impacts would be considered significant, but mitigable to a less-than-significant level (**Class II**).

Sand replenishment in the project area could have impacts on the recreational quality of the study area. For instance, grain size of the sand could impact the ability to construct sand castles, which is a major event, but not the only event (see Section 4.13), of the U.S. Open Sandcastle Competition held at Imperial Beach. This competition and its associated events are a revenue source for the City. This is not considered a significant affect since the USACE has considered the compatibility of sand material in its selection of borrow sites **(Class III).**

Designated Swimming Area. According to the City of Imperial Beach Lifeguard Unit, swimming is permitted only within a designated swim area, which extends from Palm Avenue south to Imperial Beach Boulevard (Section 4.13.1). Swimming would be restricted during the construction period and for maintenance activities that would take place within this reach.

The south end of the study area, which is currently not included in the designated swim area (from Palm Avenue south to Imperial Beach Boulevard), would likely attract more swimmers since some of the typical swim areas would be closed. Potentially perilous ocean conditions could pose a risk to public

safety, which would result in impacts that are significant, but mitigable to less-than-significant levels (**Class II**).

Fishing. Potentially adverse, but less than significant impacts (**Class III**) are associated with fishing. Fill would cover sand crab and clam populations, which fishermen depend on for bait. This impact is considered temporary and would exist until sand crab and clam communities reorganized **(Class III)**.

Construction and Maintenance. Recreational uses including surfing, swimming, kayaking, walking/ running/jogging, sunbathing, picnicking, volleyball, bicycling, sightseeing, and fishing would be temporarily impacted by construction and maintenance activities. Water access areas would be restricted during the construction phase. This impact is considered temporary and therefore less than significant (**Class III**).

Wave Formation. Recreational activities that involve water contact such as surfing, bodyboarding, bodysurfing, and swimming would be impacted if the beach replenishment altered the quality of wave formation offshore. However, as addressed in Section 5.3, impacts associated with wave formation and water turbidity are anticipated to be less than significant.

Mitigation Measures

Fill material that contains shell fragments could have an adverse affect on offshore users of the beach.

R-1 Periodically remove shell fragments, if present, from beach using a sand sweeper or other mechanical separation device.

Swimmers could be exposed to perilous ocean conditions in an area not patrolled by lifeguards.

R-2 Extend lifeguard services south of Imperial Beach Boulevard to the end of Seacoast Drive during construction of shore protection measures.

Construction equipment and staging areas would impede beach access and use.

R-3 Post signs to announce construction and maintenance activities two to three weeks prior to their inception. Maintain postings within the duration period of the activity. (This mitigation measure may be combined with Mitigation Measure N-5.)

5.13.4 Environmental Consequences and Mitigation Measures for Alternative 2B

Alternative 2B involves an initial beach nourishment consisting of 925,000 cm (1,209,000 cy) of beach fill, plus an additional 764,000 cm (999,312 cy) of fill. After the initial renourishment, subsequent replenishments would occur every ten years (four replenishments total) with 764,000 cm (999,312 cy). The resulting beach width would be maintained at a minimum of 25 m (82 ft) from the backshore limit

to the foreshore berm with a crest elevation of +4 m +13.12 ft). A total of 4,270,000 cm (6,206,460 cy) of fill would be placed on the beach over the 50-year evaluation period. Alternative 2B would have similar recreational impacts (**Class II, III,** and **IV**) as Alternative 1B. The initial fill is greater for Alternative 2B than 1B, as such, the beach would be maintained at a greater width for Alternative 2B. No new impacts would be created from the greater width of the beach. Therefore, potential impacts would remain the same for both onshore and offshore users and Mitigation Measures R-1 through R-3 should be implemented under Alternative 2B.

5.13.5 Environmental Consequences and Mitigation Measures for Alternative 3B

Alternative 3B involves an initial beach nourishment consisting of 1,250,000 cm (1,635,000 cy) of beach fill, plus an additional 764,000 cm (999,312 cy) of fill. After the initial renourishment, subsequent replenishments would occur every ten years (four replenishments total) with 764,000 cm (999,312 cy). The resulting beach width would be maintained at a minimum of 34 m (115 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). A total of 4,270,000 cm (6,631,560 cy) of fill would be placed on the beach over the 50-year evaluation period. Alternative 3B would have similar recreational impacts (**Class II, III,** and **IV**) as Alternative 1B. The initial fill is greater for Alternative 3B than 1B and 2B, as such, the beach would be maintained at a greater width for Alternative 3B. No new impacts would be created from the greater width of the beach. Therefore, potential impacts would remain the same for both onshore and offshore users and Mitigation Measures R-1 through R-3 should be implemented under Alternative 3B.

5.13.6 Environmental Consequences and Mitigation Measures for Alternative 4B

Alternative 4B involves an initial beach nourishment consisting of 2,000,000 cm (2,616,000 cy) of beach fill, plus an additional 764,000 cm (999,312 cy) of fill. After the initial renourishment, subsequent renourishments would occur every ten years (four renourishments total) with 764,000 cm (999,312 cy). The resulting beach width would be maintained at a minimum of 54 m (177 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). A total of 5,820,000 cm 6,906,240 cy) of fill would be placed on the beach over the 50-year evaluation period. Alternative 4B would have similar recreational impacts (**Class II, III,** and **IV**) as Alternative 1B. The initial fill is greater for Alternative 4B than 1B 2B, and 3B, as such, the beach would be maintained at a greater width for Alternative 4B. No new impacts would be created from the greater width of the beach. Therefore, potential impacts would remain the same for both onshore and offshore users and Mitigation Measures R-1 through R-3 should be implemented under Alternative 4B.

5.13.7 Summary of Unavoidable Significant Impacts

Significant impacts could occur under all of the alternatives but can be mitigated with the implementation of Mitigation Measures R-1 to R-4. However, none of the alternatives would present unavoidable significant impacts to recreation in the study area.

6. ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES

The Imperial Beach Shore Protection project requires consumption and expenditure of energy. Energy use is an issue that may affect or be affected by the Proposed Action and its alternatives. The purpose of the Energy Requirements and Conservation Potential of Alternatives and Mitigation Measures section is to provide an integral discussion of the potential energy impacts of the proposed project. This particular discussion is based on the energy conservation requirements outlined in the CEQA Guidelines, Appendix G, which includes:

- Emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy
- Review of efficiency in managing energy resource expenditures with fiscal resource expenditures.

About 20 preliminary alternatives were considered for the shore protection project. These included variations in quantities and replenishment cycles. Four action alternatives and the no action alternative were selected for further evaluation in this EIS/EIR. Alternative 1B has been selected as the Proposed Action.

The project would require two offshore borrow sites that have been identified for fill material, referenced as “Area A” and “Area B” on Figure 2.1-3. Area A is located approximately 2 kilometers (1.2 miles) north of the Imperial Beach pier; Area B is located approximately 4.5 kilometers (2.8 miles) south of the pier. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem.

Fill from the offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a hopper. The stationary pipeline dredge would be located on a barge type floating apparatus that would be located directly over the borrow site locations. The pipeline would discharge directly to either the onshore or offshore replenishment sites. Two tug boats would accompany the dredge to move it (approximately 100 feet at a time every other day) to different locations on the borrow site, or to bring the dredge into the harbor if the threat of bad weather or high seas exist.

The hopper dredge is a boat that has dragarms and dragheads that extend from each side of the ship's hull. The dragheads would be lowered to the ocean bottom and would slowly be pulled over the area. Pumps would create suction in the dragarm and the sand would be drawn up through the arms and deposited in the hopper bins in the vessel's midsection. When the bins are full, the dredge would move to the designated disposal area and empty the dredged material through large hopper doors in the bottom of the hull for offshore deposition. To deposit the material on the beach, the boat would go as close as possible to the shore, and a pipeline would be connected to the hopper bins and extended to the onshore replenishment site. This dredge would normally work continuously for 12 days, then tie-up for 2 days for fuel, water, supplies and maintenance. A crew of 29 workers would operate on a 10-day-on, 4-day-off schedule.

Since the borrow sites are offshore, there would be essentially no haul truck trips associated with the project. Onshore, approximately four bulldozers would operate on the beach to manipulate the fill material received from offshore. The only onshore truck trips would result from the delivery of the bulldozers and the daily commutes of the operators. It is estimated that beach replenishment operations would last between four to six months. Operations of the beach would likely be limited to the hours between 7 a.m. to 7 p.m.

The only energy issue that arises is the amount of fuel needed to pursue the various project alternatives. The majority of the construction equipment (i.e., four dozers and the hopper dredge) would run on diesel fuel, and an estimated three service trucks, which are anticipated to run on gasoline fuel. The anticipated amount of diesel fuel needed to perform each of the alternatives would range between approximately 140,000 to 325,000 gallons, depending on the alternative selected (see Table 6-1).

Table 6-1 Fuel Usage Per Alternative

Alternative	Fuel Usage (gallons)			
		Hopper Dredge		
	Dozers	Pump Engines	Propulsion Engines	Total
1B	38,261	68,168	32,809	139,238
2B	54,206	96,574	46,490	197,270
3B	63,777	119,954	54,724	238,455
4B	89,292	159,048	76,638	324,978

Notes: a diesel fuel density of 7.1 pounds/gallon and a power output of 0.40 pound/hp-hour were used to calculate the total fuel usages for the alternatives. See Appendix C for the assumed equipment usage hours and horsepower.
Source: USEPA, 1996.

Fuel consumption may impact air quality and create the potential for a fire hazard; these issues have been considered in this Draft EIS/EIR. Because replenishment of the shore would be temporary (three to seven month period every ten years), the project would consume a limited amount of fuel and the anticipated energy requirements would not be significant. However, the USACE would require its contractors to implement the following practice to provide additional consideration of energy conservation:

> When not in use, vehicles shall not idle in excess of ten minutes. Contractor shall ensure that project personnel operating vehicles (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the idling restrictions and these records shall be maintained at the construction site for inspection.

7. UNAVOIDABLE SIGNIFICANT IMPACTS

NEPA Regulations (40 C.F.R. § 1502.1) and CEQA Guidelines (§ 15126.2[b]) require a description of any significant impacts, including those that can be mitigated, but not to a level below significant.

The environmental effects of the Imperial Beach Shore Protection alternatives are discussed in Section 5 (Environmental Consequences of Proposed Action and Alternatives). The analysis in Section 5 addresses whether implementation of an alternative would result in a significant adverse impact in any of the specific environmental issue areas. A significance threshold was defined for each issue and for each potential impact addressed in Section 5. When significant adverse impacts were identified, mitigation measures were developed that would reduce impacts below the threshold of significance. In most cases, the potential impacts identified as significant can be adequately reduced to levels below significant through incorporation and implementation of the appropriate mitigation measures.

Some significant impacts, however, cannot be fully mitigated or reduced below their respective significance thresholds by reasonably practicable measures. These impacts are labeled as unavoidable significant impacts.

As presented in Section 5, there would be no unavoidable significant impacts associated with the proposed beach replenishment project. The evaluation considered impacts associated with the Proposed Action and its three action alternatives. The project and the alternatives would provide beneficial impacts to the project area through shore protection and recreation. For those areas where there was the potential for a significant impact, mitigation measures were identified to reduce impacts to levels below significant.

8. GROWTH INDUCING IMPACTS

NEPA (40 C.F.R. § 1508.8) defines indirect effects as those that include growth-inducing effects or other effects related to induced changes in population density or growth rate. CEQA Guidelines § 15126.2(d) requires a discussion of growth-inducing impacts of the proposed project. A project is defined as growth inducing when it:

- Fosters economic growth, population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment
- Removes obstacles to population growth
- Results in further taxes to existing community service facilities
- Encourages or facilitates other activities that could significantly affect the environment, either individually or cumulatively.

Growth inducement is generally dependent on the presence or lack of existing utilities and public services in the area. The provision of new utilities and services in an undeveloped area can induce growth in that area. Growth inducement can also occur if the proposed project makes it more feasible to increase the density of development in surrounding areas. Growth may be considered beneficial, detrimental, or of little significance to the environment, depending on its actual impacts to environmental resources.

The Proposed Action and its alternatives would not result in direct or indirect growth-inducing impacts. The project would involve the nourishment of the beach with sand in specified 10-year cycles, but would not include the development of new or upgraded infrastructure that would provide opportunities for growth. Although the proposed project would increase storm and flood protection to adjacent land uses, these areas are fully built-out. Existing land uses have the potential for future redevelopment through new construction, up-grade, and re-use of existing parcels (Imperial Beach, 1994). However, the potential for growth (redevelopment) would not increase with implementation of any of the alternatives.

9.1 INTRODUCTION

Cumulative environmental impacts result from the relationship of the beach shore protection project to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from minor, but collectively significant actions undertaken over a period of time and by various agencies or persons. In accordance with NEPA and CEQA regulations, a discussion of cumulative impacts resulting from actions and projects that are proposed, under implementation, or reasonably anticipated to be implemented in the near future is required.

Federal regulations implementing NEPA (40 C.F.R. §§ 1500-1508) require that the cumulative impacts of a proposed action be assessed. NEPA defines a cumulative impact as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 C.F.R. § 1508.7).

CEQA Guidelines require a discussion of significant environmental impacts that would result from project-related actions in combination with "closely related past, present, and probable future projects" located in the immediate vicinity (CEQA Guidelines, § 15130 [b][1][A]). These cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, § 15355).

Potential cumulative environmental impacts associated with the beach protection project in conjunction with the other past or reasonably foreseeable projects are discussed in Section 9.2. For the purposes of this cumulative analysis, the No Action Alternative is not considered because this alternative would not result in an action that would contribute to cumulative impacts in the project area. The discussion includes the issue areas discussed in Sections 4 and 5 of this EIS/EIR.

9.2 CUMULATIVE ACTIONS

Projects considered to have the potential of creating cumulative impacts in association with the Proposed Action are described briefly below. In each instance, the assessment focuses on addressing two fundamental questions: (1) Does a relationship exist such that the impacts from the Proposed Action might affect or be affected by impacts from other actions? (2) If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

In discussions with the City of Imperial Beach, the San Diego Association of Governments (SANDAG), the San Diego Port District, and the Southwest Wetlands Interpretative Association, ten projects were identified as cumulative projects for this analysis. Table 9-1 provides a summary of the project and a short description. The discussion that follows the table provides more detail on these cumulative projects.

Table 9-1 Summary of Key Cumulative Projects

Project Name	Agency/Organization	Brief Description	Anticipated Schedule
San Diego Regional Beach Sand Project	SANDAG	Monitoring onshore and offshore results of beach replenishment conducted in September 2001	Spring and Fall From 2002 through 2005
Palm and Carnation Avenue Street End Improvements	Port of San Diego	Promote and enhance public safety, recreational opportunities and accessibility to the general public	Begin Spring 2003 Construction expected to be 6 months
Street Improvements	Port of San Diego	Promote and enhance public safety, recreational opportunities and accessibility to the general public	Some have been completed. The remaining ones will occur in the next ten years
14-mile Border Infrastructure	US Immigration and Naturalization, US Border Patrol	Fencing will be placed along 14 miles of the border	Estimated – 2003
Replacement and Maintenance of Pacific Ocean Surf Fence	US Immigration and Naturalization, US Border Patrol	Replacement and maintenance of the surf fence along US/Mexico border	Estimated – 2003
Goat Canyon Enhancement Project	California Department of Parks and Recreation	Construct, operate and maintain sediment basins	September 2003
Tijuana Estuary Tidal Restoration Program	Southwest Wetlands Interpretative Association	Marsh restoration and beach replenishment	In planning stages – within next five years
Optimizing Current and Future Training and Maintenance at Beaches of Naval Amphibious Base Coronado and Naval Radio Receiving Facility Imperial Beach	US Navy	Current and future operations and training	Estimated – 2003
Redevelopment Projects	City of Imperial Beach	Commercial center improvements	Ongoing
Seawall	Private Property Owner	Construction of a sea wall for a privately held property	Currently under construction

San Diego Regional Beach Sand Project. In June 2000, SANDAG and the U.S. Department of the Navy (USDN) prepared an Environmental Impact Report/Environmental Assessment (EIR/EA) for the San Diego Regional Beach Sand Project. This document evaluated the dredging and placement of 1,529,052 cm (2 million cy) of sand on a maximum of 13 receiver sites in the San Diego Region; Imperial Beach was included as one of the receiver sites. SANDAG completed the beach replenishment project evaluated in the EIR/EA in September 2001. At Imperial Beach, SANDAG placed 137,615 cm (180,000 cy) of sand. SANDAG is now in the monitoring phase and will conduct onshore and offshore monitoring in the spring and fall. These surveys or monitoring will be conducted for four years (Rundle, 2002). The monitoring will include onshore and offshore areas along the beach.

Palm Avenue and Carnation Avenue Street End Improvement Projects. A Notice of Preparation (NOP) was released in March 2002 regarding the improvement of Palm Avenue and Carnation Avenue street ends. These streets are located within the City of Imperial Beach. The street improvements, as stated in the NOP, will promote and enhance public safety, recreational opportunities, and accessibility to the general public (Port of San Diego, 2002).

Palm Avenue will be reconfigured to allow two-way traffic with a turnaround provided at the street end or beach interface. Parking would be provided along both sides of the street and curb, and gutter, and sidewalk improvements are being proposed. The project would establish year-round lateral beach access including handicapped access, lifeguard access, and emergency vehicle access by providing a permanent transition from the street end to the beach. Beach nourishment is proposed as part of this improvement, but no quantity was provided in the NOP (Port of San Diego, 2002).

The public right a way for Carnation Avenue would be increased through a 20-foot easement that would be obtained from the US Navy. Other improvements such as a curved landscaped walkway, stairway to the beach, street furniture, and other street enhancements would be part of this street improvement. Beach nourishment is proposed as part of this improvement, but no quantity was provided in the NOP (Port of San Diego, 2002).

Street Improvements. In addition to the projects noted above, the Port of San Diego has completed or will have completed another eleven street improvements in the City of Imperial Beach. These street improvements would improve beach access by the public, improve accessibility to the beach, and enhance the neighborhoods by providing public art and public viewing areas as well as improved gutters and curbs. The streets involved in this improvement effort include Dahlia Avenue, Daisy Avenue, Date Avenue, Elm Avenue, Elder Avenue, Elkwood Avenue, Ebony Avenue, Imperial Beach Boulevard, Admiralty Avenue, Descanso Avenue, and Encanto Avenue. About half of the street improvements have been completed and the remaining ones will be completed within the next ten years. These improvements would primarily occur onshore with only a small portion of the proposed project involving the beach area (Mailander, 2002).

14-mile Border Infrastructure. The U.S. Immigration and Naturalization Service, Border Patrol proposes a border infrastructure system that starts at the Pacific Ocean and extends 14 miles inland. A Draft EIS was submitted to the State Clearinghouse on February 11, 2002. The review period on this document ended on May 2, 2002. The Proposed Action for this project is the development of a multi-tiered fence, which would include the existing primary fence, secondary fence, patrol and maintenance rods, lights, Integrated Surveillance and Intelligence System components, and third fence along the entire 14-mile corridor. The EIS for this project will also consider other alternatives such as a tactically optimal alternative that would require significant cut and fill to minimize hills and canyons and an alternative that would include a secondary fence only (McGregor, 2002).

Replacement and Maintenance of the Pacific Ocean Surf Fence. The U.S. Immigration and Naturalization Service, Border Patrol proposes to replace and maintain the surf fence from the toe of Monument Mesa extending west approximately 465 feet into the Pacific Ocean beyond the low mean tide line (McGregor, 2002). No schedule or status of the proposed project was provided.

Goat Canyon Enhancement Project. The California Department of Parks and Recreation issued a Notice of Determination on January 17, 2002 to construct, operate, and maintain a series of sediment basins designed to capture the full 100-year storm event and reduce sedimentation. The preferred

alternative would include in-canyon diversion structure and sedimentation basin system consisting of two basins that would hold and remove sediment from the water that flows from Goat Canyon Creek. The EIS have been approved and certified for this project. Construction on this project is anticipated in September 2003 (Winters, 2002).

Tijuana Estuary Tidal Restoration Program. The Southwest Wetlands Interpretative Association received a grant to develop this project, which would include 480 acres of marsh restoration and a beach replenishment component. A technical advisory group is being formed to assist with developing the parameters of this project. As this project is in the planning stages, it would be completed within the next five years (Winters, 2002).

Naval Amphibious Base Coronado and Naval Radio Receiving Facility Imperial Beach. A Notice of Intent to prepare an EIS was filed with the State Clearinghouse on August 9, 2001. The EIS would evaluate the impact of current and future operations, training, and maintenance of beaches of the Naval Amphibious Base Coronado and Naval Radio Receiving Facility Imperial Beach (EPA, 2002). No information was available on the specifics of this project or the proposed schedule.

Redevelopment Projects. The City of Imperial Beach has a number of redevelopment projects proposed for the City of Imperial Beach. These include renovation activities consistent with the City's adopted redevelopment plan. For example, the redevelopment plan includes reference to the renovation of the Sea Coast Inn located between Date Avenue and Daisy Avenue. This project would include renovation of the Date Avenue street end and improvement to the sea wall (Wade, 2002). These projects would be primarily onshore and would involve the use of local streets and properties for construction staging and site renovation.

Sea Wall. A seawall is under construction on a private property between Elkwood and Ebony Avenues (Wade, 2002). This seawall would be completed by the time the beach replenishment project is underway.

9.3 ANALYSIS OF CUMULATIVE IMPACTS

Topography and Geography

The current topography of the study area would be altered by the cumulative addition of beach fill. However, the additional fill material would prevent damage to beachfront structures and enhance recreational opportunities, and is considered a beneficial impact. Because the cumulative projects would require operation of mechanized equipment, spills or leaks of fuel could occur. Some leaks, spills, or accidental releases might be significant enough to contaminate the soil. In order for the project to reduce its individual contribution to soil contamination, implementation of Mitigation Measure G-1 (Section 5.1.3) would minimize the potential for adverse affects from spills, leaks, or accidental spills. With the implementation of this mitigation measure, the project's contribution to the cumulative impacts would be less than significant (**Class II**).

Coastal Processes (Oceanography)

As noted in Section 5 of this EIS/EIR, the project would not significantly impact coastal processes as replenishment activities would be in the range of natural processes. Therefore, the project's contribution to cumulative impacts to coastal processes would be less than significant because the impacts would be short-term and beneficial and those anticipated cumulative projects that involve significant beach replenishment efforts are not expected to occur in the same location or within the same timeframe as the Proposed Action. The City of Imperial Beach is proposing to undertake street end improvements that include a beach replenishment component. While no volume was provided in the NOP for these projects, it is thought that these activities would be to return the site to pre-project conditions. SANDAG conducted sand replenishment activities in September 2001. Since beach replenishment projects have been conducted in the past, there is the potential for potential impacts on coastal processes. The impacts would be less than significant (**Class III**) because of their temporary nature, occurrence at different locations, and/or a significant time period has elapsed between the proposed project and previous efforts.

Water Resources

The impact assessment (presented in Section 5.2) considered the impacts to the receiving beach and borrow areas. The assessment concluded that Class III impacts would result from implementation of the Proposed Action. The project would also be considered to have a less than significant (**Class III**) cumulative impact. In addition, any onshore or offshore activities that have the potential to impact water quality would require compliance with Regional Water Quality Control Board requirements. The proposed project would therefore not produce long-term turbidity at the borrow sites or receiver sites and no cumulative impacts would result when considered in conjunction with other reasonably foreseeable projects.

Essential Fish Habitat

The impacts from the project on essential fish habitat would be expected to less than significant as they would be temporary and localized during the dredging activities at the borrow sites. The cumulative projects that would have an offshore component are expected to occur at a different location and within a different timeframe from the Proposed Action. Therefore, the project in combination with other reasonably foreseeable projects would have a less than significant impact (**Class III**) on essential fish habitat.

Biological Resources

The evaluation of project impacts to biological resources considered impacts to upland vegetation and wildlife, marine plants, infauna, epifauna, fishes, shorebirds and water birds, marine mammals and threatened and endangered species. The analysis determined that impacts would be less than significant (**Class III**) because most of the impacts would be temporary and localized, and thus, the project would not significantly contribute to cumulative biological impacts. Therefore, the Proposed Action would not significantly contribute to significant cumulative biological resource impacts (**Class III**).

Cultural Resources

The Proposed Action would have the potential to affect underwater archeological sites as a result of dredging. Measure C-1 was identified to reduce potential impacts to underwater archeological sites to a less than significant level. Because cumulative projects would be required to address underwater archeological resources in a similar manner, the Proposed Action would have less than significant (**Class II**) cumulative impacts on underwater archeological sites with the implementation of Mitigation Measure C-1.

Aesthetics

The sand replenishment project would have short-term visual impacts that would end at the completion of the construction or sand replenishment activities. The project would provide a beneficial impact to the visual quality of the project area since it would widen the beach and improve coastal views. The Proposed Action in combination with other proposed projects would have the potential to impact the visual quality of the project area if construction of cumulative projects occurs at the same time. However, project construction would be temporary and when complete, most of the cumulative projects would provide a visual enhancement to the city. Therefore, the Proposed Action would not significantly contribute to cumulative aesthetic impacts (**Class III**).

Air Quality

As discussed in Section 5.8, the project would not contribute significant air emissions during construction or operation of the project. If the construction of the cumulative projects occurred at the same time, the combined effects of the Proposed Action with other cumulative actions would result in an incremental and cumulative effect to air quality during construction activities. However, these impacts would be reduced once construction is completed. The project would not contribute to long-term air emissions during operation because it involves sand replenishment in ten-year intervals for four additional cycles. As a result the Proposed Action would not significantly contribute to a cumulative air quality impact (**Class III**).

Noise

The cumulative increase in ambient noise levels in the project area as a result of the implementation of the Proposed Action would temporarily increase the ambient noise levels in the area. Environmental commitments have been identified to reduce potential construction noise to insignificant levels. The Proposed Action would not contribute long-term noise during operation because it involves sand replenishment in ten-year intervals for four additional cycles. Due to the short-term nature of the construction activities and the implementation of measures N-1 through N-5 as well as the sporadic nature of operational noise, the Proposed Action would not significantly contribute to cumulative noise impacts (**Class III**). In addition, cumulative actions would also be required to address construction noise as part of their approval processes, which would further reduce the potential for significant cumulative noise impacts.

Socioeconomics

The Proposed Action would not result in a direct or indirect population and housing increase. In combination with other projects in the project area, the Proposed Action may provide a beneficial but limited increase in the number of construction jobs. However, this is expected to be minimal. In addition, the Proposed Action and cumulative projects could attract residential and commercial interests to the project area, which would be a beneficial cumulative socioeconomic impact (**Class III**).

Transportation

Development of all approved or proposed projects in the project area would result in an overall increase in traffic volumes on the existing and future roadway network. However, the Proposed Action would add approximately 10 daily vehicle trips to the surrounding street network during the duration of the construction period with an additional 10 haul trips that would be required to bring equipment and supplies to the project site. This increase in vehicles can be accommodated on the existing street network. Although this project does not cause the existing deficiencies on these roads, cumulative development in the project area may incrementally affect the existing street network. Project-specific environmental commitments for the cumulative actions (similar to Mitigation Measure T-1) would reduce cumulative transportation impacts to below a level of significance (**Class III**).

Land Use

As noted in Section 5.10, the Proposed Action would be consistent with City policies that require minimizing impacts to the shoreline sand supply and would provide beneficial impacts to the study area with regard to shore protection. Therefore, the Proposed Action would not contribute to adverse cumulative land use impacts.

Recreation

During construction, recreational uses would be temporarily disrupted. Beaches in the surrounding area would need to be used during this construction activity. There is the potential for cumulative impacts to recreation if construction of all of the cumulative projects were to occur at the same time. However, beach closure as a result of the Proposed Action would be temporary and other nearby recreational opportunities would be available (south end of the study area). Therefore, the Proposed Action would not contribute significantly to cumulative recreation impacts (**Class II and III**).

This section provides a compilation of the measures identified in Section 5 of this report. These environmental commitments will be implemented by the USACE and the Local Sponsor to reduce any potential impacts from the proposed beach replenishment project. With the implementation of these commitments, potentially significant impacts would be reduced to less-than-significant levels.

The measures listed below would apply to the Proposed Action and its alternatives, with one exception. If Alternative 4B is implemented, one additional measure would be needed to reduce construction air emissions associated with this project. Refer to Section 5 for the additional measure that would be required for Alternative 4B.

A Mitigation Monitoring Plan (MMP) is included as Appendix I. The MMP briefly describes the mitigation monitoring process for the proposed Imperial Beach Shore Protection Project. It has been developed on the basis of the mitigation measures presented in the project's Final EIS/EIR. It describes the resources/issue areas requiring mitigation, the corresponding mitigation action(s), anticipated residual impacts, phase of implementation, and the party(s) responsible for its implementation. The USACE and City of Imperial Beach are the parties responsible for the MMP's implementation. The MMP for the Imperial Beach Shore Protection Project, will be in effect throughout all phases, including final design, construction, and operation.

Biological Resources

B-1 During construction a qualified biologist will regularly monitor off- and onshore activities to ensure that potential impacts to biological resources that may be associated with turbidity and nourishment/renourishment deposition are minimized to the extent feasible. Specific monitoring activities/protocol will be reviewed with appropriate state and federal agencies prior to implementation.

Topography and Geography

G-1 Preparation of a Spill Prevention, Containment, and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include:

- On- and offshore activities and use and refueling of equipment
- Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site
- Immediate control, containment and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage

from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment

- An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. A monitoring program will be implemented to ensure that the plans are followed throughout the period of construction.

Cultural Resources

C-1 Prior to final approval for construction of the project, an underwater archeological and remote sensing survey of proposed borrow site Areas A and B will be performed. The findings of the survey shall be subsequently used to identify and implement any mitigation measures that may be necessary to minimize off shore impacts to a level of less than significant.

Noise (Construction)

N-1 Staging areas shall be located away from sensitive receptors (schools, hospitals, residential areas, etc.) to avoid noise impacts.

N-2 Conduct all onshore construction activities involving motorized equipment between the hours of 7 a.m. and 7 p.m. Monday through Saturday.

N-3 Maintain properly functioning mufflers on all internal combustion and vehicle engines used in construction and direct muffler exhaust away from sensitive receptor locations to reduce noise levels at the receptor locations to the maximum extent feasible.

N-4 Construction contractor shall provide advance notice by mail to all residents and property owners on the west side of Seacoast Drive between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than seven days occur, an additional notice shall be made either in person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The contractor shall also publish a notice of the impending construction in local newspapers, stating when and where construction will occur.

N-5 Construction contractor shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise disturbance. Construction contractor shall also establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for promptly responding to callers and recording the disposition of calls. Procedures for reaching the public liaison officer via telephone or in person shall be included in the notices distributed to the public in accordance with Mitigation Measure N-4. If construction noise complaints are received, temporary noise curtains or shields shall be employed to reduce construction noise to levels that would not cause

disturbances to anyone working or residing in the area, per Section 9.32.020 of the City of Imperial Beach General Plan.

Recreation

R-1 Periodically remove shell fragments from beach using a sand sweeper or other mechanical separation device.

R-2 Extend lifeguard services south of Imperial Beach Boulevard to the end of Seacoast Drive during construction of shore protection measures.

R-3 Post signs to announce construction and maintenance activities two to three weeks prior to their inception. Maintain postings within the duration period of the activity. (This mitigation measure may be combined with Mitigation Measure N-5.)

Socioeconomics

S-1 Thirty days prior to the start of construction the local Imperial Beach commercial fishermen's association shall be provided with written notification of the intended start date of off-shore construction and its duration. Noticing shall include a point of contact throughout the entire construction phase to respond to concerns regarding interference and/or other issues associated with local commercial fishing operations.

Transportation

T-1 Standard construction practices and safety precautions shall be incorporated into the design of the project staging area(s). Construction staging areas shall be clearly marked and appropriately guarded to ensure public safety.

Energy Conservation

When not in use, vehicles shall not idle in excess of ten minutes. Contractor shall ensure that project personnel operating vehicles (including contractors, subcontractors, and service company representatives) sign a statement acknowledging their awareness of the idling restrictions and these records shall be maintained at the construction site for inspection.

11. COMPLIANCE WITH ENVIRONMENTAL REGULATIONS AND REQUIREMENTS

11.1 ENVIRONMENTAL STATUTES AND REGULATIONS

The Proposed Action and its alternatives have been designed and evaluated in accordance with the requirements of applicable Federal, State and regional standards and regulations. This section presents how the project is compliant with applicable regulations.

National Environmental Policy Act of 1969, Public Law 91-190 and California Environmental Quality Act of 1976. This EIS/EIR has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, Public Law 91-190 and the California Environmental Quality Act (CEQA) of 1976. The report was developed consistent with Article 9 Section 15120 to 15132 of the CEQA Guidelines and in accordance with the following NEPA requirements:

- Section 102 of the NEPA requires that all Federal agencies use a systematic, interdisciplinary approach to protection of the human environment; this approach will ensure the integrated use of the natural and social sciences in any planning and decisionmaking that may have an impact upon the environment. The NEPA also requires the preparation of a detailed EIS on any major Federal action that may have a significant impact on the environment. This EIS must address any adverse environmental effects that cannot be avoided or mitigated, alternatives to the proposed action, the relationship between short-term uses and long-term productivity of the environment, and any irreversible and irretrievable commitments of resources involved in the project.
- Council of Environmental Quality (CEQ) Regulations on Implementing NEPA Procedures (40 CFR 1500 et seq.). These regulations provide for the use of the NEPA process to identify and assess the reasonable alternatives to proposed actions that avoid or minimize adverse effects of these actions upon the quality of the human environment. "Scoping" is used to identify the scope and significance of important environmental issues associated with a proposed Federal action through coordination with Federal, State, and local agencies; the public; and any interested individual or organization prior to the development of an impact statement. The process is also intended to identify and eliminate, from further detailed study, issues that are not significant or that have been covered by prior environmental review.
- USACE Environmental Quality Procedures for Implementing NEPA (33 CFR Parts 230 and 325) provides guidance for implementation of the procedural provisions of NEPA for the Civil Works Program of the Corps. It supplements Council on Environmental Quality (CEQ) Regulations 40 C.F.R. 1500-1508, November 29, 1978 in accordance with 40 C.F.R. 1507.3, and is intended to be used in conjunction with the CEQ regulations. This regulation is applicable to all USACE personnel responsible for preparing and processing environmental documents in support of civil works programs.

As specified in NEPA and CEQA, reasonable alternatives were identified and evaluated, as reviewed in Section 3. Potential environmental effects were identified and mitigation measures proposed to reduce any potentially significant impacts to a less-than-significant level.

In addition, the Draft EIS/EIR was circulated for a 45-day period for public and resource agency review and comment. This review period exceeds the minimum 30-day review period required by CEQA and NEPA. The Proposed Action is therefore in compliance with the stipulations of NEPA and CEQA.

Clean Water Act of 1977, as Amended. Impacts affecting water resources of the United States, as defined under the Clean Water Act, have been considered in this Final EIS/EIR. The Proposed Action does not propose to modify the capacity of the water flow or create potential surface or groundwater contamination. The Proposed Action would reduce the potential for soil erosion and sediment build-up. Thus, this project is in compliance with the Clean Water Act. The Federal Water Pollution Control Act Amendment of 1972, as amended by the Clean Water Act of 1977 requires an assessment of impacts associated with the discharge of dredged or fill materials into the Waters of the United States. Appendix F of this EIS/EIR provides an evaluation of these impacts, and concludes that the Proposed Action would be in compliance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendment of 1972.

The USACE does not issue itself a Section 404 Permit, but must comply with the Clean Water Act (CWA). Section 230.10 (a)(2) of the 404(b)(1) guidelines state that "an alternative is practicable if it is available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes." A 404(b)(1) analysis for the proposed project has been prepared to ensure that the project is in compliance with the CWA (see Appendix F).

As noted in Section 1.7, the USACE submitted a letter to the RWQCB for Section 401 State Water Quality certification on June 12, 2002 (Appendix J). In response to the change in the NED Alternative between the Draft and Final EIS/EIR, the USACE submitted a new letter requesting Section 401 State Water Qualify Certification in September 2002. Project construction will not commence until after Section 401 State Water Quality certification is obtained. Should the project require either a National Pollution Discharge Elimination System (NPDES) permit or Water Discharge Requirements (WDR) permit, it shall be obtained by the project's construction contractor.

Clean Air Act of 1970, as Amended. Potential air quality impacts have been assessed in this Final EIS/EIR. Both short and long-term emissions of criteria pollutants resulting from the construction and operation of the Proposed Action were evaluated. The Proposed Action has the potential to contribute air emissions during the construction of the project, which ranges from 3 months to 7 months. However, construction emissions would be below General Conformity Rule *de minimus* thresholds. The project would have minimal effect on air quality during operation. Therefore, no significant short or long-term significant adverse impacts to air quality have been identified. The Clean Air Act additionally specifies in Section 176(a) that no department, agency or instrumentality of the Federal Government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve, any activity that does not conform with applicable State Implementation Plans after it has been approved. Appendix G of this EIS/EIR provides a Record Of Non-Applicability (RONA) for the Proposed Action. As referenced above, emission levels associated with the Proposed Action fall below the General Conformity Rule *de minimus* emission thresholds. Therefore, the Proposed Action would be consistent with the requirements of the Clean Air Act.

Fish and Wildlife Coordination Act (16 U.S.C. Section 661 et seq.). The Fish and Wildlife Coordination Act requires USACE consultation with the USFWS, National Marine Fisheries Service (as appropriate) and state agencies administering wildlife resources (as appropriate) to consider conservation of wildlife resources with the view of preventing loss of and damages to such resources, as well as providing for development and improvement. The USACE has maintained informal coordination with the USFWS, Carlsbad Office, since February 2001. In compliance with the Fish and Wildlife Coordination Act, the USACE provided funding, as well as a Scope of Work, for a Draft and Final Coordination Act Report (CAR) in February 2001. A copy of the project's Draft EIS/EIR was provided to the USFWS, Carlsbad Office, on June 17, 2002. Field reconnaissance of the project area has been completed by the USFWS (Carlsbad Office); USFWS personnel have not expressed any adverse concerns to date. The USACE has submitted a request for the species of concern located within the project area.

On September 3, 2002 the USFWS provided the USACE with a Draft CAR for the originally Proposed Action (Alternative 2B). The Draft CAR is included in Appendix D of this document. Following receipt of the Draft CAR, the USACE contacted the USFWS and informed it of the identified change in the NED/Preferred Alternative (Alternative 1B). The USACE has continued its coordination with the USFWS since this notification to address the change in the Proposed Action. A Final CAR is currently anticipated to be submitted by the USFWS prior to the close of the public and agency review period of this Final EIS/EIR. The USFWS has indicated that it will include Alternative 1B as the NED/Recommended Plan. Measures identified in the CAR will be followed during construction to minimize impacts to threatened and endangered species and other concerned biological resources.

The Draft CAR recommends that the USACE formally consult with the USFWS, pursuant to Section 7 of the Endangered Species Act, for the brown pelican, California least tern, and western snowy plover in the event that project construction extends past March 1st of any given year. The USACE will comply with this recommendation.

Endangered Species Act (ESA) of 1973, as Amended (Public Law 93-205) and the Fish and Wildlife Coordination Act of 1958 (Public Law 85-624). The Endangered Species Act (ESA) protects threatened and endangered species, as listed by the U.S. Fish and Wildlife Service (USFWS), from unauthorized take, and directs Federal agencies to ensure that their actions do not jeopardize the continued existence of such species. In compliance with the requirements of this act, the USACE has initiated coordination with the USFWS, the California Department of Fish and Game, and the National Marine Fisheries Service regarding the project. The Draft EIS/EIR analyzed project related impacts to biological resources within the project area and concluded that the proposed project would not have adverse impacts on any Federally listed species. Consequently, a formal Section 7 consultation is not required. The USACE has thus requested an informal consultation with the USFWS to satisfy the requirements of the Endangered Species Act (per 50 C.F.R. Section 402.13). The request was submitted to the USFWS on August 29, 2002; a request for a USFWS response within 30 days of the submittal was requested. A copy of the request is provided in Appendix J of this Final EIS/EIR.

Agency comments on the Draft EIS/EIR can be found in Appendix A of this document. Upon completion of the project's environmental review process and the above referenced informal consultation with the USFWS, the project will be in full compliance with this Act.

As noted above under the discussion for the Fish and Wildlife Coordination Act, the USFWS, in its Draft CAR, recommends that the USACE formally consult with the USFWS, pursuant to the Endangered Species Act, for the brown pelican, California least tern, and western snowy plover in the event that project construction extends past March 1 of any given year. The USACE will comply with this recommendation.

National Historic Preservation Act of 1966, as Amended. The Proposed Action has the potential to impact underwater archeological resources. To address potential resources, the USACE proposes to conduct a study of underwater archeological resources prior to proceeding with the project.

A previous Imperial Beach erosion project was coordinated with the California SHPO in 1978. The SHPO concurred with the USACE's determination of no effect. Given changes to the design of the project, the current project and its alternatives, as proposed will be re-coordinated with the California SHPO in accordance with the National Historic Preservation Act. Results of the archival studies, the previous terrestrial archeological surveys, and the marine surveys of the borrow sites (when completed), along with the USACE's determinations of eligibility and effect, will be sent to the California SHPO for review and comment. All documentation will also be provided to interested Native American groups. If the USACE determines that the project and its alternatives will have an adverse effect on National Register eligible properties, and the SHPO concurs, the Advisory Council will be notified per 36 CFR 800.6.

In accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act, a records search and an archeological survey of the land portion of the study area have been performed. An archival search has been performed regarding the proposed borrow sites. An archeological and remote sensing survey is required. Until the underwater surveys have been completed, the USACE cannot make determinations of National Register eligibility and effect as required by the Act.

Coastal Zone Management Act (16 U.S.C. Sections 1451 et seq.) and California Coastal Act (California Public Resources Code, Division 20, Section 30000 et seq.). The Coastal Zone Management Act preserves, protects, develops where possible, and restores and enhances the Nation's coastal zone resources. It additionally encourages and assists states in their responsibilities in the coastal zone through development and implementation of management programs. The California Coastal Act of 1976, as amended, protects and enhances coastal resources within the California Coastal Zone, including, but not limited to public coastal access, recreation, the marine environment, land resources and development. Appendix E of this EIS/EIR provides a Coastal Consistency Determination for review by the CCC in order to comply with the requirements of these acts.

and to avoid direct or indirect support of new construction in wetlands whenever a practicable alternative exists. New construction is defined as including dredging and filling activities. No wetlands, by either State or Federal definition, will be affected by the construction of the Proposed Action. Consequently, the Proposed Action would be in compliance of this Executive Order.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The objectives of this executive order include identifying and addressing disproportionately high and/or adverse impacts of Federal programs, policies, or activities on minority and/or low-income populations. No disproportionately high and/or adverse impacts to minority and/or low-income populations have been identified if the Proposed Action is implemented. In fact, this Proposed Action would improve the aesthetic quality of the project area, would provide protection from storm events, and would provide added recreational value to the shoreline, which would be a benefit to the City of Imperial Beach. The project is therefore in compliance with the directives and objectives of this executive order.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. On April 21, 1997 President Clinton signed Executive Order 13045 that requires Federal agencies to identify and assess environmental health risk and safety risks, which may disproportionately affect children. The Proposed Action would not disproportionately impact children. The Proposed Action would provide protection to shoreline structures from storm events and would widen the beach area, which would provide added recreational and habitat value to the project area. No unavoidable, significant impacts are identified in this Final EIS/EIR. Potential impacts were identified with regard to soil contamination, underwater archeological resources, construction noise, public safety, and recreational uses. Environmental commitments were identified to reduce these potential impacts to less-than-significant levels. While there was no specific study conducted to assess impacts to children, there is no indication that any impacts would disproportionately affect children. In addition, the actual sand replenishment would occur over a three to seven month period every ten years, which would result in temporary and periodic impacts to the project area.

City of Imperial Beach General Plan and Local Coastal Plan. At a State and local level, the Proposed Action and its alternatives fall within the jurisdictional boundaries of the City of Imperial Beach (City). Pursuant to California State Law (Government Code § 65300), the City has an adopted General Plan to guide long-term development within its boundaries and sphere of influence. Pursuant to the California Coastal Act, the City additionally has an adopted Local Coastal Plan to guide development and protect resources within the Coastal Zone. Applicable policies of the City's General Plan and Local Coastal Plan are provided in Sections 4.9.2.2, 4.10.2, 4.11.2, 4.12.4, and 4.13.4. The Proposed Action and its alternatives, as mitigated, would comply with all applicable policies of the City and would provide a net benefit to both the beach itself and its adjoining properties. It is additionally noted that the City, as the project's Local Sponsor, fully supports the Proposed Action and has concurred with the findings of this EIS/EIR.

11.2 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA (40 C.F.R. § 1502.16) requires that an EIS address the relationship between short-term uses of the environment and the impacts that such uses may have on the maintenance and enhancement of the long-term productivity of the affected environment. Of particular concern are impacts that would narrow the range of beneficial uses of the environment. This refers to the possibility that choosing one alternative reduces future flexibility in pursuing other options, or that transforming land or other resources to a certain land use often eliminates the possibility of other uses being performed at that site.

The Proposed Action would replenish the City of Imperial Beach's shoreline with sand from borrow areas north and south of the project site. This would provide protection to structures adjacent to the shore by reducing the potential for erosion and would widen the existing beach area, which would provide additional recreational benefit along this area of the beach. Therefore, the project would not result in any environmental impacts that would significantly narrow the range of beneficial uses of the project area or pose long-term risks to health, safety, or the general welfare of the City of Imperial Beach and surrounding communities. Instead, the project would provide a significant benefit to the City of Imperial Beach and would enhance the use of the beach for recreational activities.

11.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Both NEPA (40 C.F.R. § 1502.16 and CEQA Guidelines (§ 15126.2[c]) require analysis of significant irreversible and irretrievable effects. Irreversible commitments are damages to the environment that cannot be reversed. Irretrievable commitments are those that are lost but can be replaced either onsite or offsite after the project has been constructed. This includes the use of nonrenewable resources, such as metal, wood, fuel, paper, and other natural or cultural resources. These resources are considered committed because they would be used for the proposed action when they could have been conserved or used for other purposes. Another impact that falls under the category of the irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

The Proposed Action is comprised of beach nourishment along a 2,164 m (7,100 ft) stretch of shoreline as shown in Figure 2.1-3. The initial base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in minimum beach width of 12 m (39 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12 m (39 ft). Following initial construction, there would be four replenishment cycles (years 11, 21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach of the project's lifetime.

The project would provide protection to structures along the shoreline of the City of Imperial Beach and would provide added recreational value to city residents and visitors/tourists. The project would result

in the consumption of energy resources as described in Section 6 of this report to operate dredges, trucks, pumping equipment, and grading equipment. This use of resources would not result in a substantial energy use, would be short-term, and would not result in permanently destroying natural resources. In addition, this project would be beneficial to the City of Imperial Beach and surrounding communities because of the enhanced recreational value of the beach and the protection provided to shoreline structures.

12. LIST OF REVIEWERS AND PREPARERS

12.1 REVIEWERS

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Paul Rose	Chief, Environmental Resources Branch	U.S. Army Corps of Engineers
Chuck Mesa	Coastal Project Engineer	U.S. Army Corps of Engineers

12.2 PREPARERS

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Abbott, I.A. and G.J. Hollenberg. 1987. *Marine Algae of California*. Stanford University Press, Stanford, CA. 827 pp.

Ainley, D.G. and S.G. Allen, 1992. Abundance and Distribution of Seabirds and Marine Mammals in the Gulf of the Farallones: Final Report to the Environmental Protection Agency (Region IX) LTMS Study Group. Point Reyes Bird Observatory, Stinson Beach, CA. July 30.

Aviation Planning Associates. 1979. Seminar on Noise Control Plan Development.

_____. 1978. Calculations of Maximum A-weighted Sound Levels (dBA) Resulting from Civil Aircraft Operations.

Barber, Jim. 2001. Personal communication with Jim Barber, Maintenance Worker II for the City of Imperial Beach. January 11.

Beauchamp, R.M. 1986. *Flora of San Diego County*. Sweetwater River Press, National City, CA.

Bonnell, M.L. and M.D. Dailey, 1993. *Marine Mammals*. Pages 604-681, In: M.D. Dailey, D.J. Reish, and J. W. Anderson (eds.), Ecology of the Southern California Bight. University of California Press, Berkeley, CA.

Caltrans (California Department of Transportation). 2001. Personal communication between Matt Fagundes of Aspen Environmental Group and Ramon Ruelas, Project Manager at California Department of Transportation, January.

_____. 2000. Caltrans Traffic and Vehicle Data Systems, Traffic Operations Project website, last updated September 6, 2000. (svhqsgi4.dot.ca.gov/hq/traffops/saferest/trafdata).

CARB (California Air Resources Board). 2001. Accessed CARB website (www.arb.ca.gov/desig) *State Area Designations Maps* on January 9, 2001.

____. 1999. *California Air Quality Data Workbook, Annual Criteria Pollutant Site and Air Basin Data*, December

Cardone, Bonnie J. and Patrick Smith. *Shipwrecks of Southern California*. Birmingham, Alabama: Menasha Ridge Press, 1989.

CCA (California Coastal Act) of 1976. Section 30008.

Census, Bureau of. 1994. *County and City Data Book; 1994*. Washington D.C., U.S. Government Printing Office.

City of San Diego, 1999. Receiving Waters Monitoring Report for 1998. City of San Diego Ocean Monitoring Report, Metropolitan Wastewater Department, Environmental Monitoring and Technical Services Division, San Diego, CA.

Copper, E. and R. Patton. 1992. The Status of the California Least Tern at Navy Bases in San Diego Bay in 1991: Naval Air Station North Island. Prepared for U.S. Department of the Navy, Southwest Division, Naval Facilities Engineering Command.

Dexter, D.M. 1977. Biological Baseline Studies of the Imperial Beach Erosion Control Project Area. Prepared for the U.S. Army Corps of Engineers, Los Angeles District, by the Center for Marine Studies, San Diego State University, San Diego, CA.

Eganhouse, R.P. and M.I. Venkatesan. 1993. Chapter 3 "Chemical Oceanography." M.D. Daily, D.J. Reish, and J.W. Anderson (eds.) *Ecology of the Southern California Bight: A Synthesis and Interpretation*. Univ. California Press. Berkeley, CA.

Elwany, M.H.S. and R.E. Flick. 1996. "Relationship Between Kelp Beds and Beach Width in Southern California." J. Water. Port Coast. Ocean Engineer. 122(1):34-37.

Ezell, Dr. Paul. 1973. Unpublished archeological survey report. San Diego State University.

Fairey, R., C. Bretz, S. Lamerdin, J. Hunt, B. Anderson, S. Tudor, C.J. Wilson, F. LeCaro, M. Stephenson, M. Puckett, and E.R. Long. 1996. Chemistry, Toxicity, and Benthic Community Conditions in Sediments of the San Diego Bay Region. Report prepared for the State Water Resources Control Board, Sacramento, CA.

Feder, H.M., C.H. Turner, and C. Limbaugh. Observations on fishes associated with kelp beds in southern California. California Dept. Fish and Game Fish Bull. No. 160. 144 pp.

Ford, R.F., G. McGowen, and M.V. Needham, 1971. Biological inventory: investigations of fish, invertebrates and marine grasses in the Tijuana River Estuary. Pages 39-64, In: Environmental impact study for the proposed Tijuana River flood control channel. Technical report to Ocean Studies and Engineering, Long Beach, CA.

Foster, M.S. and D.R. Shiel. 1985. The ecology of giant kelp forests in California: a community profile. U.S. Fish and Wildlife Services Biological Report 85(7.2). 152 pp.

Hall, E.R. 1981. *The Mammals of North America*. John Wiley & Sons, New York.

Halvorson, Don (San Diego APCD). 1997. Personal communication with Thomas Murphy (Aspen Environmental Group). July 30.

Hanan, D. and J. Sisson, 1992. Marine Mammal Resources. Pages 208-211, In: *California's Living Marine Resources and Their Utilization*. W.S. Leet, C.M. Dewees, and C.W. Haugen (eds.), California Sea Grant Publication USCGEP-92-12.

Hardy, J.T. 1993. "Phytoplankton." Chapter 5, In: *Ecology of the Southern California Bight, A Synthesis and Interpretation*. M.D, Dailey, D.J. Reish, and J.W. Anderson, editors. University of California Press, Berkely and Los Angeles, CA.

Imperial Beach, City of. 2000. Swimming conditions taken from their internet webpage. http://www.ci.imperial-beach.ca.us

_____. 1997. Pier fishing information taken from their Internet Webpage last revised July 23.

_____. 1994. General Plan & Coastal Plan. October 19.

Inman, D.L., R.T. Guza, D.W. Skelly and T.E. White. 1986. Southern California Coastal Processes Data Summary. Report No. CCSTWS 86-1, Los Angeles District, Corps of Engineers, 572 p.

Largier, J.L. 1995. San Diego Bay Circulation. Final Report to the California State Water Resources Control Board and Regional Water Quality Control Board, San Diego Region.

Lagomarsino, I., 1992. Whales, Dolphins, and Porpoises. Pages 211-216, In: *California's Living Marine Resources and Their Utilization*. W.S. Leet, C.M. Dewees, and C.W. Haugen (eds.), California Sea Grant Publication USCGEP-92-12.

Lissner, A.L. and M. Dungan, 2001. Field reconnaissance of the Imperial Beach EIS/R study site, 7 January 2001. Imperial Beach, CA.

Love, M. 1996. *Probably More Than You Want to Know About the Fishes of the Pacific Coast*, Second Edition. Really Big Press, Santa Barbara, CA. 381 pp.

Luomala, Katherine. 1978 Tipai-Ipai. In *Handbook of North American Indians, Volume 8*. Robert F. Heizer, volume editor. Smithsonian Institution, Washington.

Macias-Zamora. 1996. Distributions of hydrocarbons in recent marine sediments off the coast of Baja California. *Environ. Poll.* 92:45-53.

Mailander, 2002. Personal Communication between Sandra Alarcón-Lopez of Aspen Environmental Group and Melissa A. Mailander, Environmental Review Coordinator, Port of San Diego. May 16.

Marshall, Don B. *California Shipwrecks, Footsteps in the Sea*. Seattle: Superior Publishing Company, 1978.

MBA (Michael Brandman Associates). 1990. South San Diego Bay Enhancement Plan. Volume 2/ Resources Atlas. Prepared for San Diego Unified Port District.

McGregor. 2002. Personal communication between Sandra Alarcón-Lopez of Aspen Environmental Group and Charles McGregor, US Army Corps of Engineers. Fort Worth District, Environmental Division. Undated materials provided - Executive Summary. Proposed Completion of a 14-Mile Border Infrastructure System and Executive Summary for the Replacement and Maintenance of the Pacific Ocean Surf Fence. May 20.

MEC Analytical System Inc. 1993. Kelp Reef Siting and Design Kelp Persistence Data Base. Draft Technical Memorandum for San Onofre Marine Mitigation Program, Southern California Edison Company.

Mesa, Chuck. 2001. Personal communication with Chuck Mesa, Coastal Engineer for the U.S. Army Corps of Engineers.

Morgan, R. P. II, V. J. Rasin, and L. A. Noe. 1973. Effects of Suspended Sediments on the Development of Eggs and Larvae of Striped Bass and White Perch. Ref. No. 73-110. College Park: University of Maryland Natural Research Institute. (Cited in O'Connor 1991.).

Moyle, P.B. and J.J Cech, Jr. 1988. *Fishes, An Introduction to Ichthyology*. Prentice Hall Publishing, Englewood Cliffs, NJ. 559 pp.

Nagano, C. 1982. Populations Status of the Tiger Beetles of the Genus *Cicindela* (Coleoptera: Cicindellidae) Inhabiting the Marine Shoreline of Southern California. Atala 8:33-42.

Nordby, C.S. 1982. The comparative ecology of ichthyoplankton within Tijuana Estuary and adjacent nearshore waters. M.S. Thesis. San Diego State University, San Diego, CA.

North, W.J., D.E. James, and L.G. Jones. 1993. History of kelp beds (*Macrocystis*) in Orange and San Diego counties, California. Hydrobiol. 260/261:277-283.

North, W.J. and MBC Applied Environmental Sciences. 2001. Status of the Kelp Beds of San Diego and Orange Counties for the Years 1990 to 2000. Prepared for the Region Nine Kelp Survey Consortium.

NRC (National Research Council). 1995. *Beach Nourishment and Protection*. Prepared by Committee on Beach Nourishment and Protection. National Academy Press (available at http://books.nap.edu/books/0309052904.html).

O'Connor, J. M. 1991. *Evaluation of Turbidity and Turbidity-Related Effects on the Biota of the San Francisco Bay-Delta Estuary*. Submitted to U.S. Army Corps of Engineers, San Francisco District.

O'Connor, T.P. and B. Beliaeff. 1995. Recent Trends in Coastal Environmental Quality: Results from the Mussel Watch Project. National Oceanic and Atmospheric Administration, National Ocean Service. Silver Spring, MD.

Parr, T., D. Diener and S. Lacy. 1978. Effects of Beach Nourishment on the Nearshore Sand Fauna at Imperial Beach. U.S. Army Corps of Engineers, Coastal Engineering Research Center, Misc. Report No. 78-4. Ft. Belvoir, VA.

Parsons (Parsons Engineering Science, Inc.), 1996. Wastewater Discharge Modeling and Analysis of Alternative Interim Disposal Options in Support of the Supplemental Environmental Impact Statement for the International Boundary and Water Commission International Wastewater Treatment Plant Interim Operation.

Peddicord, R., V. McFarland, D. Belfiori, and T. Byrd. 1975. Dredge Disposal Study, San Francisco Bay and Estuary. Appendix C. Effects of Suspended Solids on San Francisco Bay Organisms. U.S. Army Corps of Engineers, San Francisco District.

Perkins, C.B. 1949. The Snakes of San Diego County with Descriptions and Key. Bulletins of the Zoological Society of San Diego No. 23.

Pettus, Roy. 1985 *Preliminary Report, A Marine Cultural Resources Survey and Diver Investigation Offshore from Coronado Beach and the Silver Strand in San Diego County, California*. Prepared for the U.S. Army Corps of Engineers, Los Angeles District.

Pettus, Roy and John Hildebrand. 2000 SANDAG Regional Beach Sand Project, Marine Archaeology Technical Report: Geophysical Data Interpretation, Core Analysis, and Probability Zone Assessment. Appendix E in the *Draft Environmental Impact Report/Review Environmental Assessment, SANDAG Regional Beach Sand Project*. GeoArch Marine Archaeology Consultants, Sand Diego, California.

Pierson, Larry J., Gerald I. Shiller and Richard A. Slater. *Archaeological Resource Study: Morro Bay to Mexican Border*. Prepared for the U.S. Department of Interior, Minerals Management Service, 1987.

Port of San Diego, 2002. Notice of Preparation of a Draft Environmental Impact Report. Palm & Carnation Avenue Street End Improvements Imperial Beach. Accessed from www.portofsandiego.org. March 20.

Quast, J.C., 1971. Fish fauna of the rocky inshore zone. *Nova Hedwegia*. 32:481-507.

Rundle. 2002. Personal Communication between Sandra Alarcón-Lopez of Aspen Environmental Group and Rob Rundle, Senior Regional Planner, San Diego Association of Governments. April 24.

_____. 2002. Federal Register. Volume 66, Number 151, pages 41009-41010. From Federal Register Online via GPO access.

SANDAG (San Diego Association of Governments). 2001. Accessed SANDAG website (www.sandag.cog.ca.us/projects/transportation), San Diego Region Average Weekday Traffic Volumes for 1995 to 1999, on January 10.

_____. 2000. The San Diego Regional Beach Sand Project Final Environmental Impact Report/ Environmental Assessment. SANDAG and U.S. Department of the Navy. San Diego, CA. June.

_____. 1995. SANDAG Regional Growth Forecast Tables by Jurrisdiction and Sphere of Influence: Series 8 Regional Growth Forecasts for Total Population, Housing, and Employment. May (Interim Forecast). Data obtained from SANDAG Home Page (*http://www.sandag.cog.ca.us)*.

San Diego, City of. 1996. International Wastewater Treatment Plant, Baseline Ocean Monitoring Report. Metropolitan Wastewater Department, Environmental Monitoring & Technical Services Division. San Diego, CA.

SCCWRP (Southern California Coastal Water Research Project), 1999. Spatial Characterization of Four Water Column Parameters on the Mainland Shelf of Southern California in July 1994. Pages 89-100, In: S.B. Weisberg and D. Hallock (eds.), Southern California Coastal Water Research Project Annual Report 1997-1998. Westminster, CA.

SDCAPCD. (San Diego County Air Pollution Control District). 2002. Personal communication between Matt Fagundes of Aspen Environmental Group and Robert Rider of the San Diego County Air Pollution Control District. May 16.

Shaw, C.E. 1950. The Lizards of San Diego County with Descriptions and Key. Bulletins of the Zoological Society of San Diego No. 25.

Shaw, M.J. 1980. Artificial sediment transport and structures in coastal Southern California. Univ. of California, San Diego, Scripps Inst. of Oceanography, Reference Series 80-41, 109 pp.

Small, A. 1994. *California Birds: Their Status and Distribution*. Ibis Publishing Company, Vista, CA.

_____. 1974. *The Birds of California*. Collier Books, NY.

Stadtlander, D. 1995. History of the California Least Tern Nesting at San Diego Bay, 1978-1994. Coastal Ecosystem Program, U.S. Fish and Wildlife Service, Carlsbad, CA.

_____. 1993. Colonial Seabirds and the Western Snowy Plover Nesting in South San Diego Bay, 1993. Bay and Estuary Program, U.S. Fish and Wildlife Service, Carlsbad, CA.

Thompson, B., J. Dixon, S. Schroeter, and D.J. Reish. 1993. Benthic Invertebrates. Chapter 8, In: *Ecology of the Southern California Bight, A Synthesis and Interpretation*. M.D, Dailey, D.J. Reish, and J.W. Anderson, editors. University of California Press, Berkely and Los Angeles, CA.

Unitt, P. 1984. The Birds of San Diego County. Memoir 13 of the San Diego Society of Natural History.

USACE (U.S. Army Corps of Engineers) 2000. Silver Strand Shoreline, Imperial Beach, CA. General Reevaluation Report. April.

_____. 1997a. Project Study Plan (PSP) for Silver Strand/Imperial Beach, California Shore Protection General Re-Evaluation Report (GRR).

_____. 1997b. Unpublished data.

_____. 1997c. Silver Strand/Imperial Beach, California Shore Erosion and Storm Damage Study, Public Information Workshop Handout. May.

_____. 1995a. Environmental Evaluation (EE) for the Silver Strand Shoreline Protection Project. February.

_____. 1995b. Silver Strand Shoreline (San Diego County, California) Reconnaissance Study. Final Report. Coastal Resources Branch. December.

_____. 1992. Evaluating Environmental Effects of Dredged Material Management -- A Technical Framework. EPA 842-H-92-008. U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. Washington, D.C.

_____. 1991. State of the Coast Report, San Diego Region.

_____. 1990. Monitoring of a Nearshore Dredged Material Disposal Berm at Silver Strand State Park, San Diego, CA. Unpublished Technical Report.

_____. 1989. Historic Wave and Sea Level Data Report San Diego Region. Los Angeles District Publication, CCSTWS 88-6.

_____. 1987. Silver Strand Littoral Cell Preliminary Sediment Budget Report. Los Angeles District Publication, CCSTWS 87-3.

_____. 1985. Littoral Zone Sediments, San Diego Region, Oct. 83 - June 84. Los Angeles District Publication, CCSTWS 85-11.

_____. 1978. Final Environmental Impact Statement: Imperial Beach Erosion Control Project, San Diego County, California. September.

_____. 1975. Final Environmental Impact Statement: San Diego Harbor, San Diego County, California. February.

USDN (U.S. Department of the Navy). 1995. Final Environmental Impact Statement for the Development of Facilities in San Diego/Coronado to Support the Homeporting of One NIMITZ-Class Aircraft Carrier. Southwest Division, Naval Facilities Engineering Command. November. 3-5

_____. 1994a. Eelgrass Inventory and Mapping of San Diego Bay. Southwest Division, Naval Facilities Engineering Command, Natural Resources Branch.

_____. 1994b. Planning Aid Letter: Beach Erosion and Storm Damage Reduction, Silver Strand Shoreline, San Diego County, California. Prepared for U.S. Army Corps of Engineers, Los Angeles District by USFWS Carlsbad Field Office.

_____. 1994c. Southwest Division, Naval Facilities Engineering Command. Waterbird Survey: North and Central San Diego Bay, 1993. Prepared for USDN Naval Air Station North Island.

_____. 1994d. Determination of Endangered Status for the Pacific Pocket Mouse. Final Rule. Federal Register, September 29.

_____. 1993. Final Programmatic EIS for Dredged Material Disposal (Volume 1 of 3). Prepared by the U.S. Department of the Navy, Southwest Division, Naval Facilities Engineering Command, U.S. Department of the Navy, 3-5.

_____. 1992. Draft Programmatic EIS for Dredged Material Disposal (from Volume I of 3 volumes). Prepared by the U.S. Department of the Navy, Southwest Division, Naval Facilities Engineering Command, U.S. Department of the Navy. 3-5

U.S. Naval Historical Center. 1976 *Dictionary of American Naval Fighting Ships*, 1976, Vol.6 pp. 197-199 (http://www.hazegray.org/danfs/submar/ss142/txt).

USEPA (United States Environmental Protection Agency). 2001. Accessed U.S. EPA website (www.epa.gov/region09/air/maps) Region 9 Air Quality Attainment Designations. January 9.

_____. 1996. Final Supplemental Environmental Impact Statement for the International Boundary and Water Commission International Wastewater Treatment Plant Interim Operation. November.

_____. 1996. Region IX and International Boundary and Water Commission, U.S. Section. Draft Supplemental Environmental Impact Statement for the International Boundary and Water Commission International Wastewater Treatment Plant Interim Operation. September.

_____. 1996. AP-42, Stationary Internal Combustion Sources, Table 3.4-1, October.

_____. 1994. Final Environmental Impact Statement for the International Boundary and Water Commission International Wastewater Treatment Plant and Outfall Facilities. February.

_____. 1993. Guidelines for Deriving Site-Specific Sediment Quality Criteria for the Protection of Benthic Organisms. EPA-822-R-93-017. Washington, D.C.: EPA Office of Water and Office of Research and Development.

_____. 1978. *Protective Noise Levels*. Condensed version of USEPA levels document (No. PB82-138827).

_____. 1974. *Information on Levels of Environmental Noise Requisite to Protection Public Health and Welfare with Adequate Margin of Safety*. Report No. 550/9-74-004. March.

USFWS (U. S. Fish and Wildlife Service), 1999. Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover: Final Rule. Federal Register 64:68508-68544.

_____. 1994a. Determination of Endangered Status for the Pacific Pocket Mouse: Final Rule. Federal Register, September 29.

_____. 1994b. Planning Aid Letter, Beach Erosion and Storm Damage Reduction Silver Strand Shoreline, San Diego County, California. Prepared for the U.S. Army Corps of Engineers, Los Angeles District, Los Angeles, CA. 21 pp.

_____. 1993. Determination of Threatened Status for the Pacific Coast Population of the Western Snowy Plover. Final Rule. Federal Register, April 5.

USIBWC (U.S. International Boundary and Water Commission). 1998. Draft Supplemental Environmental Impact Statement for the International and Boundary and Water Commission South Bay International Wastewater Treatment Plant Long Term Treatment Options, Volumes I and II (Technical Appendices). Prepared by CH2M Hill for USIBWC and U.S. Environmental Protection Agency.

_____. 1976. Final Environmental Impact Statement, Tijuana River flood control project, San Diego, County, CA. 74 pp.

Ventittelli, Marsha. 1997. San Diego County APCD. Personal communication. June 30.

Wade. 2002. Personal communication between Sandra Alarcón-Lopez of Aspen Environmental Group and Greg Wade, Community Development Director , City of Imperial Beach. May 20.

Winters. 2002. Personal communication between Sandra Alarcón-Lopez of Aspen Environmental Group and Mayda Winters of the Southwest Wetlands Interpretative Association, Project Manager for the Goat Canyon Enhancement Project. May 21.

WRCC (Western Regional Climate Center). 2000. *Period of Record Monthly Climate Summary for Chula Vista.*

Zedler, J.B. and C.S. Nordby. 1986. The ecology of the Tijuana Estuary, California: an estuarine profile. U.S. Fish and Wildlife Service Biological Report 85(7.5). 104 pp.

Zedler, J.B., C.S. Nordby, and B.E. Kus. 1992. The Ecology of Tijuana Estuary, California: A National Estuarine Research Reserve. NOAA Office of Coastal Resource Management, Sanctuaries and Reserves Division, Washington, D.C.

Zeng, E.Y. and C.L.Vista. 1997. Organic pollutants in the coastal environment off San Diego, California. 1. Source identification and assessment by compositional indices of polycyclic aromatic hydrocarbons. *Environmental Toxicological Chemistry* 16:179-188.

14.1 GLOSSARY

Artificial Nourishment
The process of replenishing a beach with material (usually sand) obtained from another location.

Beach
The zone of unconsolidated material that extends landward from the low water line to the place where there is marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves). The seaward limit of a beach-- unless otherwise indicated-- is the mean low water line.

Beach Erosion
The carrying away of beach materials by wave action, tidal currents, littoral currents, or wind.

Beach Width
The horizontal dimension of the beach measured normal to the shoreline.

Currents, Coastal
One of the offshore currents flowing generally parallel to the shoreline in the deeper water beyond and near the surf zone; these are not related genetically to waves and resulting surf, but may be related to tides, winds, or distribution of mass.

Groin
A shore protection structure built (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shore.

High Tide, High Water (HW)
The maximum elevation reached by each rising tide.

Higher High Tide (HHW)
The higher of the two high waters of any tidal day. The single high water occurring daily during periods when the tide is diurnal is considered to be a higher high water.

Littoral
Of or pertaining to, a shore, especially of the sea.

Littoral Drift
The sedimentary material moved in the littoral zone under the influence of waves and currents.

Littoral Transport
The movement of littoral drift in the littoral zone by waves and currents. Includes movement parallel (longshore transport) and perpendicular (on-offshore transport) to the shore.

Littoral Zone
In beach terminology, an indefinite zone extending seaward from the shoreline to just beyond the breaker zone.

Longshore
Parallel to and near the shoreline.

Longshore Transport Rate
Rate of transport of sedimentary material parallel to the shore. Usually expressed in cubic m (cubic yards) per year.

Low Tide (Low Water, LW)
The minimum elevation reached by each falling tide.

Mean Higher High Water (MHHW)
The average height of the higher high waters over a 19-year period. For shorter periods of observation, corrections are applied to eliminate known variations and reduce the result to the equivalent of a mean 19-year value.

Mean Lower Low Water (MLLW)
The average height of the lower low waters over a 19-year period. For shorter periods of observations, corrections are applied to eliminate known variations and reduce the

results to the equivalent of a mean 19-year value.

Mean Sea Level
The average height of the surface of the sea for all stages of the tide over a 19-year period, usually determined from hourly height readings.

Nourishment
The process of replenishing a beach. It may be brought about naturally by longshore transport, or artificially by the deposition of dredged materials.

Rip Rap
A protective layer or facing of quarrystone, usually well graded within wide size limit, randomly placed to prevent erosion, scour, or sloughing of an embankment of bluff; also the stone so used. The quarrystone is paced in a layer at least twice the thickness of the 50 percent size, or 1.25 times the thickness of the largest size stone in the gradation.

Shoreline
The intersection of a specified plane of water with the shore or beach (e.g., the high water shoreline would be the intersection of the plane of mean high water with the shore or beach). The line delineating the shoreline on National Ocean Service nautical charts and surveys approximates the mean high water line.

Surf
The wave activity in the area between the shoreline and the outermost limit of breakers.

Surfzone
The area between the outermost breaker and the limit of wave uprush.

Wave Period
The time for a wave crest to traverse a distance equal to one wavelength. The time for two successive wave crests to pass a fixed point.

14.2 ACROYNMS

AAQS
Ambient Air Quality Standards

AADT
Average Annual Daily Traffic

AQMD
Air Quality Management District

c
Celcius

CAA
Clean Air Act (federal)

CAAQS
California Ambient Air Quality Standards

CALEPA
California Environmental Protection Agency

CAL OSHA
California Office of Safety and Health Administration

Caltrans
California Department of Transportation

CARB
California Air Resources Board

CCAA
California Clean Air Act

CEQA
California Environmental Quality Act

CFU
Colony Forming Units

CNEL
Community Noise Equivalent Level

CO
Carbon Monoxide

cys
cubic yards

dBA
decibel

DDT
Bichlorophenyl Trichloroethane

EIR
Environmental Impact Report

EIS
Environmental Impact Statement

F
Farenheight

HAP
Hazardous Air Pollutants

HSWA
Hazardous and Solid Waste Act

HWCL
Hazardous Waste Control Law

IBWC
International and Boundary Water Commission

kph
Kilometers per hour

m^2
Square meters

mg/L
Milligrams per liter

mph
Miles per hour

NAAQS
National Ambient Air Quality Standards

NEPA
National Environmental Policy Act

NESHAP
National Emission Standards for Hazardous Air Pollutants

NOAA
National Oceanic and Atmospheric Administration

NO_X
Nitrogen Dioxide

NPDES
National Pollution Discharge Elimination System

O_3
Ozone

OSHA
Office of Safety and Health Administration

PAH
Polycyclic aromatic hydrocarbon

PCB
Polychlorinated biphenyl

PM_{10}
Fine particulate matter

RCRA
Resource Conservation and Recovery Act

SANDAG
San Diego Association of Governments

SCB
Southern California Bight

SCCWRP
Southern California Coastal Water Research Project

SCBPP
Southern California Bight Pilot Project

SDAB
San Diego Air Basin

SDCAPCD
San Diego County Air Pollution Control District

SSLC
Silver Strand Littoral Cell

SO_x
Sulfur Dioxide

TAC
Toxic air contaminants

TOC
Total organic carbon.

USACE
United States Army Corps of Engineers.

U.S. EPA
United States Environmental Protection Agency

USFWS
United States Fish and Wildlife Service

15. INDEX

The USACE submitted the Coastal Consistency Determination for the original Proposed Action (Alternative 2B) to the CCC on June 12, 2002. This was filed by the CCC on June 26, 2002 and approved on August 6, 2002 at the CCC hearings in San Luis Obispo. Approval was based upon Staff's concurrence with the Coastal Consistency Determination provided by the USACE, including recognition that the project would significantly improve public coastal access and recreational opportunities.

Following the USACE's identification of the change in the NED/Recommended Plan to Alternative 1B, contact was made with CCC staff to address the issue. CCC staff has indicated to the USACE that the change in the NED/Recommended Plan is considered to be negligible, and that additional approvals by the CCC itself would not be required. Per CCC staff, the change in the NED/Recommended Plan remains consistent with the Coastal Zone Management Act (CZMA). Impacts related to Alternative 1B and 2B are very similar and mitigation measures are the same. Therefore, implementation of Alternative 1B instead of 2B would be consistent with the CZMA. Approval provided by the CCC for Alternative 2B remains in effect for Alternative 1B.

Farmland Protection Policy Act (7 U.S.C. Section 4201). The purpose of the Farmland Protection Policy Act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It additionally directs Federal programs to be compatible with State, and local policies for the protection of farmlands. The Proposed Action would not effect any designated prime or unique farmland, or farmland of statewide importance. Therefore, the Farmland Protection Policy Act is not applicable to the proposed project.

Migratory Bird Conservation Act (16 U.S.C Section 715 to 715a). The Migratory Bird Conservation Act establishes a Federal commission that is authorized to acquire land, water or transitional areas for the conservation of migratory birds. The Proposed Action would not entail taking, killing, or possession of any migratory birds listed under this act. Additionally, the Proposed Action would provide for a wider beach area, which would increase opportunities for nesting habitat, including habitat that potentially may be used by migratory birds. Therefore, the project is in compliance with and supports the intent of this act.

Estuary Protection Act (16 U.S.C Section 1221 et Seq.). The Estuary Protection Act requires Federal agencies, in planning for the use or development of water and related land resources, to give consideration to estuaries and their natural resources. Although the southern most end of the project is located in close proximity to the Tijuana River Estuary, the biological resources impact analysis in the EIS/EIR concludes that the Proposed Action would not impact this estuary. Consequently, the Proposed Action would be in compliance with this act.

Executive Order 11990, Protection of Wetlands. Executive Order 11990, dated May 24, 1977 is intended to support NEPA by directing Federal agencies and programs to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands,

APPENDICES

A. COMMENTS AND RESPONSES TO COMMENTS

B. ESSENTIAL FISH HABITAT ANALYSIS

C. AIR QUALITY DATA ANALYSIS

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APPENDIX A

COMMENTS AND RESPONSES TO COMMENTS

APPENDIX A. COMMENTS AND RESPONSES TO COMMENTS

The Imperial Beach Shore Protection Project's Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was circulated for public review from June 17, 2002 through August 12, 2002. During the review period comments could be submitted to the U.S. Army Corps of Engineers (USACE) in the form of either a letter, facsimile (fax), or electronic mail (e-mail).

Comments received on the project's Draft EIS/EIR are listed in Table A-1, below. Five regulatory agencies, the U.S. Department of Interior Office of Environmental Policy and Compliance, the U.S. Department of Commerce National Oceanic and Atmospheric Administration, the California Department of Fish and Game, California Department of Parks and Recreation (Tijuana River National Estuarine Research Reserve), and California State Lands Commission submitted written comments on the environmental review document. Two written comments by the public were received.

The USACE conducted a scoping meeting July 24, 2002 at the Dempsey Holder Safety Center, Imperial Beach, CA. The purpose of the meeting was to present the Storm Damage Reduction General Evaluation Report and provide an overview of the proposed plan to restore the beach and reduce the potential for coastal storm damage along the Imperial Beach shorefront. Upon completion of the project overview presentation, the meeting was opened to receive public comments on the Draft EIS/EIR.

Eight individuals presented comments. The full transcript of the scoping meeting is provided at the end of Appendix A. A short summary is presented below.

- Two commentors expressed support for the project because it will mean protection for the beach and the homes along the shoreline.
  - No response required.

- Two commentors had questions concerning dollar values used and project cost sharing.
  - Response - These questions do not involve the technical adequacy of the EIS/EIR but they were answered and the responses are included in the transcript at the end of this appendix.

- One commentor asked for clarification of the design beach width.
  - Response - This was clarified but did not require any revision to the document.

- One commentor asked what assumptions were used in the cost/benefit analysis and what is the historical success of beach restoration.
  - Response – These questions were answered and a written response regarding beach restoration success is included in this appendix, see response to comment A-4.

- One commentor questioned whether alternatives have been considered for Borrow area B.
  - Response – The USACE went through an extensive review of possible borrow sites and this was included in the evaluation report. This question was also answered in the FEIS response to comments A-3 and A-6.

- One commentor had the following concerns:
  - What about sediment being moved onshore and closing the Tijuana River mouth?
  - What are the biological impacts of the harvest area?
  - Is the sediment size the same as what has been used in the past and is it appropriate for biological resources in the area?

Since the above commentor also submitted written comments (which covered the above comments and others) responses were prepared and are included in this appendix, see response to comments C-1 thru C-7.

This appendix is formatted such that each written comment letter is provided on the left-hand side of the following pages. A number indicating each comment is indicated along the left hand margin of the letter. Each comment's corresponding response is provided on the right-hand side of the page, and is also indicated by the same number as its respective comment. All changes in the Final EIS/EIR that resulted as a function of these comments are indicated throughout the document by a vertical line in the right-hand margin of the text.

Table A-1 Written Comments on the Draft EIS/EIR

Letter	Commentor	Pages
A	United States Department of Interior Office of Environmental Policy and Compliance	A-3 to A-4
B	California Department of Fish and Game, Marine Region	A-5 to A-11
C	California Department of Parks and Recreation: Tijuana River National Estuarine Research Reserve	A-12 to A-13
D	California State Land Commission	A-14 to A-15
E	Nancy Schmidt	A-16
F	John Blackburn	A-17
G[1]	United States Department of Commerce National Oceanic and Atmospheric Administration	A-18

[1] The comment letter provided by the U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA) was received by the USACE San Diego Regulatory Branch on August 6, 2002. The letter was forwarded to the USACE Los Angeles District Environmental Resources Branch, Ecosystem Planning Section, following finalization of this Appendix. Standard presentation of comment letters received on environmental review documents follows a sequence that provides Federal agency comment letters first, State agency comment letters second, local agency comment letters third, and, public comment letters fourth. Due to the late receipt of the NOAA letter by the USACE Los Angeles District Environmental Resources Branch, Ecosystem Planning Section, its inclusion in this Appendix does not follow this standard sequence. The letter (and the USACE's corresponding response) is provided as the last comment letter in this Appendix.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1111 Jackson Street, Suite 520
Oakland, CA 94607

August 7, 2002

ER: 02/580

Ms. Stephanie Hall
U.S. Army Corps of Engineers
Los Angeles District
Environmental Resources Branch
P.O. Box 532711
Los Angeles, California 90053-2325

Subject: Review of Draft Main Report and Environmental Impact Statement/Environmental Impact Report for the Silver Strand Shoreline, Imperial Beach, San Diego County, California (Volume 1) (ER 02/580)

Dear Ms. Hall:

The Department of the Interior has reviewed the Draft Main Report and Environmental Impact Statement/Environmental Impact Report for the Silver Strand Shoreline, Imperial Beach, San Diego County, California (Volume 1) (ER 02/580). We offer the following comments for your use in preparing your final reports.

Draft Main Report

A-1 Page 1-1, paragraph 7: The US Fish and Wildlife Service (USFWS) was not coordinated with throughout the study process regarding the formulation and evaluation of the proposed Recommended Plan.

A-2 Page 2-13, paragraph 6: There is mention of an Environment Appendix. We could not find this appendix.

A-3 Page 3-1, paragraph 2: The only hardened shoreline in the project vicinity is located within the City of Imperial Beach. The beaches north and south of the project area are considerably wider and natural. There is no discussion regarding how this hardened shoreline exacerbates erosion in addition to the sediment deficit.

A-4 Page 5-3, paragraph 3: The environmental project benefits may be overstated. Grunion may benefit, however, bird nesting would certainly not occur due to heavy recreational use.

A-1 The USACE has maintained informal coordination with the USFWS, Carlsbad Office, since February 2001. In compliance with the Fish and Wildlife Coordination Act, the USACE provided funding, as well as a Scope of Work, for a Draft and Final Coordination Act Report (CAR) in February 2001. A copy of the project's Draft EIS/EIR was provided to the USFWS, Carlsbad Office, on June 17, 2002. Field reconnaissance of the project area has been completed by the USFWS (Carlsbad Office); USFWS personnel have not expressed any adverse concerns to date.

The Draft EIS/EIR analyzed project related impacts to biological resources within the project area and concluded that the proposed project would not have adverse impacts on any federally listed species. Consequently, a formal Section 7 consultation is not required. The USACE has thus requested an informal consultation with the USFWS to satisfy the requirements of the Endangered Species Act (per 50 C.F.R. Section 402.13). The request was submitted to the USFWS on August 29, 2002; a request for an USFWS response within 30 days of the submittal was requested. A copy of the request is provided in Appendix J of this Final EIS/EIR. The USACE will continue to coordinate with the USFWS throughout the informal consultation process. Until the informal consultation process is completed, construction of the project will not commence. Upon completion of the informal consultation the USACE will be in full compliance with the Fish and Wildlife Coordination Act and Endangered Species Act.

A-2 The Environmental Appendix refers to the Draft EIS/EIR that is attached to the USACE Draft Main Report.

A-3 Based on the general movement of sand from south to north in the project region, as noted in Section 4.2.5 of the Draft EIS/EIR, it is unlikely that beach nourishment activities would be a significant source of sand migration contributing to closure of the mouth of the Tijuana Estuary. Thus, no significant impacts are expected and no mitigation measures are needed.

A-4 Beach replenishment projects are a maintenance type activity. However, there are several published reports that indicate that long-term programs to renourish beaches have been successful. The American Coastal Coalition reported that West Hampton Dunes, New York began a beach nourishment project as a result of several severe nor'easters in 1992. In the 1980's there were no piping plovers in the area of West Hampton Dunes. An integral part of this beach nourishment project was a well-planned effort to manage the shoreline so that plovers would be encouraged to return. In 1997, plovers constituted 14.4 percent of the breeding pairs located in New York State and produced 20 percent of the total plover fledglings in the state (http://www.coastalcoalition.org/facts/beachnourishment.html). Also, the USACE in cooperation with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, and

Draft Environmental Impact Statement/Environmental Impact Report

A-5 Page 1-5, paragraph 2: Coordination with the USFWS has not occurred since May 1997. We initiated coordination in May 2002, requesting the status of this project.

A-6 Page 4-7, Beach Sediment Sinks: There is no discussion about the borrow areas, once dredged, becoming sinks for beach sediments in the littoral drift. Increased erosion of beaches could occur through sediment starvation. If the southern borrow area is used, how will it affect the mouth of the Tijuana River?

A-7 Page 5-6, section 5.2.3: There is no discussion of the potential for increased beach erosion as a result of the borrow areas becoming beach sediment sinks.

A-8 Page 11-1, Environmental Statutes and Regulations: Compliance with the Fish and Wildlife Coordination Act is not identified.

A-9 Page 11-2, paragraph 2: The U.S. Army Corps of Engineers has not complied with the ESA. They have not requested a current list of potential candidate, proposed, threatened, and endangered species in the project vicinity.

Thank you for the opportunity to comment on this document. We look forward to working closely with your agency and providing you with the best possible recommendations and analyses required to complete the final documents. For information or questions, please contact John Hanlon at the U.S. Fish and Wildlife Service Office in Carlsbad, California at (760) 431-9440.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc: Director, OEPC, DC
Regional Director, FWS, Portland
FWS, CNO, Sacramento

the New Jersey Division of Fish and Game, conducted a 7-year biological monitoring program addressing concerns about potential ecological impacts due to beach nourishment. Conclusions were that impacts of beach nourishment to intertidal and nearshore fauna, larval and juvenile fish assemblages, and fish food habits were minor and short-term. Suspended sediment and turbidity plumes associated with placement were limited to within a few hundred meters of the discharge pipe and concentrations were less than those experienced during storms. Borrow area animal life was significantly reduced after dredging, but most species recovered quickly, and the biomass of all species recovered within about 2 to 2.5 years. Borrow area fish showed no detectable changes in abundance, species composition, or feeding habits. Important bottom-feeding fish did not appear to rely on the borrow area for food. Beach nourishment provided suitable nesting and rearing habitat for threatened and endangered species. There was no apparent difference in recreational fishing.

A-5 Please see response to comment A-1 above.

A-6 Sand would be temporarily redistributed within the littoral system from the subtidal borrow site(s) onto Imperial Beach, from which it would gradually erode and re-enter the littoral system. Based on the information presented in Sections 4.2 and 5.2, Coastal Processes, in the Draft EIS/EIR, sand placed on Imperial Beach may be dispersed and redeposited either southward or northward, although the net movement of material is northward. The volumes of sand that would be redistributed are within the range of natural processes and not expected to cause the long-term erosion of beaches to the north or south of Imperial Beach. Therefore, impacts are not expected to habitats for endangered species including Western snowy plover and California least tern nor on dune ecosystems.

A-7 Please see response to comment A-3 above.

A-8 Please see response to comment A-1 above.

A-9 Table 4.5-1 of the EIS/EIR provides a listing of State and Federally recognized rare, threatened and endangered species that may potentially occur within the project area. Table 4.5-2 of the Draft EIS/EIR provides a listing of State and Federally listed candidate and special concern species that may occur within the project area. Sources for these listings are provided within the tables and are detailed in the Draft EIS/EIR's reference section (Section 13). The USACE will request concurrence from the USFWS regarding these listing as part of its informal consultation process (see response to comment A-1, above).

State of California - The Resources Agency
GRAY DAVIS, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
Marine Region
20 Lower Ragsdale Drive, Suite #100
Monterey, CA 93940
(831) 649-2870

Flex your POWER

August 1, 2002

Ms. Stephanie Hall
Environmental Coordinator
U.S. Army Corps of Engineers
911 Wilshire Blvd., Suite 1430
Los Angeles, CA 90017

Dear Ms. Hall:

Department of Fish and Game (Department) personnel have reviewed the Draft Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) for the Imperial Beach Shore Protection Project (SCH 2002061105). The proposed project would protect beach and beachfront properties along 7,100 feet of shoreline at Imperial Beach, City of Imperial Beach, County of San Diego, California, by dredging sand from two offshore borrow sites and depositing it on the beach. Other alternatives were considered to address the erosion and storm damage at Imperial Beach (e.g., breakwaters, additional and extended groins, revetments) but were rejected because they did not meet project criteria or public acceptability. The DEIS/EIR addresses four project alternatives, identifies the preferred alternative, and discusses a no action alternative. Each alternative includes an initial base fill, an additional fill, and a re-nourishment cycle every 10 years (for four cycles). Two offshore borrow sites (A and B) will serve as a source of fill material throughout the life of the project (50 years).

- Alternative 1B would nourish the beach with an initial base of 588,600 cubic yards (cy) of fill plus an additional 999,312 cy resulting in a 39-foot beach width. The shoreline would be is re-nourished every 10 years with 999,312 cy of fill from borrow site A or B.

- Alternative 2B (the preferred alternative) would nourish the beach with an initial base of 1,209,000 cy of fill plus an additional 999,312 cy resulting in an 82-ft beach width. The shoreline would be re-nourished every 10 years with 999,312 cy of fill from borrow site A or B.

- Alternative 3B would nourish the beach with an initial base of 1,635,000 cy of fill plus an additional 1,498,968 cy resulting in a 115.5-ft beach width. The shoreline would be re-nourished every 10 years with 1,498,968 cy of fill from borrow site A or B.

Conserving California's Wildlife Since 1870

- Alternative 4B would nourish the beach with an initial base of 2,616,000 cy of fill plus an additional 999,312 cy resulting in a 177-ft beach width. The shoreline would be re-nourished every 10 years with 999,312 cy of fill from borrow sites A or B.

The Department is a Trustee Agency in terms of the California Environmental Quality Act (CEQA). Our primary objective for reviewing environmental documents is to be able to provide the project sponsor with recommendations for avoiding or minimizing negative impacts to fish and wildlife, their use and users. In attempting to meet this objective, our attention is usually focused upon potential habitat damage or loss, acute or chronic effects to fish and wildlife from changes in habitat quality, and possible use conflicts. The Department has the following concerns and comments about the proposed project:

B-1

The Department recognizes that beach erosion is a valid concern and that replenishment efforts may be beneficial to certain marine organisms, such as shorebirds, fishes (e.g., grunion), and sand dwelling invertebrates. However, replenishment activities can have negative impacts on other marine organisms and habitats. One of the Department's main concerns with the proposed project(s) is the persistent burial of hard substrate which supports various kelps and surfgrass, and the resultant adverse impacts on the sensitive and/or recreationally and commercially important invertebrates and fish that utilize those habitats during various life stages (e.g., lobster, urchins, crabs, abalone, fishes). Equally, we have concerns with the increase in turbidity and suspended solids associated with dredging activities and the potential adverse impacts to marine plants, invertebrates, and fishes.

B-2

The DEIS/EIR concludes that all four project alternatives will not have significant impacts on biological resources. However, the document fails to provide an adequate description of the biological resources likely to be impacted by the proposed project, and merely refers to a "recent reconnaissance" of the study area. Project induced impacts can only be assessed by comparing pre-project and post-project conditions. The project proponent needs to conduct a baseline biological survey, focusing on the nearshore marine environment, prior to the project and then institute a monitoring program to detect any long-term significant impacts that may have occurred as a result of the proposed project.

B-3

Page 5-16 states that burial of algae and surfgrass on the groins in the initial fill and replenishment would be a less than significant impact because they occur on man made structures. We disagree with this conclusion. The definition of "environment" for the purposes of CEQA includes both natural and man-made conditions (CEQA Guidelines, California Code of Regulations Title 14, Chapter 3, section 15360). Thus, groins and the pier qualify as "environment" and should be afforded the same consideration as other environmental factors in the document. We could not find any other reference, other than page 5-16, pertaining to surfgrass in the document. The presence of any vegetated intertidal or subtidal habitat is always of particular concern to the Department. Thus, the presence of surfgrass needs to be discussed in greater detail (e.g., location, amount, etc.) and any project induced impacts and unavoidable losses need to be described along with a discussion of compensation for such a loss.

B-1 The USACE acknowledges these introductory comments related to concerns about burial of hard substrate that may support kelp and eelgrass, and potential impacts to organisms from turbidity and suspended solids associated with the project alternatives. Specific responses to the burial concerns are provided in Responses B-3 through B-4 and potential impacts to organisms are addressed in Responses B-3 to B-6, corresponding to more specific comments on these topics.

B-2 The biological communities in the project are typical of soft-bottom/sandy habitats throughout San Diego County and many areas of southern California, with the exception of localized hard substrate habitats represented by the Imperial Beach groins and pier and some areas of cobble and small rocks. Further, these hard bottom communities are also very typical of similar habitats throughout the same region, although the organisms on man-made structures are generally not as diverse/complex as natural reefs and rocky shorelines. This is because these groin habitats occur in a predominantly sandy shore region that is subjected to considerable sand migration and wave effects that strongly influence natural impacts and changes to these features. Thus, both the soft bottom and limited hard bottom habitats are strongly influenced by sediment movement and resuspension by waves, currents, and winds, and the biological communities are adapted to these relatively stressful and variable conditions. Existing data and information on these communities, as summarized in Section 4.5 of the Draft EIS/EIR, are appropriate to evaluate potential impacts for the range of project alternatives and type of communities, as addressed in Section 5.5.

B-3 The USACE concurs with the comment that both natural and man-made conditions, in this case the Imperial Beach groins that would be partly covered under project action alternatives, are included under the definition of environment. However, we do not believe that project impacts to organisms on the groin would be significant since the species are very common on natural and man-made hard substrate habitats throughout the San Diego region and southern California. These hard substrate communities on man-made structures are not unique or irreplaceable and generally are not as diverse/complex as natural reefs and rocky shorelines. This is because these groin habitats occur in a predominantly sandy shore region that is subjected to considerable sand migration and wave effects that strongly influence natural impacts and changes to these features. Further, impacts also will occur from trampling by human use/foot traffic on the groins. In summary, project impacts are estimated to represent a relatively small additional incremental disturbance to an already disturbed man-made habitat.

With regards to surfgrass and other vegetated/algal communities in the nearshore and intertidal project region, the predominant habitat type is sandy and main evidence of these types of species is very sparse surfgrass near the

ends of the groins and even sparser (e.g., a few occasional single strands) in the cobble area near the southern end of the project region. In each case our professional judgment is that this is seasonally variable habitat created (1) by the groin presence, but just as likely to be covered by sand during accretion periods, and (2) in the cobble area due to continued erosion of a natural sand area. Other cobble areas are seasonally exposed and the Draft EIS/EIR notes an earlier study of algae attached to cobble and small rocks near the Tijuana River mouth (e.g., Dexter, 1977); however, these habitats are quite variable and generally do not provide stable substrate for vital, persistent communities. Thus, it is not expected that significant effects would occur to vegetated habitat as related to the general lack of persistent and/or stable hard substrate in the project region.

B-4 The Department does not feel that the DEIS/EIR adequately addresses impacts to kelp habitat from the proposed project(s). Page 4-21 describes the historic Imperial Beach (IB) kelp bed as extending from 0.3 to 1.5 miles offshore, 0.9 miles north, and 1.3 miles south of the IB pier. It further states the 1997-98 El Nino caused a regional decline in kelp beds and none were evident in 1998, but recent surveys conducted in 2001 indicate the beds are returning as small canopies. Page 5-16 (Environmental Consequences) describes the potential burial impacts associated with Alternative 1B and concludes "the distances of the beds offshore and upcoast/downcoast from the pier, as noted above, are sufficiently great that significant impacts to marine plants are unlikely due to Alternative 1B." While this might address persistent burial impacts, it does not address impacts associated with the turbidity from dredging and the subsequent activities to transport the sand to the beach (e.g., tugboats, barges, pipelines, movement of hopper, etc.). These latter activities could have significant adverse impacts to kelp. Figure 2.1-3 illustrates the location of the borrow areas A and B, while Figure 4.5-2 illustrates the persistent kelp canopy. Although not on the same scale, it appears that the kelp canopy is close to Borrow Area A. Section 5.3.3 describes expected turbidity plumes at the borrow site as ranging from 100 feet to more than 500 feet under normal conditions, and extending up to 3,000 feet down current. Additional turbidity could also occur from dredge overflow and spills. The hopper dredge is expected to operate continually for a period of 4 to 6 months, 24 hours a day, days a week. Thus, the Department believes that kelp habitat could be impacted from turbidity associated with dredging. This issue should be addressed in detail in the final EIS/EIR. Additionally, it would be useful to provide a scaled map depicting the kelp, borrow areas, and planned pipeline routes. Finally, the Department recommends a turbidity monitoring plan be implemented for this project.

B-5 Another concern with the proposed Alternatives is the 50-year duration of the project. Subsequent re-nourishment cycles every 10 years would involve dredging and placement of sand at the seaward edge of the beach. Biological conditions may drastically change during the duration of the project. For example, the closest kelp beds have historically been located 0.3 to 1.5 miles offshore, 0.9 miles north, and 1.3 miles south. The current document concludes that the distances of kelp beds from the project site are sufficient enough to avoid significant impacts to kelp from project activities. We question how this can be assumed for 10, 20, 30 and 40 years in the future. As mentioned above, a baseline and subsequent surveys need to be conducted for this project. The final EIS/EIR should discuss this issue.

B-6 The Environmental Consequences section, biological resources, provided a more detailed analysis for Alternative 1B. For the other Alternatives, 2B, 3B and 4B, it was stated that impacts would be similar to 1B, but incrementally greater. Alternative 2B (the preferred alternative) has more than twice the volume of sand as 1B, while Alternative 4B has four times the volume. Page 5-15 discusses the deposition of sand for Alternative 1B and states that sand placement is not expected to affect sedimentation rates along adjacent beaches. We question what methodologies were used to reach this conclusion. Additionally, if this is an accurate assessment for impacts attributable to Alternative 1B's 1,577,912 cy fill, we question how the same can be true for Alternative 4B's 3,515,312 cy fill.

B-4 Historically, the general region seaward of the project vicinity has represented a habitat with only low kelp bed potential, as stated in the Draft EIS/EIR (Page 4-21). Specifically, only younger kelp plants (1-2 years) are known to have existed within a setting characterized by very large urchin barrens with limited hard substrate (North and MBC, 2001). Consequently, even though some kelp plants presently occur seaward of the project region and have been documented during many previous years, they do not represent a well developed kelp bed habitat, and there are many other years when no kelp plants were evident. For example, between 1965 and 2000, there have been a total of 17 years when no kelp canopy was observed within the Imperial Beach project region (North and MBC, 2001). Rough approximations, place the Year 2000 kelp canopy (Figure 4.5-2) about 3,000 feet due south of the southwestern boundary of Borrow Area A (Figure 2.1-3), easily avoidable by vessels or other equipment associated with sand transport to the beach. Thus, there should be no significant impacts to kelp plants from equipment (e.g., vessels, barges, pipelines, etc.) used to transport sand from borrow areas to shore. Borrow Area B is located even further to the south and likewise would not cause any significant impacts to kelp for the same reasons as noted for Borrow Area A.

With regards to the comment on potential turbidity effects to kelp beds, this region of the coast is a predominantly sandy bottom environment that is subjected naturally to shifting sediments that may bury or expose low-lying hard bottom substrate such as may occur in areas characterized by kelp plants. This natural variability is expected to have a much greater effect on kelp plants in the region than turbidity plumes from sand transport activities. Section 5.3.3 of the Draft EIS/EIR notes that turbidity plumes associated with sand nourishment operations may extend from 250 to 3,000 feet from the discharge point during typical to maximum current conditions, respectively, and that the plume duration could be up to four to six months (duration of each nourishment cycle) every 10 years. Notwithstanding, the natural habitat in the project region is sandy with considerable variability in turbidity levels due to sediment resuspension and transport by winds, waves, and currents, coupled with runoff effects during rainfall periods. This variability combined with the low density of kelp plants during even the most prominent periods of record (e.g., 1987 and 1989-1991; (North and MBC, 2001) suggests that significant impacts from turbidity plumes are unlikely.

An environmental commitment has been added to require that prior to project construction the USACE will provide a set of plans and specifications to the appropriate environmental agencies (USFWS and CDFG).

B-5 As noted in Response B-4, North and MBC (2001) provide data indicating that the most prominent kelp occurrence off Imperial Beach was in 1987 and 1989-1991, with substantially fewer to no plants observed during many other years of the 35-year period of record (1965-2000). Based on this long-term

record it is likely that a representative range of conditions and distribution of kelp is represented by the historical data, and that projections for 10 to 40 years in the future are reasonable to assume for the project based on these data. Further, USACE monitoring studies in support of each nourishment cycle, comparisons with data from other kelp assessments that are anticipated for the future (e.g., by CDFG or other agencies), and future Environmental Assessments that will be prepared by the USACE as part of each 10-year nourishment cycle will allow evaluations to cross check these assumptions at appropriate intervals

B-6 The general environment and biological communities in the project region are typical of soft-bottom/sandy habitats throughout San Diego County and many areas of southern California, with the exception of localized hard substrate habitats represented by the Imperial Beach groins and pier and some areas of cobble and small rocks. As such, this habitat is strongly influenced by sediment movement and resuspension by waves, currents, and winds, and the biological communities are adapted to these relatively stressful and variable conditions. For many species this takes the form of rapid recruitment to disturbed areas and/or some ability to escape from sediment burial by upward burrowing. Thus, the impact evaluations for Alternative 1B were based on extrapolations that these organisms would be able to respond to beach nourishment activities by recolonization and recovery in similar manner as natural changes, even though the frequency and intensity of effects may be somewhat different. Consequently, greater amounts of sand associated with Alternatives 2B, 3B, and 4B would cause incrementally greater impacts, but the same recolonization and recovery processes would apply. For example, coverage and smothering of most soft bottom organisms to depths of more than about several inches to a foot (depending on the species) will generally result in death of these organisms and exposure of a "new" sediment layer represented by the sand nourishment material, for example. Independent of the thickness of sand nourishment, this new layer will be recolonized in the same manner as a result of immigration from adjacent unimpacted areas and planktonic recruitment. The same logic would apply to coverage by sand nourishment of a larger spatial area. Therefore, for the purposes of this EIS it is reasonable to extrapolate across the various alternatives to evaluate potential impacts.

The Department also has concerns with sand migration, attributable to the project, closing the mouth of the Tijuana Estuary. Page 5-19 states it is unlikely that replenishment activities would be deposited in the vicinity of the estuary. We believe this issue needs to be further evaluated. In the San Diego Association of Government's regional sand project, which is referenced several times in the document, monitoring was proposed at the lagoon mouths to evaluate the relationship between lagoon mouth closures and increased sand accretion rates. Mitigation, removing the accumulated sediment, should also be proposed for project related accreted sediment. We believe the project proponent should provide similar monitoring and mitigation measures to address potential impacts to the Tijuana Estuary.

B-7

Page 3-7 states that under Alternative 1B, the hopper dredge would need to operate continually for a period of 4 to 6 months and an estimated 29 workers would work 24 hours a day, 7 days a week. These same numbers are reiterated for Alternatives 2B, 3B, and 4B. The initial amount of fill under 1B is 588,600 cy while the initial amount of fill under 2B, 3B, and 4B, is 1,209,000 cy, 1,635,000 cy, and 2,616,000 cy, respectively. We question how the time frames for all four alternatives can be the same when the volumes of fill vary range from two to four times that of Alternative 1B.

B-8

A continually operating hopper dredge during the winter months may impact local fishermen, in particular commercial lobster fishermen. Lobster is an important commercial species in San Diego County. The majority of commercial lobster fishing effort generally occurs at the beginning of the lobster season (the first Wednesday in October to the first Wednesday after the 15th of March), thus, October and November are important fishing months for lobster fishermen. Vessel traffic and dredge operations may conflict with lobster fishing traps. The Department recommends the project proponent coordinate with commercial fishermen and the dredge operator to minimize, to the extent possible, gear conflict and disruption of fishing locations. This is an issue that needs to be addressed in the final EIS/EIR

B-9

The project is expected to be conducted during winter months to minimize impacts to biological resources. Although the proposed project is anticipated to commence in the winter months, unforeseen circumstances may postpone sand replenishment activities until the following spring. Such a delay could impact the California least tern (*Sterna antillarum brownii*), a State- and Federal-listed endangered species, and the western snowy plover (*Charadrius alexandrinus nivosus*), a State species of special concern and a Federal-listed threatened species, and California grunion (*Leuresthes tenui*), a popular recreational species. Both least tern and snowy plover nesting areas are found within the vicinity of Imperial Beach. Turbidity at the receiver and dredge site reduces the ability of terns to successfully capture prey items. Deposition of sand would impact spawning grunion. All efforts should be taken to ensure that the project does indeed take place during the winter months.

B-10

On page 3-8 and 3-10 of the document, it is stated that the No Action Alternative is the only alternative that would result in significant impacts that cannot be mitigated to a less than significant level. From an EIR perspective and CEQA, the no project analysis fully describes existing conditions at the project site; the purpose of this description is to allow decision makers

B-11

B-7 Please see response to comment A-3.

B-8 The assumption of 4 to 6 months is a conservative estimate, with 4 being the best case and 6 being the worst case. In actuality, the most likely scenario would be less than 4 months. However, the resource analyst constructed their impact analysis for each alternative using extrapolations based on the differing volumes of beach fill required for each alternative

B-9 Comment noted. The Final Draft EIS/EIR has been revised to include a new mitigation measure (Mitigation Measure S-1; Final EIS/EIR Sections 5.10.3 through 5.10.7) to address potential impacts associated with local commercial fishermen. With implementation of Mitigation Measure S-1, potentially adverse impacts are anticipated to be less than significant.

B-10 Comment noted. The USACE has used a very conservative time estimate for construction related activities (please see response to comment B-8). Although no significant, adverse impacts to Federally listed threatened or endangered species are anticipated to occur as a result of the project, a new mitigation measure (Mitigation Measure B-1; Final EIS/EIR Sections 5.5.3 through 5.5.6) has been incorporated into the Final EIS/EIR to ensure that any off- or onshore construction related impacts are less than significant. The USACE will request concurrence from the USFWS on the proposed mitigation as part of its informal consultation process (please see response to comment A-1).

B-11 The CEQA guidelines at section 15126 require more than a comparison of the impacts of the proposed project with current conditions. Sections 15126(e)(2) and 15126(e)(3)(C) require that the 'no project" analysis shall discuss the existing conditions at the time the notice of preparation is published as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved. In addition, the USACE implementing regulations for NEPA (33 CFR Part 325 Appendix B 9b[5][b]) states that "The no-action alternative is one which results in no construction requiring a Corps permit.... District engineers, when evaluating this alternative, should discuss, when appropriate, the consequences of other likely uses of a project site, should the permit be denied."

B-11 Cont.

to compare the impacts of the proposed project with current conditions (CEQA guidelines, section 15126.6). Thus, the no action or no project alternative cannot result in significant impacts to the environment that are not already accounted for in the CEQA process.

As always, Department personnel are available to discuss our comments, concerns, and recommendations in greater detail. To arrange for a discussion, please contact Ms. Marilyn Fluharty, Environmental Scientist, California Department of Fish and Game, 4949 Viewridge Avenue, San Diego, CA 92123, telephone (858) 467-4231.

Sincerely,

Robert N. Tasto, Supervisor
Environmental Services Program
Marine Region

cc: Ms. Becky Frank
State Clearinghouse (original sent to lead agency)
Sacramento, California

Ms. Marilyn Fluharty
Department of Fish and Game
San Diego, California

Mr. Robert Hoffman
National Marine Fisheries Service
Long Beach, California

Mr. Martin Kenney
U.S. Fish and Wildlife Service
Carlsbad , California

Tijuana River National Estuarine Research Reserve
California Department of Parks and Recreation
301 Caspian Way • Imperial Beach • CA • 91932
(619) 575-3613 • Fax (619) 575-6913

William G. Abbott
Assistant Resource Ecologist

Aug 5, 2002

Los Angeles District
U.S. Army Corps of Engineers
P.O. Box 2711
Los Angeles, California
90053-2325

Subject: Imperial Beach Shore Protection Project
Draft Environmental Impact Report
SCH #2002061105

Dear Army Corps:

Thank you for giving California State Parks an opportunity to address our concerns about the Imperial Beach Sand Replenishment project.

The State Park System has a great deal of interest and concern about activities in Imperial Beach because we operates beach parks on both sides of Imperial Beach. Border Field on the South and Silver Strand State Beach, 1 ½ miles north of Imperial Beach. Both of theses parks also have beach erosion problems. It is our desire that any sand replenishment project would be designed to allow the sand added to Imperial Beach to naturally move along the Silver Strand Littoral Cell to either of these beaches.

C-1

The two identified "Off Shore Borrow Areas" will interfere with sand budgets at the State Parks. The depression created by Borrow Area "A" will catch sand moving north during the summer and cause increased erosion north of the borrow area. This increased beach erosion would endanger "critical habitat" at a nesting area for western snowy plovers where a wide beach is essential for their nesting success. The wide beach allows an adequate buffer between the areas used by the public and areas used by nesting plovers.

C-2

The Beach at Borrow Area "B" is already so narrow that it is difficult to protect snowy plover and California least tern nesting areas and allow simultaneously allow Border Patrol access and visitor use. To remove sand from this area would cause increased erosion at an area of "Critical Habitat" for western snowy plovers and California least terns.

C-1 Please see response to comment A-6.

C-2 Please see response to comment A-6.

Tijuana River National Estuarine Research Reserve
California Department of Parks and Recreation
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C-3 Any beach erosion North or South of Imperial beach has negative impacts on extremely rare dune ecosystems. There are very few intact dune ecosystems in Southern California and the ones North and South of Imperial Beach need to be protected and expanded.

C-4 Borrow areas also will create large disturbed ocean bottom areas that can be colonized by exotic invertebrates. The Tijuana Estuary has had frequent disturbance and it has been colonized by several non-native invertebrate and vertebrate species. The whole concept of off shore borrow sites needs to be addressed from an invasive point of view to decide if it is appropriate to expose large areas of ocean bottom to invasive threat.

C-5 The State Parks can accept "Alternative 1" with mitigation for damage done to Borrow Sites. If exotic invasion of disturbed borrow sites can be minimized and a sand source using material from the Zuniga Shoals or other distant offshore (3-5 miles) sites is a utilized.

C-6 The State Parks strongly oposes Alternatives 2-6 beacuse groins and off shore breakwaters will interfere with sand flow in the litoral cell and that this can cause increased beach erosion on State Park property.

C-7 Beach replenishment projects are very questionable projects without proven long term success. The city of Imperial Beach should never have allowed extensive development on areas that had a history of storm damaged.

Thank You

William G. Abbott

C-3 Please see response to comment A-6.

C-4 The soft-bottom environment in the study region will be exposed to relatively dynamic natural changes in sediment movement, resuspension, and substrate availability, similar as other habitats of this type throughout San Diego County and southern California. These habitats represent naturally variable systems where space for recruitment and colonization of species is commonly available via immigration and larval settlement. Consequently, creation of additional open space via excavation of the borrow pits would not increase the local or regional risk of invasive species since much larger areas of the shelf environment are already available for colonization as a result of natural processes, and the borrow pits collectively represent an extremely small percentage of this area.

C-5 As noted in Response C-4, the potential risk of invasive species from use of a borrow pit(s) would be inconsequential, so no mitigation is needed.

The use of Zuniga Shoals (to the north near Coronado Beach) as an alternative sand source for beach nourishment was considered in Section 4.7.2 of the Draft Main Report and EIS/EIR, Volume I, June 2002, but was not selected. Rationale for this decision included the much greater distance compared to Borrow Areas A and B, representing an important economic consideration, and that the composite grain sizes did not provide a suitable match with the Imperial Beach receiver site.

C-6 Alternatives 2 through 6 were initially considered. However, the only alternative that met all of the planning objectives was the beach nourishment alternative. Therefore, alternatives 2 through 6 were eliminated from further consideration. This was discussed on page ES-1 of the Executive Summary in the Draft EIS/EIR.

C-7 Please see response to comment A-4.

STATE OF CALIFORNIA — GRAY DAVIS, *Governor*

CALIFORNIA STATE LANDS COMMISSION
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August 5, 2002

File Ref: SD 2002-06-25.3
JTO 4
SCH 2002061105

Ms. Stephanie Hall
U.S. Army Corps of Engineers
911 Wilshire Boulevard
Los Angeles, CA 90017

Ms. Nadell Gayou
Resources Agency
901 P Street
Sacramento CA 95814

Dear Ms. Hall and Ms. Gayou:

SUBJECT: Draft Environmental Impact Statement/Environmental Impact Report for the Silver Strand Shore Protection Project, SCH 2002061105

Staff of the California State Lands Commission (CSLC) has reviewed the subject document. Under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), the Corps and the City of Imperial Beach are co-Lead Agencies and the CSLC is a Responsible and/or Trustee Agency for any and all projects that could directly or indirectly affect sovereign lands, their accompanying Public Trust resources or uses, and the public easement in navigable waters.

The document addresses alternatives to address the continued erosion of the Silver Strand shoreline. The environmentally preferred alternative and the recommended National Economic Development Plan is identified as Alternative 2 and involves the initial placement of approximately 2.2 million cubic yards of beach sand along a 7100 foot long stretch of beach beginning at the northerly groin in Imperial Beach. For information only, the north groin is covered by an existing long-term lease from the CSLC to the City of Imperial Beach (Lease PRC 2405). The lease expires May 27, 2008.

Alternative 2 would also provide for the placement of 1 million cubic yards of additional beach replenishment every 10 years within a 50-year project lifetime. The beach quality sand will be dredged from one of two offshore borrow areas, north (Borrow Site A) and south (Borrow Site B) of the Imperial Beach pier.

D-1

Borrow Site A is located within ungranted sovereign lands in the Pacific Ocean offshore the Naval Communication Station. Based on our review, it appears that Borrow Site A is located within an area that was the subject of a jurisdictional transfer of ownership (JTO 4) between the CSLC and the State Park Commission which took place in 1952. The CSLC's transfer of its sovereign interests extends to the three-mile offshore limit. However, the CSLC retained possession of the minerals. Therefore, any dredging of material from this area will require a lease from the CSLC.

Borrow Site B is located within ungranted sovereign lands in the Pacific Ocean offshore Border Field State Park. Therefore, any dredging of material from this area will require a lease from the CSLC. Within this area, the City of San Diego has a 49-year lease (Lease PRC 7888) from the CSLC for maintenance of the South Bay Ocean Outfall line. In addition, the San Diego Association of Governments (SANDAG) was issued a lease (PRC 8228.9) from the CSLC for dredging of material from this same area in conjunction with their countywide beach replenishment project. This lease expires on February 28, 2004. If this borrow site is selected, we would require letters of non-objection from both the City of San Diego and SANDAG.

With regard to the beach replenishment area, the most northerly portion above Carnation Avenue will involve ungranted sovereign lands under the jurisdiction of the CSLC. This portion of the beach replenishment will require a lease from the CSLC. The remainder of the beach replenishment area will involve sovereign lands that were legislatively granted in trust to the City of Imperial Beach pursuant to Chapter 330, Statutes of 1961, minerals reserved to the State, and subsequently granted to the San Diego Unified Port District pursuant to Chapter 168, Statutes of 1990, with minerals reserved to the State. The Port, as trustee, should be contacted concerning any permit requirements they may have.

Thank you for the opportunity to comment. If you have any questions concerning the CSLC's jurisdiction, please contact Jane E. Smith, Public Land Management Specialist, at (916) 574-1892.

Sincerely,

Stephen L. Jenkins, Assistant Chief
Division of Environmental Planning
and Management

cc: Jane E. Smith

D-1 We concur with the California State Lands Commission (CSLC) statement and all permits, easements, leases, will be obtained by the City of Imperial Beach through coordination with the CSLC, San Diego Unified Port District, City of San Diego, and SANDAG prior to project construction.

NANCY SCHMIDT
Attorney at Law
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TELEPHONE (619) 442-1024
OR 442-4245

August 7, 2002

Mr. Robert Blasberg, Study Manager
Coastal Studies Group
U. S. Army Corp of Engineers
P.O. Box 532111
Los Angeles, California 90053-2325

Re: Imperial Beach sand replenishment project

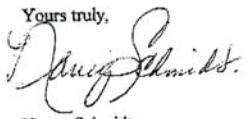
Dear Mr. Blasberg:

E-1 I am concerned that the sand replenishment project which is being considered for the shoreline of Imperial Beach has not been adequately noticed. I therefore request extention of the review period to allow for more complete public review.

E-2 It is my understanding that the proposed project is not fully financed at this time, and that the City will have to bear a large part of the expense. I hope that all public agencies involved in the project will consider the vital importance of complete financial disclosure, and make sure that the public is fully infomed about the source and availability of all funding. I believe it would be a serious mistake to commit to any project before the money is firmly in place. This is especially important since your cost/benefit analysis appears to be based in large part on speculation.

E-3 I will be happy to discuss this matter with you any time, and I am generally in favor of the project; however, I do feel that there are matters which should have further consideration. These include the wildlife concerns and other issues which were raised at the public meeting on July twenty-fourth and elsewhere.

Yours truly,



Nancy Schmidt

cc: City Council of Imperial Beach

E-1 Per NEPA and CEQA regulations, the Draft EIS/EIR was circulated for public and agency review for 45-days beginning June 17, 2002 through August 12, 2002. A public scoping meeting was held on the Draft EIS/EIR on July 24, 2002 in the City of Imperial Beach. The scoping meeting was publicly noticed by the City of Imperial Beach the week of July 5, 2002. Appendix K of this Final EIS/EIR provides all public noticing on the project's environmental review process. All public comments of the Draft EIS/EIR are included in this appendix of the Final EIS/EIR.

E-2 The initial beach fill project and subsequent renourishment projects will not be constructed until funds are fully in place for each activity. Per federal policy, a Pre-Construction Agreement (PCA) must be signed between the USACE and the City of Imperial Beach to award any construction contract. The PCA can be signed only if both parties have their funding fully in place for each activity.

E-3 Comment noted. A copy of the July 24, 2002 Public Scoping Meeting is provided at the end of this appendix. A summary of concerns expressed at the meeting is provided at the beginning of this appendix. Where additional evaluation and/or mitigation has been warranted in response to comments on the Draft EIS/EIR, it is indicated throughout this Final EIS/EIR by a vertical line in the right hand margin of this document.

John Blackburn
Received August 14, 2002 - Page 1

8-3-2002

Dear Sir;

I would like to know what provisions have been made to preserve the Pismo clams when you discharge sand upon the beach. As a long time resident of IB (50 years) I can remember spending many day harvesting clams but over the years over harvesting and poaching plus the two other times sand has been placed on the beach had decimated the population. Several years ago the "El Nino" provided excellent temperature for the remaining clams to repopulate the beach and in spite of the Vietnamese poaching for the last two years there are a large number of clams that are now 4" (4 ½" is the legal size). I wonder if it would be possible with power rakes to collect the clams in the project area and transplant them either South or North of the deposition zone. If something is not done those clams in the project area will surely be smothered. The silt from the placement will be hard on the clams outside the area but they should survive. I would appreciate a response. Thank You

F-1

John Blackburn
868 Ninth St
Imperial Beach Ca
91932-2102
619-424-7011
jack739@cox.net

F-1 Pismo clams (*Tivela stultorum*) are commonly found along many sandy beaches in southern California including 1B, commonly ranging between mean low water (+0.3 m) and extreme low water (-0.6 m), but in general, can be equally abundant from the intertidal to about 30 m depths (Dailey et al., 1993; J. Ljubenkov, pers. comm., August 2002) Parr et al. (1978) concluded that beach replenishment at 1B resulted in a significant decrease in average density of Pismo clams at intertidal sampling stations; however, the results were based on small sample size. Some individuals collected by Parr et al. indicated successful recruitment to 1B within the previous 1 to 2 years. For the present project, significant localized impacts may occur, but the population likely ranges over a much broader depth range than proposed for any of the alternatives, and recolonization is expected from adjacent, unaffected areas, as well as from larval recruitment.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

AUG - 6 2002 F/SWR4:RSH

Colonel Richard G. Thompson
District Engineer
Los Angeles District
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Dear Colonel Thompson:

Thank you for the opportunity to review the Draft Imperial Beach Shore Protection Project Environmental Impact Statement/Environmental Impact Report and Draft Feasibility Study. This letter is provided in accordance with the Fish and Wildlife Coordination Act and PL 94-265 - the Magnuson-Stevens Fishery Conservation and Management Act.

G-1

The proposed project is located in an area identified as Essential Fish Habitat (EFH) for fish species federally managed under the Pacific Groundfish Fishery Management Plan and Coastal Pelagic Fishery Management Plan. We concur with your assessment, given the winter construction time frame, that the proposed project will not result in significant adverse impacts to EFH.

Should you have any questions, please contact me at 562-980-4043 or via email at: bob.hoffman@noaa.gov.

Sincerely,

Robert S. Hoffman
Acting Assistant Regional Administrator
for Habitat Conservation

cc:
USFWS - Carlsbad (Martin Kenney)
CDFG - San Diego (Marilyn Fluharty)

G-1 Comment noted.

APPENDIX B

ESSENTIAL FISH HABITAT ANALYSIS

This assessment of Essential Fish Habitat (EFH) for the Army Corps of Engineers Imperial Beach Shore Protection Project is being provided in conformance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (see FR 62, 244, December 19, 1997). The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Marine Fisheries Service (NMFS), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate EFH for all managed species. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to the Service's recommendations. This assessment covers those managed fish species located within an area designated as EFH for the Coastal Pelagics and Pacific Groundfish Management Plans.

B.1 PROPOSED ACTION

The proposed project and its alternatives are located within the City of Imperial Beach, San Diego County, California. The City of Imperial Beach is approximately 4.5 square miles in area, and is located immediately north of the United States (U.S.)/Mexico international boundary (Figure 2.1-1). The specific beach area under evaluation is located within Silver Strand, a relatively narrow sand spit that extends northward from the Tijuana River inlet to a landmass at the entrance of San Diego Bay. It separates San Diego Bay from the Pacific Ocean, and includes, from north to south, the shorelines of the U.S. North Island Naval Air Station, the City of Coronado, the U.S. Navy Amphibious Base, Silver Strand State Beach, the U.S. Naval Communications Station, and the City of Imperial Beach. The study area for this EIS/EIR is located along the southernmost stretch of the Silver Strand shoreline that corresponds with the corporate boundary of the City of Imperial Beach, which extends from the U.S. Naval Communications Station approximately 3.6 miles (5.8 kilometers) to the U.S./Mexico border.

The study area consists of both off- and onshore components. The onshore component of the study area is centered around 2,164 meter (m) (7,100 feet [ft]) of shoreline that extends southward from the northern-most groin of the beach (see Figures 2.1-2 and 2.1.3). The offshore component of the project is centered around the nearshore area that parallels the above-referenced onshore component, as well as two offshore borrow areas that are located approximately 1.9 kilometers (1.2 miles) north and 4.5 kilometers (2.8 miles) south of the Imperial Beach Pier.

The Proposed Action Alternative is comprised of beach nourishment along the 2,164 m (7,100 ft) stretch of shoreline indicated for beach fill in Figure 2.1-3. The base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 12 m (39 ft) from the backshore limit to the to the foreshore berm. Alternative 1B would have a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of renourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12m (39 ft). Following initial construction, this alternative would have four replenishment cycles

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Deleted: over the project's lifetime, as described for Alternative 1B.

(years 11,21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach over the project's lifetime.

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The two offshore borrow sites would be used for fill material; they are referenced as "Area A" and "Area B" on Figure 2.1-3. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem. Fill from the offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a Hopper dredge.

Project Objectives

The primary purpose of the Imperial Beach Shore Protection Project is to provide shore protection to the City of Imperial Beach and to prevent damage to adjacent beachfront structures, U.S. Naval Communications Station facilities, and public utilities. Shore protection includes developing and maintaining the beach and is intended to prevent the severe beach erosion that can result from winter storms. The shore protection, associated with sand replenishment along the beach, would also enhance recreational opportunities and tourism, as well as preserve or improve environmental resources within the study area.

The current summer beach at Imperial Beach is about 15 m (50 ft) wide, with essentially no winter beach (USACE, 1995b). Net sand transport along the ocean side of the Silver Strand Shoreline (from Imperial Beach at the south end to Coronado Beach at the north) is upcoast. The most severe erosion is occurring in Imperial Beach (where 76,455 cubic meters (cm) (1,000,000 cubic yards [cy]) of sediment is expected to erode annually), and accretion is taking place at the City of Coronado's beaches (with 38,226 cm [50,000 cy] per year accreting). A 1995 Reconnaissance Study (USACE, 1995b) reported that about 90 residences, apartments, condominiums, and commercial structures would be impacted from storm damage, which would sustain about $4.7 million in damages from a 100-year storm event, and with annual damages averaging $953,000. In addition, the loss of sand at the beach would have a negative impact on beach recreation and tourism that supports the local economy.

The primary objective of the Imperial Beach Shore Protection Project is to protect beachfront and adjacent properties from storm damage resulting from beach erosion. This action will also allow development and maintenance of a sandy beach for recreational use along the length of City of Imperial Beach's beachfront for about 2,164 m (7,100 ft) from Carnation Avenue at the northern city limit to the last city residence at the southern end of Seacoast Drive.

Description of the Project Alternatives

In evaluating viable alternatives that meet the need and objectives of the project, as described in Section 3 of the project's Environmental Impact Statement/Environmental Impact Report (EIS/EIR), an array of 20 possible alternatives was initially developed. These alternatives included maintaining beach widths of (12 m) (39 ft), 25m (82 ft), 34 m (115 ft), and 54 m (177 ft), with beach replenishment cycles of 5, 10,

15, 22 and 50 years (see Table 3.3-1 of the EIS/EIR). Based on initial screening of the 20 alternatives, the following alternatives were addressed in EIS/EIR:

No Project Alternative

Under the No Project Alternative the properties and structures along the beachfront would be susceptible to continued damage caused by inundation, wave attack, and erosion. In addition, the recreational value of the beach would diminish over time as beach erosion continues.

Structural damage associated with the No Project Alternative is detailed in the project's General Reevaluation Report (GRR) (USACE, 2000). Structures along the project's northern reach would be susceptible to inundation and wave attack. Additionally, long-term erosion would eventually cause structures to be condemned, undermined, or completely destroyed. Structures along the southern reach also would be susceptible to inundation and wave attack.

Alternative 1B

Alternative 1B is comprised of beach nourishment along a 2,164 m (7,100 ft) stretch of shoreline. The initial base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000cm (999,312 cy) of fill that would result in minimum beach width of 12 m (39 ft) from the backshore limit to the to the foreshore berm, with a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12m (39 ft). Following initial construction, this alternative would have four replenishment cycles (years 11, 21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach over the project's lifetime.

Two offshore borrow sites have been identified for fill material, referenced as "Area A" and "Area B". Area A is located approximately 1.9 kilometers (1.2 miles) north of the Imperial Beach pier; Area B is located approximately 4.5 kilometers (2.8 miles) south of the pier. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem. Fill from the offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a hopper dredge. The stationary pipeline dredge would be located on a barge type floating apparatus that would be located directly over the borrow site locations. The pipeline would discharge directly onshore. Two tugboats would accompany the dredge to move it to different locations at the borrow sites, and bring the dredge into the harbor if the threat of bad weather or high seas exist.

Alternative 2B

Alternative 2B is comprised of beach nourishment along the same 2,164m (7,100 ft) stretch of shoreline as described for Alternative 1B. The base beach fill would consist of 925,000 cm (1,209,000 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 25 m (82 ft) from the backshore limit to the to the foreshore berm. Alternative 2B would have a crest elevation of

+4 m (+13 ft). An additional 764,000 cm (999,312 cy) of renourishment would then be placed on the beach every ten years over the project's lifetime, as described for Alternative 1B. In total, 4,745,000 cm (6,206,460 cy) of fill would be placed on the beach over the 50-year evaluation period.

On- and offshore construction/operations for Alternative 2B would be the same as described as for Alternative 1B.

Alternative 3B

Alternative 3B is comprised of an initial base beach fill of 1,250,000 cm (1,635,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline. This alternative would result in a minimum beach width of 34 m (115 ft) from the backshore limit to the to the foreshore berm. The alternative would have a crest elevation of +4 m (+13.12 ft). Under this scenario, the shoreline would then be renourished with an additional 764,000 cm (999,312 cy) every ten years to maintain the minimum beach width of 34 m (115 ft). The total volume of nourishment/renourishment for this alternative over the 50-year project lifetime would 5,070,000 cm (6,631,560 cy).

On- and offshore construction/operations for Alternative 3B would be the same as described for Alternative 1B.

Alternative 4B

Alternative 4B is comprised an initial base beach replenishment fill of 2,000,000 cm (2,616,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline, thereby resulting in a minimum beach width of 54 m (17 ft) from the backshore limit to the to the foreshore berm. Alternative 4B would have a crest elevation of +4 m (+13 ft). The beach would then be resnourished with 999,312cy (764,000cm) every ten years. The total volume of nourishment/ renourishment for Alternative 4B would be 5,820,000 cm (6,906240 cy).

On- and offshore construction/operations for Alternative 4B would be the same as for Alternative 1B, as described above.

Based on conclusions from the EIS/EIR, Alternative 1B was selected as the Proposed Action Alternative.

Deleted: 2B

B.2 EFFECTS OF THE PROPOSED ACTION ON EFH

As detailed in Section 4.5 of the EIS/EIR, between 60 (Quast 1971) and 100 (Feder et al., 1974) fish species have been documented in southern California kelp beds. Some of the most common fish species occurring in the Imperial Beach kelp beds (approximately 0.5 to 2.3 kilometers [0.3 to1.5 miles] offshore and 1.4 kilometers [0.9 mile] north and 2.1 kilometers [1.3 miles] south of the Imperial Beach Pier) include rockfishes, opaleye (*Girella nigricans*), halfmoon (*Medialuna californiensis*), giant

kelpfishes (*Heterostichus rostratus*), and several surfperch species (Embiotocidae) (USIBWC, 1998). Open water habitats in the study area support a wide diversity of pelagic fish species, including northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), chub mackerel (*Scomber japonicus*), topsmelt (*Atherinops affinis*), jacksmelt (*Atherinopsis californiensis*), and Pacific butterfish (*Peprilus simillimus*) (USIBWC, 1998; SANDAG and USDN, 2000).

Recent trawl surveys along the 20 m (65 ft) depth contour in the vicinity of the study area reported 3 to18 fish species in soft substrate habitats (SCCWRP, 1999). Commonly collected species included barred sand bass (*Paralabrax nebulifer*), yellowchin sculpin (*Icelinus quadriseriatus*), speckled sanddab (*Citharichthys stigmaeus*), Pacific sanddab (*C. sordidus*), and California halibut (*Paralichthys californicus*). Similarly, the City of San Diego collected 25 demersal fish species at trawl stations along the 30 m (100 ft) isobath near the study area (City of San Diego, 1999). Flatfishes predominated trawl samples, including Pacific sanddab, longfin sanddab (*C. xanthostigma*), English sole (*Pleuronectes vetulus*), and California tonguefish (*Symphurus atricauda*).

Fishes associated with exposed beaches usually move between the surf zone and deeper subtidal areas and are generally more localized in their movements than offshore species (Moyle and Cech, 1988; USIBWC, 1998). Dominant fishes in this area likely include small active plankton feeders such as northern anchovy and topsmelt; roving substrate feeders such as the blackeye goby (*Coryphopterus nicholsii*); flatfishes such as speckled sanddab and juvenile California halibut; fishes that migrate through the surfzone such as mullets (*Mugil* spp.); and beach spawners such as California grunion (*Leuresthes tenuis*) (Moyle and Cech, 1988; Love, 1996; USIBWC, 1998).

Dexter (1977) observed five fish species on or near subtidal pier pilings at the Imperial Beach Pier, including topsmelt, sculpin (*Clinocottus* spp.), walleyed surfperch (*Hyperprosopon argenteum*), barred surfperch (*Amphistichus argenteus*), and C-O turbot (*Pleuronichthys coenosus*). The most common fish species taken off the pier include northern anchovy, bat rays (*Myliobatis californica*, chub mackerel, white croaker (*Genyonemus lineatus*), and several surfperches (City of Imperial Beach Webpage, 1997; USIBWC, 1998).

Impact Analysis

The proposed project is located within an area designated as EFH for two Fishery Management Plans (FMP): the Pacific Groundfish and Coastal Pelagics FMPs (PFMC 1998a and 1998b, respectively). Of the 86 fish species that are federally managed under these two plans, approximately 32 are likely occur in the vicinity of Imperial Beach and could be affected by the proposed project, as summarized in Table B-1.

Assessment of potential effects from project activities on managed biological resources is presented in Table B-2. Project activities potentially affecting FMP species include dredging at the borrow areas and subsequent disposal/renourishment of sand along the beach. Because the borrow areas proposed for this project are located a substantial distance from any kelp beds 0.48 to 2.4 kilometers (0.3 to 1.5 miles,

see Section 4.5 of the EIS/EIR), no significant impacts would occur to this EFH. Temporary impacts to groundfish FMP species could potentially occur by temporarily reducing foraging habitat, increasing turbidity, and decreasing water quality. However, due to the highly mobile nature of these species in the project area, impacts would be localized and/or transient. Therefore, potential impacts to groundfish FMP species would be less than significant.

Table B-1
EFH Species Occurring in the Imperial Beach Sand Replenishment Project Area

Common Name	Scientific Name	Habitat/Location
	Coastal Pelagics FMP Species	
Northern anchovy	*Engraulis mordax*	Pelagic, open water areas
Pacific sardine	*Sardinops sagax*	Pelagic, open water areas
Chub mackerel	*Scomber japonicus*	Pelagic, open water areas
Jack mackerel	*Trachurus symmetricus*	Pelagic, open water areas
	Groundfish FMP Species	
Leopard Shark	*Triakis semifasciata*	Soft bottom, offshore borrow areas
Spiny Dogfish	***Squalus acanthias***	Soft bottom, offshore borrow areas
Big Skate	*Raja binoculata*	Soft bottom, offshore borrow areas
California Skate	*R. inornata*	Soft bottom, offshore borrow areas
Ratfish	*Hydrolagus colliei*	Soft bottom, offshore borrow areas
California Scorpionfish	***Scorpaena gutatta***	Soft bottom, offshore borrow areas
Greenspotted Rockfish	*Sebastes chlorostictus*	Soft bottom, offshore borrow areas
Curlfin Sole	*Pleuronichthys decurrens*	Soft bottom, offshore borrow areas
English Sole	*Parophrys vetulus*	Soft bottom, offshore borrow areas
Pacific Sanddab	*Citharichthys sordidus*	Soft bottom, offshore borrow areas
Petrale Sole	*Eopsetta jordani*	Soft bottom, offshore borrow areas
Lingcod	*Ophiodon elongatus*	Rocky reefs, kelp beds
Cabezon	*Scorpaenichthys marmoratus*	Rocky reefs, kelp beds
Kelp Greenling	*Hexagrammos decagrammus*	Rocky reefs, kelp beds
Black-and-Yellow Rockfish	*Sebastes chrysomelas*	Rocky reefs, kelp beds
Blue Rockfish	*Sebastes mystinus*	Rocky reefs, kelp beds
Brown Rockfish	*Sebastes auriculatus*	Rocky reefs, kelp beds
Calico Rockfish	*Sebastes dallii*	Rocky reefs, kelp beds
Copper Rockfish	***Sebastes caurinus***	Rocky reefs, kelp beds
Gopher Rockfish	*Sebastes carnatus*	Rocky reefs, kelp beds
Grass Rockfish	*Sebastes rastrelliger*	Rocky reefs, kelp beds
Kelp Rockfish	*Sebastes atrovirens*	Rocky reefs, kelp beds
Olive Rockfish	*Sebastes serranoides*	Rocky reefs, kelp beds
Rosy Rockfish	*Sebastes rosaceus*	Rocky reefs, kelp beds
Squarespot Rockfish	*Sebastes hopkinsi*	Rocky reefs, kelp beds
Starry Rockfish	*Sebastes constellatus*	Rocky reefs, kelp beds
Treefish	*Sebastes serriceps*	Rocky reefs, kelp beds
Vermilion Rockfish	*Sebastes miniatus*	Rocky reefs, kelp beds
Widow Rockfish	*Sebastes entomelas*	Rocky reefs, kelp beds
Yelloweye Rockfish	***Sebastes ruberrimus***	Rocky reefs, kelp beds

Similarly, dredging and renourishment activities could impact pelagic species by temporarily decreasing visibility for foraging activities as a result of increased turbidity and decreasing water quality (see Section 5.3 of the project's EIS/EIR). Similar to groundfishes, impacts to coastal pelagic FMP species also would be temporary and localized. In contrast, some short-term benefits could occur as a result of

dredging and renourishment activities. For example, increased prey availability due to resuspended material during dredging may attract some pelagic schooling fishes. Notwithstanding, potential adverse impacts to coastal pelagic FMP species would be less than significant.

Table B-2
Summary of Potential Effects of the Proposed Project Activities on FMP Species

Project Alternative	Impact Assessment
1B	Temporary and localized (less than significant) potential impacts on FMP species as a result of temporarily reduced foraging habitat, increased turbidity, decreased water quality, and avoidance of immediate area of dredging by adults; some larval mortality also may occur.
2B	Same as described for Alternative 1B.
3B	Same as described for Alternative 1B.
4B	Same as described for Alternative 1B.

B.3 MITIGATION

Temporary and localized areas of increased turbidity would occur during dredging operation at the borrow areas and disposal along the beach. However, no significant operations at the borrow areas and disposal along the beach. However, no significant impacts are expected to essential fish habitats, including kelp beds in the Imperial Beach region. Because impacts to FMP species and EFH are considered temporary, localized, and less than significant (i.e., no significant adverse impacts), no mitigation measures would be required.

REFERENCES

City of Imperial Beach Webpage. 1997. http://www.cityofib.com/pierfish.htm.

City of San Diego, 1999. Receiving Waters Monitoring Report for 1998. City of San Diego Ocean Monitoring Report, Metropolitan Wastewater Department, Environmental Monitoring and Technical Services Division, San Diego, CA.

Dexter, D.M. 1977. Biological Baseline Studies of the Imperial Beach Erosion Control Project Area. Prepared for the U.S. Army Corps of Engineers, Los Angeles District, by the Center for Marine Studies, San Diego State University, San Diego, CA.

Feder, H.M., C.H. Turner, and C. Limbaugh. 1974. Observations on fishes associated with kelp beds in southern California. California Dept. Fish and Game Fish Bull. No. 160. 144 pp.

Love, M.S. 1996. Probably More Than You Want to Know About Pacific Coast Fishes. Really Big Press, Santa Barbara, CA. 381 pp.

Moyle, P.B. and J.J Cech, Jr. 1988. *Fishes, An Introduction to Ichthyology*. Prentice Hall Publishing, Englewood Cliffs, NJ. 559 pp.

PFMC (Pacific Fishery Management Council). 1998a. Final Environmental Assessment/ Regulatory Impact Review for Amendment 11. Pacific Coast Groundfish Fishery Management Plan. Pacific Fishery Management Council, Portland, Oregon. October.

PFMC. 1998b. Amendment 8 to the Northern Anchovy Fishery Management Plan: The Coastal Pelagic Species Fishery Management Plan. Pacific Fishery Management Council, Portland, Oregon. December.

Quast, J.C. 1971. Fish fauna of the rocky inshore zone. *Nova Hedwegia*. 32:481-507.

SANDAG (San Diego Association of Governments) and USDN (U.S. Department of the Navy). 2000. The San Diego Regional Beach Sand Project Final Environmental Impact Report/Environmental Assessment. SANDAG and U.S. Department of the Navy. San Diego, CA. San Diego Association of Governments (SANDAG) and USDN. 2000. Final Environmental Impact Report/Review Environmental Assessment for the San Diego Regional Sand Project.

SCCWRP (Southern California Coastal Water Research Project), 1999. Spatial Characterization of Four Water Column Parameters on the Mainland Shelf of Southern California in July 1994. Pages 89-100, In: S.B. Weisberg and D. Hallock (eds.), Southern California Coastal Water Research Project Annual Report 1997-1998. Westminster, CA.

USACE (U.S. Army Corps of Engineers). 1995b. Silver Strand Shoreline (San Diego County, California) Reconnaissance Study. Final Report. Coastal Resources Branch. December.

USIBWC (U.S. International Boundary and Water Commission), 1998. Draft Supplemental Environmental Impact Statement for the International and Boundary and Water Commission South Bay International Wastewater Treatment Plant Long Term Treatment Options, Volumes I and II (Technical Appendices). Prepared by CH2M Hill for USIBWC and U.S. Environmental Protection Agency.

APPENDIX C.

AIR QUALITY DATA ANALYSIS

Imperial Beach Shore Protection EIS/EIR Project
Table C-1: On-site Emissions for Alternative 1B

Equipment	Horsepower	Number	Days	Hours per Day	Total Hours	Load Factor (%)	Adjusted Hours
Diesel:							
Dozer	400	4	72	10	2880	59	1699
Hoppers Hydraulic Dredge	565	2	72	24	3456	62	2143
Hoppers Propulsion Engines	1125	2	72	24	3456	15	518
Gasoline:	Fuel Use gal/hr						
Support Vehicles	2	3	72	10	2160	15	324

Emission Factors (lbs/hp.hr), unless otherwise stated				
	Hoursepower	Adjusted Hours	VOC	NO_x
Diesel:				
Dozer	400	1699	0.0014	0.0185
Hoppers Hydraulic Dredge	565	2143	0.0014	0.0185
Hoppers Propulsion Engines	1125	518	0.0014	0.0185
Gasoline:	Fuel Use gal/hr		lbs/gallons of fuel	
Support Vehicles	2	324	0.1224	0.0958

*Idling exhaust emission factors in lb/hr

Total Emissions (lbs)		
	VOC	NO_x
Diesel (hp):		
Dozer	951.55	12574.08
Hoppers Hydraulic Dredge	1694.89	22396.78
Hoppers Propulsion Engines	816.48	10789.20
Gasoline:		
Support Vehicles	79.32	62.08
Total Emissions (lbs)	3542.24	45822.14
Total Emissions (tons)	**1.77**	**22.91**

Sources:

U.S. EPA Office of Mobile Sources, Assessment of Modeling Division, 1998. Exhaust Emission Factors for Nonroad Engine Modeling Compression-Ignition. Report No. NR-009A, June 15.

SCAQMD CEQA Air Quality Handbook, 1993

Assumptions:

Based on the assumption that it would take approximately 5 months to dredge 2.6 million cubic yards (Mesa, 2001) of material, it would take approximately one week to dredge 0.13 million cubic yards of material.

Alternative 1B involves 1.59 million cubic yards of dredged material

Duration of Construction: 12 weeks

One construction week is 6 days

The hopper dredge would operate on a 14-day cycle: 12 days on; 2 days off

Imperial Beach Shore Protection EIS/EIR Project
Table C-2 Offsite Emissions for Alternative 1B

Vehicle Type	Vehicle Trips	Round trip Miles	VOC		NOx	
			Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	288.0	40	2.31	58.61	1.82	46.18
Workers Commuting (LDGT)	432.0	40	3.06	116.47	2.42	92.11
Equipment Haul Trips (HDDV)	10.0	40	1.34	1.18	9.27	8.17
Total Emissions (lbs)				176.26		146.46
Total Emissions (tons)				0.09		0.07

Notes: Emission factors obtained from Appendix J of AP-42 (USEPA, 1998)
Emission factors assume 35 mph at 75F; year 2000

Ten worker vehicle trips cummuting to and from the beach site are divided between four Light Duty Gasoline Vehicles (LDGV) and six Light Duty Gasoline Trucks (LDGT). It is assumed that the workers would commute to the work site six days a week for a total of 72 work days (12 weeks).

Haul trips are assumed to be Heavy Duty Diesel Vehicles (HDDV); requiring approximately 10 roundtrips to deliver the four bulldozers and other construction equipment and supplies.

Imperial Beach Shore Protection EIS/EIR Project
Table C-3: On-site Emissions for Alternative 2B

Equipment	Horsepower	Number	Days	Hours per Day	Total Hours	Load Factor (%)	Adjusted Hours
Diesel:							
Dozer	400	4	102	10	4080	59	2407
Hoppers Hydraulic Dredge	565	2	102	24	4896	62	3036
Hoppers Propulsion Engines	1125	2	102	24	4896	15	734
Gasoline:	Fuel Use gal/hr						
Support Vehicles	2	3	102	10	3060	15	459

Emission Factors (lbs/hp.hr), unless otherwise stated				
	Hoursepower	Adjusted Hours	VOC	NO_x
Diesel:				
Dozer	400	2407	0.0014	0.0185
Hoppers Hydraulic Dredge	565	3036	0.0014	0.0185
Hoppers Propulsion Engines	1125	734	0.0014	0.0185
Gasoline:	Fuel Use gal/hr		lbs/gallons of fuel	
Support Vehicles	2	459	0.1224	0.0958

*Idling exhaust emission factors in lb/hr

Total Emissions (lbs)		
	VOC	NO_x
Diesel (hp):		
Dozer	1348.03	17813.28
Hoppers Hydraulic Dredge	2401.10	31728.77
Hoppers Propulsion Engines	1156.68	15284.70
Gasoline:		
Support Vehicles	112.36	87.94
Total Emissions (lbs)	5018.17	64914.70
Total Emissions (tons)	**2.51**	**32.46**

Sources:

U.S. EPA Office of Mobile Sources, Assessment of Modeling Division, 1998. Exhaust Emission Factors for Nonroad Engine Modeling Compression-Ignition. Report No. NR-009A, June 15.

SCAQMD CEQA Air Quality Handbook, 1993

Assumptions:

Based on the assumption that it would take approximately 5 months to dredge 2.6 million cubic yards (Mesa, 2001) of material, it would take approximately one week to dredge 0.13 million cubic yards of material.

Alternative 2B involves 2.21 million cubic yards of dredged material

Duration of Construction: 17 weeks

One construction week is 6 days

The hopper dredge would operate on a 14-day cycle: 12 days on; 2 days off

Imperial Beach Shore Protection EIS/EIR Project
Table C-4 Offsite Emissions for Alternative 2B

Vehicle Type	Vehicle Trips	Round trip Miles	VOC		NOx	
			Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	408.0	40	2.31	83.04	1.82	65.42
Workers Commuting (LDGT)	612.0	40	3.06	165.00	2.42	130.49
Equipment Haul Trips (HDDV)	10.0	40	1.34	1.18	9.27	8.17
Total Emissions (lbs)				249.22		204.08
Total Emissions (tons)				0.12		0.10

Notes: Emission factors obtained from Appendix J of AP-42 (USEPA, 1998)
Emission factors assume 35 mph at 75F; year 2000

Ten worker vehicle trips cummuting to and from the beach site are divided between four Light Duty Gasoline Vehicles (LDGV) and six Light Duty Gasoline Trucks (LDGT). It is assumed that the workers would commute to the work site six days a week for a total of 102 work days (17 weeks).

Haul trips are assumed to be Heavy Duty Diesel Vehicles (HDDV); requiring approximately 10 roundtrips to deliver the four bulldozers and other construction equipment and supplies.

Imperial Beach Shore Protection EIS/EIR Project
Table C-5: On-site Emissions for Alternative 3B

Equipment	Horsepower	Number	Days	Hours per Day	Total Hours	Load Factor (%)	Adjusted Hours
Diesel:							
Dozer	400	4	120	10	4800	59	2832
Hoppers Hydraulic Dredge	565	2	120	24	5760	62	3571
Hoppers Propulsion Engines	1125	2	120	24	5760	15	864
Gasoline:	Fuel Use gal/hr						
Support Vehicles	2	3	120	10	3600	15	540

Emission Factors (lbs/hp.hr), unless otherwise stated				
	Hoursepower	Adjusted Hours	VOC	NO_x
Diesel:				
Dozer	400	2832	0.0014	0.0185
Hoppers Hydraulic Dredge	565	3571	0.0014	0.0185
Hoppers Propulsion Engines	1125	864	0.0014	0.0185
Gasoline:	Fuel Use gal/hr		lbs/gallons of fuel	
Support Vehicles	2	540	0.1224	0.0958

*Idling exhaust emission factors in lb/hr

Total Emissions (lbs)		
	VOC	NO_x
Diesel (hp):		
Dozer	1585.92	20956.80
Hoppers Hydraulic Dredge	2824.82	37327.97
Hoppers Propulsion Engines	1360.80	17982.00
Gasoline:		
Support Vehicles	132.19	103.46
Total Emissions (lbs)	5903.73	76370.23
Total Emissions (tons)	**2.95**	**38.19**

Sources:

U.S. EPA Office of Mobile Sources, Assessment of Modeling Division, 1998. Exhaust Emission Factors for Nonroad Engine Modeling Compression-Ignition. Report No. NR-009A, June 15.

SCAQMD CEQA Air Quality Handbook, 1993

Assumptions:

Based on the assumption that it would take approximately 5 months to dredge 2.6 million cubic yards (Mesa, 2001) of material, it would take approximately one week to dredge 0.13 million cubic yards of material.

Alternative 3B involves 2.63 million cubic yards of dredged material

Duration of Construction: 20 weeks

One construction week is 6 days

The hopper dredge would operate on a 14-day cycle: 12 days on; 2 days off

Imperial Beach Shore Protection EIS/EIR Project
Table C-6 Offsite Emissions for Alternative 3B

Vehicle Type	Vehicle Trips	Round trip Miles	VOC		NOx	
			Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	480.0	40	2.31	97.69	1.82	76.97
Workers Commuting (LDGT)	720.0	40	3.06	194.11	2.42	153.52
Equipment Haul Trips (HDDV)	10.0	40	1.34	1.18	9.27	8.17
Total Emissions (lbs)				292.99		238.65
Total Emissions (tons)				0.15		0.12

Notes: Emission factors obtained from Appendix J of AP-42 (USEPA, 1998)
Emission factors assume 35 mph at 75F; year 2000

Ten worker vehicle trips cummuting to and from the beach site are divided between four Light Duty Gasoline Vehicles (LDGV) and six Light Duty Gasoline Trucks (LDGT). It is assumed that the workers would commute to the work site six days a week for a total of 120 work days (20 weeks).

Haul trips are assumed to be Heavy Duty Diesel Vehicles (HDDV); requiring approximately 10 roundtrips to deliver the four bulldozers and other construction equipment and supplies.

Imperial Beach Shore Protection EIS/EIR Project
Table C-7: On-site Emissions for Alternative 4B

Equipment	Horsepower	Number	Days	Hours per Day	Total Hours	Load Factor (%)	Adjusted Hours
Diesel:							
Dozer	400	4	168	10	6720	59	3965
Hoppers Hydraulic Dredge	565	2	168	24	8064	62	5000
Hoppers Propulsion Engines	1125	2	168	24	8064	15	1210
Gasoline:	Fuel Use gal/hr						
Support Vehicles	2	3	168	10	5040	15	756

Emission Factors (lbs/hp.hr), unless otherwise stated				
	Hoursepower	Adjusted Hours	VOC	NO_x
Diesel:				
Dozer	400	3965	0.0014	0.0185
Hoppers Hydraulic Dredge	565	5000	0.0014	0.0185
Hoppers Propulsion Engines	1125	1210	0.0014	0.0185
Gasoline:	Fuel Use gal/hr		lbs/gallons of fuel	
Support Vehicles	2	756	0.1224	0.0958

*Idling exhaust emission factors in lb/hr

Total Emissions (lbs)		
	VOC	NO_x
Diesel (hp):		
Dozer	2220.29	29339.52
Hoppers Hydraulic Dredge	3954.75	52259.16
Hoppers Propulsion Engines	1905.12	25174.80
Gasoline:		
Support Vehicles	185.07	144.85
Total Emissions (lbs)	8265.22	106918.32
Total Emissions (tons)	**4.13**	**53.46**

Sources:

U.S. EPA Office of Mobile Sources, Assessment of Modeling Division, 1998. Exhaust Emission Factors for Nonroad Engine Modeling Compression-Ignition. Report No. NR-009A, June 15.

SCAQMD CEQA Air Quality Handbook, 1993

Assumptions:

Based on the assumption that it would take approximately 5 months to dredge 2.6 million cubic yards (Mesa, 2001) of material, it would take approximately one week to dredge 0.13 million cubic yards of material.

Alternative 4B involves 3.62 million cubic yards of dredged material

Duration of Construction: 28 weeks

One construction week is 6 days

The hopper dredge would operate on a 14-day cycle: 12 days on; 2 days off

Imperial Beach Shore Protection EIS/EIR Project
Table C-8 Offsite Emissions for Alternative 4B

Vehicle Type	Vehicle Trips	Round trip Miles	VOC		NOx	
			Emission Factor (g/mile)	Total Emissions (lbs)	Emission Factor (g/mile)	Total Emissions (lbs)
Workers Commuting (LDGV)	672.0	40	2.31	136.77	1.82	107.76
Workers Commuting (LDGT)	1008.0	40	3.06	271.76	2.42	214.92
Equipment Haul Trips (HDDV)	10.0	40	1.34	1.18	9.27	8.17
Total Emissions (lbs)				409.71		330.85
Total Emissions (tons)				0.20		0.17

Notes: Emission factors obtained from Appendix J of AP-42 (USEPA, 1998)
Emission factors assume 35 mph at 75F; year 2000

Ten worker vehicle trips cummuting to and from the beach site are divided between four Light Duty Gasoline Vehicles (LDGV) and six Light Duty Gasoline Trucks (LDGT). It is assumed that the workers would commute to the work site six days a week for a total of 168 work days (28 weeks).

Haul trips are assumed to be Heavy Duty Diesel Vehicles (HDDV); requiring approximately 10 roundtrips to deliver the four bulldozers and other construction equipment and supplies.

APPENDIX D.

U.S. FISH AND WILDLIFE SERVICE

Original Planning Aid Letter

Final Coordination Act Report

APPENDIX E.

CALIFORNIA COASTAL COMMISSION

June 2002 Coastal Consistency Determination

1. INTRODUCTION

This Coastal Consistency Determination is being submitted to the California Coastal Commission for the Imperial Beach Shore Protection Environmental Impact Statement/Environmental Impact Report (EIS/EIR). Both a National Environmental Policy Act (NEPA) (Federal) and a California Environmental Quality Act (CEQA) (State) environmental review process is required prior to a decision. NEPA review is triggered by the direct involvement of a Federal agency in the project or by the use of Federal funds. CEQA review is triggered by the involvement of a State or local agency (in this case, the City of Imperial Beach, as Local Sponsor). The two environmental review processes are similar and typically are undertaken jointly for projects that require both NEPA and CEQA review. A combined EIS/EIR has been prepared to satisfy the environmental review requirements of both NEPA and CEQA. The purpose of the EIS/EIR is to identify and disclose information about the potentially significant environmental effects of the environmentally preferred alternative and the various alternatives.

2. PROJECT DESCRIPTION

In March 1997, the Committee of Energy and Water Development of the House of Representatives authorized a study to re-evaluate the Federal interest in solutions to problems associated with the shoreline erosion and storm damage along the City of Imperial Beach shoreline (USACE, 1997c). That authorization resulted in the development of the Imperial Beach Shore Protection Project.

The current summer beach at Imperial Beach is about 50 feet wide, with essentially no winter beach (USACE, 1995b). Net sand transport along the ocean side of the Silver Strand Shoreline (from Imperial Beach at the south end to Coronado Beach at the north) is upcoast. The most severe erosion is occurring in Imperial Beach (where 76,453 cubic meters [cm] [100,000 cubic yards {cy}) of sediment is expected to erode annually), and accretion is taking place at the City of Coronado's beaches (with 38,226 cm [50,000 cy] per year accreting). A 1995 Reconnaissance Study (USACE, 1995b) reported that about 90 residences, apartments, condominiums, and commercial structures would be impacted from storm damage, which would sustain about $4.7 million in damages from a 100-year storm event and with annual damages averaging $953,000. In addition, the loss of sand at the beach would have a negative impact on beach recreation that supports the local economy.

The environmentally preferred alternative for this project is comprised of beach nourishment, with an initial beach fill of 1,689,000 cm (2,208,312 cy) of suitable beach sand; 2,164 meters (m) (7,100 feet [ft]) of sand would be placed from the existing northern groin to the end of the study area's boundary (see Figure E-1). It would provide a minimum beach width of 25 m (82 ft) seaward to an elevation of +4 m (+13 ft). Following the initial nourishment, the shoreline would be renourished with n additional 764,000 cm (999,312 cy) of fill every 10 years over the 50-year evaluation period.

Two offshore borrow sites have been identified for fill material, referenced as "Area A" and "Area B" on Figure E-1. Area A is located approximately 2 kilometers (1.2 miles) north of the Imperial Beach pier; Area B is located approximately 4.5 kilometers (2.8 miles) south of the pier. Throughout the life of the project, both of these areas would be utilized, sometimes individually and sometimes in tandem.

Fill from the offshore borrow sites would be acquired primarily from dredging. Dredging operations may entail either a stationary hydraulic pipeline or a Hopper dredge. The stationary pipeline dredge would be located on a barge type floating apparatus that would be located directly over the borrow site locations. The pipeline would discharge directly onshore. Two tugboats would accompany the dredge to move it to different locations on the borrow sites, and bring the dredge into the harbor if the threat of bad weather or high seas exist.

The Hopper dredge is a boat that has dragarms and dragheads that extend from each side of the ship's hull. The dragheads would be lowered to the ocean bottom and would slowly be pulled over the area. Pumps would create suction in the dragarm and the sand would be drawn up through the arms and deposited in the hopper bins in the vessel's midsection. When the bins are full, the dredge would move to the designated disposal area and empty the dredged material through large hopper doors in the bottom of the hull for offshore deposition. To deposit the material on the beach, the boat would go as close as possible to the shore, and a pipeline would be connected to the hopper bins and extended to the onshore replenishment site.

Since the borrow sites are offshore, there would be essentially no haul truck trips associated with the project. Onshore, approximately four bulldozers would operate on the beach to manipulate the fill material received from offshore. The only onshore truck trips would result from the delivery and pick-up of bulldozers, and the daily commutes of construction crews. Operations on the beach would likely be limited to the hours of 7 a.m. to 7 p.m. for an estimated period of four to six months, including site mobilization and demobilization. Subsequent onshore renourishments are anticipated to require the same length of time.

For initial construction, the project would require the hopper dredge to operate continuously for an estimated period of four to six months. An estimated 29 workers would typically operate 24 hours per day, seven days per week. Subsequent renourishments would require the hopper dredge to operate under the same scenario.

3. PROJECT LOCATION

The Imperial Beach Shore Protection Project is located within the City of Imperial Beach, San Diego County, California (Figure E-2). The City of Imperial Beach is approximately 4.5 square miles in area, and is located immediately north of the United States (U.S.)/Mexico international boundary. The specific beach area under evaluation is located within Silver Strand, a relatively narrow sand spit that

extends northward from the Tijuana River inlet to a landmass at the entrance of San Diego Bay. It separates San Diego Bay from the Pacific Ocean, and includes, from north to south, the shorelines of the U.S. North Island Naval Air Station, the City of Coronado, the U.S. Navy Amphibious Base, Silver Strand State Beach, the U.S. Naval Communications Station, and the City of Imperial Beach. The study area for this project is located along the southernmost stretch of the Silver Strand shoreline that corresponds with the corporate boundary of the City of Imperial Beach, which extends from the U.S. Naval Communications Station approximately 5.8 kilometers (3.6 miles) to the U.S./Mexico border.

The study area consists of both off- and onshore components. The onshore component is centered around 2,164 m (7,100 ft) of shoreline that extends southward from the northern-most groin of the beach. The offshore component of the project is centered around the nearshore area that parallels the above-referenced onshore component, as well as two offshore borrow areas that are located approximately 2 kilometers (1.2 miles) north and 4.5 kilometers (2.8 miles) south of the Imperial Beach pier.

4. PROJECT NEED

The current summer beach at Imperial Beach is about 50 feet wide, with essentially no winter beach (USACE, 1995b). Net sand transport along the ocean side of the Silver Strand Shoreline (from Imperial Beach at the south end to Coronado Beach at the north) is upcoast. The most severe erosion is occurring in Imperial Beach (where 76,453 cm [100,000 cy] of sediment is expected to erode annually), and accretion is taking place at the City of Coronado's beaches (with 38,226 cm [50,000 cy] per year accreting). A 1995 Reconnaissance Study (USACE, 1995b) reported that about 90 residences, apartments, condominiums, and commercial structures would be impacted from storm damage, which would sustain about $4.7 million in damages from a 100-year storm event and with annual damages averaging $953,000. In addition, the loss of sand at the beach would have a negative impact on beach recreation that supports the local economy.

The purpose of the Imperial Beach Shore Protection Project is to provide shore protection to the City of Imperial Beach and to prevent damage to adjacent beachfront structures, U.S. Naval Communications Station facilities, and public utilities. Shore protection includes developing and maintaining the beach and is intended to prevent the severe beach erosion that results from winter storms.

5. DETERMINATION OF CONSISTENCY

A Consistency Determination is required for dredging and disposal of dredged material, since the proposed operation could have an effect upon the California Coastal Zone (Coastal Zone). The following Determination of Consistency is prepared in compliance with the Federal Coastal Zone

Management Act of 1972, Section 307 (Title 16, U.S.C. Section 1456(c)), which states that Federal actions must be consistent with approved state coastal management programs to the maximum extent practicable. This Consistency Determination summarizes the Imperial Beach Shore Protection Project EIS/EIR. The EIS/EIR provides greater detail on the environmentally preferred alternative, the existing environment, and the project's potential environmental effects.

Based on a review of the applicable sections of the California Coastal Act (Act) of 1976, and on the data presented in the EIS/EIR, the Imperial Beach Shore Protection Project is consistent with the Act, to the maximum extent practicable. This Determination of Consistency has been prepared with the following sections to address applicable provisions of the Act.

5.1 CHAPTER 3, ARTICLE 2: PUBLIC ACCESS

Section 30210. *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Mitigation measures were presented in the EIS/EIR to address public access and safety, primarily during the construction period. These measures are outlined below.

Standard construction practices and safety precautions shall be incorporated into the design of the project staging area(s). Construction staging areas shall be clearly marked and appropriately guarded to ensure public safety. Staging areas shall also be located to avoid noise impacts to sensitive receptors (i.e, schools, hospitals, residential areas, etc.).

The construction contractor shall provide advance notice by mail to all residents and property owners on the west side of Seacoast Drive between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than seven days occur, an additional notice shall be made, either in person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The contractor shall also publish a notice of the impending construction in local newspapers, stating when and where construction will occur.

The construction contractor shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise disturbance. Construction contractor shall also establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for promptly responding to callers and recording the disposition of calls. Procedures for reaching the public liaison officer via telephone or in person shall be included in the notices distributed to the public in accordance with Mitigation Measure discussed above. If construction noise complaints are received, temporary noise curtains or shields shall be employed to

reduce construction noise to levels that would not cause disturbances to anyone working or residing in the area, per Section 9.32.020 of the City of Imperial Beach General Plan.

All onshore construction activities shall be conducted between the hours of 7 a.m. and 7 p.m. Monday through Saturday. Finally, construction crews shall maintain properly functioning mufflers on all internal combustion and vehicle engines used in construction and direct muffler exhaust away from sensitive receptor locations to reduce noise levels at the receptor locations to the maximum extent feasible.

5.2 CHAPTER 3, ARTICLE 3: RECREATION

Section 30220. *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

Section 30221. *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

In general, the study area is of high recreational value. Common recreational activities include surfing (short- and long-board), bodyboarding, bodysurfing, sun bathing, swimming, jogging, sightseeing, bird watching, horseback riding, picnicking, bicycling, hiking/walking, various types of fishing (e.g., pier-, boat-, beach-, bow/arrow-), and various organized activities that attract thousands of visitors annually. Surfing is the most popular recreational activity in the study area and Imperial Beach is the southernmost surfing area in California. Surf spots vary daily, weekly, monthly, seasonally and so on, depending on tidal and climatic conditions. Imperial Beach is also the site for various annual recreational events that attract thousands of visitors to the area such as: U.S. Open Sandcastle Competition, the Imperial Beach 1 kilometer Pier Swim/5 Kilometer Run & Walk, and Multi-Sport Championships.

One of the intentions of the preferred alternative is to develop and maintain the beach for recreational use; however, construction and maintenance activities could present temporary impacts. There are some temporary recreational impacts that would be considered significant but can be mitigated to a less than significant level. Dredged sand used to replenish the beach could contain shell fragments that pose a potential danger to onshore users.

Swimmers would be attracted to areas with more perilous ocean conditions while designated swim areas on the beach are closed for construction. Water access areas used for other recreational activities, i.e. walking, sunbathing, picnicking, fishing, etc., would be restricted during construction as well. The following measures were presented in the EIS/EIR to mitigate these impacts:

- Fill material that contains shell fragments could have an adverse affect on offshore users of the beach. Periodically remove shell fragments from beach using a sand sweeper or other mechanical separation device.

- Swimmers could be exposed to perilous ocean conditions in an area not patrolled by lifeguards. Extend lifeguard services south of Imperial Beach Boulevard to the end of Seacoast Drive during construction of shore protection measures.
- Construction equipment and staging areas would impede beach access and use. Post signs to announce construction and maintenance activities two to three weeks prior to their inception. Maintain postings within the duration period of the activity.

There are also potential impacts that would be considered insignificant. The composition of the sand could be incompatible with one of Imperial Beach's larger revenue grossing events, the annual U.S. Open Sandcastle Competition. The USACE has considered the compatibility of sand material in the selection of borrow sites to try and avoid this potential impact. Disorganization of sand crab and clam populations used for fishing bait when fill is added is considered temporary until the communities reorganized.

5.3 CHAPTER 3, ARTICLE 4: MARINE ENVIRONMENT

Section 30230. *Marine resources shall be maintained, enhanced, and, where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231. *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30233(a). *The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

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

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used

for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource-dependent activities.

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

***(c)** In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division. For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay, shall be designed and used for commercial fishing activities.*

***(d)** Erosion control and flood control facilities constructed on watercourses can impede the movement of sediment and nutrients, which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.*

Vegetation and Wildlife Habitat. The initial beach nourishment would generally cause a short-term loss of resident biota (see below), including infaunal and epifaunal invertebrates, which provide food resources for shorebirds; temporary noise and activity that may disrupt wildlife use of the area; and an alteration of the current beach profile, in which the area of upland habitat is increased, while the lower portion of the beach is steepened as wave action erodes the newly placed sediment. Since local sand sources are being used, it is not expected that the physical composition (percent fines) of the beach

would change substantially. The deposition area at Imperial Beach does not support sensitive dune vegetation or valuable wildlife habitat, with its ecological values being limited by the seasonal instability of the beach, the close proximity of residential development immediately above the zone of tidal and wave action, and high levels of recreational use.

Nearshore dredging and subsequent sand placement would not be expected to significantly affect wave action or erosion and sedimentation rates along the beaches north and south of the beach nourishment area. Therefore, impacts to habitats north and south of the project area are not anticipated.

Marine Plants. No marine plants, other than algae on the groins and pier, some surfgrass near the end of the groins, and sparse algae on scattered pebbles or cobble, occur within either the beach fill areas or the borrow areas. Historically, the closest kelp beds have been generally located about 0.48 to 2.42 kilometers (0.3 to 1.5 miles) offshore and 1.4 kilometers (0.9 mile) north and 2.1 kilometers (1.3 miles) south of the pier (Section 4.5.2.1 of the EIS/EIR). The 1997-98 El Nino event caused a decline in regional kelp beds, such that no kelp canopies were evident off Imperial Beach in 1998. However, recent surveys indicated that very small canopies currently are observed in the project region. The distances of the beds offshore and upcoast/downcoast from the pier, as noted above, are sufficiently great that significant impacts to marine plants are unlikely due to the project. Algae that might be covered on the groins and pier due to the initial fill and replenishment cycles are part of a community that only occurs in these locations due to the presence of these man-made structures, and represent common species in rocky intertidal areas throughout the region. Therefore, these impacts would be considered less than significant.

Infauna. Dredging at the borrow areas would temporarily impact the benthic community by disturbing and removing many organisms. However, following completion of dredging, relatively rapid recolonization (likely within one year) would occur by larval recruitment and immigration of organisms from nearby unaffected areas that are common throughout unaffected coastal areas in the region. Disturbances would be localized, short term, and any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes.

In addition, increased suspended sediments (turbidity) could also affect organisms in the vicinity of the dredge site or along the shoreline, particularly filter or suspension feeding organisms. The turbidity would be expected to be localized to the discharge location (average 76 m [250 ft]) under average current conditions, and could extend up to 304 to 912 m (1,000 to 3,000 ft) downcurrent under maximum current speeds at some sites. Plumes would be expected to be limited within 304 m (1,000 ft) from shore. Further, concentrations within the plume would not be expected to be higher than concentrations occurring naturally in nearshore waters under higher wave or storm conditions, and with implementation of longitudinal dikes, would be even less. Thus, the concentrations would not exceed those to which the organisms are exposed under natural episodic conditions. The suspended solids could clog gills and feeding appendages, reducing feeding ability, and consequently reducing survival, growth, and biomass of the organisms. However, studies by Peddicord et al. (1975) and O'Connor

(1991) on the bivalves *Tapes japonica*, *Mytilus edulis*, and *Mytilus californianus* showed variable responses when exposed to 100,000 mg/L kaolin clay for 10 days, and demonstrated little mortality (*T. japonica*), 10 percent mortality (*M. edulis*), and 50 percent mortality (*M. californianus*). Total suspended solids levels during dredging operations are likely to be much lower than those used in the study (generally less than a few hundred mg/L). Therefore, impacts on benthic infauna associated with increased suspended solids in the water column would also be less than significant since any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes.

Epifauna. During dredging operations at the borrow areas, resident epifauna organisms would be disturbed and removed, as noted above for infauna. They also would potentially experience direct and indirect impacts due to increased turbidity that could cause clogging of feeding structures and reduced water quality. However, because of the transient nature of water column effects, no significant long-term impacts on epifauna would occur. In addition, some of these epifaunal species could by buried during beach replenishment. However, many mobile species would be able to migrate from affected areas, thereby escaping impacts. Eventual recolonization (months to about a year) would occur from nearby unaffected areas. Therefore, impacts on epifauna would also be less than significant due to the localized nature of the disturbance, the commonality of the species throughout the general region, the small percentage of habitat that would be affected, and any changes would not cause substantial effects on higher food chain species (e.g., some fishes and birds) that are addressed by Federal and State statutes.

Some epifauna, particularly sessile species, such as mussels and barnacles that comprise the fouling communities on the groins and pier, might be covered due to the fill. However, as noted for plants, these communities only occur in these locations due to the presence of these man-made structures, and represent common species in rocky intertidal areas throughout the region. Therefore, these impacts would also be considered less than significant.

Fishes. Temporary impacts on the fish community from dredging operations at the borrow areas would occur as a result of the removal of some slow-moving or burrowing species such as gobies, or from increased turbidity on pelagic species. Further, some species would be disturbed or potentially buried during beach nourishment activities. Although some studies have identified the effects of suspended sediments on fish species, increased total suspended solids (TSS) levels from dredging (e.g., a few hundred mg/L) would be well below the concentrations indicated in these studies that cause significant effects on fishes (refer to Section 5.5.3.1 of the EIS/EIR for further detail).

California grunion (*Leuresthes tenuis*) spawn on sandy beaches in the San Diego region between March and August, and have the potential to be affected by beach replenishment due to temporary disruption of habitat and increased turbidity. However, since dredging and disposal activities for the project would occur in the winter, potential impacts would be avoided or minimized below a level of

significance. Furthermore, the long-term benefits from the project could occur for grunion and other species typical of nearshore sand habitats due to the creation of additional habitat from beach widening.

Essential Fish Habitat (EFH). Project activities potentially affecting Fishery Management Plan (FMP) species include dredging at the borrow areas and subsequent disposal/renourishment of sand along the beach. Because the replenishment and borrow areas proposed for this project are located a substantial distance from any kelp beds (at least 0.48 to 2.42 kilometers [0.3 to 1.5 miles]), no significant impacts would occur to this EFH. Temporary impacts to groundfish FMP species could potentially occur by temporarily reducing foraging habitat, increasing turbidity, and decreasing water quality. Due to the highly mobile nature of these species in the project area, impacts would localized and/or transient, and therefore less than significant.

Marine Mammals. Marine mammals do not regularly use or depend on the study area for food or habitat resources, particularly when compared to the large area of undisturbed water in the region. Temporary construction impacts are not likely to cause significant impacts since marine mammals, such as California sea lions, harbor seals, dolphins, and whales, are highly mobile species that could avoid the region during project operations.

Shore- and Waterbirds. The beach area that would be affected has limited value as feeding or resting habitat for shorebirds. The impacts of sediment placement during the initial nourishment and 10-year replenishment cycles include short-term disruption of feeding and resting opportunities along this stretch of beach but are considered less than significant. Long-term impacts may be beneficial to the extent that beach nourishment lessens the seasonal disappearance of the beach during winter and provides an expanded area that can be utilized by shorebirds for resting and foraging. Any beneficial impact would be small, however, due to the narrow beach width associated with this alternative.

Threatened and Endangered Species. Dredging and beach nourishment activities are not likely to adversely affect any threatened, endangered or special status species. Areas of direct impact do not represent limited habitat for these species, whereas the more sensitive beach areas north and south of the study area are not expected to experience substantive changes in erosion, sedimentation, or wave action that might (if they were to occur) ultimately affect sensitive plant and animal species that occur in, or utilize, the beach and dune areas. The increased beach width may allow more frequent (but still transient) use of the beach for foraging and resting by snowy plovers, a threatened species that nests north and south of the study area. This effect would be slight because the relatively narrow beach would still be subject to fairly concentrated use and disturbance associated with proximity to shoreline development. Localized, temporary increases in turbidity at the dredging and deposition sites are not expected to affect wide-ranging waterbird species such as the California brown pelican. Dredging and deposition areas are sufficiently far from nesting areas of California least terns such that this species is not likely to be affected.

Tijuana River Estuary. Due to the distance of the project activities from the estuary, impacts to vegetation and wildlife species and habitat at the Tijuana River Estuary are not anticipated.

Section 30232. *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.*

The project requires operation of dredging and grading equipment for an estimated four to six months every 10 years, which could result in spills or leaks of fuels, lubricants, etc. Some leaks, spills, or accidental releases may be significant enough to substantially contaminate the soil but implementation of the following mitigation measure presented in the EIS/EIR would minimize the potential for adverse affects from spills, leaks, or accidental spills.

Preparation of a Spill Prevention, Containment and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include:

- On- and offshore activities and use and refueling of equipment
- Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site
- Immediate control, containment and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment
- An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. A monitoring program will be implemented to ensure that the plans are followed throughout the period of construction.

Section 30235. *Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fishkills should be phased out or upgraded where feasible.*

The dredging and beach replenishment involved with the preferred alternative is intended to prevent the severe beach erosion that results from winter storms. There are no existing marine structures contributing to pollution and/or fishkills identified in the project area.

5.4 CHAPTER 3, ARTICLE 5: LAND RESOURCES

Section 30240. ***(a)*** *Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*

(b) *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

Dredging and beach nourishment activities are not likely to adversely affect any threatened, endangered or special status species or habitat. Areas of direct impact do not represent limited habitat for endangered or special status species, whereas the more sensitive habitat in the beach areas north and south of the study area are not expected to experience substantive changes in erosion, sedimentation, or wave action that might (if they were to occur) ultimately affect sensitive habitat and wildlife that occur in, or utilize, the beach and dune areas.

During the approximately four to six months of dredging activity, there would be limited use of the beach for recreational activities. Dredging is temporary (although periodic every ten years over the 50-evaluation period) and would ultimately result in an improvement to the study area. It would also provide for added protection of adjacent property and structures from inundation, wave attacks, and erosion and would maintain the beach width at a minimum of 25 m (82 ft). The land use impacts associated with this project are considered to be less than significant because there would not be any permanent structure associated with the preferred alternative. The preferred alternative would involve offshore dredging and essentially no haul truck trips would be associated with this project since it would involve a pipeline dredge located directly over the offshore borrow locations. The only onshore truck trips would result from the delivery of the bulldozers and the daily commutes of the operators. The borrow locations would be north and south of the project site and would be of a sufficient distance to eliminate the potential for any land use compatibility issue.

Section 30244. *Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.*

The identification of cultural resources in the project's area of potential effects (APE) has not been completed. The potential exists for the presence of National Register eligible properties within the project's APE. Proposed borrow site Areas A and B require a marine cultural resources study. Until

the identification phase is completed, and National Register evaluations are performed on any sites present, an impact assessment for preferred alternative cannot be made. However, if National Register eligible properties are present, they may be avoidable through implementation of the following mitigation measure:

Prior to final approval for construction of the project, an underwater archeological and remote sensing survey of proposed borrow site Areas A and B will be performed. The findings of the survey shall be subsequently used to identify and implement any mitigation measures that may be necessary to minimize offshore impacts to a level of less than significant.

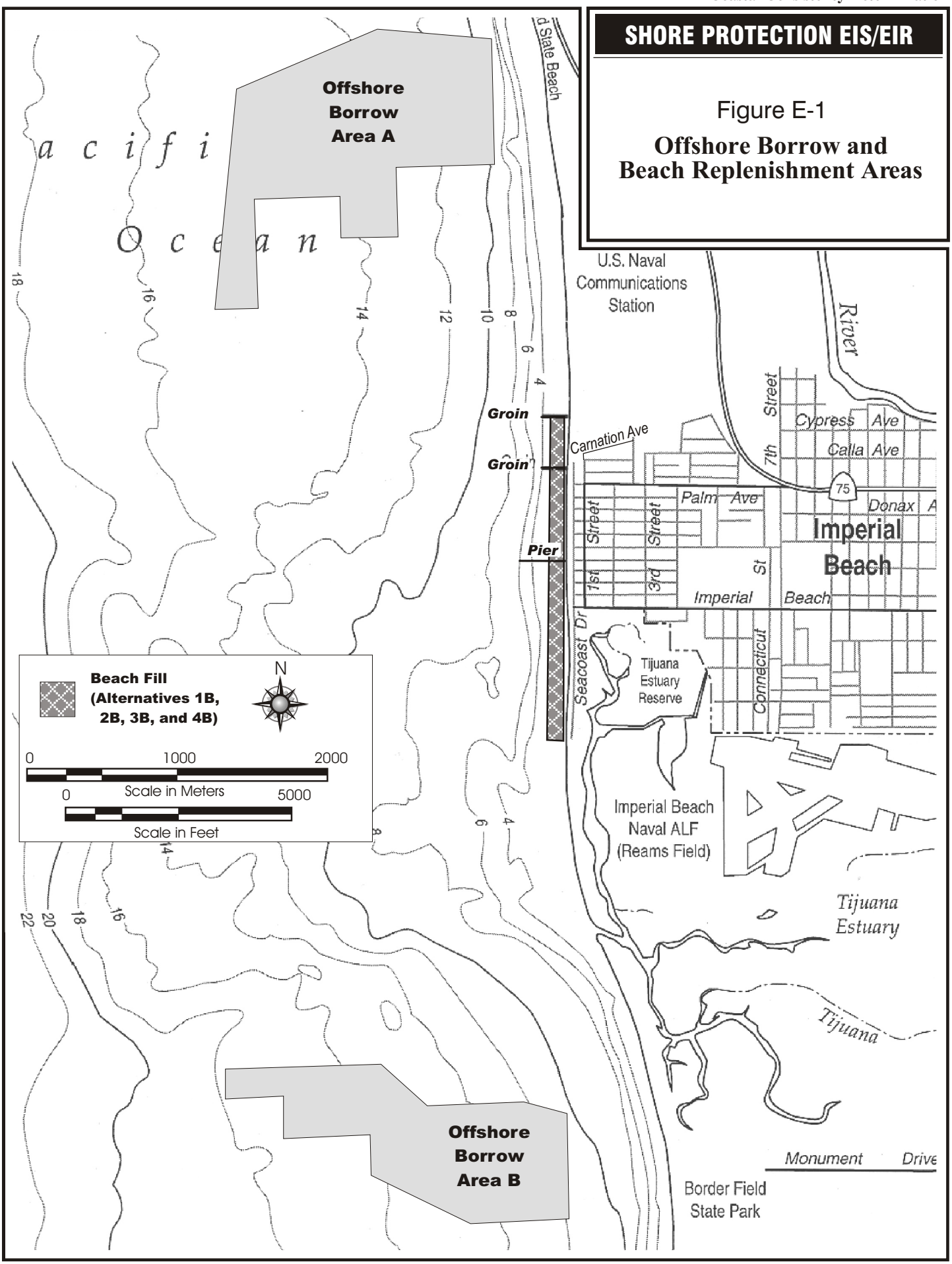
A previous Imperial Beach erosion project was coordinated with the California State Historic Preservation Officer (SHPO) in 1978. The SHPO concurred with the USACE's determination of no effect. Given changes to the design of the project, the current project and its alternatives, as proposed will be re-coordinated with the California SHPO in accordance with the National Historic Preservation Act. Results of the archival studies, the previous terrestrial archeological surveys, and the marine surveys of the borrow sites (when completed), along with the USACE's determinations of eligibility and effect; will be sent to the California SHPO for review and comment. All documentation will also be provided to interested Native American groups. If the USACE determines that the project will have an adverse effect on National Register eligible properties, and the SHPO concurs, the Advisory Council will be notified per 36 CFR 800.6.

In accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act, a records search and an archeological survey of the land portion of the study area have been performed. An archival search has been performed regarding the proposed borrow sites. An archeological and remote sensing survey is required. Until the underwater surveys have been completed, the USACE cannot make determinations of National Register eligibility and effect as required by the Act.

REFERENCES

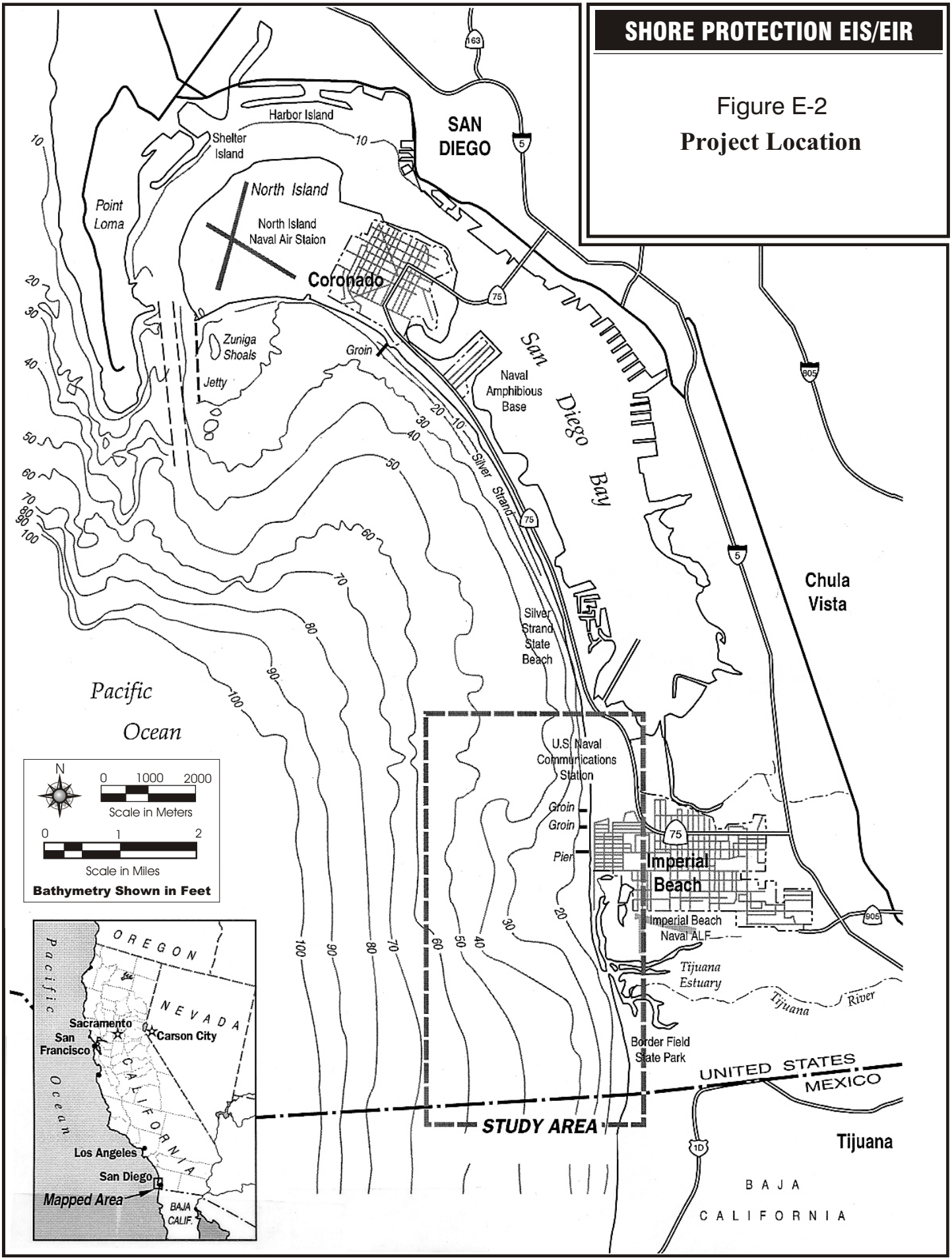
Peddicord, R., V. McFarland, D. Belfiori, and T. Byrd. 1975. Dredge Disposal Study, San Francisco Bay and Estuary. Appendix C. Effects of Suspended Solids on San Francisco Bay Organisms. U.S. Army Corps of Engineers, San Francisco District.

O'Connor, J.M. 1991. Evaluation of Turbidity and Turbidity-Related Effects on the Biota of the San Francisco Bay-Delta Estuary. Submitted to U.S. Army Corps of Engineers, San Francisco District.


SHORE PROTECTION EIS/EIR
Figure E-1
Offshore Borrow and Beach Replenishment Areas
Offshore Borrow Area A
Offshore Borrow Area B
Beach Fill (Alternatives 1B, 2B, 3B, and 4B)
N
0
1000
2000
Scale in Meters
0
5000
Scale in Feet
Groin
Groin
Pier
U.S. Naval Communications Station
River
Carnation Ave
Cypress Ave
Calla Ave
Palm Ave
Donax A
Imperial Beach
Imperial Beach
7th Street
1st Street
3rd Street
St
Seacoast Dr
Connecticut
Tijuana Estuary Reserve
Imperial Beach Naval ALF (Reams Field)
Tijuana Estuary
Tijuana
Monument Drive
Border Field State Park
75

SHORE PROTECTION EIS/EIR

Figure E-2
Project Location



APPENDIX F.

EVALUATION OF SECTION 404(B)(1) OF THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972

APPENDIX F. 404(b)(1)
EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIALS INTO THE WATERS OF THE UNITED STATES

I. INTRODUCTION

The following is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) as amended by the Clean Water Act of 1977 (CWA) (Public Law 95-217). Its intent is to succinctly state and evaluate information regarding the effects of discharge of dredged or fill material into the waters of the United States. As such, it is not meant to stand alone and relies heavily upon information provided in the environmental document to which it is attached. Use of the "Documentation" category is for expansion of discussions only when necessary or for references and citation.

Project Purpose. Section 230.10(a) of 404(b)(1) guidelines states "an alternative is practicable if it is available and capable of being done after taking into consideration costs, existing technology and logistics in light of overall project purposes." One of the primary objectives of the proposed project is to provide shore protection via beach nourishment and replenishment for the City of Imperial beach to protect residential and military properties and public infrastructure from continued beach erosion (See Sections 2 and 3 of the project's Environmental Impact Statement/Environmental Impact Report [EIS/EIR] for detailed information). Five alternatives (No Action and four project alternatives) were developed and evaluated in detail in the EIS/EIR.

Description of Alternatives. The No Action Alternative would assume no new construction activities and the beach erosion process would continue to threaten private and public structures as well as the recreational value along the shoreline. Long-term erosion may eventually result in the destruction of properties and infrastructure and degrade environmental and habitat quality.

Alternative 1B would provide beach nourishment consisting of an estimated 450,000 cubic meters (cm) (588,600 cubic yards [cy]) of beach fill (sand) plus an additional 764,000 cm (999,312cy) of fill. The fill would be approximately 2,164 meters (m) (7,100 feet [ft]) long and 12 m (39 ft) seaward (wide) to an elevation of +4 m (+13 ft) MLLW. Once the beach has been replenished, it would need to be maintained every 10 years through the addition of approximately 764,000 cm (999,312 cy) of fill. The beach renourishment process would occur four times throughout the 50-year evaluation period.

Alternative 2B would provide beach nourishment along the same 2,164 m (7,100 ft) stretch of shoreline as described for Alternative 1B. The base beach fill would consist of 925,000 cm (1,209,000 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in a minimum beach width of 25 m (82 ft) from the backshore limit to the to the foreshore berm. Alternative 2B would have a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of renourishment would then be placed on the beach every ten years over the project's lifetime, as described for Alternative 1B. In total, 4,745,000 cm (6,206,460 cy) of fill would be placed on the beach over the 50-year evaluation period.

Alternative 3B would provide an initial base beach fill of 1,250,000 cm (1,635,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline. This alternative would result in a minimum beach width of 34 m (115.52 ft) from the backshore limit to the to the foreshore berm. This alternative would have a crest elevation of +4 m (+13 ft). Under this scenario, the shoreline would then be renourished with an additional 764,000 cm (999,312 cy) every ten years to maintain the minimum beach width of 34 m (115 ft). The total volume of nourishment/renourishment for this alternative over the 50-year project lifetime would be approximately 5,070,000 cm (6,631,560 cy).

Alternative 4B would provide an initial base beach replenishment fill of 2,000,000 cm (2,616,000 cy), plus an additional 764,000 cm (999,312 cy) of fill for the same 2,164 m (7,100 ft) span of shoreline, thereby resulting in a minimum beach width of 54 m (177 ft) from the backshore limit to the to the foreshore berm. Alternative 4B would have a crest elevation of +4 m (+13 ft). The beach would then be renourished with 764,000 cm (999,312 cy) every ten years. The total volume of nourishment/ renourishment for Alternative 4B would be 5,820,000 cm (6,906,240 cy).

Least Environmentally Damaging Practicable Alternative

The "No Action" alternative, as previously discussed, would continue to create loss and damage to the beach and private and public structures within this study area. Therefore, the No-Action Alternative is not the least environmentally damaging practicable alternative.

Alternative 1B, which is also the National Economic Development (NED) Plan, consists of 450,000 cm (588,600 cy) of beach fill (sand) plus an additional 764,000cm (999,312 cy) of fill. Beach replenishment consisting of 764,000 cm (999,312 cy) would occur every ten years over the 50-year evaluation period. Out of all the alternatives, Alternative 1B would have the shortest beach width, which also would entail a shorter construction period. However, construction operations are temporary in nature and would have no bearing on long-term impacts to water and biological resources. The shorter beach width limits the level of recreation other land use opportunities. However, the USFWS indicates that although a wider beach increases suitable nesting habitat for the California least tern and western snowy plover the proposed project area is a heavily used recreational beach. It is unlikely that any wildlife benefits would result from the new beach fill and wider beach width. Benefits to the California least tern, western snowy plover, and California grunion are not expected as a result of any of the alternatives (see appendix D, USFWS Final Coordination Act Report). Therefore, Alternative 1B is considered the least environmentally damaging practicable alternative.

Alternative 2B consists of 925,000 cm (1,209,000 cy) plus an additional 764,000 cm (999,312 cy) of fill. Beach replenishment would then occur every ten years, as with Alternative 1B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, the dredging and filling construction operations would be temporary in nature and would have no bearing on long-term impacts to biological and water resources. Alternatives 3B and 4B, as discussed below, provide the widest beach widths, and, therefore, increase opportunities for erosion control, and recreation, they also increase air quality emissions (impacts) and are not economically practicable. Additionally, as discussed by the USFWS in the CAR, the service sees no biological benefit for any of the alternatives. Therefore, Alternative 2B is not considered to be the least environmentally damaging practicable alternative.

Alternative 3B consists of 1,250,000 cm (1,635,000 cy), plus an additional 764,000 cm (999,312 cy) of fill. Beach replenishment would then occur every ten years, as with Alternatives 1B and 2B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, the dredging and filling construction operations would be temporary in nature and would have no bearing on long-term impacts to biological and water resources. Due to the increase in air quality emissions (impacts) and economics, Alternative 3B is not considered to be the least environmentally damaging practicable alternative.

Alternative 4B consists of an initial base beach replenishment fill of 2,000,000 cm (2,616,000 cy), plus an additional 764,000 cm (999,312 cy) of fill. The 10-year incremental replenishment throughout the

50-year evaluation period would be the same as Alternatives 1B through 3B. The volume of material to be dredged for the initial beach nourishment would be correspondingly greater, with a greater area (and/or depth) of impact at the dredging site. However, the dredging and filling construction operations would be temporary in nature and would have no bearing on long-term impacts to biological and water resources. This alternative offers the widest beach scenario, which provides additional erosion control support as well as opportunities (habitat for biological resources). However, as discussed earlier the USFWS does not see any benefit due to the wider beach area since increased recreation would eliminate any potential benefits for biological resources. This alternative consists of the widest beach compared to the aforementioned alternatives, and would thus provide additional benefits for land use and recreational resources. However, in comparison to the other alternatives it has the greatest air quality impacts and is not considered economically practicable. Therefore, it is not considered to the lease environmentally damaging practicable alternative.

II. PROJECT DESCRIPTION

A. Location. The study area, which consists of both on-shore and off-shore activities, is located along the southernmost stretch of the Silver Strand shoreline that corresponds with the corresponds with the corporate boundary of the City of Imperial Beach, which extends from the United States Naval Communications Station approximately 5.8 kilometers (3.6 miles) to the U.S./Mexico Border. The onshore portion of the study area consists of 2.164 m (7,100 ft) of shoreline that extends southward from the northern-most groin of the beach. Please refer to Figure 2.1-2 of the EIS/EIR for related mapping of the aforementioned narrative discussion of the onshore portion of the study area. The offshore portions of the study area consists of two (2) offshore borrow areas: one located approximately 1.9 kilometers (1.2 miles) north and the other 4.5 kilometers (2.8 miles) south of the onshore portion of the study area. Please refer to Figure 2.1-3 of the EIS/EIR for related mapping of the offshore portions of the study area.

B. General Description of the Proposed Action and Recommended Plan. The USACE, Los Angeles District, in conjunction with the City of Imperial Beach, California, propose to address beach erosion problems within the onshore portion of the study area to protect beachfront and adjacent properties. The EIR/EIS addresses environmental impacts related to the five alternatives (No Action Alternative and 4 alternatives) to address (or not to address) beach nourishment and replenishment. Alternative 1B is the Recommended Plan (described below).

The Recommended Plan, which is Alternative 1B, would provide shoreline protection via an initial fill consisting of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill along the 2,164 m (7,100 ft) onshore portion of the study area. Subsequently, every 10 years through the 50-year evaluation period the onshore portion of the study area will be replenished with approximately 764,000 cm (999,312 cy) of fill. The total fill required over the 50-year evaluation period would be approximately 4,270,000 cm (5,585,160 cy).

Offshore Borrow Areas "A" and "B". The offsite borrow areas, referenced as Areas A and B would be utilized throughout the life of the project. Please refer to Figure 2.1-3 of the EIS/EIR for mapping of both areas. Dredging within these areas would occur via a Hopper dredge or a stationary hydraulic pipeline. The Hopper dredge would consist of dragheads equipped with suction pumps. Sediment would be pumped into bins and brought to the onshore project area where it would be deposited via a pipeline. The stationary pipeline would consist of a floating barge apparatus that would include a pipeline and will be located directly over the selected borrow

area. The pipeline would then discharge directly onshore. This type of dredge could be relocated to other areas of the borrow sites via tugboats.

Material Required for Construction. The material to be utilized during construction will consist of coarse-grained sands for the filling activity and Training dikes. The Training dikes would be constructed before sediments are placed on the beach to direct the water flow so as to allow a portion of the suspended sediments to settle out prior to release to the ocean.

Duration of Construction. Initial offshore dredging would occur continuously for a period between four and six months, seven days a week, 24 hours a day. The subsequent renourishments over the 50-year evaluation period would entail the same time frame similar to the aforementioned discussion. Onshore beach construction activities would occur approximately four to six months, 7 days a week, 12 hours a day. The subsequent renourishment activities over the 50-year evaluation period will entail a time frame similar to the aforementioned discussion.

Construction Equipment. Equipment other than the use of a Stationary and/or Hopper dredges would consist of approximately four bulldozers required to manipulate the discharged fill on the onshore portion of the Recommended Project. The bulldozers will be transported to and from the project area via haul trucks.

Future Operation and Maintenance. Operation and maintenance for the preferred alternative would entail the addition of 764,000 cm (999,312 cy) of fill to the same stretch of the onshore component every 10 years over a 50-year evaluation period. The fill would be dredged from the Offshore Areas A and B. The equipment and time frames for future operation and maintenance activities will be similar to initial construction.

C. Authority and Purpose. The Committee of Energy and Water Development of the House of Representatives authorized a study in March 1997. This study is to re-evaluate the shoreline erosion and storm damage along the City of Imperial Beach shoreline and incorporate Federal intervention to develop solutions to the problem.

D. General Description of Dredged or Fill Material. The Recommended Plan consists of initial beach nourishment and replenishment every ten years over a 50-year evaluation period. The borrow areas where dredging will occur are labeled as A and B. Borrow Area A is located approximately 1.9 kilometers (1.2 miles) north and Borrow Area B is located 4.5 kilometers (2.8 miles) south of the onshore portion of the study area. Please refer to Figure 2.1-3 of the EIS/EIR for related mapping of the offshore portions of the study area.

Sediments sampled at the borrow pit north of the Imperial Beach study site contain approximately 80 to 90 percent sands, while sediments collected at the borrow pit south of the project site were approximately 85 to 90 percent sands. Sediments on the shelf off Imperial Beach have been characterized as 8.8 percent rock, 76.4 percent sand, and 14.6 percent silt. Dominant grain sizes range from 150 to 300 microns, corresponding to very fine to medium sands. Generally coarser grained and well-sorted sediments occur at locations closer to the Tijuana River delta. As per Section 4.2 of the EIS/EIR, sediment grain size at Imperial Beach decreased with increasing water depths. Median grain sizes at depths of 0 m (0 ft), 3 m (10 ft), and 7 m (20 ft) were 210 to 250, 125 to 165, and 84 to 110 microns, respectively.

Sediments collected from bottom depths of 20 to 22 m (65 to 70 ft) by City of San Diego (1996) were characterized as coarse with greater than 80 percent sand-sized materials. In depths from 26

to 30 m (80 to 100 ft), sediments were slightly finer and contained approximately 20 percent silts. Similarly, sediments collected during the SCBPP at two sites along the 20 m (60 ft) bottom contour contained approximately 80 to 90 percent sands. These values were comparable to grain size results reported by the USACE (1997) for sediments collected at the two aforementioned borrow areas designated for the project.

In total, 4,270,000 cm (5,585,160 cy) of fill would be dredged from the aforementioned borrow areas over the 50-year evaluation period.

E. Description of the Proposed Discharge Site. The onshore portion of the study area is located within the City of Imperial Beach, San Diego County, California. The City of Imperial Beach is located immediately north of the U.S./Mexico Border. The onshore component of the study area is located within Silver Strand, a relatively narrow sand spit that extends northward from the Tijuana River inlet to a landmass at the entrance of the San Diego Bay. The Silver Strand separates San Diego Bay from the Pacific Ocean. For further detailed discussion, refer to Section 2 of the EIS/EIR.

The onshore portion of the study area is located within the coastal plain geomorphic subprovince of the Peninsular Range province. It occupies a portion of the rectangular-shaped coastal plain, characterized by a series of wave-cut terraces that extend inland for approximately 16 kilometers (10 miles). Like most of the South Bay area of the San Diego region, the study area is underlain by the San Diego Formation, a tertiary shallow water marine deposits of Pliocene Age. This formation consists of dense, easily pulverized, silty, very finely bedded sandstones. The study area is situated within the Silver Strand Littoral Cell (SSLC). A major shoreline feature within the littoral cell is the Tijuana River Delta. The sources of sand for the beaches within the littoral cell are the delta, erosion of the Playas de Tijuana sea cliffs, and beach nourishment projects. The beach material in the study area consists of cobbles and medium to fine grain sands. During the summer months, the beach builds out and is composed primarily of sand. During the winter months the beach erodes, exposing the cobbles. For more detailed information, refer to Section 4.2 of the EIS/EIR.

Upland habitat within the study area ranges from non-native species that includes but is not limited to iceplant, saltbush, and Bermuda grass and native species such as pickleweed, seablite, and saltbush. Some areas along the stretch of the study area also support native coastal dune, coastal scrub, and transitional salt marsh species. The subtidal habitat within the study area includes numerous species of algae, with the Giant kelp being the most notable species. Various species of low, middle, and high marsh vegetal habitat occur at the Tijuana River Estuary, which is located at the extreme southern portion of the study area. For more detailed habitat information, refer to the Biological Resources Section (Section 4.5) in the EIS/EIR.

F. Description of Disposal Method. Material dredged within the study area will be reused for the onshore portion of the study area and offsite disposal will not be required. The dredging and filling activities will comply with the California Ocean Plan and any potential additional requirements for discharges may be specified via Waste Discharge Requirements (WDR) that may be issued by the Regional Water Quality Control Board, although WDR limits typically are similar to those specified in the California Ocean Plan.

III. FACTUAL DETERMINATIONS

A. Disposal Site Physical Substrate Determinations

1. **Substrate Elevation and Slope.** The onshore portion of the study area would slope in a westward (seaward) direction and the final constructed crest elevation will be approximately +4m (+13 ft).

2. **Sediment Type.** The onshore soils in this category consist of cobbles and medium to fine grain sands. During the summer months, the beach builds out and is composed primarily of sand. The proposed fill will consist of coarse-grained sands. Refer to Section E under Project Description and Section 4.2 in the EIS/EIR for a detailed sediment description

.

3. **Dredged/Fill Material Movement.** The proposed onshore filling activity will introduce a large volume of sand to the back beach area over a short period of time, which is different than the natural sediment deposition mechanisms. However, this material would be subject to natural coastal processes and redistributed within the littoral system over time. The formation of small nearshore bathymetric features (sand bars) as a result of the redistribution of the nourishment sands will be substantially similar to that which occurs naturally.

   Nearshore dredging and subsequent sand placement is not be expected to significantly affect wave action or erosion and sedimentation rates along the beaches north and south of the proposed study area.

4. **Physical Effects on Benthos (burial, changes in sediment type, composition, etc.).** Dredging and filling activities required for the project will temporarily impact the benthic community via disturbance, removal, and/or burial. However, recolonization would occur by larval recruitment and immigration of organisms from nearby unaffected areas that are common throughout coastal areas in the region. Recolonization of the community would be relatively rapid (likely within a year or less) following completion of dredging or initial sand renourishment. The disturbances to benthos will be localized and short term and any changes will not cause substantial effects on higher food chain species.

5. **Other Effects.** Operation and maintenance activities regarding beach replenishment every 10 years over the 50-year evaluation period will be similar to those of project construction, but on a reduced scale.

6. **Actions Taken to Minimize Impacts.** As discussed in the above Part 3, Training dikes will be installed to limit the extent of sediment suspension during project construction. Table 1 lists the Topography/Geography mitigation measures from Section 5.1.3 of the EIS/EIR. As indicated in the EIS/EIR, through the implementation of these measures, potential impacts to topography and would be reduced to a less-than-significant level.

Additional mitigation measures that are not part of the EIS/EIR are presented in Table 2.

Table 1 Topography/Geography Mitigation Measures from EIS/EIR

No	Mitigation Measure Description
G-1	Preparation of a Spill Prevention, Containment and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include: • On- and offshore activities and use and refueling of equipment • Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site • Immediate control, containment and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment • An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel. A monitoring program will be implemented to ensure that the plans are followed throughout the period of construction.

Source: Imperial Beach Shore Protection Draft EIS/EIR, Section 5.1.3

Table 2 Additional Mitigation Measures

No.	Mitigation Measure Description
1	Stabilize any areas of exposed soil, such as dirt stockpiles, dirt berms, and temporary dirt roads, with controlled amounts of sprinkled water.
2	At the close of each working day, sweep up any materials tracked onto the street or laying uncontained in the construction areas, and dispose of any trash accumulated in construction areas.

B. Water Circulation, Fluctuation and Salinity Determinations

1. **Effect on Water Quality.** Increased turbidity will occur along the shore as a result of pumping a mixture of dredged sediments and water directly onto the beach. Drainage water associated with the dredged sediments, containing fine-grained suspended particles, will flow into the surf zone and spread along the shore near the study area. Training dikes constructed before sediments are placed on the beach could direct the water flow and allow a portion of the suspended sediments to settle out prior to release to the ocean, thereby minimizing suspended particle concentrations in the return flow and resulting turbidity effects.

   Dredging will result in localized suspension of bottom sediments. This will cause temporary and localized increases of suspended particle concentrations. Because sediments within Borrow Areas A and B consist of sand-sized particles, suspended particles would settle rapidly to the bottom and dispersion to locations outside of the borrow areas would be limited. Some additional loss of sediments, from overflow or spills from the hopper dredge may occur but would rapidly disperse.

   None of the materials dredged and placed on the beach will exceed criteria in the California Ocean Plan for bacteria, dissolved oxygen, contaminants, sulfides, nutrients, or pH.

2. **Effect on Current Drainage Patterns, Circulation and Effect on Normal Water Level Fluctuations.** The Recommended Plan will not significantly alter the nearshore currents and the incoming wave energy. Therefore, there will be no impacts to coastal processes, and beach nourishment within the study area would not increase risks of damages to coastal structures in other coastal locations outside the study area. The formation of small nearshore bathymetric features (sand bars) as a result of the redistribution of the nourishment sands will be substantially similar to that which occurs naturally; consequently, no significant impact requiring mitigation would occur

3. **Salinity Gradients.** The Recommended Plan will not have any impacts to the salinity gradients.

4. **Actions Taken to Minimize Effects.** Refer to Section A6 of this document regarding mitigation measures. Monitoring will also occur to ensure that the Recommended Plan complies with the California Ocean Plan and WDRs that may be required by the Regional Water Quality Control Board.

C. Suspended Particulate/Turbidity Determinations at Disposal Site

1. **Expected Change in Suspended Particulate and Turbidity Levels in the Vicinity of Disposal Site.** As discussed in Section F under the Project Description, all dredged material will be used for the onshore portion of the project. Refer to Section B, Part 1 for a description on turbidity and suspended particulate matter for the dredging and filling operations as part of the Recommended Plan.

2. **Effects (degree and duration) on Chemical and Physical Properties of the Water Column.** As discussed in Section B, Part 1, dredging and filling operations sediment to become suspended and turbidity. The increased turbidity could reduce light penetration and dissolved oxygen levels, and be visually unpleasing. However, because of the high percentage of coarse-grained material, the sediments will not remain suspended for a long time. Training dikes constructed before sediments are placed on the beach could direct the water flow and allow a portion of the suspended sediments to settle out prior to release to the ocean, thereby minimizing suspended particle concentrations in the return flow and resulting turbidity effects. Concentrations of individual metal and organic matter content within the proposed fill material are low, most likely due to the coarse-grained material.

3. **Effects of Turbidity on Biota.** Increased suspended sediments (turbidity) could also affect organisms in the vicinity of the dredge site or along the shoreline, particularly filter or suspension feeding organisms, marine mammals and fish, and submerged vegetation. Turbidity would be expected to be short term and localized to the discharge location (average 76 m [250 ft]) under average current conditions, and could extend up to 304 to 912 m (1,000 to 3,000 ft) down current under maximum current speeds at some sites. Plumes would be expected to be limited within 304 m (1,000 ft) from shore. Further, concentrations within the plume would not be expected to be higher than concentrations occurring naturally in nearshore waters under higher wave or storm conditions. Thus, the concentrations will not exceed those to which the organisms are exposed under natural episodic conditions.

4. **Actions Taken to Minimize Impacts.** Refer to the above Section A.6 for a discussion of mitigation measures to reduce the extent of sediment suspension.

D. Contamination Determination. Metals, and other chemical compounds in sediments collected from the offshore borrow areas and onshore portion of the Recommended Plan were found to be low and/or below detection limits, with the exception of a pesticide derivative detected in offshore samples. However, another recent study did not detect such derivative. Refer to Section 4.3 of the EIS/EIR for a detailed discussion regarding water and sediment contamination within the study area. Please refer to Section A.6 of this document for mitigation measures for contamination resulting from construction equipment and materials.

E. Aquatic Ecosystem and Organism Determination. Other than temporary adverse impacts resulting from dredging and filling, the overall project will create additional area for habitat and shorebird resting and foraging.

F. Actions Taken to Minimize Effects. Measures to mitigate project impacts resulting from turbidity and contamination to biological resources are presented in Section A.6 of this document.

G. Determination of Cumulative Effects of Disposal of Fill on the Aquatic Ecosystem. The Recommended Plan coupled with other projects will contribute to cumulative impacts within the region for biological resources. In order to minimize turbidity, Training dikes will be installed to limit the extent of sediment suspension during project construction. Refer to the above Section A.6 for a complete listing of mitigation measures. Any inland project would not cause significant construction-related impacts to water resources because any of the inland projects would need to comply with the NPDES requirements for construction activities disturbing 5 or more acres. The Stormwater Pollution Prevention Plan (SWPPP), which is required as part of the NPDES permit, would address stormwater quality as well as quantity. The Recommended Plan and other similar replenishment projects will comply with the California Ocean Plan and WDRs that may be required by the Regional Water Quality Control Board. Therefore, the Recommended Plan, coupled with other cumulative projects, will not significantly impact the aquatic ecosystem.

H. Determination of Secondary Effects of Disposal of Fill on the Aquatic Ecosystem. Mitigation measures presented in the above Section A.6 should adequately reduce any sedimentation or contamination effects on aquatic ecosystems.

IV. FINDING OF COMPLIANCE

No significant adaptations of the 404(b)(1) guidelines were made relative to this evaluation.

A review of the proposed project indicates that:

1. As evaluated in the EIS/EIR, the discharge represents the least environmentally damaging practicable alternative, and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem.

   __X__ Yes _____ No

2. The activity does not appear to 1) violate applicable state water quality standards or effluent standards prohibited under the CWA, or 2) jeopardize the existence of federally listed endangered or threatened species or designated marine sanctuary.

   __X__ Yes _____ No

3. The activity will not cause or contribute to significant degradation of waters of the U.S., including adverse effects on human health; life stages of organisms dependent on the aquatic ecosystem; ecosystem diversity; productivity and stability; and recreational, aesthetic, and economic values.

   __X__ Yes _____ No

4. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

   __X__ Yes _____ No

Note: A negative response indicates that the proposed project does not comply with the guidelines.

Section 404(r) of the Clean Water Act exempts Federal projects from the Section 404 regulatory program if they meet specific criteria. This project meets the criteria for a 404(r) exemption such that it is (1) a Federal construction project that (2) requires Congressionally authorized funds and (3) for which an EIS and a Section 404(b)(1) Evaluation have been prepared. As such, this exemption eliminates the need for a Section 401 water quality certification. The Corps hereby requests this project be declared exempt, and that Section 401 State Water Quality Certification be waived for the project construction per Section 404(r) regulation.

APPENDIX G.

RECORD OF NON-APPLICABILITY (RONA)

IMPERIAL BEACH SHORE PROTECTION PROJECT
IMPERIAL BEACH, CALIFORNIA

The Draft Imperial Beach Shore Protection Project Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was completed in June 2002. The purpose of the EIS/EIR is to evaluate potential impacts associated with the proposed beach nourishment. The recommended plan is to dredge beach quality sand from two offshore borrow sites and deposit it along a 2,164 m (7,100 ft) stretch of Imperial Beach shoreline. The initial base beach fill would consist of 450,000 cm (588,600 cy) plus an additional 764,000 cm (999,312 cy) of fill that would result in minimum beach width of 12 m (39 ft) from the backshore limit to the foreshore berm with a crest elevation of +4 m (+13 ft). An additional 764,000 cm (999,312 cy) of nourishment would then be placed on the beach every ten years to maintain the minimum beach width of 12 m (39 ft). Following initial construction, this alternative would have four replenishment cycles (years 11, 21, 31 and 41) over the 50-year evaluation period. In total, 4,270,000 cm (5,585,160 cy) of fill would be placed on the beach of the project's lifetime.

The Clean Air Act (CAA) as amended in 1990, specifies in Section 176(a) that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated under Section 110 of this title. A Conformity is defined in Section 176(c) of the CAA as conformity to the State Implementation Plans (SIPs) purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of such standards, and that the activities will not:

1. Cause or contribute to any new violation of any standard in any area; or

2. Increase the frequency or severity of any existing violation of any standard in any area; or

3. Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Air quality standards in the area of the Imperial Beach Shore Protection Project are under the jurisdiction of the San Diego County Air Pollution Control District. Air quality in the San Diego Air Basin (SDAB) regularly exceeds the NAAQS for ozone (O_3). As a result, the U.S. Environmental Protection Agency (U.S. EPA) has classified the SDAB as nonattainment of the NAAQS for O_3. Because the SDAB is currently a nonattainment area for ozone, the USACE must evaluate conformity of the proposed project with the SIP.

The USACE has estimated the quantity and duration of emissions expected to be generated from construction equipment, workers' vehicles, and the dredge operations, and has prepared a determination of conformity with the Federal Clean Air Act and the State Implementation Plan.

Under 40 CFR, Section 93.153 (Applicability), if the total direct and indirect emissions from the Proposed Action are below the General Conformity Rule "de minimis" emission thresholds, the Proposed Action would be exempt from performing a comprehensive Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP. Because the SDAB is designated as a non-attainment area of the NAAQS and for ozone, the General Conformity "de minimis" emission thresholds for nitrous oxides (NOx) and volatile organic compounds (VOC's) is 50 tons per year.

Table 1 compares the annual emission levels of the preferred alternative with the General Conformity "de minimis" emission thresholds. As shown, the annual projected NOx and VOC emission levels fall below the "de minimis" emission thresholds and, therefore, the subject project is exempt from the General Conformity requirements.

Table 1 Comparison of Project (Preferred Alternative) Emissions with the General Conformity De Minimis Threshold

Annual Emission Level	VOC	NOx
On-site Construction Emissions	1.77	22.91
Off-site Construction Emissions	0.09	0.07
Total Construction Emissions	1.86	22.98
De minimis Threshold	50	50
Exceed the *de minimis* Threshold	**NO**	**NO**

For further information, please contact Bill Butler, U. S. Army Corps of Engineers at (213) 452-3845.

_____ _____

Date Name, Title

APPENDIX H.

NOTICE OF INTENT

APPENDIX I

MITIGATION AND MONITORING PLAN (MMP)

APPENDIX I. MITIGATION MONITORING PLAN

Pursuant to the California Environmental Quality Act (CEQA) (California Public Resources Code, Division 13, §21000 et. seq.) and the Guidelines for implementation of CEQA (California Code of Regulations, Title 13, Division 6, Chapter 3, §15000 et. seq.), when a decision making body adopts an environmental review document (Environmental Impact Report [EIR] or Mitigated Negative Declaration [MND]), it must also adopt a program for reporting or monitoring the mitigation measures that were included in it (CEQA §21081(a); Guidelines §15091(d) and 15097). The purpose of a Mitigation Monitoring Plan (MMP) it to ensure that the mitigation measures adopted to mitigate or avoid significant impacts are implemented.

This MMP briefly describes the mitigation monitoring process for the proposed Imperial Beach Shore Protection Project. It has been developed on the basis of the mitigation measures presented in the project's Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR). It describes the resources/issue areas requiring mitigation, the corresponding mitigation action (or actions), anticipated residual impacts, phase of implementation, and the party (or parties) responsible for its implementation. The U.S. Army Corps of Engineers (USACE) and City of Imperial Beach (City) are the parties responsible for the MMP's implementation. The MMP for the Imperial Beach Shore Protection Project, will be in effect throughout all phases, including final design, construction, and operation. Table I-1 provides the MMP.

Table I-1 Mitigation Monitoring Plan

Environmental Resource/Issue Area	Level of Impact	Mitigation Measure(s)	Monitoring Action(s)	Implementation Phase(s)	Responsible Agency
Topography and Geography	Class II – soil contamination Class IV - topography	**G-1**: Preparation of a Spill Prevention, Containment, and Countermeasures Plan (SPCCP) that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill. This Plan, at a minimum, shall include: • On- and offshore activities and use and refueling of equipment • Handling and storage of construction and maintenance fluids (oils, antifreeze, fuels). Fluids shall be stored in closed containers (no open buckets or pans) and disposed of promptly and properly away from permeable areas to prevent contamination of the site • Immediate control, containment, and cleanup of fluids released because of spills, equipment failure (broken hose, punctured tank) or refueling, as per Federal and State regulations. All contaminated materials should be disposed of promptly and properly to prevent contamination of the site. To reduce the potential for spills on the beach during refueling, refueling of portable equipment shall occur within a contained area. Where that is not possible, barriers shall be placed around the site where the fuel nozzle enters the fuel tank. The barriers shall be such that spills shall be contained and easily cleaned up. Someone shall be present to monitor refueling activities to ensure that spillage from overfilling, nozzle removal, or other action does not occur. No more than one gallon of fuel or other maintenance fluids (transmission fluids, antifreeze, oils) shall be stored on dredging equipment.	Prepare SPCCP per recommendations of Mitigation Measure G-1 and other Best Management Practices (BMPs) as warranted.	Prior to construction.	USACE.
		G-1: An environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel.	Ensure completion of training program for all off- and on-shore construction personnel.	Prior to construction.	USACE.
		G-1: Implementation of the SPCCP and environmental training program throughout all phases of construction.	Implement measures of the SPCCP and training program throughout all phases of construction. Contractor to report any deviations from the SPCCP and training program for corrective/remedial actions, as warranted.	Construction.	USACE.

Environmental Resource/Issue Area	Level of Impact	Mitigation Measure(s)	Monitoring Action(s)	Implementation Phase(s)	Responsible Agency
Biological Resources	Class III – near shore, shoreline, Tijuana River Estuary	**B-1**: During construction a qualified biologist will regularly monitor off- and onshore activities to ensure that potential impacts to biological resources that may be associated with turbidity and nourishment/ renourishment deposition are minimized to the extent feasible. Specific monitoring activities/protocol will be reviewed with appropriate state and federal agencies prior to implementation.	Prior to construction coordinate with USFWS and CDFG to provide proposed plans for construction-phase biological monitoring. Regularly monitor off- and onshore construction-related activities to ensure that impacts to biological resources are minimized to the extent feasible.	Prior to construction, construction.	USACE and City.
Cultural Resources	Class II – underwater archeological resources	**C-1**: Prior to final approval for construction of the project, an underwater archeological and remote sensing survey of proposed borrow site Areas A and B will be performed. The findings of the survey shall be subsequently used to identify and implement any mitigation measures that may be necessary to minimize offshore impacts to a level of less than significant.	Conduct underwater surveys. Prepare findings for review and approval by State Historic Preservation Officer. Incorporate additional mitigation, as may be warranted, to minimize potentially significant impacts.	Prior to construction.	USACE.
Noise	Class II – construction noise Class II – operational noise	**N-1**: Staging areas shall be located away from sensitive receptors (schools, hospitals, residential areas, etc.) to avoid noise impacts.	Identify construction staging areas that conform to the City's adopted noise ordinances and policies regarding sensitive receptors.	Prior to construction.	USACE and City.
		N-2: Conduct all onshore construction activities involving motorized equipment between the hours of 7 a.m. and 7 p.m. Monday through Saturday.	Limit onshore construction activities to the prescribed times of 7 a.m. and 7 p.m., Monday through Saturday. During construction, obtain City approval for any onshore activities that deviate from prescribed construction times.	Construction.	USACE and City.

Environmental Resource/Issue Area	Level of Impact	Mitigation Measure(s)	Monitoring Action(s)	Implementation Phase(s)	Responsible Agency
		N-3: Maintain properly functioning mufflers on all internal combustion and vehicle engines used in construction and direct muffler exhaust away from sensitive receptor locations to reduce noise levels at the receptor locations to the maximum extent feasible.	Maintain construction equipment per standard BMPs. Identify sensitive receptors within the project area and ensure that construction-related effects conform to the City's adopted noise ordinances and policies regarding sensitive receptors.	Construction.	USACE and City.
		N-4: Construction contractor shall provide advance notice by mail to all residents and property owners on the west side of Seacoast Drive between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than seven days occur, an additional notice shall be made either in person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The contractor shall also publish a notice of the impending construction in local newspapers, stating when and where construction will occur.	Complete prescribed noticing two (2) to four (4) weeks prior to the initiation of construction. Repeat the noticing a minimum of two weeks prior to construction if delays occur.	Prior to construction.	USACE and City.
		N-5: Construction contractor shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise disturbance. Construction contractor shall also establish a toll-free telephone number for receiving questions or complaints during construction and develop procedures for promptly responding to callers and recording the disposition of calls. Procedures for reaching the public liaison officer via telephone or in person shall be included in the notices distributed to the public in accordance with Mitigation Measure N-4. If construction noise complaints are received, temporary noise curtains or shields shall be employed to reduce construction noise to levels that would not cause disturbances to anyone working or residing in the area, per Section 9.32.020 of the City of Imperial Beach General Plan.	Two to four weeks prior to construction identify and notice, as part of Mitigation Measure N-4, a point of contact name and toll free number for public concerns regarding noise-related impacts. Maintain point of contact throughout all construction phases, including clean-up and demobilization.	Prior to construction, construction.	USACE and City.

Environmental Resource/Issue Area	Level of Impact	Mitigation Measure(s)	Monitoring Action(s)	Implementation Phase(s)	Responsible Agency
Socioeconomics	Class II – Commercial fishing.	**S-1**: Thirty days prior to the start of construction the local Imperial Beach commercial fishermen's association shall be provided with written notification of the intended start date of off-shore construction and its duration. Noticing shall include a point of contact throughout the entire construction phase to respond to concerns regarding interference and/or other issues associated with local commercial fishing operations.	Written notification of construction shall be provided to the local fishermen's association that provides (1) the start date and duration of off-shore construction and (2) a point of contact throughout construction to respond to issues and concerns regarding potential conflicts with local commercial fishing operations.	Prior to construction, construction.	USACE and City.
Recreation	Class II – sand quality/ swimming area Class III – fishing/ wave formation	**R-1**: Periodically remove shell fragments from beach using a sand sweeper or other mechanical separation device.	Immediately following construction a City-designated monitor shall inspect the beach and determine if sand sweeping (or alternative separation devise) should comb the project area to alleviate potential effects of sediment size differences and shell fragment content of fill material. The construction area shall continue to be monitored at one-month intervals, as warranted, until potential impacts associated with the fill material are considered less than significant.	Post-construction.	City.

Environmental Resource/Issue Area	Level of Impact	Mitigation Measure(s)	Monitoring Action(s)	Implementation Phase(s)	Responsible Agency
		R-2: Extend lifeguard services south of Imperial Beach Boulevard to the end of Seacoast Drive during construction of shore protection measures.	Starting on the first day of construction mobilization, and continuing throughout all construction, including demobilization, provide additional lifeguard services along the beach area adjacent to Seacoast Drive.	Construction.	City.
		R-3: Post signs to announce construction and maintenance activities two to three weeks prior to their inception. Maintain postings within the duration period of the activity. (This mitigation measure may be combined with Mitigation Measure N-5.)	Two to three weeks prior to construction complete and maintain prescribed noticing to alert public to project activities.	Prior to construction, construction.	USACE and City.

APPENDIX J

AGENCY CONTACT AND COORDINATION

APPENDIX J. AGENCY CONTACT AND COORDINATION			
From	**To**	**Subject**	**Date**
California Coastal Commission San Francisco, CA	U.S. Army Corps of Engineers, Los Angeles District	Approval of Consistency Determination	August 6, 2002
Governors Office of Planning and Research State Clearinghouse	U.S. Army Corps of Engineers, Los Angeles District	Notice of close of Review of Draft EIS/EIR	August 6, 2002
Governors Office of Planning and Research State Clearinghouse	U.S. Army Corps of Engineers, Los Angeles District	Notice of Start of Review of Draft EIS/EIR	July 11, 2002
Governors Office of Planning and Research State Clearinghouse	U.S. Army Corps of Engineers, Los Angeles District	Notice of Start of Review of Draft EIS/EIR	July 11, 2002
U.S. Army Corps of Engineers, Los Angeles District	National Marine Fisheries Service Long Beach, CA	Notice of Draft EIS/EIR	June 12, 2002
U.S. Army Corps of Engineers, Los Angeles District	U. S. Environmental Protection Agency San Francisco, CA	Notice of Draft EIS/EIR	June 12, 2002
U.S. Army Corps of Engineers, Los Angeles District	U. S. Environmental Protection Agency Washington, DC	Notice of Draft EIS/EIR	June 12, 2002
U.S. Army Corps of Engineers, Los Angeles District	Department of the Interior Office of Environmental Policy and Compliance Washington, DC	Notice of Draft EIS/EIR	June 12, 2002
U.S. Army Corps of Engineers, Los Angeles District	California Coastal Commission San Francisco, CA	Notice of Draft EIS/EIR	June 12, 2002
U.S. Army Corps of Engineers, Los Angeles District	California Regional Water Quality Control Board, San Diego, Region	Notice of Draft EIS/EIR	June 12, 2002
U. S. Department of the Interior, Fish and Wildlife Service	U.S. Army Corps of Engineers, Los Angeles District	Planning Aid Letter (PAL)	November 29, 1994

APPENDIX K

PUBLIC NOTICES

Federal Register

Public Scoping Meeting Notice

Letters to Reviewers

US Army Corps of Engineers
Los Angeles District

Notice of Public Meeting
Silver Strand Shoreline, Imperial Beach, California
a General Reevaluation Report

Wednesday, September 18, 2002 at 7:00pm
City Council Chambers
825 Imperial Beach Blvd, Imperial Beach, California 91932

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, US ARMY CORPS OF ENGINEERS
COASTAL STUDIES GROUP
P.O. BOX 523711
LOS ANGELES, CA 90053-2325

OFFICIAL BUSINESS

FIRST CLASS MAIL

Interested Parties:

This is an open invitation to all interested parties to be presented by the U.S. Army Corps of Engineers and the City of Imperial Beach the proposed final plan for storm damage reduction in Imperial Beach, California. A public meeting on the study and the final storm damage reduction plan will be held on September 18th at 7:00 pm at the City Council Meeting, City Council Chambers, 825 Imperial Beach Boulevard, Imperial Beach, California 91932.

The U.S. Army Corps of Engineers and the City of Imperial Beach held a public review and public meeting on July 24, 2002 at the Dempsey Holder Public Safety Center, Imperial Beach, California to present the draft the results of the draft General Reevaluation Report (GRR) study. At the July 2002 public meeting, the U.S. Army Corps of Engineers presented the results of the draft GRR study as well as the draft proposed plan involving the construction of a base beach fill consisting of 925,000 cubic meters (1,210,000 cubic yards) of suitable beach sand, providing a base nourishment beach width of 25 meters (82 feet); a sacrificial advance beach fill of 764,000 cubic meters (1,000,000 cubic yards), providing a sacrificial advance beach width of 20 meters (66 feet); for a total initial beach fill of 1,689,000 cubic meters (2,209,000 cubic yards) and a total initial beach nourishment width of 45 meters (148 feet) beyond the existing beach line. Additionally, the draft proposed plan consisted of a renourishment volume of 764,000 cubic meters (1,000,000 cubic yards) at a renourishment frequency of once every 10 years.

Upon further review of the analysis conducted to assess the scale of possible damages associated with coastal storm activities, the U.S. Army Corps of Engineers concluded that a smaller beach fill project would provide sufficient storm damage reduction in Imperial Beach. As a result, the U.S. Army Corps of Engineers proposes to recommend a final plan to construct a project with a base beach fill consisting of 450,000 cubic meters (589,000 cubic yards) of suitable beach sand, providing a base nourishment beach width of 12 meters (39 feet); a sacrificial advance beach fill of 764,000 cubic meters (1,000,000 cubic yards), providing a sacrificial advance beach width of 20 meters (66 feet); for a total initial beach fill of 1,214,000 cubic meters (1,589,000 cubic yards) and a total initial beach nourishment width of 32 meters (105 feet) beyond the existing beach line. Additionally, the final plan consists of a renourishment volume of 764,000 cubic meters (1,000,000 cubic yards) at a renourishment frequency of once every 10 years. Placement of the beach nourishment material will extend from the northerly groin to the southern end of the Imperial Beach development, an approximate distant of 2,165 meters (7,100 feet).

The purpose of this public meeting is to inform the public of the changes to the Recommended Plan and to describe in detail the proposed final plan. A summary of the study results and a brief description of the final Recommended Plan and Environmental Impacts are included in this announcement.

Questions or further information regarding the Imperial Beach, GRR study or the public meeting can be addressed to Mr. Robert Blasberg, Study Manager, Coastal Studies Group, U.S. Army Corps of Engineers, P.O. Box 532711, Los Angeles, California, 90053-2325. Mr. Blasberg may also be reached by telephone at (213) 452-3836 or via e-mail at rblasberg@spl.usace.army.mil

We have attempted to send this information to all individuals and organizations that may have an interest in the City of Imperial Beach shoreline. If you know of individuals who may desire to attend and have not been contacted by us, please bring this invitation to their attention.

THE SILVER STRAND SHORELINE-IMPERIAL BEACH, CA
FINAL GENERAL REEVALUATION REPORT
PROJECT SUMMARY

Authority and Purpose

The U.S. Army Corps of Engineers was authorized by the River and Harbor Act of 1958 to build five stone groins along the City of Imperial Beach shoreline to stabilize, restore and maintain the former recreational beach, and to prevent over wash into the backshore areas. The plan of improvement provided for a system of five stone groins, the northernmost at the north end of the existing U. S. Naval Radio Station seawall and the other four at intervals of about 300 meters (1,000 feet). Groin No. 1 (northernmost) was completed in September 1959 and extended in 1963. Groin No. 2 was completed in January 1961. The groins were not effective due to the lack of sand supply and the project was deferred.

The City requested that the Corps reactivate the project and investigate alternative means to stabilize and restore the beach. A Post Authorization Change Report, reflecting a submerged offshore breakwater in lieu of a groin system, was approved by the Chief of Engineers in 1979. After award of a construction contract in 1985, a Federal District Court enjoined the project on the basis that significant changes had occurred since the Environmental Impact Study (EIS) had been prepared in 1978. The construction was terminated, but as the contract had already been awarded, project cost-shared, contributed funds could not be reimbursed to the local interests. The Imperial Beach authorized project was re-classified to deferred category in 1993-94.

This GRR was initiated in March 1997 to determine if a solution exists to reduce the potential for storm damage within the City of Imperial Beach that meets all applicable Federal Water Resources laws and policies, and is consistent with all U. S. Army Corps of Engineers regulations, policies and guidelines relating to the conduct of Federal Hurricane and Storm Damage Reduction feasibility studies.

Study Participants

The GRR study was prepared by the Los Angeles District, U.S. Army Corps of Engineers, in coordination with the City of Imperial Beach. Coordination was also conducted with the Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Game (CDFG), California Coastal Commission (CCC), California Department of Boating and Waterways, (CDBW), Regional Water Quality Control Board (RWQCB), State Historic Preservation Office (SHPO), local municipalities and other interested parties. The Non-Federal Sponsor of this project is the City of Imperial Beach.

Problem Description

The shoreline at the City of Imperial Beach is severely impacted by erosion. An estimate of the sediment budget indicates that approximately 76,000 cubic meters (100,000 cubic

yards) per year is eroding from the beach at Imperial Beach, corresponding to a shoreline retreat rate of 2 meters per year (6.6 feet per year). Many private property owners have constructed stone revetments or vertical seawalls to protect their property, but these non-continuous protection structures do not solve the erosion issue, and may fail as the beach recedes. Intermittent beach fills have been constructed, but not at sufficient quantity to halt the shoreline retreat. At the current retreat rate, the shoreline in the northern portion of the study area could reach the first line of development by 2007.

If no action is taken at the City of Imperial Beach, its properties and structures will be increasingly susceptible to damages caused by erosion (including loss of land and of properties), inundation, and wave attack.

Plan Formulation

Plan formulation considered the Planning Objectives of reducing the storm damage potential at Imperial Beach and preserving or improving environmental resources. An array of both structural and non-structural alternatives were considered and evaluated based on their capability of meeting the Planning Objectives. Through a process of screening out alternatives, beach nourishment was considered most viable
.
The formulation of the final alternatives considered the optimization of protective beach buffers to maximize net annualized National Economic Development (NED) benefits. This included the optimization of periodic renourishment intervals.

The final alternatives were evaluated based on comparisons to the No Action Plan and contributions to National Economic Development (NED) and environmental impacts to determine compliance with environmental laws, policies and other guidelines. The plan selected is the NED Plan.

Recommended Plan

The Recommended (NED) Plan involves construction of a base beach fill consisting of 450,000 cubic meters (589,000 cubic yards) of suitable beach sand, plus a sacrificial advance beach fill of 764,000 cubic meters (1,000,000 cubic yards), for a total initial beach fill of 1,214,000 cubic meters (1,589,000 cubic yards). The placement will be 2,165 meters (7,100 feet) long extending from the northerly groin to the southern end of the development, providing a base nourishment beach width of 12 meters (39 feet) at an elevation of +4 meters (+13 feet) MLLW. The additional sacrificial beach width will be 20 meters (66 feet), so that initially the nourished beach will be 32 meters (105 feet) wider than the existing beach.

The nourished beach is expected to erode to the 12-meter (39-foot) width after 10 years. It will be renourished with a sacrificial periodic beach fill of 764,000 cubic meters (1,000,000 cubic yards) every 10 years within the 50-year project lifetime.

The benefits of the Recommended Plan include structural, recreational and environmental benefits. Along the South Reach, the project will provide a sandy beach fronting the revetment and will minimize any nuisance flooding to the southernmost end of Seacoast Drive. Along the North Reach, the project will provide protection for the existing coastal structures during coastal storms from being undermined, condemned, or

destroyed. The annualized cost of the proposed plan totals $1,255,000. Annual Economic benefits of the plan total $2,657,500 yielding a benefit-to-cost ratio of 2.12 to 1.

Environmental Impacts of the Recommended Plan

The environmental impacts and mitigation plans associated with the Recommended Plan are presented in detail in the Environmental Impact Statement (EIS) included in the General Reevaluation Report. Environmental impacts were evaluated for the offshore sand borrow sites and the receiving beach. There are no long-term unavoidable significant impacts resulting from implementation of the Recommended Plan. The following impacts require mitigation to be reduced to a less than significant level:

__Construction equipment leaks and spills could contaminate soil and water.
__Cultural resources surveys in the project's area of potential effects (APE) have not been completed. Potential exists for the presence of National Register eligible properties within the project's APE.
__Short-term construction noise is anticipated.
__Construction staging areas may temporarily impose access/use restrictions and safety problems.
__Fill material that contains shell fragments could have an adverse impact on users of the beach.
__The southern portion of the study area that is currently not included in the designated swim area would likely attract more swimmers. Swimmers could be exposed to perilous ocean conditions in an area not patrolled by lifeguards.

Plan Implementation Requirements

The District Engineer's recommended plan will require authorization through an Act of Congress, typically in a Water Resources Development Act, prior to project implementation. The estimated first cost of construction (construction contract and construction supervision and administration) for the recommended plan totals $9,900,000. The City of Imperial Beach, as the Non-Federal Sponsor will be required to pay during the period of construction 36% of the first cost of construction or $3,564,000. Costs borne by the Non-Federal Sponsor for lands, easements, rights-of-way, relocations, and material disposal areas associated with the recommended plan may be credited toward the Non-Federal share of the project costs. The Federal government will be responsible for providing 64% of the total project first cost of construction or $6,336,000. In addition, the Federal government will be responsible for administering contracts for construction and supervision of the project after authorization and funding and receipt of Non-Federal assurances.