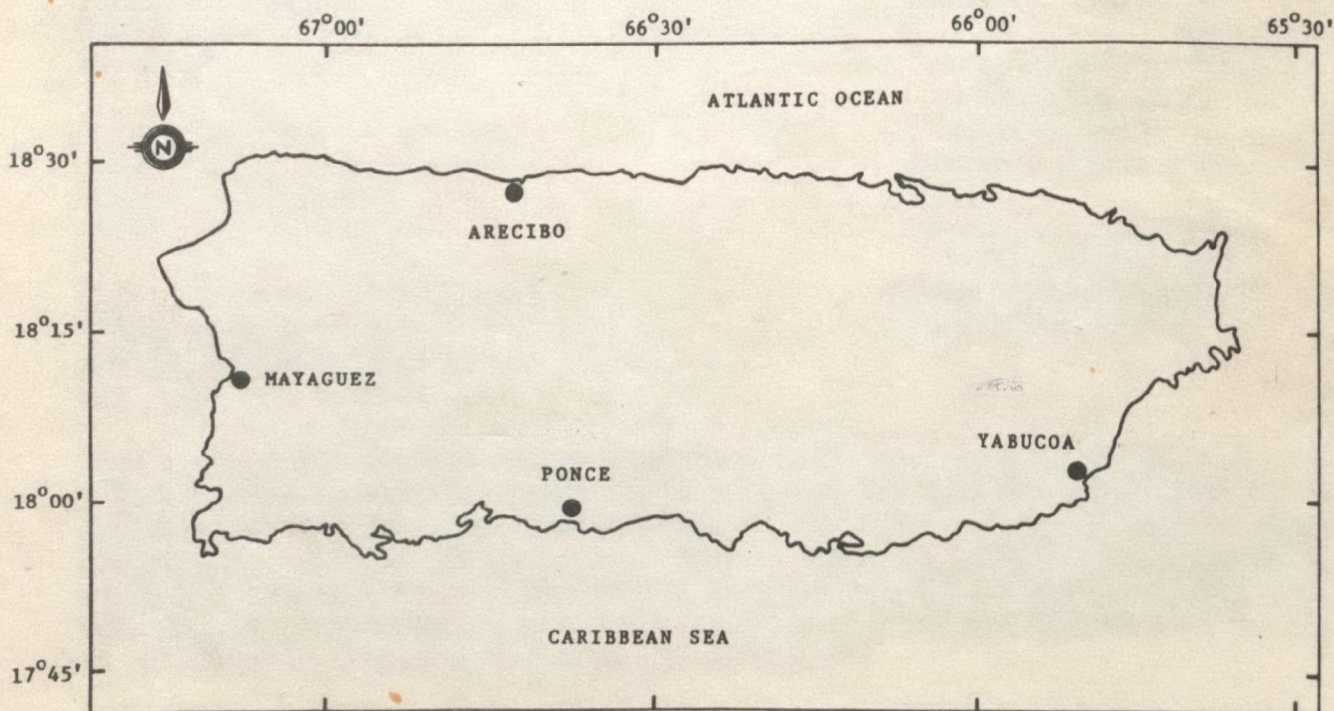




Final Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

MAY 05 1988

To All Interested Government Agencies and Public Groups:

This is to inform you that the Final Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico will be available for public review at the following locations:

U.S. Environmental Protection Agency
Environmental Impacts Branch
26 Federal Plaza, Room 500
New York, New York

U.S. Environmental Protection Agency
Caribbean Field Office
1413 Avenida Fernandez Juncos - Stop 20
Santurce, Puerto Rico

U.S. Environmental Protection Agency
Public Information Reference Unit
Room 2904 (Rear)
401 M Street, S.W.
Washington D.C.

U.S. Army Corps of Engineers
Jacksonville District Office
400 W. Bay Street
Jacksonville, Florida

U.S. Army Corps of Engineers
San Juan Area Office
400 Avenida Fernandez Juncos
San Juan, Puerto Rico

Puerto Rico Department of
Natural Resources
Oficina 204
Centro Gubernamental
Avenida Rotarios
Arecibo, Puerto Rico

Puerto Rico Department of
Natural Resources
Oficina A
Centro Comercial
2 Alturas de Mayaguez Carr.
Mayaguez, Puerto Rico

Puerto Rico Department of
Natural Resources
5 Calle Celenia
Humacao, Puerto Rico

Puerto Rico Department of
Natural Resources
Hospital Sub-Regional
Ponce, Puerto Rico

This final environmental impact statement (EIS) was prepared by the U.S. Environmental Protection Agency (EPA) - Region II, with the assistance of Science Applications International Corporation, an environmental consulting firm under contract to Battelle Laboratories. The document has been prepared in accordance with the EPA regulations implementing the National Environmental Policy Act (NEPA), and in accordance with EPA's policy for voluntary preparation of EISs on significant regulatory actions (39 FR 37119).

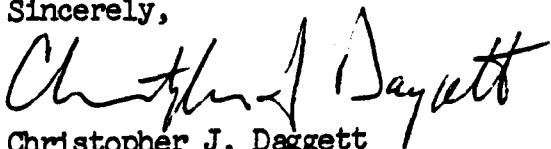
A draft EIS regarding these proposed site designations was published on September 3, 1986. The draft EIS evaluated the environmental impacts associated with the designation of sites for ocean disposal of dredged material from the harbors of Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico, and utilized these evaluations in proposing particular sites for designation. The final EIS recapitulates the alternatives analysis, responds to comments on the DEIS, and presents the EPA's conclusions on these site designations.

In accordance with the EPA's Ocean Dumping Regulations (40 CFR Part 228), a proposed rule-making for designation of the four ocean disposal sites is also being issued concurrently with this final EIS. Copies of the proposed rule-making are also available for public review at the above repositories. Comments or questions on the proposed rule-making should be sent to Mario P. Del Vicario, Chief, Marine and Wetlands Protection Branch, U.S. Environmental Protection Agency, Room 837, 26 Federal Plaza, New York, New York 10278.

Comments concerning the content of the final EIS may also be submitted to the EPA for consideration. All comments must be received within 45 days after the date of publication of the proposed rule-making and the Notice of Availability for this final EIS in the Federal Register, which is expected to be May 27, 1988. Please address all comments concerning the final EIS to Ms. Barbara Pastalove, Chief, Environmental Impacts Branch, U.S. Environmental Protection Agency, Room 500, 26 Federal Plaza, New York, New York 10278.

If you require additional information regarding this final EIS, please contact Mr. Robert Witte, Project Monitor, at (212) 264-6681.

Sincerely,



Christopher J. Daggett
Regional Administrator

Final
Environmental Impact Statement
for the Designation of Ocean Dredged
Material Disposal Sites for Arecibo
Mayaguez, Ponce, and Yabucoa,
Puerto Rico

Prepared by
U.S. Environmental Protection Agency
Region II

Abstract: In accordance with the National Environmental Policy Act (NEPA) and the regulations of the U.S. Environmental Protection Agency (USEPA), a final environmental impact statement (EIS) has been prepared for the designation of four ocean dredged material disposal sites for Puerto Rico. The purpose of the proposed action is the designation of environmentally acceptable ocean sites for disposal of dredged material from the four harbors of Arecibo, Mayaguez, Ponce, and Yabucoa.

The final EIS summarizes the purpose and need for the action, describes the analytical methodology and the alternatives analysis conducted for each site, provides a responsiveness summary concerning the comments received on the draft EIS, and presents the conclusions of the final EIS regarding the four sites.

The final EIS concludes that for Arecibo, the interim site, located approximately 1.5 nautical miles (nmi) north of the harbor, should be designated as the disposal site. For Mayaguez, Alternate Site 1, approximately 6 nmi west of the harbor, should be designated. For Ponce, Alternate Site 1, approximately 4.5 nmi south of the harbor, should be designated. For Yabucoa, Alternate Site 2, approximately 6 nmi east of the harbor, should be designated as the disposal site. A proposed rulemaking concerning designation of these four sites is being issued concurrently with this final EIS.

**FINAL
ENVIRONMENTAL IMPACT STATEMENT
FOR THE DESIGNATION OF OCEAN DREDGED MATERIAL
DISPOSAL SITES FOR THE HARBORS OF
ARECIBO, MAYAGUEZ, PONCE, AND
YABUCOA, PUERTO RICO**

May 1988

**U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278**

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The proposed action addressed by this final environmental impact statement (FEIS) is the designation of four environmentally acceptable ocean dumping sites for the disposal of dredged material from the harbors of Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico, resulting from maintenance or new dredging projects. The draft EIS (DEIS) for this action was published by the U.S. Environmental Protection Agency (EPA) on September 3, 1986. This FEIS has been prepared as a summary document because the comments received did not require major changes or additions to the DEIS. Unless otherwise noted, the DEIS is incorporated by reference into this document. Together, the DEIS and this FEIS constitute the complete FEIS.

BACKGROUND

Ocean dumping has been regulated by EPA since the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) authorized EPA to establish and apply criteria for reviewing and evaluating permit applications for the dumping of waste material into ocean waters, and to designate sites where such dumping may occur. In addition, Section 102(c) of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et seq., requires that Federal agencies prepare EISs on proposals for major Federal actions significantly affecting the quality of the human environment. The objective of NEPA is to build into the EPA decision-making processes careful consideration of all environmental aspects of proposed actions. Although EPA activities under MPRSA are statutorily exempt from compliance with NEPA, EPA has voluntarily made a commitment to prepare EISs in connection with ocean dumping site designations (39 FR 16186; May 7, 1974).

SUMMARY OF ANALYSES

The purpose of this FEIS is to identify and select for designation four environmentally acceptable ocean disposal sites for dredged material from the four harbors. The designation of an ocean disposal site for dredged material must be based on an evaluation of possible sites using the Criteria (40 CFR 228.5 - 228.6) of the Ocean Dumping Regulations (ODR). All candidate sites

are evaluated for compliance with the criteria. Of the sites that are acceptable under the criteria, the site nearest the point of dredging is selected unless there are significant environmental advantages in designation of more distant sites. If no site is found that satisfies the criteria, no site is designated. Two alternate sites for Arecibo and three alternate sites each for Mayaguez, Ponce, and Yabucoa were identified using a site selection methodology developed by EPA and the U.S. Army Corps of Engineers (COE). Locations of the interim sites for the four harbors are as follows:

- Arecibo - 1.5 nautical miles (2.7 km) north of the harbor
- Mayaguez - 5 nautical miles (9.3 km) northwest of the harbor
- Ponce - 4 nautical miles (7.4 km) south of the harbor
- Yabucoa - 4.5 nautical miles (8.3 km) east of the harbor.

Normally, EPA ocean disposal sites are chosen in such a way that dumped material is contained within the site after disposal as far as possible. This is generally feasible in those shallow water environments where valuable natural resources will not be placed at risk. In Puerto Rico, however, shallow water environments typically are inhabited by corals. To avoid direct disposal on coral resources, deeper water sites are selected. As a consequence of selecting deeper water sites, some dredged material will be transported outside site boundaries. However, the effects of transport will be small.

The key factors used in deciding which site to designate for each location considered in this FEIS are discussed below.

Arecibo

At Arecibo, the interim site is suitable for designation. The site meets all criteria of the ODR. Dredged material is not expected to be transported far from the site by ocean currents because the site is in water that has depths between 101 and 417 meters and the dredged material to be disposed of is primarily sand, which will be rapidly deposited on the sea floor. No adverse effects are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment from the continuing use of this site. There have been no operational problems encountered during surveillance or monitoring activities at this site.

Previous use of this interim site has resulted in more sand in the sediments in the area of the site than is found in other areas near the site. This has caused an increase in the number of animals that are adapted to live in coarser sediments at the site. The designation of the interim site therefore will result in less change in the composition of species of the local environment than would result from the use of any alternate site.

Mayaguez

The interim site at Mayaguez is not suitable for designation. This site is over the insular shelf area; consequently, fine sediments from dredged material disposal are likely to be transported onto coral reefs and into areas of sport fishing and commercial fishing. It also is located within a few hundred meters of a shipwreck.

Alternate site 1 at Mayaguez is suitable for designation. This site is approximately 1.5 nautical miles (nmi) farther from Mayaguez harbor, and from the nearest shoreline, than the interim site. This location places the site in deeper water (almost twice as deep), and reduces the chance of dredged material inadvertently being transported onto coral reefs or into sport or commercial fishing areas. No adverse effects from the future use of this site are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment. No problems were encountered during the baseline monitoring activities at this site and none are expected from future use of the site.

Ponce

The Ponce interim site is not suitable for designation. Under appropriate conditions of wind and near-surface currents, dumping of the predominantly silty clay dredged material at this site would result in a high probability that fine sediments would be transported to coral reef areas located approximately 1.5 nmi northwest of the site. Although the dredged material transport and fate model does not predict this possible impact, uncertainty over the direction and velocity of currents likely to be experienced during individual disposal events makes the relocation of the site environmentally prudent.

Alternate Site 1, the site recommended to be designated for Ponce, is 1.5 nmi farther than the interim site from the harbor, and 1 nmi farther than the interim site from the nearest shoreline. However, it has the advantage of being 2.5 nmi farther than the interim site from the nearest coral reefs, substantially reducing the possibility of damage to the reefs caused by fines (particles in the dredged material <0.06 mm in diameter) transported by currents. In other respects, the site also meets all of the criteria for site selection specified in the ODR. No adverse effects are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment from the future use of this site. No problems were encountered during the baseline monitoring activities at this site and none are expected during future use of the site.

Yabucoa

The Yabucoa interim site is not suitable for designation. The site is over shallow areas that may contain coral reefs. Coral reefs are present in the general area, and a ridge of shallow bottom (depths of only 16 meters) runs through the site. This sinuous ridge, which is identified on National Oceanic and Atmospheric Administration (NOAA) topographic maps of the area (NOAA 1983), has morphology and biota similar to a coral reef, although direct observations have not been made on this feature.

Similarly, Alternate Site 1 is not suitable for designation. This site is essentially contained within the deeper portions of the interim site, but is sufficiently close to the coral-like feature that dredged material will be transported to that feature should dumping occur.

Alternate Site 2, which is the next closest alternate site evaluated, is suitable for designation. This site is approximately 2.6 nmi farther from the harbor than the interim site, 1 nmi farther from the nearest coastline than the interim site, and 2 nmi farther from the coral-like features than the interim site. Transport of dredged material after dumping would be primarily in the direction of very deep water, and consequently is expected to have little impact. The site meets all of the criteria for site selection specified in the ODR. No adverse effects are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment. No

problems were encountered during the baseline monitoring activities at this site and none are expected from future use of this site.

Land-Based Alternatives

Whereas the evaluation of land-based disposal alternatives is the responsibility of the COE as a part of the dredged material disposal permitting process, the EIS development process requires the consideration of a range of alternatives to the proposed action. Land-based disposal methods considered in the DEIS included placement of dredged material as hydraulic fill, use of dredged material to create wetlands, and use of dredged material as cover in landfills or barren areas.

RESPONSIVENESS SUMMARY

On October 17, 1986, a notice of availability of the DEIS for public review and comment was published in the Federal Register (51 FR 37068). The public comment period on the DEIS closed December 15, 1986. Nine comment letters were received on the DEIS. Of these nine letters, two made no comments, two requested additional copies of the DEIS without comment, and two agreed with the proposal to relocate three of the disposal sites to alternate sites.

The U.S. Department of Health and Human Services requested additional existing information on pathogenic organisms that might be in the dredged material. Testing for pathogenic species is not conducted without some evidence to support the presence of harmful organisms, but if determined to be necessary, the COE could require such testing as part of the permit evaluation process.

The Commonwealth of Puerto Rico Department of Natural Resources requested that creation of wetland habitat be considered as an alternative. Land-based alternatives to ocean dumping are considered by the COE at the time of permit decisions on ocean dumping. Site designation does not authorize use of the site, but only provides an environmentally acceptable location for the ocean dumping of dredged material should the COE issue a dumping permit. Thus, further evaluations of land-based alternatives are not considered appropriate in the FEIS.

The COE made several comments on the purpose and need for an EIS, the evaluation of land-based alternatives in the EIS, and the technical justification and economic aspects of moving the designated sites from the interim locations to locations farther offshore. The COE input was incorporated into this FEIS. Discussions on the technical justification for moving the disposal site locations have resulted in no change in the proposed action to designate three alternate sites.

CONCLUSIONS

As a result of the analyses conducted pursuant to the preparation of this EIS, the EPA proposes to designate four dredged material disposal sites located offshore of Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico for the disposal of dredged material removed from the Arecibo, Mayaguez, Ponce, and Yabucoa harbors, respectively. This action is necessary to provide acceptable ocean dumping sites for the current and future disposal of this material.

The analyses conducted for this FEIS indicate that for Arecibo, the interim site, approximately 1.5 nmi north of the harbor, should be designated as the ocean site for dredged material disposal. For Mayaguez, Alternate Site 1, approximately 6 nmi west of the harbor, should be designated as the disposal site. For Ponce, Alternate Site 1, about 4.5 nmi south of the harbor, should be designated as the disposal site. For Yabucoa, Alternate Site 2, approximately 6 nmi east of the harbor, should be designated as the disposal site. As a result of the confirmation and refinement of the site mapping and distance measuring process, the distances given here for the Mayaguez and Ponce sites are 1 mile less than the distances presented in the DEIS. These proposed site designations are for an indefinite period of time, and the sites will be subject to continuing monitoring and site management by EPA to ensure that unacceptable adverse environmental impacts do not occur.

It should be emphasized that the designation of a site for ocean dumping of dredged material does not imply that dumping will occur at the site. Decisions on the acceptability of ocean dumping are made on a case-by-case basis during permitting or review of Federal projects. During the decision-making process on permit issuance, land-based alternatives are also considered as disposal alternatives. Ocean dumping is chosen only when it is the environmentally preferred alternative.

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1. INTRODUCTION

1. INTRODUCTION

The purpose of this final environmental impact statement (FEIS) is to identify and designate four environmentally acceptable dredged material disposal sites located offshore of Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico for the disposal of dredged material removed from the Arecibo, Mayaguez, Ponce, and Yabucoa harbors, respectively. Figure 1-1 shows the locations of these four harbors. This action is necessary to provide an acceptable ocean dumping site for the current and future disposal of dredged material when ocean disposal is the preferred alternative.

The draft EIS (DEIS) was published by the U.S. Environmental Protection Agency (EPA) on September 3, 1986. It identifies the interim and alternate ocean disposal sites for each harbor, characterizes the affected environments and types of materials to be released at the sites, and analyzes potential consequences of the proposed action. Because the comments received did not require major changes or additions to the DEIS, this FEIS has been prepared as a summary document. Unless otherwise noted, the DEIS is incorporated by reference into this document. Together, the DEIS and this FEIS constitute the complete EIS.

This section of the FEIS provides background information, states the purpose and need for the action, and presents the analytical methodology used to complete the analyses that constitute the findings of this FEIS. Section 2 summarizes information on the analysis of alternatives for each harbor. Section 3 provides EPA's responses to comments received on the DEIS. Section 4 presents the conclusions of this FEIS. Section 5 lists those parties contacted by EPA for input to the FEIS development process.

1.1 BACKGROUND

Section 102(c) of the Marine Protection, Research, and Sanctuaries Act of 1972, (MPRSA) as amended, 33 U.S.C. 1401 et seq., gives the Administrator of EPA the authority to designate sites where ocean dumping of dredged material may be permitted. On December 24, 1986, the Administrator delegated the authority to designate ocean dredged material dumping sites to the Regional

Administrator of the EPA Region in which the site is located. This site designation is being made pursuant to that authority.

Section 103 of MPRSA gives authority to the Secretary of the Army to issue dredged material permits. Such permits are evaluated according to criteria promulgated in the EPA Ocean Dumping Regulations (ODR) (40 CFR Chapter I, Subchapter H, Part 227) and are reviewed by EPA for concurrence before issuance. In all cases, a need for ocean disposal must be established before issuance of a disposal permit. Section 103 of the Act also requires the Secretary to use recommended sites designated by EPA to the extent feasible.

The harbors of Arecibo, Mayaguez, Ponce, and Yabucoa are periodically dredged to maintain the authorized depths. In the past, materials from these dredging operations were disposed of at interim designated ocean disposal sites and at land-based sites.

The ODR (Section 228.4) state that ocean dumping sites will be designated by publication in Part 228. A list of "Approved Interim and Final Ocean Dumping Sites," including the interim sites for Arecibo, Mayaguez, and Ponce, was published on January 11, 1977 (42 FR 2461 et seq.). The interim site for Yabucoa was added to the list on May 11, 1979 (44 FR 27662). This EIS identifies and recommends the interim site at Arecibo and alternate sites at Mayaguez, Ponce, and Yabucoa for designation. The designation of the recommended sites is being published as a proposed rulemaking in accordance with Section 228.4(e) of the ODR, which permits the designation of ocean disposal sites for dredged material. EPA generally is not required to designate ocean disposal sites for dredged material, but does so when it believes ocean disposal may be a reasonable disposal alternative.

In 1980, the National Wildlife Federation (NWF) challenged the practice of using interim ocean disposal sites pending completion of long-term studies and final designation pursuant to MPRSA. In resolving the lawsuit, the EPA and the U.S. Army Corps of Engineers (COE) entered into a consent decree with the NWF to take steps to designate final ocean dredged material disposal sites (DMDSs) for certain sites with interim designation. Although these four

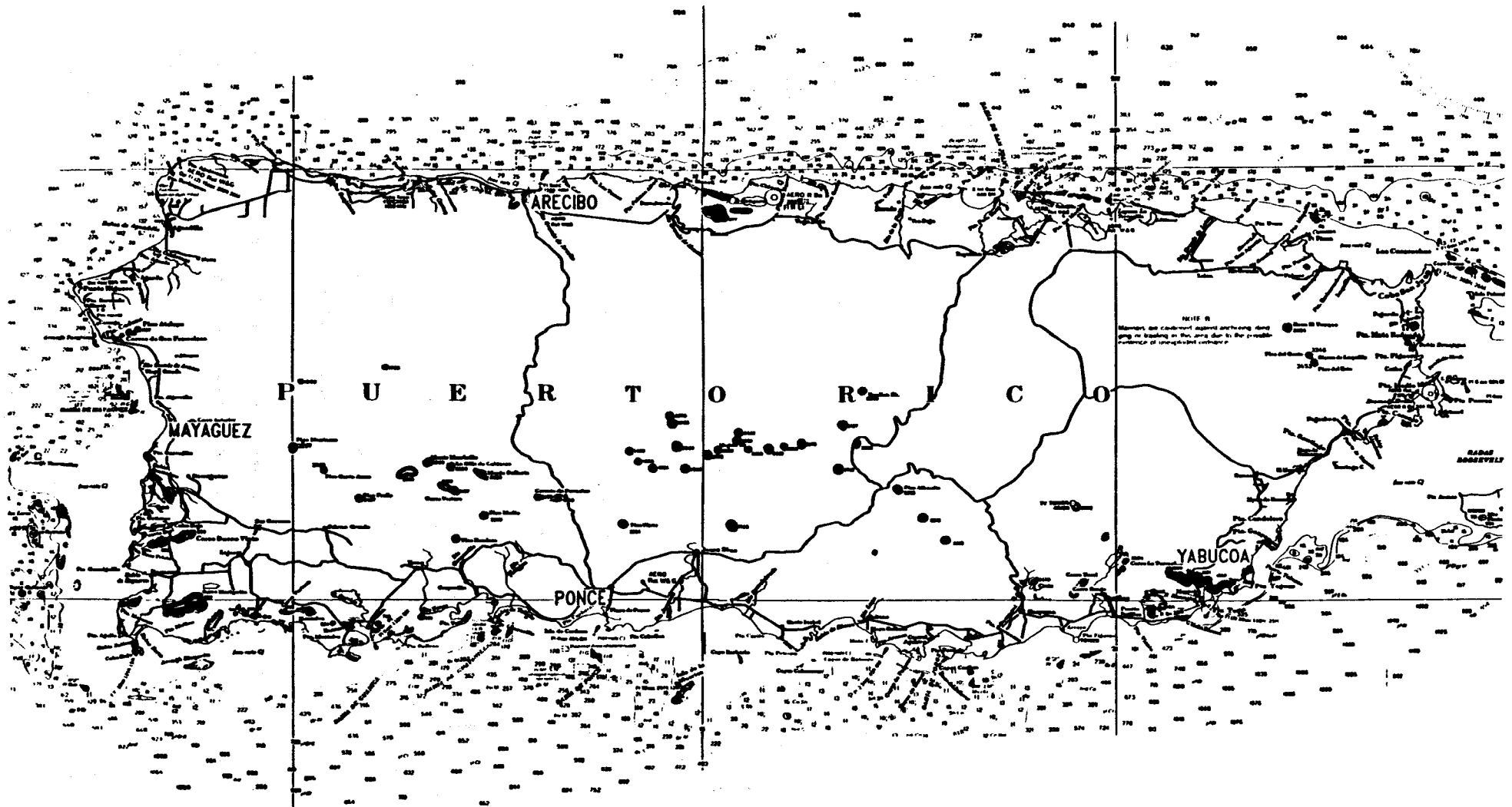


FIGURE 1-1. MAP OF PUERTO RICO

Puerto Rican interim disposal sites were not covered by the consent decree, EPA is responding to the need to have designated ocean dredged material disposal sites in Puerto Rico.

Section 102(c) of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et seq., requires that Federal agencies prepare an EIS on proposals for major Federal actions significantly affecting the quality of the human environment. The objective of NEPA is to build into the EPA decision-making process careful consideration of all environmental aspects of proposed actions. Although actions under MPRSA are specifically exempt from NEPA compliance, EPA has voluntarily made a commitment to prepare EISs in connection with ocean dumping site designations (39 FR 16186; May 7, 1974). Figures 1-2 through 1-5 show the study areas and interim ocean disposal sites for each harbor.

1.2 STATEMENT OF PURPOSE AND NEED FOR THE ACTION

The harbors of Arecibo, Mayaguez, Ponce, and Yabucoa are essential to the continued commercial and industrial growth of Puerto Rico. Ocean-going ships require channels, berths, and turning basins that are, at a minimum, about 11 meters (6 fathoms) deep. Each harbor is subject to gradual shoaling and filling as a result of sediment deposition from rivers and storm-waves. Without dredging, the harbors would eventually become inaccessible to large commercial vessels. Periodic maintenance dredging is an ongoing activity and is essential for the continued use of these harbors. Future dredging may include both maintenance dredging and harbor channel deepening.

Since 1977, the COE has used ocean dredged material disposal sites in Puerto Rico that were designated by EPA on an interim basis. Use of these sites has been an essential element of COE compliance with the requirements of MPRSA and its ability to carry out its statutory responsibility for maintaining safe navigation in the harbors of Puerto Rico.

To continue to maintain these waterways, COE considers it essential that EPA identify, evaluate, and permanently designate environmentally acceptable

ocean dredged material disposal sites. These sites will be used after reviews of each project and permit application have established that the proposed activity is in compliance with the criteria and requirements of EPA and COE regulations.

Although the evaluation of land-based disposal alternatives is the responsibility of the COE as a part of the dredged material disposal permitting process, the EIS development process allows for the consideration of a range of alternatives to the proposed action. Land-based disposal methods considered in the DEIS included placement of dredged material as hydraulic fill, use of dredged material to create wetlands, and use of dredged material as cover in landfills or barren areas. Beach nourishment is generally not feasible for the materials dredged from the harbors considered in this EIS. Because of their small grain size, the sediments of these harbors are unsuitable for beach nourishment.

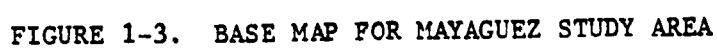
1.3 ANALYTICAL METHODOLOGY FOR ANALYSIS OF ALTERNATIVES

The decision to designate an ocean disposal site for dredged material is based on an evaluation of possible sites using the Criteria (40 CFR 228.5 - 228.6) of the ODR. All candidate sites are evaluated for compliance with the criteria. Of the sites that are acceptable under the criteria, the site nearest the point of dredging is selected unless there are significant environmental advantages in designation of more distant sites. If no site is found that satisfies the criteria, no site is designated.

Alternate ocean dredged material disposal sites that were evaluated in the DEIS were selected using a map overlay screening methodology developed by EPA and the COE (EPA/COE 1983). The interim and two alternate sites for Arecibo and the interim and three alternate sites each for Mayaguez, Ponce, and Yabucoa were identified using this methodology. A brief description of the EPA/COE recommended site-designation process follows:

- Phase 1: Establish Zones of Siting Feasibility (ZSFs)
 - A preliminary screening of environmental factors, based on the nine evaluation factors specified in MPRSA Section 102a and the criteria specified in the ODR (Part 228), to eliminate conflicts with areas having protected resources and with existing uses of the ocean.

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- Phase II: Select Alternate Sites
 - Evaluate interim dredged material disposal sites, and identify other possible ocean disposal sites believed to be in accordance with the ocean dumping criteria.
- Phase III: Evaluate Interim and Alternate Sites
 - Evaluate the suitability of each of the sites and select, based on ODR criteria, a site for designation as the Dredged Material Disposal Site (DMDS) for continuing use.

Normally, EPA selects ocean disposal sites in such a way that dumped dredged material is contained within the site after disposal. This is generally feasible in shallow water environments where valuable natural resources will not be placed at risk. In Puerto Rico, shallow water environments typically are inhabited by corals. To avoid direct disposal on coral resources, deeper water sites are selected. As a consequence of selecting deeper water sites, some dredged material will be transported outside site boundaries. However, the effects of transport will be small.

To supplement the site identification process, sediment transport and fate modeling was conducted to simulate sediment deposition characteristics for dump events at each of the interim and alternate sites. Because Puerto Rico has well-developed coral reef areas, and a substantial portion of local fish populations depends on the reef ecosystems for food and habitat, particular ecological concern was paid to identifying potential adverse impacts of the dumping of dredged spoil materials on live corals. The model results indicated that, for the four harbors studied, bottom topography and subsurface currents are critical factors in determining dispersion of the dredged material and the pattern of its deposition on the sea floor. Using the model results, sites were evaluated, and recommendations were made based on the ability to predict the transport of dumped dredged material to deeper water and its dispersion to negligible concentrations.

To further support an evaluation of existing environments offshore of the four harbors, a survey of the ocean floor was conducted using the OSV P.W. Anderson. The results of this cruise also were incorporated into the analyses of interim and alternate sites.

2. ALTERNATIVES ANALYSIS

2. ALTERNATIVES ANALYSIS

INTRODUCTION

This section of this final environmental impact statement (FEIS) addresses the alternatives considered by the U.S. Environmental Protection Agency (EPA) for the disposal of dredged material from Arecibo, Mayaguez, Ponce, and Yabucoa harbors, Puerto Rico. The proposed action addressed in this FEIS is the permanent designation of ocean dredged material disposal sites for these four harbors.

Alternatives to the proposed action were considered and evaluated under the requirements of the National Environmental Policy Act of 1969 (NEPA). All alternative disposal methods must be evaluated by the U.S. Army Corps of Engineers (COE) during the consideration of permit applications for dredged material disposal projects. The selection and permanent designation of environmentally acceptable ocean dredged material disposal sites for the four harbors is independent of individual project requirements. Consequently, the non-ocean disposal alternatives presented in this section provide a general overview of the potential availability of land-based disposal methods rather than a definitive assessment of each method. The alternatives considered in the draft EIS (DEIS) for each harbor were:

- No-Action: The no-action alternative to final designation is to refrain from designating ocean disposal sites to continue disposal activities at the interim ocean disposal sites until their interim status expires.
- Land-Based Disposal: The land-based disposal alternatives considered in the DEIS included placement of dredged material as hydraulic fill, use of dredged material to create wetlands, and use of dredged material as cover in landfills or barren areas.
- Designation of the interim ocean disposal site as the site for continuing use.
- Designation of an alternate ocean disposal site as the site for continuing use.

NO-ACTION ALTERNATIVE

The no-action alternative to the proposed action would be to refrain from designating permanent ocean sites for the disposal of dredged material from

the harbors and nearby areas of Arecibo, Mayaguez, Ponce, and Yabucoa. This would result in the termination of the use of the interim sites when their interim designations expire. The net result of the no-action alternative would be that the COE would not have EPA-approved, final designated ocean sites for disposal of the operation and maintenance material from these harbors. Therefore, the COE would be required to either: (1) justify an acceptable alternate disposal method (e.g., land-based), (2) develop information sufficient to select an acceptable ocean site for disposal, or (3) modify or cancel operation and maintenance dredging projects that depend on ocean disposal as the only feasible method for disposal of the dredged material. Adoption of the no-action alternative was not considered to be an acceptable alternative because such an approach would be counter to the intent of the consent decree entered into by EPA and COE with the National Wildlife Federation (NWF) in 1980, to take steps to designate final ocean dredged material disposal sites for sites with interim designations, even though these particular sites are not affected by that consent decree.

The following subsections summarize the disposal alternatives considered for each harbor and address land-based disposal, use of the interim ocean disposal site, and use of an alternate ocean disposal site. A summary is presented addressing the basis for the selection of the recommended alternative and the expected impacts.

2.1 ALTERNATIVES ANALYSIS FOR ARECIBO

2.1.1 Alternatives Considered

The alternatives considered for the disposal of dredged material from Arecibo harbor included the use of ocean disposal sites and land-based disposal alternatives.

2.1.1.1 Land-Based Disposal Options for Arecibo

The locations of landfills and barren areas near Arecibo were identified and evaluated in the DEIS as potential dredged material disposal sites, taking into account the location of each site relative to Arecibo and sensitive resources such as mangroves, its distance from the coast, its elevation, its

geohydrology, and other factors. There are significant disadvantages associated with all of the possible land-based disposal options. Fill locations, if any suitable sites can be located and acquired, are likely to be limited in size and very expensive. Construction of viable wetlands is considered infeasible due to ocean conditions (high wave energies) and a lack of suitable sites. The only option that might be technically, environmentally, and economically feasible would be use of one of the barren areas because one area appears to contain a series of abandoned sand pits. Environmental studies would have to be conducted to determine whether such a barren area would have the capacity to receive Arecibo dredged material.

2.1.1.2 Ocean Disposal Site Options for Arecibo

Using the EPA/COE approved ocean disposal site selection methodology discussed previously, the interim site and two alternate sites were selected for evaluation as candidate sites for designation. Figure 2-1 presents the zone of siting feasibility (ZSF) for Arecibo and the locations of the interim site and alternate sites 1 and 2. These sites were evaluated and compared in the DEIS, using the criteria of the Ocean Dumping Regulations (ODR) to determine their environmental suitability as ocean disposal sites.

2.1.2 Description of the Recommended Alternative

The proposed action for Arecibo is to designate the interim site as the ocean disposal site for continuing use. This site is located approximately 1.5 nautical miles (nmi) north of the Arecibo harbor, and occupies an area of approximately 1 square nmi. Water depths within the site range from 101 to 417 meters (55 to 228 fathoms). The corner coordinates of the site are as follows:

18°30'00" N, 66°42'45" W
18°30'00" N, 66°43'47" W
18°31'00" N, 66°43'47" W
18°31'00" N, 66°42'45" W.

2.1.3 Basis for the Selection of the Recommended Alternative

At Arecibo, the interim site is suitable for designation as the site suitable for continuing use. The site meets all criteria of the ODR. Dredged

material is not expected to be transported by ocean currents any significant distance outside of the proposed site because of the depth of the water at the site and because the dredged material to be disposed of is primarily sand. Very little transport of materials away from the proposed DMDS is expected. Materials released at this site will tend to be deposited on the sea floor, rather than dispersed, because currents are weak and the sea floor is not sufficiently deep for prolonged transport of sinking materials to occur.

The two alternate sites shown in Figure 2-1 also were considered for designation. All of the sites met all the criteria of the ODR. However, the interim site was 1 nmi closer to Arecibo harbor than Alternate Site 1 and 2 nmi closer than Alternate Site 2. Because the interim site had been used previously, its use should result in less of a change in the ecology of the site than that which would result from use of either of the alternate sites.

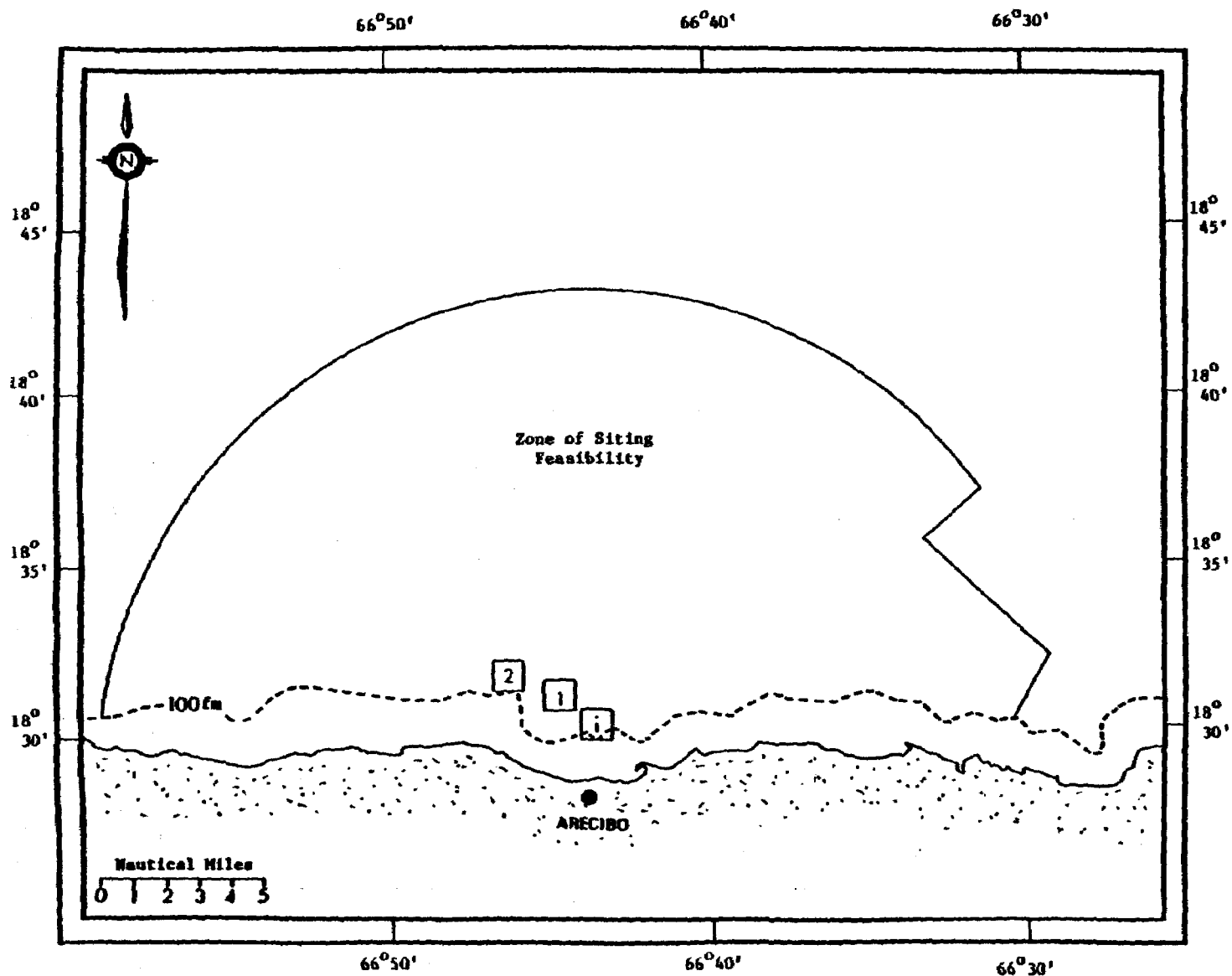
2.1.4 Impacts of the Recommended Alternative

No adverse effects are expected on biotic and mineral resources, or on socioeconomic or cultural aspects of the environment, from the continuing use of this site. There have been no operational problems encountered during surveillance or monitoring activities at this site, and none would be expected in the future.

Approximately 150,000 cubic yards (cu yds) of fine-grained, predominantly sandy dredged material expected to be disposed of at the Arecibo site once every 3 to 5 years. The material will be generated in the maintenance of navigational channels and berthing areas in Arecibo harbor. The dumping would occur from hopper dredges or barges, depending on the availability of equipment when dredging occurs.

The site is at least 1 to 2 nmi from the nearest significant breeding, spawning, or nursery area of nearshore organisms. There is no evidence to suggest that the proposed site has any unique importance to feeding or passage areas of marine fauna because it is typical of nearby well-flushed open ocean locations. However, the 1984 survey cruise detected an increase in the percentage of silty sand at the proposed Arecibo site compared with nearby

FIGURE 2-1. ZONE OF SITING FEASIBILITY AND INTERIM AND ALTERNATE SITES FOR ARECIBO



sediments. A total of 584,477 cu yds of dredged material has been disposed of previously at the Arecibo interim site. Because the proposed site historically has been used for dumping, it is presumed that the differences in sediment types are due to previous dumping. Except for previous dredged material disposal at this site, there are no other current or previous dischargers at or near the site. Historical use at the existing Arecibo site has not resulted in substantial adverse effects to living resources of the ocean or to other uses of the marine environment.

Dredged material disposed of at the proposed Arecibo site will be deposited on the sea floor and will bury benthic organisms. The types of benthic organisms that were collected at the site reflect the increased sand content of the site (due to previous disposal operations) over that of the surrounding area. Among polychaete worms and crustaceans, the percentage of species and individuals of ecological types suited to sandy environments was found to be higher at the proposed site than at nearby locations. Therefore, the fauna at the proposed site are well-adapted for recolonizing the type of materials expected to be deposited during future disposal operations. Since only part of the site will be affected during any particular disposal operation, organisms from surrounding, unaffected portions of the site are expected to be able to rapidly recolonize the affected area. Impacts of dredged materials will be limited primarily to the sea floor, and disposal is not likely to interfere with other uses of the ocean.

Endangered sea turtles and the brown pelican inhabit coastal Puerto Rico. Available information indicates that these species are most active in the nearshore coastal environment and are only transients in oceanic environments. Consequently, oceanic dredged material disposal is not expected to adversely affect these species.

Previous disposal at the proposed Arecibo site has not caused any development of nuisance species at the site. In the unlikely event that pathogens were contained in the dredged material, it is considered unlikely that they could survive and reproduce in the cold, deep-water environment of the sea floor at the site.

The waters near the site are characterized by weak (3 to 5 cm/s) subsurface currents moving in a westerly direction. Dispersal and horizontal mixing of the water column are weak because of the low current speeds. The dispersal, horizontal transport, and vertical mixing characteristics of the site are such that dumped dredged material is nearly all confined at the site. Because of the decreasing water depth in the westerly direction, dumped materials are expected to be deposited within the dump site or a short distance west of the dump site within a short time after disposal.

Water quality at the Arecibo site is good, typical of the well-flushed open ocean conditions in Puerto Rican coastal areas. The water is optically clear with little suspended material, and there is no evidence of organic enrichment or eutrophication. Oxygen concentrations are high and nutrient concentrations are low.

The Arecibo site is about 6 nmi from the nearest recreational beach. Since virtually all dredged material will settle to the bottom near the release point, it is not anticipated that any released material would adversely affect the nearby shoreline. No dredged material is expected to be transported to beaches by ocean currents should the site be used for disposal.

Similarly, little impact is expected on other uses of the ocean. Ships from Arecibo do not traverse specified shipping lanes. Fishing areas are located to the east and south (inshore) of the proposed site. The weak prevailing currents would tend to transport any dredged material away from these areas. No mineral extraction or fish and shellfish culture exist or are planned near the dumpsite. Desalination does not occur near the site. No dredged materials are expected to be transported toward shore-based recreational areas. There are no known cultural or historical features in the vicinity of the site that could be affected by dredged material disposal. Dumping activities at the proposed Arecibo site will not effect any areas of special scientific importance or impact any recreational activities.

U.S. Coast Guard surveillance by shipriders, separate vessels, or helicopter overflights would not be difficult at the proposed Arecibo site because of its proximity to shore. Water depths are not sufficient to impede either water quality sampling or benthic sampling during monitoring activities.

2.2 ALTERNATIVES ANALYSIS FOR MAYAGUEZ

2.2.1 Alternatives Considered

The alternatives considered for the disposal of dredged material from Mayaguez included the use of ocean disposal sites and land-based disposal alternatives.

2.2.1.1 Land-Based Disposal Options for Mayaguez

The locations of landfills and barren areas near Mayaguez were identified and evaluated in the DEIS as potential dredged material disposal sites. The use of land-based disposal alternatives near Mayaguez may be technically feasible. No potential sites for hydraulic filling were identified. However, one potential marsh construction site, two possible landfills, and one possible barren area (quarry) site were identified. Prior to the use of any of these sites as dredged material disposal sites, site-specific field studies would be required. In addition, site-specific evaluations of dredged material disposal and monitoring costs would be necessary to determine the economic feasibility of each potential location as a dredged material disposal site.

2.2.1.2 Ocean Disposal Site Options for Mayaguez

Using the EPA/COE approved ocean disposal site selection methodology discussed previously, the interim site and three alternate sites were selected for evaluation as candidate sites for designation. Figure 2-2 presents the zone of siting feasibility for Mayaguez and the locations of the interim site and Alternate Sites 1, 2, and 3. In the DEIS, these sites were evaluated and compared using the ODR criteria to determine their environmental suitability as ocean disposal sites.

2.2.2 Description of the Recommended Alternative

The proposed action for Mayaguez is to designate Alternate Site 1 as the ocean disposal site for continuing use. This site is located approximately 6 nmi west of the Mayaguez harbor, and occupies an area of approximately

1 square nmi. Water depths within the site range from 351 to 384 meters (192 to 210 fathoms). The corner coordinates of the site are as follows:

18°15'30" N, 67°16'13" W
18°15'30" N, 67°15'11" W
18°14'30" N, 67°15'11" W
18°14'30" N, 67°16'13" W.

2.2.3 Basis for the Selection of the Recommended Alternative

The site proposed for designation at Mayaguez is Alternate Site 1. This site is between 1 and 2 nmi farther from the Mayaguez harbor, and from the nearest shoreline, than the interim site. This location places the site in deeper water (almost twice as deep as the interim site), and reduces the chance of dredged material inadvertently being transported onto coral reefs or into sport or commercial fishing areas. No operational problems were encountered during the baseline monitoring activities at this site and none are expected from future use of the site.

The interim site was eliminated from consideration because it is in relatively shallow water close to shore, where released dredged materials are likely to be transported into a coral reef area, and into sport and commercial fishing areas. Also, it is located within a few hundred meters of a shipwreck. Use of the interim site could potentially expose coral reef areas that begin 1 to 2 km southeast of the site to sedimentation rates sufficient to damage living corals and consequently decrease reef productivity.

The other two alternate sites shown in Figure 2-2 also were considered for designation. Alternate Sites 2 and 3 met all the criteria of the ODR. However, Alternate Site 2 was eliminated because it is farther from Mayaguez harbor than the proposed site, and Alternate Site 3 was eliminated because dredged material dumped at that site would be deposited in shallower water, and prevailing currents could transport the dumped material closer to the shelf break than at the proposed site.

2.2.4 Impacts of the Recommended Alternative

No adverse effects from the future use of this site are expected on biotic resources such as corals, fisheries, or on nursery grounds. Alternate

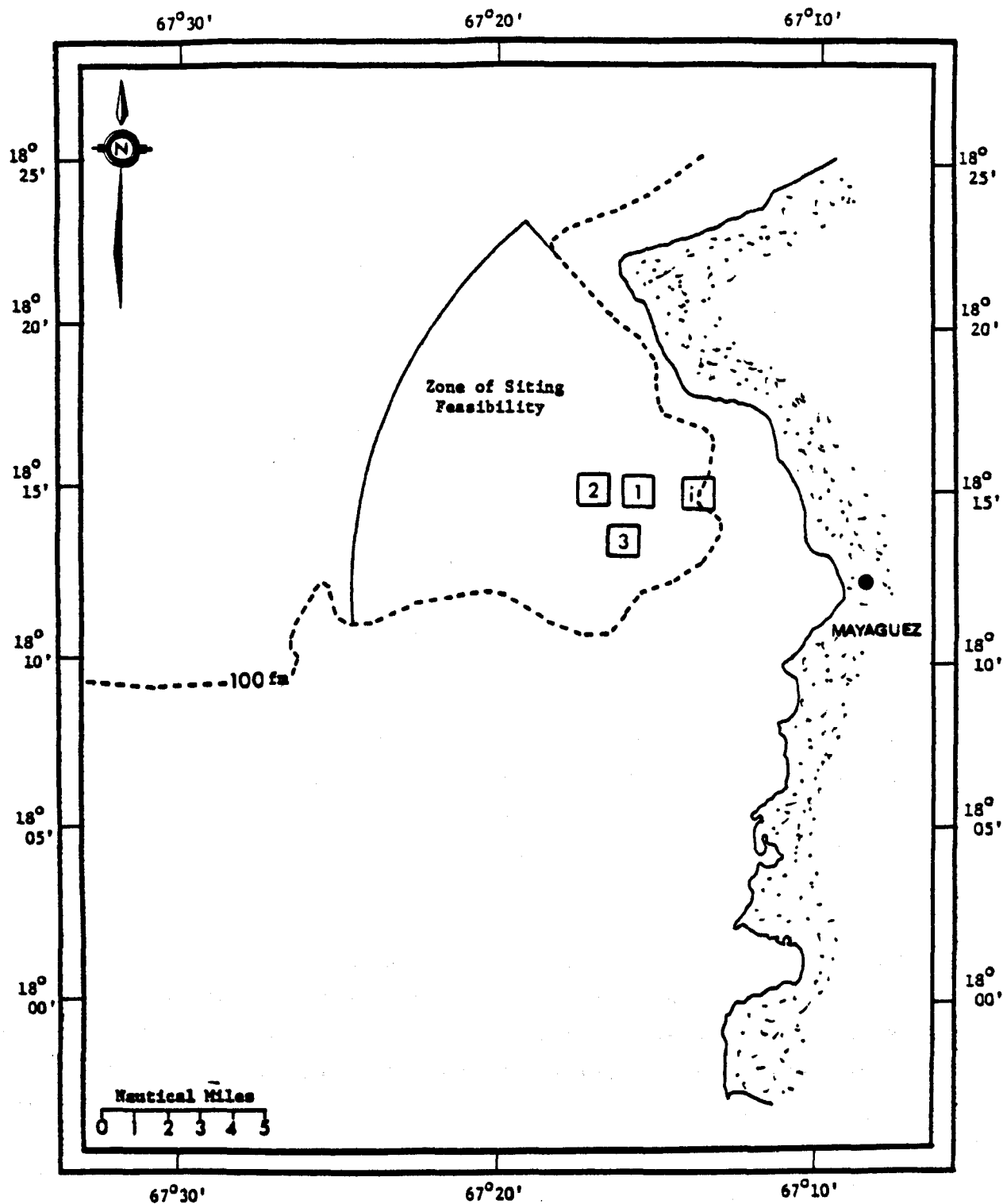


FIGURE 2-2. ZONE OF SITING FEASIBILITY AND INTERIM AND ALTERNATE SITES FOR MAYAGUEZ

site 1 has no unique ecological or environmental characteristics, being similar in sediment type and benthic biological community to most other sites in the Mayaguez study area. No effects are expected on any mineral resources or socioeconomic and cultural aspects of the environment from use of the proposed site. There should be no problems conducting surveillance activities.

Approximately 53,500 cu yds of mixed sand, silt, and clay dredged material are expected to be disposed of at the Mayaguez site once every 2 years. The material is generated in the maintenance of navigational channels and berthing areas in Mayaguez harbor. The dumping would occur primarily from hopper dredges.

The proposed Mayaguez site is at least 3 nmi from the nearest significant breeding, spawning, or nursery area of nearshore living resources. The site is located approximately 3.5 nmi west of the nearest coastline. There is no evidence to suggest that the proposed site has any unique importance to feeding or passage areas of marine or avian biota since it is typical of nearby well-flushed open ocean locations.

Benthic organisms at the proposed site are primarily deposit feeders, an ecological type well-adapted to living in the high turbidity that might be caused by dredged material disposal. It is not likely that use of the proposed site will have a detrimental effect on benthic communities outside of the immediate mound caused by disposal.

Endangered sea turtles and the brown pelican inhabit coastal Puerto Rico. Available information indicates that these species are most active in the nearshore coastal environment and are only transients in oceanic environments. Consequently, oceanic dredged material disposal is not expected to adversely affect these species.

There has been no known dumping of dredged material at the proposed Mayaguez site. Previous dredged material disposal has occurred at the nearby interim site. There are no other current or previous discharges at or near the proposed site. The 1984 survey cruise detected no difference in species

composition of bottom fauna between the proposed site and nearby areas. Dredged material disposal at the proposed Mayaguez site primarily will be deposited on the sea floor at and near the site. This deposition will bury benthic organisms. Because of the relatively fine nature of the dredged material, burial is not expected to have long-term impacts because the dumped material can be recolonized easily by nearby communities. Impacts of dredged material will be limited primarily to the sea floor.

Because the proposed Mayaguez site is in deep ocean waters well-flushed by currents, nuisance species of plants, animals, or pathogens are unlikely to survive or reproduce at the disposal site. The dredged material to be disposed of would be similar in type to that existing at the site and would result in a similar fauna at the site.

The waters near the proposed Mayaguez site are characterized by moderate (15 cm/s) generally southwesterly subsurface currents. Dispersal and horizontal mixing of the water column are weak because of the slow current speeds. Silt and clay would be carried the farthest. The dumped dredged materials are expected to be deposited within the dump site or within 1.5 nmi southwest of the dumpsite within a short time of disposal.

Water quality at the proposed Mayaguez site is good, typical of the well-flushed open water conditions in Puerto Rican coastal areas. The water is optically clear with little suspended material, and there is no evidence of organic enrichment or eutrophication. Oxygen concentrations are high and nutrient concentrations are low.

The proposed Mayaguez site is about 4 nmi from the nearest recreational beach. Modeling of the fate of dumped material at the proposed Mayaguez site indicated that dredged material would not be transported to the shoreline and, consequently, there would be no impacts at the shoreline. No dredged material is expected to be transported to this area by ocean currents should the site be used for disposal.

There are no fish or shellfish culture operations or desalination plants near the proposed Mayaguez site. It is not expected that disposal of dredged

materials at the proposed site would damage coral reefs or their associated fish or shellfish assemblages, on which local fisheries are based. There will be no interference with shipping lanes because there are no designated shipping lanes in Puerto Rican waters. Dumping activities at the proposed Mayaguez site are not expected to effect any areas of special scientific importance, or impact any recreational activities.

There is a shipwreck within 1 nmi of the proposed Mayaguez site, but predominant currents are expected to carry dumped dredged material away from this location. Other known shipwrecks in the area are very unlikely to be affected by dredged material disposal.

U.S. Coast Guard surveillance by shipriders, separate vessels, or helicopter overflights would not be difficult at the proposed Mayaguez site because of its proximity to shore. Water depths are not sufficient to impede either water quality sampling or benthic sampling during monitoring activities.

2.3 ALTERNATIVES ANALYSIS FOR PONCE

2.3.1 Alternatives Considered

The alternatives considered for the disposal of dredged material from Ponce included the use of ocean disposal sites and land-based disposal alternatives.

2.3.1.1 Land-Based Disposal Options for Ponce

The locations of landfills and barren areas near Ponce were identified and evaluated in the DEIS as potential dredged material disposal sites. The use of land-based disposal alternatives near Ponce may be technically feasible. One potential diked containment area site for hydraulic fill and one potential wetland formation area were identified. No existing landfills were found suitable, though four small sand-mining pits could be suitable if they were permanently inactive. Prior to the use of any of these sites as dredged material disposal sites, an extensive, site-specific field study would be required.

2.3.1.2 Ocean Disposal Site Options for Ponce

Using the EPA/COE approved ocean disposal site selection methodology discussed previously, the interim site and three alternate sites were selected for evaluation as candidate sites for designation. Figure 2-3 presents the zone of siting feasibility for Ponce and the locations of the interim site and Alternate Sites 1, 2, and 3. In the DEIS, these sites were evaluated and compared in the DEIS using the ODR criteria to determine their environmental suitability as ocean disposal sites.

Figure 2-3 indicates both an original and an extended zone of siting feasibility for Ponce. The original zone of siting feasibility was conservatively placed over 8 nmi offshore when preliminary feasibility studies raised concern over possible sediment transport into sensitive fishing areas east of the interim site. The subsequent availability of additional data to characterize physical transport conditions permitted an improved estimation of expected transport conditions in the area. The results of this analysis indicated that some locations inshore from the original zone of siting feasibility would not necessarily result in sediment transport into these fishing areas and an extended zone of siting feasibility was added to include areas farther inshore than originally mapped.

2.3.2 Description of the Recommended Alternative

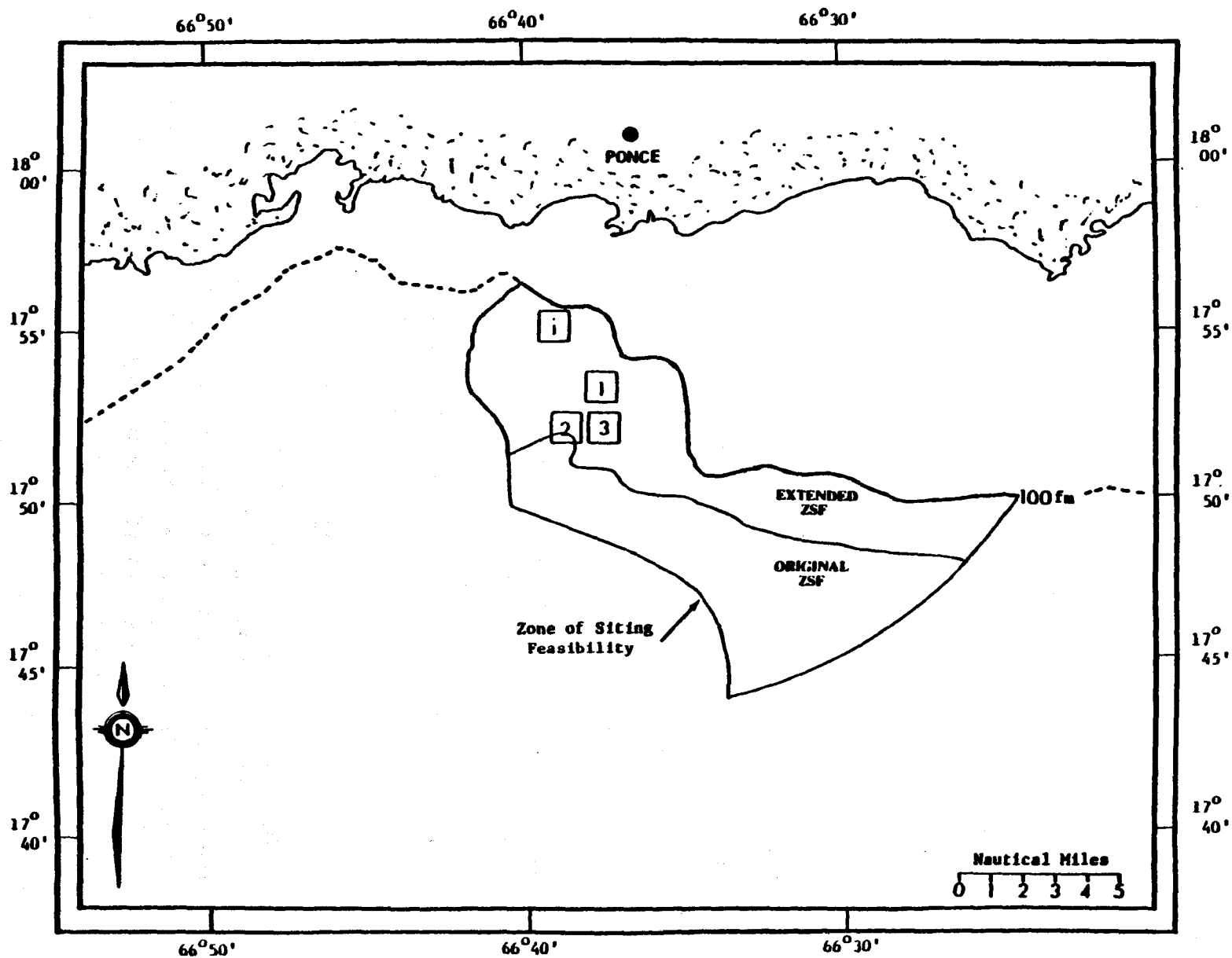
The proposed action for Ponce is to designate Alternate Site 1 as the ocean disposal site for continuing use. This site is located approximately 4.5 nmi south of the Ponce harbor, and occupies an area of approximately 1 square nmi. Water depths within the site range from 329 to 457 meters (180 to 250 fathoms). The corner coordinates of the site are as follows:

17°54'00" N, 66°37'43" W
17°54'00" N, 66°36'41" W
17°53'00" N, 66°36'41" W
17°53'00" N, 66°37'43" W.

2.3.3 Basis for the Selection of the Recommended Alternative

The site proposed for designation at Ponce is Alternate Site 1, which is located 4.5 nmi south of the harbor. This site is 1.5 nmi farther than the

FIGURE 2-3. ZONE OF SITING FEASIBILITY AND INTERIM AND ALTERNATE SITES FOR PONCE



interim site from the harbor, and 1 nmi farther than the interim site from the nearest shoreline. However, it has the advantage of being 2.5 nmi farther than the interim site from the nearest coral reefs, substantially reducing the possibility of damage to the reef caused by fine sediments transported by currents. The site also meets all of the criteria for site selection specified in the ODR. The sediment transport and fate model predicts that all sediment deposition would occur in deep water for alternate site 1 after accounting for bottom topography and currents, a result not predicted for the interim site and the other alternate sites studied for Ponce.

The interim site at Ponce is not suitable for designation. Dumping of the predominantly silty-clay dredged material at the interim site would have the greatest potential among the sites considered for the transport of fine sediments to coral reef areas (located approximately 1.5 nmi northwest of the site) under the influence of random variations in the conditions of wind and near-surface currents. Although the dredged material transport and fate model does not predict this possible impact, uncertainty over the direction and velocity of currents likely to be experienced during an individual disposal event makes the relocation of the site environmentally prudent.

The other two alternate sites shown in Figure 2-3 also were considered for designation. Alternate Sites 2 and 3 met all the criteria of the ODR. However, these sites were not recommended for designation over Alternate Site 1 because they required an additional 1.5 nmi travel to the sites without gaining any significant environmental advantages.

2.3.4 Impacts of the Recommended Alternative

No adverse effects are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment from the future use of this site. The site has no unique ecological or environmental characteristics, being similar in sediment type and benthic biological community to most other sites in the Ponce study area. Benthic sampling at deep water sites presents difficulties; however, these difficulties have been overcome at previous sampling activities at the site.

Between 250,000 and 290,000 cubic yards of silty dredged material would be disposed of at the Ponce site once every 2 years. The material is generated in the maintenance dredging of navigational channels and berthing areas in Ponce harbor. The dumping would occur primarily from clamshell unloading of scows, but hopper dredges might be used if available.

The proposed Ponce site is at least 4 nmi from the nearest coastline and significant breeding, spawning, or nursery area of nearshore living resources. There is no evidence to suggest that the proposed site has any unique importance to feeding or passage areas of biota because it is typical of nearby well-flushed open ocean locations.

There has been no known dumping of dredged material at the proposed Ponce site. Previous dredged material disposal has occurred at a nearby interim disposal site. There are no other current or previous discharges at or near the site. The 1984 survey cruise detected no difference in bottom fauna or sediments between the proposed site and nearby areas. Dredged material disposal at the proposed Ponce site will be widely distributed over the sea floor. Because it is widely distributed, only thin layers of dredged material will be deposited at a given sea floor location. The effects of deposition of this material on the benthic biota and the physical environment are expected to be negligible. Impacts of dredged material will be primarily limited to the sea floor.

Benthic organisms at the proposed site are primarily deposit feeders, an ecological type well-adapted to living in the high turbidity that might be caused by dredged material disposal. The wide dispersal of the material makes it unlikely that use of the proposed site will have a detrimental effect on benthic communities.

Endangered sea turtles and the brown pelican inhabit coastal Puerto Rico. Available information indicates that these species are most active in the nearshore coastal environment and are only transients in oceanic environments. Consequently, oceanic dredged material disposal is not expected to adversely affect these species.

Because the proposed Ponce site is in deep ocean waters well-flushed by currents, nuisance species of plants, animals, or pathogens are unlikely to survive or reproduce at the disposal site or any area nearby on the perimeter of the disposal site where dredged material may settle. The dredged material to be disposed of would be similar in type to that existing at the site and at nearby areas, and would result in a similar fauna at the site and at nearby areas.

The waters near the proposed Ponce site are characterized by weak (5 to 10 cm/sec) deep water (i.e., 100 to 300 meters) west-northwesterly currents. Because of the fine nature of the dredged material, it is expected to be transported over considerable distances (potentially up to 10 nmi) before settling to the bottom. Transport in the direction of the coastline would be limited because significant transport only occurs at depths in excess of 300 meters. Dredged material would settle on the bottom as shallower depths are encountered if transport toward the shore occurs. The proposed site has the least potential for dispersion affecting nearshore areas that may contain coral reefs. Over the distances traveled, dispersion would be extensive even though the general nature of the water column is not dispersive.

Water quality at the Ponce proposed site is good, typical of the well-flushed open water conditions in Puerto Rican coastal areas. The water is optically clear with little suspended material, and there is no evidence of organic enrichment or eutrophication. Oxygen concentrations are high and nutrient concentrations are low.

The proposed Ponce site is several nautical miles from the nearest recreational beach. Modeling of the fate of dumped material at the proposed Ponce site indicated that dredged material would not be transported to the shoreline and, consequently, there would be no impacts at the shoreline. No dredged material is expected to be transported to this area by ocean currents should the site be used for disposal.

There are no fish or shellfish culture operations or desalination plants near the proposed Ponce site. Even though dumped dredged material will be dispersed over a wide area, it is not expected that disposal of dredged

materials at the proposed site would damage coral reefs or their associated fish or shellfish assemblages, on which local fisheries are based. There will be no interference with shipping lanes because there are no designated shipping lanes in Puerto Rican waters. There are no features of cultural or historical significance near the site that may be affected by dredged material disposal. Dumping activities at the proposed Ponce site are not expected to effect any areas of special scientific importance, or impact any recreational activities.

U.S. Coast Guard surveillance by shipriders, separate vessels, or helicopter overflights would not be difficult at the proposed Ponce site because of its proximity to shore. Water depths are not sufficient to impede either water quality sampling or benthic sampling during monitoring activities. Benthic sampling at deep water sites presents difficulties; however, these difficulties have been overcome at previous sampling activities at the site.

2.4 ALTERNATIVES ANALYSIS FOR YABUCOA

2.4.1 Alternatives Considered

The alternatives considered for the disposal of dredged material from Yabucoa included the use of ocean disposal sites and land-based disposal alternatives.

2.4.1.1 Land-Based Disposal Options for Yabucoa

The locations of landfills near Yabucoa were identified and evaluated in the DEIS as potential dredged material disposal sites. No sand or gravel pits, or quarries, were identified in this area. The use of land-based dredged material disposal alternatives at Yabucoa may be technically feasible. Sites suitable for hydraulic fill may be available, although no specific sites for diked containment areas were identified. There is sufficient land of suitable topography for diked containment areas near the coast in the Yabucoa Valley. However, this use of these low-lying coastal locations would compete with the use of undeveloped areas as farmland. No sites suitable for wetland formation, landfill cover material application, or barren area cover material application were identified near Yabucoa.

2.4.1.2 Ocean Disposal Site Options for Yabucoa

Using the EPA/COE approved ocean disposal site selection methodology discussed previously, the interim site and three alternate sites were selected for evaluation as candidate sites for designation. Figure 2-4 presents the zone of siting feasibility for Yabucoa and the relative locations of the interim site and Alternate Sites 1, 2, and 3. For Yabucoa, rather than using the 100-fathoms line as the shoreward side of zone of siting feasibility, the boundary was extended farther offshore to a point where a true shelf break was identified and much deeper waters could be obtained. In the DEIS, these sites were evaluated and compared using the Criteria of the ODR to determine their environmental suitability as ocean disposal sites.

2.4.2 Description of the Recommended Alternative

The proposed action for Yabucoa is to designate Alternate Site 2 as the ocean disposal site for continuing use. This site is located approximately 6 nmi east of the Yabucoa harbor, Puerto Rico, and occupies an area of approximately 1 square nmi. Water depths within the site range from 549 to 914 meters (300 to 500 fathoms). The corner coordinates of the site are as follows:

18°03'42" N, 65°42'49" W
18°03'42" N, 65°41'47" W
18°02'42" N, 65°41'47" W
18°02'42" N, 65°42'49" W.

2.4.3 Basis for the Selection of the Recommended Alternative

The interim site at Yabucoa is not suitable for designation. The site is over shallow areas that may contain coral reefs. Coral reefs are present in the general area, and a ridge of shallow bottom runs through the site with depths of only 16 meters (9 fathoms). This sinuous ridge, which is identified on National Oceanic and Atmospheric Administration (NOAA) topographic charts of the area (NOAA 1980), has morphology apparently similar to a coral reef, though no direct observations have been made on this feature. Because it includes these areas of quite shallow water, the site does not meet the ODR criterion of being off the shelf.

Alternate Site 1 is not suitable for designation for the same reasons as the interim site. A portion of this site is contained within the deeper portions of the interim site, and is sufficiently close to the coral-like feature that dredged material may be transported to that feature should dumping occur. Transport and fate modeling results have predicted that disposal at either the interim site or Alternate Site 1 would likely result in transport of suspended sediments into the very narrow nearshore shelf areas to the southwest, and thus adversely impact an important nearshore commercial fishing area.

Alternate Site 2, which is 6 nmi east of the harbor, was selected as the proposed site. The site is approximately 2.6 nmi farther from the harbor than the interim site, 1 nmi farther from the nearest coastline than the interim site, and 2 nmi farther from the coral-like features present at the interim site. Transport of dredged material after dumping will be primarily in the direction of very deep water, and consequently is expected to have little impact. The site meets all of the criteria for site selection specified in the ODR. No problems were encountered during the baseline monitoring activities at this site and none are expected from future use of this site.

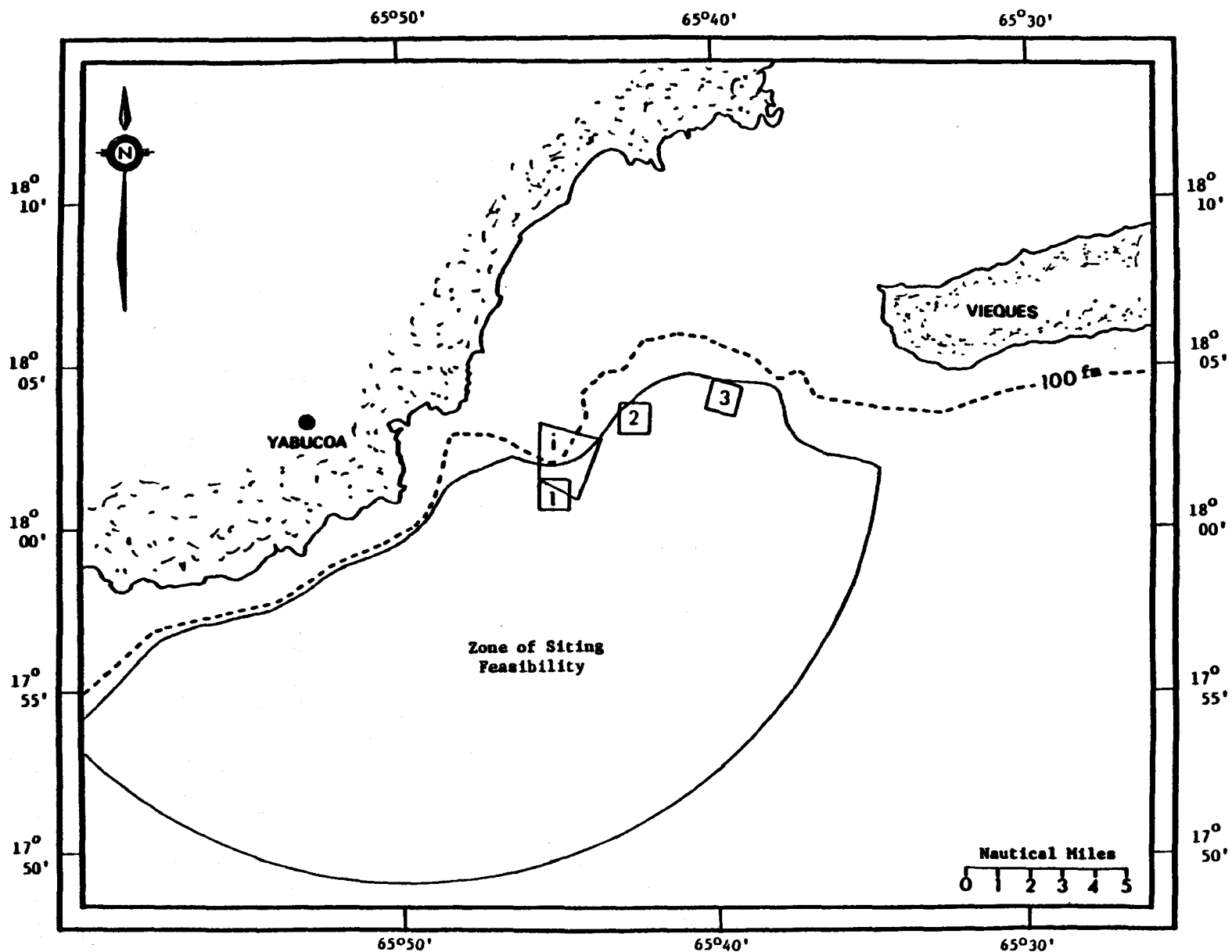
Alternate Site 3 also was considered for designation. This site met all the criteria of the ODR. However, because Alternate Site 3 required an additional 3 miles farther travel to the site, without providing any significant environmental advantage, it was not recommended for designation over Alternate Site 2.

2.4.4 Impacts of the Recommended Alternative

No adverse effects are expected on biota, including corals, and fisheries and nursery grounds, from use of the proposed DMDS. No effects are expected on any mineral resources or socioeconomic and cultural aspects of the environment from future use of the proposed site.

Approximately 150,000 cu yds of predominantly silty dredged material mixed with some sand are expected to be disposed of at the Yabucoa site once every 3 to 5 years. The material will be generated in the maintenance of

FIGURE 2-4. ZONE OF SITING FEASIBILITY AND INTERIM AND ALTERNATE SITES FOR YABUCOA



navigational channels and berthing areas in Yabucoa harbor. The dumping would occur primarily from clamshell unloading of scows, but hopper dredges might be used if available.

The proposed site is located approximately 4.5 nmi east of the nearest coastline. Modeling of the fate of dumped material at the proposed Yabucoa site indicated that dredged material would not be transported to the shoreline and, consequently, there would be no impacts at the shoreline. The bottom of the site slopes sharply from 549 to 914 meters.

The proposed Yabucoa site is at least 4 nmi from the nearest significant breeding, spawning, or nursery area of nearshore living resources. There is no evidence to suggest that the proposed site has any unique importance to feeding or passage areas of biota, because it is typical of nearby well-flushed open ocean locations.

There has been no known dumping of dredged material at the proposed Yabucoa site. Previous dredged material disposal has occurred at a nearby interim disposal site. There are no other current or previous discharges at or near the site. The 1984 survey cruise detected no difference in bottom fauna or sediments between the proposed site and nearby areas. Dredged material disposed of at the proposed Yabucoa site will be widely distributed over the sea floor. Because it is widely distributed, only thin layers of dredged material will be deposited at a given sea floor location. The effects of deposition of this material on the benthic biota and the physical environment are expected to be negligible. Impacts of dredged material will be primarily limited to the sea floor.

Benthic organisms at the proposed site are primarily deposit feeders, an ecological type well-adapted to living in the high turbidity that might be caused by dredged material disposal. The wide dispersal of the material makes it unlikely that use of the proposed site will have a detrimental effect on benthic communities.

Because the proposed Yabucoa site is in deep ocean waters well-flushed by currents, nuisance species of plants, animals, or pathogens are unlikely to

survive or reproduce at the disposal site or any area where dredged material may settle. The dredged material to be disposed of would be similar in type to that existing at the site and at nearby areas, and would result in a similar fauna at the site and at nearby areas.

Endangered sea turtles and the brown pelican inhabit coastal Puerto Rico. Available information indicates that these species are most active in the nearshore coastal environment and are only transients in oceanic environments. Consequently, oceanic dredged material disposal is not expected to adversely affect these species.

The waters near the proposed Yabucoa site are characterized by moderate (15 cm/s) deep water (100 to 500 meters) west-southwesterly currents. Because of the fine nature of the dredged material, it is expected to be transported over considerable distances (potentially up to 10 nmi) before settling to the bottom. Transport in the direction of the coastline would be limited because significant transport only occurs at depths in excess of 300 meters. Dredged material would settle on the bottom as shallower water is encountered if transport toward the shore occurs. Over the distances traveled, dispersion would be extensive even though the general nature of the water column is not dispersive. Because of the wide dispersion of the material, and the limiting effect of depth on shoreward sediment transport, impacts to the benthic habitat are expected to be insignificant.

Water quality at the proposed Yabucoa site is good, typical of the well-flushed open water conditions in Puerto Rican coastal areas. The water is optically clear with little suspended material, and there is no evidence of organic enrichment or eutrophication. Oxygen concentrations are high and nutrient concentrations are low.

The proposed Yabucoa site is between 4 and 5 nmi from the nearest recreational beach. No dredged material from dumping at the proposed site is expected to be transported to this area by ocean currents.

There are no fish or shellfish culture operations or desalination plants near the proposed site. Even though dumped dredged material will be dispersed

over a wide area, it is not expected that disposal of dredged materials at the proposed site would damage nearshore shallow water coral reefs or their associated fish or shellfish assemblages, on which local fisheries are based. There will be no interference with shipping lanes because there are no designated shipping lanes in Puerto Rican waters. Dumping activities at the proposed Yabucoa site are not expected to effect any areas of special scientific importance, or impact any recreational activities.

One shipwreck has been identified near the interim site for Yabucoa. Use of the proposed site will have no effect on this feature because Alternate Site 1 is 1 nmi from the shipwreck and prevailing currents are directly away from the feature.

U.S. Coast Guard surveillance by shipriders, separate vessels, or helicopter overflights would not be difficult at the proposed Yabucoa site because of its proximity to shore. Water depths are not sufficient to impede either water quality sampling or benthic sampling during monitoring activities. Benthic sampling at deepwater sites presents difficulties; however, these difficulties have been overcome during previous sampling activities at the site.

3. RESPONSIVENESS SUMMARY

3. RESPONSIVENESS SUMMARY

3.1 INTRODUCTION

The purpose of this section is to address comments received in response to the draft environmental impact statement (DEIS). The DEIS was made available for public review on September 3, 1986, and the comment period was open for a period of 60 days. The comment period for the Environmental Quality Board of the Commonwealth of Puerto Rico was extended through January 31, 1987.

Discussions were conducted with several commentors, including the government of the Commonwealth of Puerto Rico and the U.S. Army Corps of Engineers (COE).

3.2 COMMENTS AND RESPONSES

Letters that included written comments on the DEIS for which responses are provided in this section were received from various federal, state, and local organizations. Complete copies of these letters are presented in Appendix A. Letters also are included in Appendix A from other commentors that do not address technical issues. Since these letters did not address technical issues, responses have not been prepared for this FEIS.

Substantive comments for which responses have been prepared are presented in the following listing, and the relevant paragraph(s) in each of these letters are marked and numbered in Appendix A to identify the source of each comment. The individual and/or organization making particular comments is identified in this section before the comment listed.

3.2.1 Ruth D. Carreras, Assistant Secretary for Permits Area
Department of Natural Resources
Puerto Rico
(November 24, 1986)

Comment 1: Regulation No. 13 of the Planning Board classifies the site at Santa Isabel as Zone I (floodable), in which the disposal of fill material is not permitted unless a hydrologic-hydraulic study supports it.

Response 1: Since fill material is not planned to be disposed of at the land site, the concern expressed by this comment is not applicable to the actions addressed in the DEIS.

Comment 2: The creation of wetland habitats for wildlife should be evaluated as a desirable alternative. This kind of dredged material is adequate in the formation of wetlands.

Response 2: Whereas the DEIS development process allows for the consideration of a broad range of alternatives to the proposed action, the detailed analyses of specific land-based disposal options is a responsibility of the COE under its authority to issue permits for the ocean dumping of dredged material. Consequently, the U.S. Environmental Protection Agency (EPA) considers such a comprehensive analysis of the creation of wetland habitats from dredged material to be outside the scope of the DEIS.

3.2.2 Santos Rohena, Jr., Chairman
Environmental Quality Board
Commonwealth of Puerto Rico
Office of the Governor
(November 24, 1986)

Comment 3: The EIS should be translated into the Spanish language (according to the Environmental Public Policy Act).

Response 3: Section 1.4 of the regulations cited in Mr. Rohena's letter indicates that these regulations apply to departments, agencies, government corporations, municipalities, and instrumentalities of the Commonwealth. Thus, these regulations do not apply to Federal agencies. Federal agencies are subject to the environmental review requirements of the National Environmental Policy Act of 1969 (NEPA). NEPA does not require translation of environmental review documents into Spanish. However, EPA has done so in certain cases where EPA believed that participation and review by individual citizens was necessary (e.g., EIS on Culebra Wastewater Facilities). In other cases (e.g., San Juan Harbor Dredged Material Disposal Site EIS), the level of interest expressed by the general public did not justify the expenditure of time and public funds necessary to publish a translated version; consequently, the EPA did not prepare a Spanish-language version. The level of public interest concerning the DEIS has not been substantial enough to justify the publication of a Spanish version.

3.2.3 James H. Lee, Regional Environmental Officer
United States Department of the Interior
Office of Environmental Project Review
(December 2, 1986)

Comment 4: Some of the present interim sites for ocean dumping could have detrimental effects on near-shore wildlife habitats. The proposed alternate sites for Mayaguez, Ponce, and Yabucoa are farther away from shore, in much deeper water, and are more likely to avoid harmful impacts to coastal wildlife habitats. We agree with the document's proposal to keep the Arecibo site at its present (interim site) location.

Response 4: The EPA agrees with Mr. Lee. The site selection process used for this DEIS involved the development of a zone of siting feasibility for each harbor. An EPA/COE approved map overlay methodology (EPA/COE 1983) was used to identify areas in which candidate disposal sites could be located. By design, these sites were to be located in areas free from conflicts with sensitive resources or incompatible uses of the ocean. Once the candidate sites for each harbor were identified, various analyses were conducted, including computer modeling of the sediment deposition characteristics for each site. As a result of these analyses, alternate sites for Mayaguez, Ponce, and Yabacoa were recommended over continued use of the interim sites for those harbors.

3.2.4 Vernon N. Houk, M.D., Assistant Surgeon General
Director
Center for Environmental Health
(December 11, 1986)

Comment 5: Section 2.4.2(8), page 2-31, of the DEIS states that beaches (at Arecibo) will not be reached by any sediments released at the disposal sites and, therefore, there will be no effects on recreational swimming, diving, or fishing at the shore. How was this determined? Was the Dredged Material Transport and Fate Model used?

Response 5: The transport and fate model described in the DEIS was used to assess sediment deposition characteristics at all candidate sites, including Arecibo. Due to the depth of the water and the density of the material dumped, the neutral buoyancy point was not achieved at the proposed Arecibo site. Consequently, unlike the other three harbors, dredged material dumped at Arecibo is expected to remain within the boundaries of the dump site, and adverse impacts on recreational swimming, diving, and fishing at the shore are not expected to occur.

Comment 6: Additional information should be provided on the statement in Section 2.4.2(10), page 2-32, of the DEIS that any human disease organisms that may be present in the dumped materials are unlikely to survive and reproduce in the cold, high-pressure environment of the sea floor at the site because of well-flushed currents. Information should be provided regarding the identification of the suspected organisms. If the organisms have not been identified, analyses of the dredged materials should include identification of the organisms.

Response 6: The DEIS did not identify any human disease organism as being found in the dredged material. As a matter of practice, tests for human disease organisms are not conducted on dredged materials to be transported to ocean disposal sites when pathogens are not expected in the dredged material. Without evidence that suggests the presence of harmful organisms

(e.g., proximity to sewage outfalls), the expense of such testing is not justified. In any case, such testing, if determined to be necessary, normally would be conducted as a part of the permit evaluation process under Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA), as amended.

3.2.5 George R. Kleb, Colonel
U.S. Army Corps of Engineers
Commander and Director
(December 17, 1986)

Comment 7: The EPA's purpose and mandate is to locate and designate environmentally acceptable and economically feasible ocean disposal sites for each coastal project area where a continuing need for ocean disposal has been defined by the COE. Each such site is considered on a case-by-case basis by the Corps, along with land-based options in the Corps' project NEPA documents. The stated purpose of paragraph 1 of the report abstract is not correct. The purpose, as presently stated, is a COE responsibility, through a separate NEPA action.

Response 7: The EPA agrees with Colonel Kleb. The DEIS states incorrectly in the abstract that "the purpose of the action is to provide environmentally acceptable alternatives for the disposal of dredged material..." The purpose of the action addressed in the EIS, as correctly expressed in the executive summary, is to identify and designate environmentally acceptable ocean disposal sites for dredged material from the four harbors. The responsibility to address alternatives to ocean disposal is a COE responsibility as a part of the COE permitting process, specified in Section 103 of MPRSA.

Comment 8: As a followup to Comment 7, alternatives addressed in the EIS must be confined exclusively to alternative ocean disposal site locations and the no-action alternative. An evaluation of land-based alternatives is a COE responsibility and has been discussed separately in a Corps NEPA document. All such discussions of land-based alternatives should be deleted from consideration as specific alternatives addressed by this document and should be discussed instead under the appropriate sections that address purpose and need.

Response 8: The EPA agrees with the COE that the evaluation of land-based alternatives is a COE responsibility as a part of the dredged material permitting process. However, it is the responsibility of EPA to inform the public of its rationale for identifying and designating environmentally acceptable ocean disposal sites. The presentation of an analysis of land-based disposal options as given in Appendix C is not inconsistent with NEPA. Whereas the DEIS development process allows for a consideration of a broad range of alternatives to the proposed action of designating ocean disposal sites, the detailed analyses addressed by

the DEIS are focused on assessments of environmental impacts associated with dredged material disposal at various candidate ocean disposal sites. Consequently, EPA believes that the existing discussions of alternatives are appropriate.

Comment 9: The EIS recommends that three of the four interim sites be abandoned for environmentally preferred alternatives. From figures in the report, each of these alternative sites appears to be about 2 miles farther into the ocean than its associated interim site. The level of economic impact on dredging costs resulting from these changes should be discussed in the EIS. The Jacksonville District office of the Corps should assist in evaluating these impacts.

Response 9: The EIS does recommend relocation of the dredged material disposal sites from the interim site to an alternate site for Mayaguez, Ponce, and Yabucoa. Continued use of the interim site is recommended for Arecibo. The additional distances (beyond the interim sites) required to reach the recommended alternate site are 1.5, 1.5, and 2.75 nautical miles, respectively, for Mayaguez, Ponce, and Yabucoa. Such distances cannot be considered as cost prohibitive. Information was supplied by the COE for costs associated with the typical Island Class hopper barge historically used for these dredging applications. The cost per additional 1-mile round trip would be \$.32 per cu yd, or approximately \$316 per 1,000 cu yds full (effective) barge load (Hanson 1988). EPA considers the incremental cost associated with transport of dredged material to an environmentally preferred alternate site to be acceptable and consistent with the intent of the site designation process.

Comment 10: The evaluation of environmental consequences in the EIS does not indicate any documented evidence of negative impacts from past use of the interim sites. If available, this information would provide a stronger basis for making a determination to select alternate sites in lieu of the interim sites at three locations. This would be particularly helpful in light of some of the questionable predictions of adverse impacts discussed in the document.

Response 10: Candidate ocean disposal sites were selected based on an EPA/COE approved map overlay methodology (EPA/COE 1983) that focused on the identification of environmentally preferable site locations rather than the evaluation of one existing site. EPA generally selects an interim site as one of three or more alternate sites to be evaluated for designation unless previous use of the interim site has caused unacceptable impacts. When the interim site is considered as one of the possible alternatives, it is usually the prime candidate for designation unless environmental advantages would be attained through designation of an alternate site.

The site selection methodology used for the DEIS was designed to emphasize the mitigation of future environmental impacts rather than looking primarily at past activities. If information from past activities had been available, it would have been used to assist in the evaluation process. Unfortunately, such evaluations of impacts due to past activities usually require, except where impacts have been determined to be severe or catastrophic in nature, extensive analysis and verification beyond what is normally justified for the designation process. Since such data are often difficult to obtain, decisions must be based primarily on a comparative analysis of the potential for future impacts.

The interim sites for all four locations (Arecibo, Mayaguez, Ponce, and Yabucoa) were evaluated as part of the DEIS for possible selection. Alternate sites were designated for Mayaguez, Ponce, and Yabucoa because EPA believes that the designation of alternate sites at these locations will achieve environmental advantages over the interim sites at only small additional operational cost.

Comment 11: Figure 2-11, page 2-43, of the DEIS shows the interim site and all alternates to Ponce to be outside the zone of siting feasibility (ZSF). Although the reasons for this are explained on page 2-3, paragraph 2.3.1.3, Figure 2-11 can nonetheless be confusing. Figure 2-11 should be footnoted with a reference to paragraph 2.3.1.3 to ensure the reader's understanding as to why the sites are located outside the depicted ZSF.

Response 11: A map showing the extended ZSF for Ponce is presented on page 3-66 of the DEIS, and the explanation of the reason it was extended is given on page 2-23 of the DEIS. The extended ZSF shown on page 3-66 of the DEIS is discussed and illustrated on pages 2-14 and 2-15, respectively, of this FEIS.

Comment 12: Based on the DEIS, the Corps is not convinced that several of the actions proposed are adequately justified from a technical point of view, nor do they necessarily reflect the most cost-effective, environmentally acceptable solutions.

Response 12: The EPA believes that the existing analyses in the DEIS adequately support the recommendations made from a technical point of view. Recommendations for all sites were based on the most environmentally acceptable option available to decision-makers. The recommendations were based, at least in part, on the results of model predictions. In each case where a site was relocated, however, the decision to relocate was not based solely on model predictions. The model is based on average currents that predominate over long periods of time. With significant short-term variations in current directions and velocities, the probability that dredged material would be carried to shallow coral reefs was considered to be high for some of the sites studied. When this was possible for an interim site, the interim site was not selected in order to minimize adverse impacts.

3.2.6 Santos Rohena, Jr., Chairman
Environmental Quality Board
Commonwealth of Puerto Rico
Office of the Governor
(January 29, 1987)

Comment 13: The EIS must be prepared in Spanish and in such a way as to be objective, analytical, concise, and in terms that can be easily understood by the community, but with enough information to orient specialists on particular problems in their fields of specialized knowledge.

Response 13: The DEIS is not available in a Spanish language version. See response to Comment 3.

Comment 14: Section 5.5.2.2 (Processing Requirements) of Article 4(c) of the Environmental Public Policy Act states that when the Preliminary EIS is circulated for comments, the lead agency shall notify the public about its availability for inspection, as well as of its right to comment on the same. This notification shall be made by means of an environmental notice in a newspaper of general circulation for one day. This notice shall be published within ten (10) calendar days from the date that Preliminary EIS was submitted to the Board. The lead agency shall pay the cost of such notice and shall submit copy of the payment voucher to the Board. The Board will not issue comments on the Preliminary EIS until it has received evidence that the cost of said notice has been paid.

Response 14: Section 1.4 of the regulations cited in Mr. Rohena's letter indicates that these regulations apply to departments, agencies, government corporations, municipalities and instrumentalities of the Commonwealth. Thus, these regulations do not apply to federal agencies. Federal agencies are subject to the environmental review requirements of NEPA. All requirements for public notices under NEPA have been met by EPA.

3.2.7 Jose S. Rodriguez Mercado, Director
Land Use Planning Bureau
Puerto Rico Planning Board
(April 3, 1987)

Comment 15: Draft Environmental Impact Statements should be submitted to the Puerto Rico Environmental Quality Board for their evaluation and determination of compliance with procedures established by Act No. 9 of June 1970, as amended.

Response 15: Mr. Rodriguez was contacted by telephone on several occasions and an understanding was reached that a coastal zone management program determination by the Puerto Rico coastal zone management authority is not required for site designation. However, when a dredging permit is issued it will have to be certified by the

appropriate Puerto Rico authority as consistent with the Puerto Rico Coastal Zone Management Program.

3.3 OTHER COMMUNICATIONS CONCERNING THE DEIS

3.3.1 Telephone Questions

One commentor telephoned the EPA Regional Office to question the date of a reference in the DEIS concerning shipwrecks and statements in the DEIS on the number of shipwrecks adjacent to candidate ocean disposal sites. The following pages in the DEIS should be modified to reflect EPA's response to this comment:

- Page 3-55, Paragraph 3.2.8 is changed to read as follows:

"There are two shipwrecks located near the Mayaguez interim site (Figure 3-25, University of Puerto Rico 1976). One shipwreck is 1 nmi east of the interim site. The other wreck is immediately adjacent to the northwest corner of the interim site and is also 1 nmi east of Alternate Site 1. No other wrecks have been identified at or near any of the other alternate sites. No other features of historical or cultural importance have been identified in the Mayaguez ZSF."

- Page 3-108, Paragraph 3.4.8 is changed to read as follows:

"There is one shipwreck 2 nmi south of the southern corner of the Yabucoa interim site and 1.5 nmi southeast of Alternate Site 1 (Figure 3-53). All other shipwrecks reported in this area are two or more nautical miles from the ZSF (University of Puerto Rico 1976). No other features of historical or cultural importance have been identified in the Yabucoa ZSF."

- Page 7-19, Reference for University of Puerto Rico

University of Puerto Rico. 1976. A Marine Atlas of Puerto Rico, Department of Marine Sciences Contributions, Mayaguez, PR: University of Puerto Rico.

3.3.2 Endangered Species Act

In accordance with the requirements of Section 7 of the Endangered Species Act, and 50 CFR Part 402, the EPA initiated informal consultation with the Protected Species Management Branch of the Marine Fisheries Service to ensure compliance with all relevant endangered species laws. Their response is presented on page A-18 of Appendix A and concurs with the EPA conclusion that no populations of endangered or threatened species would be adversely affected by the proposed action.

4 CONCLUSIONS OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT

4. CONCLUSIONS OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT

The purpose of the final environmental impact statement (FEIS) is to identify and designate environmentally acceptable ocean disposal sites for dredged material from the harbors of Arecibo, Mayaguez, Ponce and Guayanilla, and Yabucoa, Guayama and Roosevelt Roads harbors, Puerto Rico. This section summarizes the conclusions of the FEIS for each of these harbors.

The decision to designate an ocean disposal site for dredged material is based on an evaluation of possible sites using the Criteria (40 CFR 228.5 - 228.6) of the Ocean Dumping Regulations (ODR). In this evaluation, any interim site (listed in 40 CFR 228.12) is evaluated first. If the interim site does not satisfy the criteria, a comparative evaluation of the alternate site is carried out to determine which site is the most acceptable with respect to the criteria. This becomes the preferred site for final designation. If no site is found that satisfies the criteria, no site is designated.

The following subsections summarize the important information used in determining which site to designate for each harbor.

4.1 ARECIBO

At Arecibo, the interim site is suitable for designation. The site meets all criteria of the ODR. Dredged material is not expected to be transported far from the site by ocean currents because the site is in relatively shallow water and the dredged material to be disposed of is primarily fine-grained sand. No long-term adverse effects are expected on biota, mineral resources, or socioeconomic or cultural aspects of the environment from the continuing use of this site. There have been no problems encountered during surveillance or monitoring activities at this site.

Previous use of this site has resulted in more sand in the sediments on the site than is found in surrounding areas. This has caused an increase in the number of animals that are adapted to live in coarser sediments at the site. The designation of the interim site will therefore result in less change in the species composition of the local environment than would result from the use of any alternate site.

4.2 MAYAGUEZ

The interim site at Mayaguez is not suitable for designation. Fine sediment from dredged material disposal are likely to be transported onto coral reefs and into areas of sport fishing and commercial fishing. It is also located within a few hundred meters of a shipwreck.

Alternate Site 1 at Mayaguez is suitable for designation. This site is approximately 1.5 nautical miles (nmi) farther from the Mayaguez harbor, and from the nearest shoreline, than the interim site. This location places the site in water almost twice as deep as the interim site, and reduces the chance of dredged material inadvertently being transported onto coral reefs or into sport or commercial fishing areas. No long-term adverse effects from the future use of this site are expected on biota, mineral resources, or socioeconomic or cultural aspects of the environment. No problems were encountered during the baseline monitoring activities at this site and none are expected from future use of the site.

4.3 PONCE

The interim site at Ponce is not suitable for designation. Under appropriate conditions of wind and near-surface currents, there is a high probability that dumping of the predominantly silty-clay dredged materials at the site would result in the transport of fine sediments to the coral reef areas located approximately 1.5 nmi northwest of the site. Although the dredged material transport and fate model does not predict this possible impact, uncertainty over the direction and velocity of currents likely to be experienced during individual disposal events makes the relocation of the site environmentally prudent. The potential for navigational error or of short dumps during inclement weather also indicates that relocation of the site will be environmentally beneficial.

Alternate Site 1, the site to be designated for Ponce, is 1.5 nmi farther than the interim site from the harbor, and 1 nmi farther than the interim site from the nearest shoreline. However, it has the advantage of being 2.5 nmi farther than the interim site from the nearest coral reefs, substantially reducing the possibility of damage to the reefs caused by fine sediments

transported by currents. In other respects, the site also meets all of the criteria for site selection specified in the ODR. No adverse effects are expected on living resources, mineral resources, or socioeconomic or cultural aspects of the environment from the future use of this site. No problems were encountered during the baseline monitoring activities at this site and none are expected from future use of the site.

4.4 YABUCOA

The interim site at Yabucoa is not suitable for designation. Coral reefs are present in the general area, and a ridge of shallow bottom (depths of only 16 meters) runs through the site. This sinuous ridge, which is identified on National Oceanic and Atmospheric Administration (NOAA) topographic maps of the area (NOAA 1983), has morphology and biota similar to a coral reef, though no direct observations have been made on this feature.

Similarly, Alternate Site 1 is not suitable for designation. A portion of this site is contained within the deeper portions of the interim site, but is sufficiently close to the coral-like feature that dredged material could be transported to that feature should dumping occur.

Alternate Site 2, which is the next closest alternate site evaluated, is suitable for designation. This site is approximately 2.6 nmi farther from the harbor than the interim site, 1 nmi farther from the nearest coastline than the interim site, and 2 nmi farther from the coral-like features than the interim site. Transport of dredged material after dumping primarily will be in the direction of very deep water and consequently is expected to have little impact. The site meets all of the criteria for site selection specified in the ODR. No adverse effects are expected on biota, mineral resources, or socioeconomic or cultural aspects of the environment. No problems were encountered during the baseline monitoring activities at this site and none are expected from use of this site.

5. CONTRIBUTORS TO THE ENVIRONMENTAL IMPACT STATEMENT

5.0 CONTRIBUTORS TO THE ENVIRONMENTAL IMPACT STATEMENT

This section summarizes the backgrounds and qualifications of the primary contributors to this Final Environmental Impact Statement (FEIS). Project direction was provided by the Environmental Impacts Branch of the U.S. Environmental Protection Agency (EPA), Region II.

This FEIS was prepared with the assistance of the technical and scientific staff of Science Applications International Corporation (SAIC) of McLean, Virginia through EPA's contract with Battelle New England (Contract No. 68-03-3319).

LIST OF CONTRIBUTORS

U.S. Environmental Protection Agency, Region II

Barbara Pastalove	Chief, Environmental Impacts Branch (EIB)
William Lawler, P.E.	Chief, Environmental Analysis Section, EIB
Robert Witte	Work Assignment Manager, EIB
Frank Csulak	Environmental Scientist, Marine and Wetlands Protection Branch

Science Applications International Corporation (SAIC)

Jeffrey Weiler

Mr. Weiler was the Work Assignment Leader and Technical Coordinator for the EIS. He holds an M.S. in Resource Economics/Environmental Management from the University of Maryland. As Work Assignment Manager and Technical Coordinator, Mr. Weiler directed the technical staff in the organization and writing of the FEIS. Mr. Weiler has been involved with the preparation of the EIS and the site designation rulemaking since 1983.

Robert Kelly

Dr. Kelly provided technical input to the project in the areas of assessments of aquatic pollution and ocean dumping site designation and permitting. He holds a Ph.D. in Zoology/Biology from Hobart College. Dr. Kelly is the author of EPA's Ocean Dumping Permit Writers' Guide and Ocean Dumping Site Designation Delegation Handbook for Dredged Material.

6. COORDINATION

6. COORDINATION

Public participation is an integral part of the EPA decision-making process for permitting ocean disposal activities, EIS preparation, and the ocean disposal site designation process. During the data-gathering efforts performed in preparation of this FEIS, numerous government agencies, non-government organizations, and individuals were provided with copies of the DEIS. These parties are listed below.

Federal

Resident Commissioner of Puerto Rico, House of Representatives, Washington, DC, 20515

U.S. Army Corps of Engineers, Mr. David Mathis, Water Resources Support Center, Kingman Building, Fort Belvoir, Virginia, 22060

U.S. Army Corps of Engineers, District Engineer, Jacksonville District, 400 West Bay Street, P.O. Box 4970, Jacksonville, Florida, 32232

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U.S. Army Corps of Engineers, San Juan Area Office, Deputy District Engineer, P.O. Box 4970, 400 Fernandez Juncos Avenue, San Juan, Puerto Rico, 00901

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U.S. Coast Guard, Environmental Impacts Branch, GWEP/62, 400 7th Street, NW, Washington, DC, 20590

U.S. Department of Agriculture, Institute of Tropical Forestry, University of Puerto Rico, Agricultural Experiment Station, Box AQ, San Juan, Puerto Rico, 00928

U.S. Department of Commerce, Administrator, Maritime Administration, Washington, DC, 20230

U.S. Department of Commerce, Assistant Secretary for Policy, Washington, DC, 20230

U.S. Department of Health and Human Services, Regional Environmental Officer, 26 Federal Plaza, New York, New York, 10278

U.S. Department of the Interior, Bureau of Land Management, Washington, DC, 20240

U.S. Department of the Interior, Office of Environmental Project Review, 18th and C Streets, NW - Room 4239, Washington, DC, 20240

U.S. Department of the Interior, U.S. Geological Survey, Reston, Virginia, 22092

U.S. Federal Emergency Management Agency, Mr. Michael Chivinski, Chief, Disaster Assistance Programs Division, 26 Federal Plaza, New York, New York, 10278

U.S. Fish and Wildlife Service, Mr. Paul E. Gertler, Field Supervisor, Caribbean Field Office, P.O. Box 491, Boqueron, Puerto Rico, 00622

U.S. Fish and Wildlife Service, Region IV Director, Mr. Richard B. Russell, Federal Building, 25 Spring Street, SW, Atlanta, Georgia, 30303

U.S. Geological Survey, District Chief, Puerto Rico District Office, GPO Box 4424, San Juan, Puerto Rico, 00936

U.S. National Marine Fisheries Service, Chief, Protected Species Management Branch, Southeast Regional Office, 9450 Koger Boulevard, St. Petersburg, Florida, 33702

U.S. National Marine Fisheries Service, Environmental Assessment Branch, 3500 Delwood Beach Road, Panama City, Florida, 32407

U.S. National Park Service, Heritage Conservation and Recreation Service, 440 G Street, NW, Washington, DC, 20243

U.S. Naval Station, Commanding Officer, Roosevelt Roads, Fleet Post Office, Miami, Florida, 34051

U.S. Public Health Service, Chief, Center for Environmental Health, Centers for Disease Control, Atlanta, Georgia, 30333

U.S. Soil Conservation Service, Director, Caribbean Area Office, Federal Office Building, Hato Rey, San Juan, Puerto Rico, 00917

Commonwealth

Autoridad de los Puertos, GPO Apartado 2829, San Juan, Puerto Rico, 00936

Caribbean Fishery Management Council, Executive Director, Suite 1108-Banco De Ponce Building, Hato Rey, Puerto Rico, 00918

Department of Physical Planning, Engineer Adelberto Colon, Puerto Rico Planning Board, Minillas Government Center, P.O. Box 4119, Santurce, Puerto Rico, 00940

Estacion Environmental, Sociedad de Historica Natural, Apartado AQ, Rio Piedras, Puerto Rico, 00928

Federal Assistance Programs, Director, Puerto Rico Planning Board, P.O.
Box 4119, San Juan, Puerto Rico, 00940

Institute de Cultura Puertorriquena, Mr. Luis M. Morales, GPO Box 4184, San
Juan, Puerto Rico, 00905

Puerto Rico Administrator de Parques y Recro, Administrator, GPO Apartado
3207, San Juan, Puerto Rico, 00904

Puerto Rico de Fomento Economico, Administrator, GPO Apartado 2350, San Juan,
Puerto Rico, 00936

Puerto Rico Department of Health, Secretary, P.O. Box 9342, Santurce, Puerto
Rico, 00908

Puerto Rico Department of Natural Resources, Centro Comercial Oficina A,
2 Alturas de Mayaguez Carr., Mayaguez, Puerto Rico, 00708

Puerto Rico Department of Natural Resources, Centro Gubernamental Oficina 204,
Avenida Rotarios, Arecibo, Puerto Rico, 00612

Puerto Rico Department of Natural Resources, Hospital Sub-Regional, Ponce,
Puerto Rico, 00731

Puerto Rico Department of Natural Resources, Secretary, P.O. Box 5887, Puerto
de Tierra, Puerto Rico, 00906

Puerto Rico Department of Social Services, 1633 Ponce de Leon Avenue,
Stop 24 1/2 - Edificio Saldana, Santurce, Puerto Rico, 00910

Puerto Rico Department of Transportation and Public Works, Torre Sur Building,
De Deigo Avenue, Stop 22, Santurce, Puerto Rico, 00904

Puerto Rico Environmental Quality Board, Chairman, P.O. Box 11488, Santurce,
Puerto Rico, 00910

Puerto Rico Environmental Quality Board, Water Quality Area, Director,
P.O. Box 11488, Santurce, Puerto Rico, 00910

Puerto Rico Natural History Society, P.O. Box 1393, Hato Rey, San Juan, Puerto
Rico, 00919

Puerto Rico State Historic Preservation Officer, Office of the Governor, P.O.
Box 82-La Fortaleza, San Juan, Puerto Rico, 00901

Puerto Rico Water Resources Authority, Executive Director, P.O. Box 4267,
San Juan, Puerto Rico, 00905

University of Puerto Rico, Director, Planning Office, Recinto Ciencias Medicas,
Centro Medio, Rio Piedras, Puerto Rico, 00928

Water Resources Institute, Director, University of Puerto Rico, Mayaguez,
Puerto Rico, 00708

Other

American Littoral Society, Building ZZ, Fort Hancock, New Jersey, 07732

Colorado State University, Ms. Beverly Rauch, The Library, Fort Collins, Colorado, 80523

Council on Environmental Quality, 722 Jackson Place NW, Washington, DC, 20206

Environmental Defense Fund, 1525 18th Street NW, Washington, DC, 20036

Great Lakes Dredge and Dock Company, Mr. Andy Johnson, 2122 York Road, Oakbrook, Illinois, 60521

National Academy of Sciences, 2101 Constitution Avenue, NW, Washington, DC, 20037

National Audubon Society, 1511 K Street, NW, Washington, DC, 20005

National Ocean Services, Ocean Assessment Division, Acting Chief, NOAA-N/MOS 33, Rockwall Building - Room 652, Rockville, Maryland, 20850

National Science Foundation, Committee on Environmental Affairs, Room 641, 1800 G Street, NW, Washington, DC, 20550

National Wildlife Federation, Assistant Director for Pollution and Toxic Substances, 1421 16th Street, NW, Washington, DC, 20036

Resources for the Future, 1755 Massachusetts Avenue, NW, Washington, DC, 20036

Science Applications International Corporation, Mr. Jeffrey Weiler, 8400 Westpark Drive, McLean, Virginia, 22102

Sierra Club, 330 Pennsylvania Avenue, SE, Washington, DC, 20003

Sun Refining and Marketing Company, Mr. Tom Zale, 1801 Market Street - 15th Floor, Philadelphia, Pennsylvania, 19103

Water Pollution Control Federation, 2626 Pennsylvania Avenue, NW, Washington, DC, 20037

Water Resources Research Center, Mr. Henry Smith, Caribbean Research Institute, College of the Virgin Islands, St. Thomas, Virgin Islands, 00801

Yabucoa Sun Oil Company, Mr. Bruce Hawthorne, P.O. Box 186, Yabucoa, Puerto Rico, 00767

APPENDICES

APPENDIX A
COMMENT LETTERS



DEPARTMENT OF HEALTH & HUMAN SERVICES

October 31, 1986

Ms. Barbara Pastalove
Chief, Environmental Impacts Branch
Room 702
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

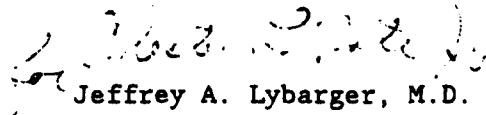
Dear Ms. Pastalove:

We have reviewed the Draft Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Aricebo, Mayaguez, Ponce, and Yabucoa, Puerto Rico. We are responding on behalf of the U.S. Public Health Service.

We have reviewed this Draft EIS on behalf of the U.S. Public Health Service and believe that this document adequately addresses these issues. Therefore, we have no comments to offer at this time.

Thank you for the opportunity to review this EIS. Please send us a copy of the Final EIS when it becomes available.

Sincerely yours,



Jeffrey A. Lybarger, M.D.
Acting Chief
Environmental Affairs Group
Center for Environmental Health



November 14, 1986

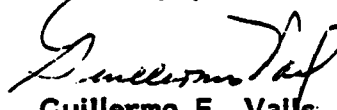
Ms. Barbara Pastalove
Chief
Environmental Impacts Branch
Room 702
U. S. Environmental Protection Agency
26 Federal Plaza
New York, N. Y. 10278

Dear Ms. Pastalove:

Reference is made to the draft of the Environmental Impact Statement for the designation of ocean dredge material disposal sites for Arecibo, Mayaguez, Ponce, and Yabucoa harbors in Puerto Rico, submitted with circular letter dated September 3, 1986.

We want to inform that no objections are interposed to the selection of the proposed sites in the indicated ports.

Cordially yours,


Guillermo F. Valls
Executive Director



DEPARTMENT OF NATURAL RESOURCES

November 24, 1986

Ms. Barbara Pastalove
Chief, Environmental Impact Branch
Room 702
U.S. Environmental Protection Agency
26 Federal Plaza
New York, N.Y. 10278

Subject: Draft Environmental
Impact Statement for the
Designation of Ocean Dredged
Material Disposal Sites for
Arecibo, Mayaguez, Ponce and
Yabucoa, Puerto Rico

DIA 1086-011 EPA

Dear Ms. Pastalove:

Reference is made to the Draft Environmental Impact Statement mentioned above.

The Department of Natural Resources has no objection to the proposed disposal sites. Nevertheless, the Regulation #13 of the Planning Board classify the site at Santa Isabel as Zone I (floodable) in which the disposal of fill material is not permitted unless a Hydrologic-Hydraulic study support it.] 1

Also, we understand that the creation of wetland habitats for wildlife should be evaluated as a desirable alternative. This kind of dredged material is adequate in the formation of wetlands.] 2

Cordially yours,

Ruth D. Carreras

Ruth D. Carreras
Assistant Secretary
for Permits Area



COMMONWEALTH OF PUERTO RICO / OFFICE OF THE GOVERNOR

Environmental
Quality Board

November 24, 1986

Ms. Barbara Pastalove
Chief
Environmental Impacts Branch
Room 702
U.S. Environmental Protection Agency
26 Federal Plaza, New York N.Y. 10278

Subject: Draft E.I.S. for the Designation
of Ocean Dredged Mat.
Disposal Sites for Arecibo,
Mayaguez, Ponce and Yabucoa, P.R.

Dear Ms. Pastalove:

The Environmental Quality Board (EQB) has received a copy of the above mentioned document. In order to evaluate the overall impact of the project, the applicant must submit to our Agency six (6) more copies of the E.I.S. as required by Article 4c of the Environmental Public Policy Act (law number 9 approved on June 18th 1970 as amended).

At least two (2) of the copies must be in Spanish language.

} 3

Sincerely yours,

Santos Rohená, Jr.
Chairman



United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW

Southeast Region / Suite 1360
Richard B. Russell Federal Building
75 Spring Street, S.W. / Atlanta, Ga. 30303
Telephone 404/221-4524 - FTS: 242-4524

DEC 2 1986

ER-86/1290

Ms. Barbara Pastalove, Chief
Environmental Impacts Branch
U.S. Environmental Protection Agency
26 Federal Plaza, Room 702
New York, New York 10278

Dear Ms. Pastalove:

We have reviewed the draft environmental statement (DEIS), Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yaboucoa, Puerto Rico, and have the following comments.

The DEIS is well written and informative. Some of the present interim sites for ocean dumping could have detrimental effects on near-shore wildlife habitats. The proposed alternate sites for Mayaguez, Ponce, and Yabucoa are further away from shore, in much deeper water, and are more likely to avoid harmful impacts to coastal wildlife habitats. } 4

We agree with the document's proposal to keep the Arecibo site at its present location. The site does not pose a problem to near-shore habitat.

We do not foresee any adverse effects to threatened or endangered species nor designated critical habitat under the jurisdiction of the Fish and Wildlife Service. The National Marine Fisheries Service is responsible for assessing potential offshore impacts on oceanic species such as sea turtles and whales.

Thank you for the opportunity to comment on this DEIS.

Sincerely yours,

James H. Lee
Regional Environmental Officer

NATIONAL SCIENCE FOUNDATION

WASHINGTON, D.C. 20550

December 9, 1986



OFFICE OF THE
ASSISTANT DIRECTOR
FOR GEOSCIENCES

Ms. Barbara Pastalove
Chief, Environmental Impacts Branch
Room 702
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

Dear Ms. Pastalove:

The National Science Foundation has no comment on the Draft Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico. We believe that the offshore disposal of dredged material will in no way affect the operation of the NSF-sponsored National Astronomy and Ionosphere Center in Arecibo, Puerto Rico.

Thank you for the opportunity to review this DEIS.

Sincerely,

A handwritten signature in cursive script, which appears to read "A. F. Montgomery".

Adair F. Montgomery
Staff Associate for Budget and
Environmental Policy



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

December 11, 1986

Ms. Barbara Pastalove
Chief
Environmental Impacts Branch
Room 702
U.S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

Dear Ms. Pastalove:

Thank you for sending us a copy of the Draft Environmental Impact Statement (EIS) for Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico. We are responding on behalf of the U.S. Public Health Service.

In general, we are in agreement with the actions proposed in this document to designate an environmentally acceptable ocean disposal site for dredged material from the four harbors listed above. Since the harbors will require dredging every three or four years to permit continuing access to freight traffic and large ocean-going commercial vessels, it seems prudent to select an environmentally acceptable site rather than continue using interim disposal sites.

We were pleased to note the criteria for designating these permanent sites will be consistent with the London Dumping Convention (LDC) of 1975 and the U.S. Ocean Dumping Regulations of 1977.

Some specific questions we have are as follows: In Section 2.4.2 (8), page 2-31, it states beaches will not be reached by any sediment released at the disposal sites and therefore there will be no effects on recreational swimming, diving, or fishing at the shore. How was this determined? Was the Dredged Material Transport and Fate Model used? Also, we would like additional information on the statement in Section 2.4.2 (10), page 2-32, that any human disease organisms that may be present in the dumped materials are very unlikely to survive and reproduce in the cold, highpressure environment of the sea floor at the site because of well flushed currents. If the suspected organisms have been identified, we would like to know what they are. If not, analyses of the dredged materials should include identification of the organisms.

5

6

Page 2 - Ms. Barbara Pastalove

We appreciate the opportunity to review this Draft EIS. Please send us one copy of the final document when it becomes available.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'V. N. Houk', written in a cursive style.

Vernon N. Houk, M.D.
Assistant Surgeon General
Director
Center for Environmental Health



COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
PUERTO RICO PLANNING BOARD

Minillas Governmental Center, North Bldg.
De Diego Ave, Stop 22
P.O. Box 41119, San Juan, P.R. 000940 - 9985

December 11, 1986

Mr. Robert Witte
Environmental Analysis Section
Environmental Impacts Branch
Room 702
26 Federal Plaza
New York, 10278

Re: Draft Environmental Impact
Statement for the Designation
of Ocean Dredge Material
Disposal Sites for Arecibo,
Mayaguez, Ponce and Yabucoa
Puerto Rico

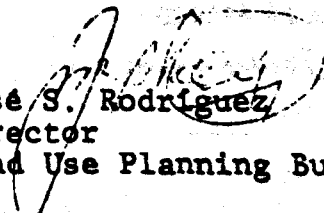
Dear Sir:

According with the standard procedure for the Coastal
Zone Management Program Consistency determination, we
circulate the documents sent by the applicants to different
agencies.

In order to comply with this procedure, we are
requesting seven (7) additional copies of the referred
document.

Thank you for your assistance in this matter.

Cordially yours,


José S. Rodríguez
Director
Land Use Planning Bureau

Enclosure: Application for Certification of Consistency with
the Puerto Rico Coastal Management Program

COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
PUERTO RICO PLANNING BOARD
PHYSICAL PLANNING AREA
LAND USE PLANNING BUREAU

APPLICATION FOR CERTIFICATION OF CONSISTENCY WITH THE
PUERTO RICO COASTAL MANAGEMENT PROGRAM

General Instructions:

- A. Attach a 1:20,000 scale, U.S. Geological Survey topographic quadrangular base map of the site.
- B. Attach a reasonably scaled plan or schematic design of the proposed project, indicating the following:
 1. Peripheral areas
 2. Bodies of water, tidal limit and natural systems
- C. You may attach any further information you consider necessary for proper evaluation of the proposal.
- D. If any information requested in the questionnaire does not apply in your case, indicate by writing "N/A" (not applicable).
- E. Submit a minimum of seven (7) copies of this application.

DO NOT WRITE IN THIS BOX

Type of application:	Application number:
Date received:	Date of certification:
Evaluation result: <input type="checkbox"/> objection <input type="checkbox"/> acceptance <input type="checkbox"/> negotiation	
Technician:	Supervisor:
Comments:	

1. Name of Federal Agency:
2. Federal Program Catalog Number:
3. Type of Action:
☐ Federal Activity ☐ License or permit ☐ Federal assistance
4. Name of Applicant:
Postal Address:
Telephone:
5. Project Name:
6. Physical Description of Project Location:
(area, facilities such as vehicular access, drainage, storm and sanitary sewer placement, etc.)

7. Type of construction or other work proposed:

drainage () channeling () landfill () sand extraction () pier ()
bridge () residential () tourist ()

Other (specify and explain)

Construction of a sea wall and 5 piers 3' x 80' dredge of para area to depth of 5 feet.

Description of proposed work:

8. Natural, artificial, historic or cultural systems likely to be affected by the project

Place an X opposite any of the systems indicated below that are in the project area or its surroundings which are likely to be affected by the activity. Indicate the distance from the project to any outside system that would likely be affected.

System	Within Project	Outside Project	Distance (meters)	Local name of affected system
beach, dunes				
marshes				
coral, reefs				
river, estuary				
bird sanctuary				
pond, lake, lagoon				
agricultural unit				
forest, wood				
cliff, breakwater				
cultural or tourist area				
other (explain				

Describe the likely impact of the project on the identified system (s) .

Positive ☐

Negative ☐

Explain: Better the fiscal aspect of the area

9. Indicate permits, approvals and endorsements of the proposal, by Federal and Puerto Rican government agencies. Evidence of such support should be attached to the proposal.

		Yes	No	Pending	Application Number
a. Planning Board	A-11	()	()	()	
b. Regulation and Permits Administration		()	()	()	

	<u>Yes</u>	<u>No</u>	<u>Pending</u>	<u>Application Number</u>
c. Environmental Quality Board	()	()	()	_____
d. Department of Natural Resources	()	()	()	_____
e. State Historic Preservation Office	()	()	()	_____
f. U. S. Army Corps of Engineers	()	()	()	_____
g. U. S. Coast Guard	()	()	()	_____
h. Other (s) (specify)	()	()	()	_____

CERTIFICATE: I certify that (project name) _____
is consistent with the Puerto Rico Coastal Zone Management Program,
and that to the best of my knowledge the above information is true.

(Signed) _____

(Position) _____

DATE: _____



DEPARTMENT OF THE ARMY
WATER RESOURCES SUPPORT CENTER, CORPS OF ENGINEERS
CASEY BUILDING
FORT BELVOIR VA. 22060

REPLY TO
ATTENTION OF:

17 DEC 1966

WRSC-D

Ms. Barbara Pastalove, Chief
Environmental Impacts Branch (Room 702)
U. S. Environmental Protection Agency
26 Federal Plaza
New York, New York 10278

Dear Ms. Pastalove:

This responds to your office's Draft Environmental Impact Statement for the Designation of Ocean Dredged Material Disposal Sites for Arecibo, Mayaguez, Ponce, and Yabucoa, Puerto Rico.

The U. S. Army Corps of Engineers offers the following general comments on this document:

a. Purpose of Document: EPA's purpose and mandate is to locate and designate environmentally acceptable and economically feasible ocean disposal sites for each coastal project area where a continuing need for ocean disposal has been defined by the Corps of Engineers. Each such site is considered on a case-by-case basis by the Corps, along with land-based options in our project NEPA documents. The stated purpose of paragraph 1 of the report abstract is not correct. The purpose, as presently stated, is a Corps of Engineers responsibility, through a separate NEPA action.

b. EIS Alternatives: As a follow-up to point (a) above, alternatives addressed in this document must be confined exclusively to alternative ocean disposal site locations and the no action alternative. An evaluation of land-based alternatives is a Corps of Engineers responsibility which has been covered separately in a Corps NEPA document. We request that all such discussions of land-based alternatives (e.g., S2-S3 and Chapter 2) be deleted from consideration as specific alternatives addressed by this document and discussed instead under the appropriate sections which address purpose and need.

17 DEC 1966

c. The EIS recommends that three of the four interim sites be abandoned for environmentally preferred alternatives. From figures in the report, each of these alternative sites appears to be about two miles further into the ocean than its associated interim site. The level of economic impact on dredging costs resulting from these changes should be discussed in the EIS. Your staff should contact our Jacksonville District office for assistance in evaluating these impacts (Lloyd Saunders, FTS 946-2202).

9

d. The evaluation of environmental consequences does not indicate any documented evidence of negative impacts from past use of the interim sites. This information, if available, would provide a stronger basis for making a determination to select alternate sites in lieu of the interim sites at three locations. This would be particularly helpful in light of some of the questionable predictions of adverse impacts discussed in the document (e.g., adverse impacts to beaches some 10 miles distant from the point of disposal).

10

e. Figure 2-11, page 2-43, shows the interim site and all alternates to Ponce to be outside the Zone of Siting Feasibility (ZSF). While the reasons for this are explained on page 2-3, paragraph 2.3.1.3., Figure 2-11 can nonetheless convey in itself a confusing picture to the reader. We recommend that Figure 2-11 be footnoted with a reference to paragraph 2.3.1.3. to ensure the reader's understanding as to why the sites are outside the depicted ZSF.

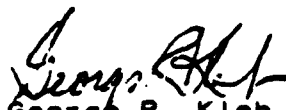
11

We fully recognize the unique environmental attributes that must be considered in the management of dredged material disposal activities at these Puerto Rico harbors. However, based on the present document, we are not convinced at this time that several of the actions proposed in this EIS are adequately justified from a technical point of view, nor do they necessarily reflect the most cost-effective, environmentally acceptable solutions.

12

Please contact Mr. David Mathis of my staff (FTS 385-3099) if you require additional clarification of our review comments. We would encourage your staff to meet with our Jacksonville District Office at your earliest convenience to discuss these concerns in detail.

Sincerely,


A-14 George R. Kleb
Colonel, Corps of Engineers
Commander and Director



Environmental
Quality Board

January 29, 1987

Mrs. Barbara Pastalove, Chief
Environmental Impacts Branch
Room 702, U.S. Environmental
Protection Agency
26 Federal Plaza
New York, N.Y. 10278

PE: Draft EIS for the Designation
of Ocean
Dredge Material Disposal Sites
for Arecibo, Mayaguez, Ponce
and Yabucoa, P.R.

Dear Mrs. Pastalove:

This acknowledges receipt of your comments of our letter of November 24, 1986 requesting six additional copies of the spanish version of the DEIS for the project referred to above.

According to the submitted information six (6) additional copies of the english version for the aforementioned project were enclosed as the spanish version was not available.

The Regulation for the Environmental Impact Statement of June 4, 1984 has been promulgated to establish the content requirements and administrative procedures to comply with the process of Environmental Impact Statement (EIS), established by Article 4 (c) of the Environmental Public Policy Act. (Law No. 9, approved on June 18th, 1970, as amended) Section 5.3.1 (Content Requirements) of the Regulation for the Environmental Impact Statement read as follows:

- "The EIS must be prepared in Spanish and in such a ways as to be objective, analytical, concise, and in terms that can be easily understood by the community, but with enough information to orient specialists on particular problems on their fields of specialized knowledge".

13

Page #2
Mrs. Barbara Pastalone

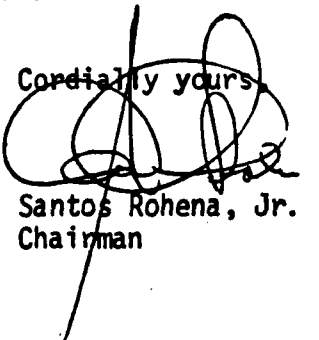
...as for Section 5.5.2.2 (Processing Requirements) read as follows:

- "When the Preliminary EIS is circulated for comments, the lead agency shall notify the public about its availability for inspection, as well as of its right to comment on the same. This notification shall be made by means of an environmental notice in a newspaper of general circulation for one day. This notice shall be published within ten (10) calendar days from the date that Preliminary EIS was submitted to the Board. The lead agency shall pay the cost of such notice and shall submit copy of the payment voucher to the Board. The Board will not issue comments on the Preliminary EIS until it has received evidence that the cost of said notice has been paid."

14

We understand that the DEIS should be also translated into spanish in order to give the public a better chance to understand it. Furthermore we esteemed your agency should fully comply with section 5.5.2.2 of the aforementioned regulation.

Cordially yours,


Santos Rohena, Jr.
Chairman



COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
PUERTO RICO PLANNING BOARD

Minillas Governmental Center, North Bldg.
De Diego Ave, Stop 22
P.O. Box 41119, San Juan, P.R. 000940 - 9985

April 3, 1987

Mr. Robert Witte
Environmental Analysis Section
Environmental Inspect Branch
Room 702
26 Federal Plaza
New York, 10278

Re: Draft Environmental Impact
Statement for the Designation
of Ocean Dudge Material Disposal
Sites for Arecibo, Mayaguez, Ponce
and Yabucoa

Dear Mister Witte:

As you recall it was agreed in our telephone conversation of March, 1987 that you are not presently requesting a Coastal Zone Management Program (CZMP) determination of consistency for the documents in reference. A determination of consistency, as previously indicated, will not be entertain until such a time as specific projects for particular areas are submitted to this Planning Board for evaluation.

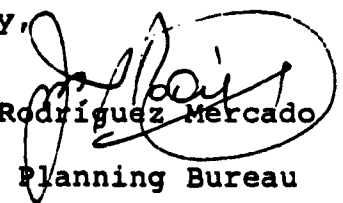
As a rule, Draft Environmental Impact Statements (DEIS) should be submitted to the Puerto Rico Environmental Quality Board for their evaluation and determination of compliance with procedures establish by Act No. 9 of June 1970, as amended.

15

Based on the above, we are not presently, commenting on the different alternatives for interim ocean disposal sites included in the DEIS.

Please, contact us if we can be of further assistance.

Cordially,


José S. Rodríguez Mercado
Director
Land Use Planning Bureau



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, FL 33702

January 22, 1988 F/SER23:TAH:td

Barbara Pastalove, Chief
Environmental Impacts Branch
U.S. Environmental Protection Agency
Region II, 26 Federal Plaza
New York, New York 10278

Dear Ms. Pastalove:

This responds to your December 22, 1987, letter regarding the proposed designation of sites for disposal of maintenance dredging materials from the harbors of Arecibo, Mayaguez, Ponce and Guayanilla, and Yabucoa, Puerto Rico. An Environmental Impact Statement (EIS) was transmitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the EIS and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions, please contact Dr. Terry Henwood, Fishery Biologist at FTS 826-3366.

Sincerely yours,

Charles A. Oravetz

Charles A. Oravetz, Chief
Protected Species Management Branch

cc: F/PR2
F/SER1



APPENDIX B
ABBREVIATIONS AND ACRONYMS

LIST OF ACRONYMS AND ABBREVIATIONS

COE	-	U.S. Army Corps of Engineers
cm/s	-	centimeter per second
cu yds	-	cubic yards
CZM	-	Coastal Zone Management
DEIS	-	Draft Environmental Impact Statement
DMDS	-	Dredged Material Disposal Sites
EPA	-	U.S. Environmental Protection Agency
f	-	fathom
FEIS	-	Final Environmental Impact Statement
FR	-	Federal Register
km	-	kilometer
LDC	-	London Dumping Convention
m	-	meter
MPRSA	-	Marine Protection, Research, and Sanctuaries Act
NEPA	-	National Environmental Policy Act
nmi	-	nautical mile
NOAA	-	National Oceanic and Atmospheric Administration
NWF	-	National Wildlife Federation
ODMDS	-	Ocean Dredged Material Disposal Site
ODR	-	Ocean Dumping Regulations (EPA)
OMEP	-	Office of Marine and Estuarine Protection (EPA)
PL	-	Public Law
RA	-	Regional Administrator (EPA)
USC	-	United States Code
USCG	-	U.S. Coast Guard
ZSF	-	Zone of Siting Feasibility

APPENDIX C
REFERENCES

REFERENCES

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APPENDIX D
GLOSSARY

GLOSSARY

ABUNDANCE	The number of individuals of a species inhabiting a given area. Normally, a community of several species will be present. Measuring the abundance of each species is one way of estimating the comparative importance of each species.
ADSORB	To adhere in an extremely thin layer of molecules to the surface of a solid or liquid.
AMBIENT	Pertaining to the undisturbed or unaffected conditions of an environment.
APPROPRIATE SENSITIVE BENTHIC MARINE ORGANISMS	Pertaining to bioassays required for ocean dumping permits, "at least one species each representing filter-feeding, deposit-feeding, and burrowing species chosen from among the most sensitive species accepted by EPA as being reliable test organisms to determine the anticipated impact on the site" (40 CFR § 227.27).
APPROPRIATE SENSITIVE MARINE ORGANISMS	Pertaining to bioassays required for ocean dumping permits, "at least one species each representative of phytoplankton or zooplankton, crustacean or mollusk, and fish species chosen from among the most sensitive species documented in the scientific literature or accepted by EPA as being reliable test organisms to determine the anticipated impact of the wastes on the ecosystem at the disposal site" (40 CFR § 227.27).
ASSEMBLAGE	A group of organisms sharing a common habitat.
BACKGROUND LEVEL	The naturally occurring concentration of a substance within an environment that has not been affected by unnatural additions of that substance.
BASELINE CONDITIONS	The characteristics of an environment before the onset of an action that can alter that environment; any data serving as a basis for measurement of other data.
BASELINE SURVEYS, BASELINE DATA	Surveys and data collected prior to the initiation of actions that may alter an existing environment.
BENTHOS	All marine organisms (plant or animal) living on or in the bottom of the sea.
BIOACCUMULATION	The uptake of substances (e.g., heavy metals) leading to elevated concentrations of those substances within plant or animal tissue.
BIOTA	Plants and animals inhabiting a given region.

CONTINENTAL SHELF	That part of the Continental Margin adjacent to a continent extending from the low water line to where the Continental Slope begins.
CONTINENTAL SLOPE	That part of the Continental Margin consisting of the declivity from the edge of the Continental Shelf down to the Continental Rise.
CONTOUR LINE	A line on a chart connecting points of equal elevation above or below a reference plane, usually mean sea level.
CONTROLLING DEPTH	The least depth in the approach or channel to an area that determines the maximum draft of vessels that can obtain passage.
DIFFUSION	Transfer of material (e.g., salt) or a property (e.g., temperature) under the influence of a concentration gradient; the net movement is from an area of higher concentration to an area of lower concentration.
DISCHARGE PLUME	A region of water that can be distinguished from the surrounding water due to a discharge of waste.
DISPERSION	The dissemination of discharged matter over large areas by natural processes (e.g., currents).
DIVERSITY (species)	A statistical measurement that generally combines a measure of the total number of species in a given environment with the number of individuals of each species. Species diversity is high when there are many species with a similar number of individuals; low when there are fewer species and when one or two species dominate.
DOMINANT SPECIES	A species or group of species which, because of their abundance, size, or control, strongly affect a community.
EBB CURRENT, EBB TIDE	The tidal current moving away from land or down a tidal stream.
ECONOMIC RESOURCE ZONE	The oceanic area within 200 nmi from shore; coastal states possess exclusive rights to living and non-living marine resources in this zone.
ECOSYSTEM	The organisms in a community together with their physical and chemical environments.
ENDEMIC	Restricted or peculiar to a locality or region; found at a locality.
ESTUARY	A semi-enclosed coastal body of water that has a free connection to the sea within which the mixing of saline and fresh water occurs.

FAUNA	The animal life of any location, region, or period.
PINFISH	Term used to distinguish true fish from shellfish.
HALOCLINE	A level in the water column where a salinity gradient is stronger than in the waters above or below that level.
HOPPER DREDGE	A self-propelled vessel with capabilities to dredge, store, transport, and dispose of dredged materials.
HYDROGRAPHY	That part of science that deals with the measurement of the physical features of waters and their marginal land areas.
INDIGENOUS	Having originated in or living naturally in a particular region or environment; native.
INFAUNA	Animals that live in the bottom sediment.
INITIAL MIXING	Dispersion of liquid, suspended particulate, and solid phases of a waste material that occurs within 4 hours of dumping.
IN SITU	(Latin) in the original or natural setting (in the environment).
INTERIM DISPOSAL SITES	Ocean disposal sites tentatively approved for use by the EPA.
INVERTEBRATES	Animals that lack a backbone.
ISOBATH	A line on a chart connecting points of equal depth.
ISOTHERMAL	Of the same temperature.
LITTORAL	Of or pertaining to the seashore, especially the regions between tide lines.
LONGSHORE CURRENT	A current that flows parallel to a coastline.
MAIN SHIP CHANNEL	The designated shipping corridor leading into a harbor.
MAINTENANCE DREDGING	Periodic dredging of a waterway necessary to maintain depth for ship passage.
MESOPELAGIC	Pertaining to free-living organisms found at depths of 200 to 1,000 meters below the open ocean surface.
MIXED LAYER	The upper layer of the ocean, which is normally well-mixed by wind and wave activity; the deepest extent of the mixed layer is usually a halocline or thermocline.
MONITORING	As used herein, observation of environmental effects of disposal operations through biological and chemical data collection and analysis.

NUISANCE SPECIES	Organisms of no commercial value, which, because of predation or competition, may be harmful to commercially important organisms; pathogens; pollution tolerant organisms present in large numbers that are not normally considered dominant in the area.
PARAMETER	Values or physical properties that describe the characteristics or behavior of a set of variables.
PATHOGEN	An entity producing or capable of producing disease.
PELAGIC	Pertaining to free-living organisms of the open ocean beyond the Continental Shelf.
PERTURBATION	A disturbance of a natural or regular system; any departures from the usual state of a system.
PLUME	A region of water that can be distinguished from surrounding water because of its characteristics; usually turbid.
PRECIPITATE	A dissolved substance that becomes solid through chemical or physical change and separates from a solution or suspension.
PRIMARY PRODUCTIVITY	The amount of organic matter synthesized by organisms (primarily plants) from inorganic substances per unit time and volume of water.
QUALITATIVE	Pertaining to the non-numerical assessment of a parameter.
QUANTITATIVE	Pertaining to the numerical assessment of a parameter.
RECRUITMENT	Addition to a population of organisms by reproduction or immigration of new individuals.
RELEASE ZONE	An area defined by the locus of points 100 meters from a vessel engaged in dumping activities.
RUNOFF	That portion of precipitation upon land that ultimately reaches streams, rivers, lakes, or oceans.
SALINITY	The amount of salts dissolved in water; expressed in parts per thousand.
SEA STATE	The description of wind-generated waves on the surface of the sea; ranges from 1 (smooth) to 8 (mountainous).
SHELF WATER	Water that occurs at, or can be traced to, the Continental Shelf; identified by characteristic temperatures and salinities.
SHELLFISH	An invertebrate having a rigid outer covering, such as a shell or exoskeleton; includes some molluscs and anthropods; term is the counterpart of finfish.

SHIPRIDER	A shipboard observer who ensures that a waste-laden vessel is dumping in accordance with permit specifications.
SHORT DUMPING	The discharge of waste from a vessel anywhere outside designated disposal sites.
SLOPE WATER	Water that occurs at, or can be traced to, the Continental Slope; identified by characteristic temperatures and salinities.
SPECIES	A group of morphologically similar organisms capable of interbreeding and producing fertile offspring.
STANDING STOCK	The biomass or abundance of living organisms per unit volume of water or area of sea-bottom.
SUBSTRATE	The solid material upon which an organism lives or to which it is attached (e.g., rocks, sand).
SURVEILLANCE	Systematic observation of an area by visual, electronic, photographic, or other means for the purpose of ensuring compliance with applicable laws, regulations, and permits.
SUSPENDED SOLIDS	Finely divided particles of a solid temporarily suspended in a liquid (e.g., soil particles in water).
THERMOCLINE	A temperature gradient in a layer of a body of water that is appreciably greater than the gradients above or below it; a layer in which such a gradient occurs.
TRACE METAL	An element found in the environment in extremely small quantities; usually bioaccumulative or toxic.
TRANSMITTANCE	A measure of water clarity, measured by an instrument that transmits a known quality of light to a collector. The percentage of the beam's energy that reaches the collector is the water's transmittance.
TREND ASSESSMENT SURVEYS	Surveys conducted over long periods of time to detect shifts in environmental conditions within a region.
TURBIDITY	Cloudy or hazy appearance in a naturally clear liquid caused by a suspension of colloidal liquid droplets, fine solids, or small organisms.
VECTOR	A straight or curved line representing both direction and magnitude.
WATER MASS	A body of water, identified by its temperature-salinity values or chemical composition.
ZOOPLANKTON	Weakly swimming animals whose distribution in the ocean is ultimately determined by current movements.

4. CONCLUSIONS OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT