**U.S. Army Corps of Engineers**
New York District

# Dredged Material Management Plan for the Port of New York and New Jersey

## DRAFT

## Programmatic Environmental Impact Statement

September 1999

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| | |
|---|---|
| **AP** | Acid Precipitation |
| **BHNIP** | Boston Harbor Navigation Improvement Project |
| **BOD** | Biological Oxygen Demand |
| **CAC** | Consolidated Aggregate Corporation |
| **CAD** | Contained Aquatic Disposal |
| **CCMP** | Comprehensive Conservation Management Plan |
| **CDF** | Confirmed Disposal Facility |
| **CEQ** | Council on Environmental Quality |
| **CERCLA** | Comprehensive Environmental Response, Compensation and Liability Act |
| **CFR** | Code of Federal Regulations |
| **CO** | Carbon Monoxide |
| **CSO** | Combined Sewer Overflow |
| **CWA** | Clean Water Act |
| **CY** | Cubic Yard |
| **DDT** | Dichlorodiphenyltrichloroethane |
| **DDMIWG** | Dredged Material Management Integration Work Group |
| **DMMP** | Dredged Material Management Plan |
| **DO** | Dissolved Oxygen |
| **EFH** | Essential Fish Habitat |
| **EIS** | Environmental Impact Statement |
| **FMC** | Fishery Management Councils |
| **GRNA NPS** | Gateway National Recreation Area, National Park Service |
| **HARS** | Historic Area Remediation Site |
| **HEP** | Harbor Estuary Plan |
| **HTRW** | Hazardous, Toxic and Radioactive Waste |
| **ISC** | Interstate Sanitation Commission |
| **MA** | Massachusetts |
| **MCY** | Million Cubic Yards |
| **MDS** | Mud Dump Site |
| **MESA** | Marine Ecosystem Analysis |
| **mg/l** | milligrams per liter |
| **MOTBY** | Military Ocean Terminal at Bayonne |
| **MPRSA** | Marine Protection Research and Sanctuaries Act |
| **MSFCMA** | Magnuson-Stevens Fishery Conservation and Management Act of 1996 |
| **MSRC** | Marine Science Research Center |
| **NJAC** | New Jersey Administrative Code |
| **NAAQS** | National Ambient Air Quality Standards |
| **NBCDF** | Newark Bay Confined Disposal Facility |
| **NEPA** | National Environmental Policy Act |
| **NJ** | New Jersey |
| **NJDEP** | New Jersey Department of Environmental Protection |
| **NJMR** | Office of New Jersey Maritime Resources |

# LIST OF ABBREVIATIONS and COMMONLY USED TERMS



| | |
|---|---|
| **NJSD** | New Jersey SCUBA Diver |
| **NJSHPO** | New Jersey State Historic Preservation Office |
| **NMFS** | National Marine Fisheries Service |
| **NOAA** | National Oceanic and Atmospheric Administration |
| **NOX** | Nitrogen Oxides |
| **NRHP** | National Register of Historic Places |
| **NY** | New York |
| **NYCDEP** | New York City Department of Environmental Protection |
| **NYCEDC** | New York City Economic Development Corporation |
| **NYCLPO** | New York City Landmarks Preservation Office |
| **NYD** | The United States Army Corps of Engineers – New York District |
| **NYSDEC** | New York State Department of Environmental Conservation |
| **NYSHPO** | New York State Historic Preservation Office |
| **OENJ** | Orion Elizabeth New Jersey |
| **PA** | Pennsylvania |
| **PANY/NJ** | Port Authority of New York/New Jersey |
| **PADI** | Professional Association of Diving Instructors |
| **PAH** | Poly aromatic Hydrocarbons |
| **Pb** | Lead |
| **PCB** | Polychlorinated Biphenyl |
| **PEIS** | Programmatic Environmental Impact Statement |
| **PM-10** | Inhalable Particulates |
| **ppm** | parts per million |
| **PSE&G** | Public Service Electric and Gas |
| **PWP** | Priority Waterbody Problems |
| **RCRA** | Resource Conservation and Recovery Act |
| **RPF** | Redox Potential Discontinuity |
| **SAV** | Submerged Aquatic Vegetation |
| **SEQRA** | State Environmental Quality Review Act (New York) |
| **SERG** | Senior Executive Review Group |
| **SHPO** | State Historic Preservation Offices |
| **$SO_2$** | Sulfur Dioxide |
| **SPI** | Sediment Profile Imagery |
| **SS** | Smoke Shade |
| **STORET** | EPA Storage of HTRW Information |
| **SVOC** | Semi-Volatile Organic Compounds |
| **TCLP** | Toxic Characteristic Leaching Procedure |
| **TSCA** | Toxic Substances Control Act |
| **TSP** | Total Suspended Particulates |
| **TSS** | Total Suspended Solids |

# LIST OF ABBREVIATIONS and COMMONLY USED TERMS



| | |
|---|---|
| **USACE** | United States Army Corps of Engineers |
| **USEPA** | United States Environmental Protection Agency |
| **USFWS** | United States Fish and Wildlife Service |
| **VOC** | Volatile Organic Compounds |
| **WES** | Waterways Experiment Section |

# 1 SUMMARY

## 1.1 Major Findings and Conclusions

**a.** Coordination with interested parties including scoping meetings and the Dredged Material Management Integration Work Group has resulted in a consensus that the Port of New York/New Jersey serves a vital role in the economy and well being of the entire region. This is supported by the fact that $29 billion enters the economy and 92,000 direct jobs and 74,000 indirect jobs depend on the Port generated business (DMMP). Many of the Port of New York/New Jersey channels are too shallow to allow efficient operation by the Port users without maintenance dredging. The current trend toward deeper draft vessels requires even deeper channels. Thus, a difficult situation has been developing in which the Port of New York/New Jersey will cease to be a major destination for shipping unless action is taken to maintain currently authorized channel depths and deepen others.

**b.** Lightering is used as an interim measure until navigation channels and berths can be dredged. This process is the off-loading of a vessel's cargo in deep waters onto a shallow draft vessel or barge that would then be able to berth at shallower cargo handling facilities. In many instances the larger vessels, which draw less water in a 'lightered' state, can then access the shallower facilities as well. Double handling of cargo increases the chance of accidents and spillage, and greatly increases the cost of shipping. The dependence on such practices as lightering is incentive to major shipping lines to move to other ports with channels deep enough to avoid such costly practices.

**c.** The amount of material that currently needs to be dredged includes the volume to bring Federal channels to their authorized depth, as well as the volume to maintain or improve individual Port berthing areas and non-Federal channels (DMMP Table 1-1). There are several authorized or planned increases in depth of channels to accommodate the deeper draft of many present and future vessels. In addition, there is a major Port improvement study that is investigating long-term needs including additional channel deepening. The New York & New Jersey Harbor Navigation Study is a parallel planning effort. The development of a comprehensive plan to manage dredged material for all of these maintenance and deepening activities, including associated contaminants, is the subject of the Dredged Material Management Plan (DMMP, first document of this volume), and of this draft Programmatic Environmental Impact Statement (PEIS).

**d.** The United States Army Corps of Engineers-New York District (NYD), along with its cost sharing sponsors the States of New York and New Jersey and the Port Authority of New York/New Jersey (PANY/NJ), have the final responsibility for deciding which options are included in the DMMP. In order for the plan to be successful it must have support from the regions' stakeholders and incorporate the findings of the various Port planning efforts that may affect the volumes and time frames for implementing the selected options. These studies include the following:

- PANY/NJ Major Port Improvement Study
- New York City Economic Development Corporation (NYCEDC) Cross Harbor Freight Movement Major Investment Study
- NYCEDC Strategic Plan for the Redevelopment of the Port of New York
- NYD's NY/NJ Harbor Navigation Study

**e.** The DMMP, its Technical Appendix and the draft PEIS, are combined in one volume for ease of understanding. The DMMP describes the planning process and presents alternatives and a recommended course-of-action. The PEIS addresses generic impacts of the options evaluated in the DMMP. This information was used in selecting among the different options for inclusion in the DMMP's recommedations. The Technical Appendix provides supporting information and the results of agency coordination.

**f.** Harbor dredging is needed to avoid the problems and costs associated with shallow channels and berthing areas; and to accommodate a new class of larger vessels. A plan for the disposal of dredged material is needed to provide for the large volumes and long duration of dredging operations in an environmentally acceptable and economic manner. The DMMP has evaluated many options including a wide range of technologies and many potential disposal sites. In conjunction with long-term programs to reduce contaminants at their source and to reduce sediment dredging needs, a recommended course-of-action which treats dredged material as a resource for beneficial use applications has emerged as the preferred approach to dredged material management. Beneficial use options such as ocean remediation (HARS), habitat creation, enhancement and restoration, and land remediation (including landfills, brownfields, and mined land) are combined with decontamination technologies in the recommended course-of-action. In recognition of the uncertainties associated with the estimates of volumes, the timing of dredging projects and the timely availability of specific recommended options, confined aquatic disposal pits (CADs) have been identified as a contingency to be used if beneficial use options do not meet disposal needs. CADs would be located in selected areas of the Upper Bay Complex so that this disposal-only option confines contaminated sediments in areas where contamination is already present.

**g.** The DMMP was designed as a flexible plan that would be modified over time following annual reviews by the DMMP working group. Because important preferred management options are in the small scale that stage and new techniques or options may evolve in the future, changes to the plan can be expected. The recommended course-of-action is divided into a 2000 to 2010 time interval (2010 plan), which encompasses major ongoing and proposed channel improvements, and a 2011 to 2040 time interval (2040 plan) during which maintenance dredging is the primary need and contaminant reduction efforts increase the volumes of clean sediments.

# 1.2 Relationship to Environmental Requirements

**a.** Table 1-1 presents the environmental statutes that have applicability to the options under investigation. Since this is a broad environmental assessment of the spectrum of management options for the purpose of aiding in the selection of options that would go into the plan, site-specific details are not available to fully assess impacts of specific options at specific locations. As specific options along with permit reviews are implemented, additional site-specific NEPA documentation and assessments will be necessary to complete compliance with most of the existing regulations.

**Table 1-1: RELATIONSHIP OF OPTIONS TO ENVIRONMENTAL STATUTES**

| FEDERAL ENVIRONMENTAL LAWS AND EXECUTIVE ORDERS | COMPLIANCE |
|---|---|
| Abandoned Shipwreck Act of 1987 | Pending (1) |
| Anadromous Fish Conservation Act | Pending (1) |
| Archaeological and Historic Preservation Act of 1974, as amended | Pending (1) |
| Clean Air Act, as amended | Pending (1) |
| Coastal Barrier Resources Act | Pending (1) |
| Coastal Zone Management Act of 1972, as amended | Pending (1) |
| Comprehensive Environmental Response, Compensation and Liability Act of 1980 | Pending (1) |
| Endangered Species Act of 1973, as amended | Pending (1) |
| Estuary Protection Act (PL90-454) | Pending (1) |
| Federal Migratory Bird Treaty Act | Pending (1) |
| Federal Water Pollution Control Act (Clean Water Act, 1977) | Pending (1) |
| Federal Water Project Recreation Act, as amended | Pending (1) |
| Fish and Wildlife Coordination Act of 1934, as amended | Pending (1) |
| Land and Water Conservation Fund Act of 1965, as amended | Pending (1) |
| Marine Mammals Protection Act of 1972 | Pending (1) |
| Marine Protection, Research, and Sanctuaries Act of 1972, as amended | Pending (1) |
| Magnuson-Stevens Fishery Conservation and Management Act of 1996 | Pending (1) |
| National Environmental Policy Act of 1969, as amended | Pending (1) |
| National Historic Preservation Act of 1966, as amended | Pending (1) |
| Outer Continental Shelf Lands Act | Pending (1) |
| Resources Conservation and Recovery Act | Pending (1) |
| Rivers and Harbors Appropriation Act of 1899, as amended: Section 10 | Pending (1) |
| Rivers and Harbors Act of 1970, Section 122 | Pending (1) |
| Watershed Protection and Flood Protection Act, as amended | Pending (1) |
| Wild and Scenic Rivers Act | Pending (1) |
| Executive Order 11988, Floodplain Management | Pending (1) |
| Executive Order 11990, Protection of Wetlands | Pending (1) |
| Executive Order 12114, Environmental Effects of Major Federal Actions | Pending (1) |
| Executive Order 12898, Environmental Justice | Pending (1) |
| APPLICABLE STATE LAWS OF NEW JERSEY | COMPLIANCE |
| Coastal Area Facility Review Act (NJSA 13:19-1 et seq) | Pending (1) |
| New Jersey Green Acres Land Acquisition Act of 1961 (NJSA 13:8 A-47) | Pending (1) |
| Waterfront Development Law (NJSA 12:5-3) | Pending (1) |
| Wetlands Act of 1970 (NJSA 13:9 A-1 et seq) | Pending (1) |
| Waterfront Harbors Facility Development Law of 1914 | Pending (1) |
| Coastal Zone Management Act (State Administered) | Pending (1) |
| New Jersey Water Pollution Control Act (NJSA 58:10A-1 et seq) | Pending (1) |
| Riparian Interests (NJSA 12:3-1 et seq. and 18:56-1 et seq) | Pending (1) |
| Flood Hazard Area Control Act (NJSA 58:16A-50 et seq) | Pending (1) |

| | |
|---|---|
| Freshwater Wetlands Protection Act | Pending (1) |
| APPLICABLE STATE LAWS OF NEW YORK | COMPLIANCE |
| Agricultural District Law (1971) | Pending (1) |
| Coastal Zone Consistency | Pending (1) |
| Coastal Zone Management Act | Pending (1) |
| Environmental Conservation Law, as amended | Pending (1) |
| Environmental Quality Review Law (1976) | Pending (1) |
| Fish and Wildlife Code (Title Three) | Pending (1) |
| Floodplain Protection Law (1974) | Pending (1) |
| Freshwater Wetland Protection Act (Article 24) (1975) | Pending (1) |
| Local Zone Enable | Pending (1) |
| New York State Environmental Laws (Local Admin) | Pending (1) |
| Open Space (ATRT13, Stat 247) | Pending (1) |
| Port District Enabling Law | Pending (1) |
| Soil Conservation District Law | Pending (1) |
| Stream Protection Law | Pending (1) |
| Tidal Wetlands Act | Pending (1) |
| Waterfront Revitalization and Coastal Resources Act | Pending (1) |
| Wildland Protection Law | Pending (1) |
| Wild, Scenic and Recreational Rivers System | Pending (1) |

(1) Pending, because this is a programmatic EIS and final selection of options and sites have not been determined. Compliance with law depends on the outcome of the selection process and analysis of site-specific alternatives.

## 1.3 Areas of Controversy

**a.** Areas of concern, have been articulated by various members of the public, environmental groups, and government agencies at public informational and scoping meetings, (through use of prepared statements, taped transcripts and written forms) or in letters responding to past DMMP documents (the Interim Report, Progress Report, Beneficial Use Report and Siting Criteria Report) (see Chapter 6 for details of the Public Involvment). In addition, concerns have also been raised during some of the numerous meetings of the Dredged Material Management Integration Work Group (DMMIWG) as well as other agency and public forums. These concerns have been addressed through the DMMP by the addition of design and/or operational controls to some of the options, by incorporation into siting analyses or by recommending more environmentally beneficial options. Areas of concern still persist, however, among various segments of the public.

**b.** The single most pervasive area of comment dealt with the use of the Raritan/Lower Bay complex. Many commentors felt that the overall quality of Raritan Bay has been improving and fish and shellfish are once again becoming abundant. Thus, many do not want any dredged material they termed as toxic placed in the bay because of their perception that it would destroy the bay by spreading into the water column during placement, or escaping from the facility after placement and thereby contaminate the fish and shellfish in the bay. They are opposed to having "toxic" material from elsewhere in the harbor (especially Newark Bay) disposed of in the Raritan Bay area. Their preference was to leave it where it is, treat it, or bury/build an island CDF in Newark Bay. This concern arose out of the preliminary site screening for aquatic disposal options that identified a zone for an island CDF or new subaqueous CAD pits within Lower Bay (adjacent to Raritan Bay), and a second zone for new CAD pits in Raritan Bay. The concern with CAD pits includes the loss of contaminants (spread) and the loss of habitat, although that loss would only be temporary until the pit was filled. Many commentors view an island CDF as especially detrimental and unwarranted because of the loss of hundreds of acres of bay bottom habitat.

**c.** Verbal and written comments argued that upland disposal was acceptable. Some qualified their comments by saying that only non-toxic material should be placed in upland landfills, and that toxic material should be stockpiled until decontamination technology can be developed. On the other hand, many members of the public and their elected officials strongly opposed the use of most of the upland sites specifically identified in a preliminary site screening presented in the Interim Report. Comments on capping indicated a perceived lack of confidence in the technique, with associated environmental health hazards and loss of property values. The concern was voiced that contaminants would be volatilized during disposal; but few written comments on capping or contaminant dispersal were received.

**d.** Numerous commentors stated that treatment/decontamination technologies should be used as the primary way to manage dredged material, with strong support for contaminant reduction as a means of avoiding implementation of less favorable containment options (island CDFs and nearshore fills).

**e.** A substantial number of citizens commented on their desire to have public hearings held immediately, with formal presentations and an official stenographic transcript of testimony. Most of these comments were verbal, with a few written comments submitted.

**f.** Regarding the scoping for the EIS, several comments were received about the Interim Report, erroneously believing that this report was the decision-making document. Many questioned when the EIS would be finished and asked about the roles of the states of New York and New Jersey in the decision-making process. Many of these same concerns were expressed at the three public meetings held in April of 1998.

## 1.4 Unresolved Issues

**a.** Issues, which remain unresolved at this time, include:

- The Historic Area Remediation Site (HARS) will be remediated at some time in the future and will no longer be able to accept material. Should a new ocean disposal or remediation site for suitable material be designated, and if so what steps would be necessary to do so?

- If sub-channel CAD pits are used, should they be actively capped or be allowed to passively fill with sediment from upstream sources.
- Mitigation is unresolved as to the scope, amount and kind. (Note: It was agreed among the agencies at the Interagency scoping meeting held on May 1, 1998 that out-of-kind mitigation would be required for certain options.)
- What is the current habitat use/value of existing pits?
- How can contaminants be kept from spreading outside pit areas during disposal and after closure?

# 2 PURPOSE AND NEED FOR ACTION

## 2.1 Study Authority

**a.** Legal authority to conduct navigation studies and maintain the New York Harbor includes the Rivers and Harbors Appropriation Act of 1899 (33 USC 401-466n), the Federal Water Pollution Control Act of 1972 (Clean Water Act, or CWA), and the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA). With respect to the preparation of the Dredged Material Management Plan (DMMP), the United States Army Corps of Engineers (Corps) planning guidance (EC 1165-2-200) requires each district to prepare long-term plans to maintain the projects authorized in accordance with the mission defined in the above documents. The plans must also consider non-Corps dredging and management needs.

## 2.2 Problems and Opportunities

**a.** Two major problems are associated with dredging in the Port. The Port of New York/New Jersey has an average natural depth of about 19 ft. Vessel draft for many years has exceeded this depth, making dredging necessary. Furthermore, the draft of modern vessels continues to increase. Currently, the fact that the newest vessels, which will come into general service soon, require depths in excess of 50 ft when fully loaded makes it necessary to deepen channels even further for the Port to accommodate these ships. The current estimate of average annual dredging to maintain the existing channel system is 3.5 MCY/yr and to maintain a deepened channel system is 4.1 MCY. The Port is a vital economic and environmental resource to the entire region and the nation. Dredging must occur for the Port of New York/New Jersey to remain viable in the future. Failure to do so risks the loss of some 166,600 jobs and $25 billion in commerce per year. This does not include the estimated 14.4 MCY that would have to be dredged to deepen the channels initially.

**b.** Contamination of dredged material, is caused by anthropogenic (human-generated) and industrial activity in the Port watershed that adds pollutants to the Port sediments. The contaminants vary in concentration. Generally, a substantial portion of the potential dredged material, has low concentrations of contaminants. Nevertheless, the presence of measurable amounts of contaminants has resulted in requirements for special sites and handling to manage the dredged material to protect the marine and estuarine environment and biota in and around designated ocean disposal sites. As such, sediments are tested to determine if contaminants are present and if so, in what concentrations to determine dredging and management options. Best Management Practices (BMPs) would be employed in all cases to minimize impacts.

**c.** An opportunity exists to develop plans not only for safe placement of dredged material, but also for investigating opportunities to protect and restore the estuary associated with the Port of New York/New Jersey.

## 2.3 Public Concerns

**a.** Public perception regarding the nature of the dredged material, which may contain metals, PAHS, PCBS, and dioxins, continues to be negative. Although this material does not meet requirements for ocean disposal, it generally falls below the criteria that would make it subject to hazardous waste regulations (RCRA), and would not normally be considered hazardous waste under either EPA or state regulations.

### 2.3.1 Organization of Stakeholders

**a.** The Dredged Material Management Integration Work Group (DMMIWG) has met monthly during the last several years. Its membership includes Federal and state representatives, including regulatory and government resource agencies, the States of New York and New Jersey, PANY/NJ (the City of New York), Port users, and involved stakeholder organizations. Its purpose has been to provide a forum for input to the planning process for harbor issues related to dredging and the environment, including the Dredged Material Management Plan (DMMP), and to coordinate these various efforts. This effort includes the Harbor Estuary Plan (HEP) and its Comprehensive Conservation and Management Plan (CCMP), endorsed by all the major agencies with responsibilities for the Port and its environment. In addition to this, formal meetings are held monthly among Port planners (NYD, PANY/NJ, and the States of New York and New Jersey) to discuss future needs and disposal/management options for the long term. Other meetings have been held with local interested parties. These have included meetings with working groups assembled by the borough presidents of Brooklyn and Staten Island. The public meetings included sessions on the Interim Report (1996) and Progress Report (1998) for the DMMP.

### 2.3.2 Scoping Process

**a.** Scoping is used to inform the public and other agencies of a contemplated Federal action and potential consequences of the action(s) and to obtain public responses for potential incorporation into the final decision document. The method used to inform the public can vary. The Corps generally holds some form of meeting(s) with the public. Public meetings, including poster sessions, were held on the various options and the overall planning process during February through April 1997. Scoping meetings that included posters explaining the scope of the EIS, followed by question/answer periods and the opportunity to make taped statements, were held during April 1998. Written comments were also solicited and gathered at these meetings and after their conclusion.

**b.** More than 2,000 notices of the public meetings to be held in 1997 and 1998 were sent out to Federal and state agencies, public officials, document repositories, and members of the public. Additionally, a Notice of Intent to produce a Programmatic

Environmental Impact Statement (PEIS), including an outline of its scope, was published in the Federal Register of February 24, 1998.

## 2.4 DMMP Study Objectives

**a.** The objectives of the DMMP are to maximize and expand the use of the Port, while maintaining and enhancing the estuarine environment. The options evaluated in the DMMP and this PEIS provide the building blocks which, when assembled, furnish a long-term plan of action for managing disposal of dredged material for the Port through at least the year 2040. This plan includes the use of "backup" options should preferred options fail to come on line or meet goals.

**b.** The programmatic approach has been used in this document as a tool to allow decision makers a means of assessing the environmental impacts of potential options that is in keeping with the current level of planning. It will allow them to consider the key environmental impact issues necessary to make decisions. The PEIS is an umbrella document to consider generic impacts of options and, where available, general sites. The PEIS serves as one of the major inputs to the DMMP, and, along with that plan, will help decision makers select the options to be carried forward to form the plan for the Port for the specific disposal of dredged material for the next ten years and in general for the following three decades. The PEIS is the first tier of a "tiered" NEPA document. The second tier will be the NEPA documents and permits that would address implementation of site-specific options recommended in the DMMP.

## 2.5 Other Related Port Projects

**a.** In addition to the management of dredged material, other navigation-related work has been initiated or is under investigation. This NEPA document in support of the DMMP is, in fact, related to these other efforts, since some of the dredged material addressed in the DMMP would be placed as a result of these other actions.

**b.** Federal action associated with improvements to Federal channels to accommodate deeper draft vessels are currently being investigated by a comprehensive Port study of existing Federal channels (NY/NJ Harbor Navigation Study). The study includes an EIS designed to identify and compare the impacts associated with dredging these channels. In addition, construction of Port-related facilities has been proposed. These facilities, which include new offload/onload sites and storage associated with Port commerce, are being evaluated through studies by the PANY/NJ and New York City Economic Development Corporation's (NYCEDC). Plan for the Redevelopment of the Port of New York" (in progress). Since these facilities would increase the potential for privately funded dredging activities, such as at berthing areas, they also influence the DMMP.

# 3 OPTIONS

## 3.1 Introduction

**a.** Scoping and extensive coordination over the last several years, have produced an array of options for managing dredged materials. The options under consideration are sediment contaminant reduction, sediment/dredging reduction, beneficial uses including: ocean remediation; habitat creation, enhancement and restoration, landfill, brownfield and mine remediation, and beach nourishment and construction related materials; decontamination, contained aquatic disposal facilities (pits), and confined disposal facilities (islands, nearshore, upland). Some of these basic options present a number of suboptions for managing dredged material. The DMMP is a comprehensive, flexible plan that includes multiple options and sites and will be subject to revision as different techniques/sites become available or as they drop out of consideration. For this reason additional site-specific NEPA documents will be completed and permits issued before any options, other than those already in use or permitted, can be implemented.

**b.** The descriptions of the options below are intended as brief summaries of the options that appeared in past NYD reports (1997, 1998) and have been updated to their current option status. They serve to describe each option for the reader in order to understand the impact assessment in Chapter 5. This chapter is not intended to provide a detailed description of each option. For such detailed descriptions, costs and comparisons of options the reader is referred to the DMMP and Technical Appendix (which accompanies this document). The summary tables of the DMMP provide convenient reference to the options. All options considered during the development of the DMMP have been included in this PEIS, even those no longer being proposed for use. The DMMP process included screening of all options for dredged material management and their ranking with respect to preference for use. (See DMMP Sections 1-4 and 1-5 for a discussion of the evaluation process and the ranking of options.) This PEIS will stress the preferred options, but includes all options in its analysis to compare the environmental impacts which were an important component in the ranking of options.

**c.** The options are grouped into alternatives which are potential courses of action for dredged material management. Grouping of the options is needed because no single option can provide for all of the dredged material that will be produced during the 40 year planning period. Four alternatives were developed for consideration:

- No Action
- Recommended Course of Action
- Environmentally Preferred Alternative
- Base Plan (Economically Preferred Alternative)

**d.** These alternatives are described in detail in Chapter 3 of the DMMP. Because management options are grouped in the alternatives, the assessment of the alternatives is presented in the cumulative impact section (5.6 Cumulative Impacts of Alternative Plans). The Recommended Course of Action alternative is divided into two time periods, a near term (2000-2010) in which substantial new navigation work may occur in the harbor as well as maintenance dredging and a long-term (2011-2040) when the majority of dredged material is from maintenance of facilities in place by 2010.

## 3.2 Actions by Others

**a.** Several initiatives have been undertaken by others to dredge certain facilities and/or manage dredged material. These initiatives include the dredging of Howland Hook and transport of the material from the Port to a permitted Resource Conservation and Recovery Act (RCRA) site in Utah, the excavation of a contained aquatic disposal pit in Newark Bay, and use of treated dredged material at the Jersey Gardens Mall site for base fill under a parking lot. The Seaboard Site (formerly Koppers Coke) is a brownfield under the management of S.K. Services. Part of the Seaboard Site is already on line, and has received 1.0 MCY of dredged material to date. The second phase for this old industrial site is contingent on final permitting. Landfill sites are permitted as private sites for the receipt of treated dredged material. The Orion Elizabeth New Jersey (OENJ) site in Bayonne, New Jersey is an inactive municipal landfill and encompasses a brownfield. The site was fully permitted in 1998 and awaits the first contract for dredged material. Additionally, Port facilities to aid in the offload/onload and storage of goods transported by vessels are currently in the planning phase. This may require some changes in the configuration of berthing areas and excavation and deposition of material. The entity conducting these efforts (Port Authority of NY/NJ) would be responsible for preparing the relevant NEPA documents and permit applications.

## 3.3 Management Options

**a.** The Corps and other government and private entities have investigated management options for dredged material over the past several years. Options cover an array of possibilities, ranging from contaminant reduction to construction of an island CDF. Due to the large volume of dredged material to be handled, implementation will involve multiple options either sequentially or concurrently. For the most part, selected options stress beneficial uses and back-up options stress safe containment. Large scale options that do not lend themselves to beneficial uses or contingency implementation (such as islands) have not been selected as part of the DMMP, but are still included here to provide a sufficient basis for the analysis and comparison of impacts in Chapter 5.

### 3.3.1 Sediment Contaminant Reduction

**a.** Contaminant reduction is a regionally based initiative with the goal of lowering contaminant levels in the sediments and biota of the New York/New Jersey Harbor. Dredged material that fails to meet EPA criteria for HARS (designated "non-HARS material in the DMMP") can be troublesome and costly to manage even though the levels of contaminants generally fall below standards for being subject to hazardous waste regulations. The NYD estimates that much of the dredged material from maintenance projects will not meet the criteria for HARS. As a result, the cost-per cubic yard to dispose of dredged material has increased substantially in recent years due to the presence of contaminants.

**b.** These sediments are contaminated as a result of a complex history of pollution events that have occurred over decades. Currently the volume of Federal and non-Federal maintenance material that is unsuitable for HARS averages approximately 1.9 MCY per year.

**c.** Dramatic decreases in sediment contamination from 1960s levels have been documented in some areas of the harbor. If trends toward cleaner sediments were to continue, or if reductions were duplicated in other areas of the harbor, significant reductions in the amount of non-HARS dredged material would be realized. This in turn would have profound effects on the long-term cost of dredging, on selection and siting of management options, on Port planning decisions, and on overall environmental restoration efforts.

**d.** Data are currently insufficient to reliably characterize contaminant trends for the entire harbor. The inability to accurately predict future contaminant levels constrains the region's ability to plan and budget for future needs. The contaminant reduction program would address this need through a comprehensive data gathering effort to identify and track down sources of pollution. Bi-state monitoring and source track down programs coordinated through the Contaminant Assessment and Reduction Program of HEP began in the summer/fall of 1998 and will continue through at least 2001. This is the first phase of the long-term control effort.

**e.** An accurate assessment of how much dredged material is unsuitable for HARS is essential to a successful dredged material management program. The collection and analysis of additional data would provide the basis for more reliable estimates and an important management tool for ongoing DMMP work.

**f.** These estimates would in turn facilitate the implementation of shorter term and lower capital cost dredged material management options compared to the current plan. As new information on contaminant sources and distributions becomes available, it would be incorporated into the contaminant reduction program and the DMMP. Because this program can increase the volume of dredged material that can be used beneficially, often at reduced cost, this option is strongly supported as a keystone of the DMMP.

**g.** To meet the program goals, existing regulatory enforcement and improved remediation programs will be needed. Four main techniques have been identified to reduce contaminants: (1) elimination of point source discharge, (2) control and treatment of combined sewer overflows, (3) sewage treatment plant upgrades, and (4) removal or isolation of contaminated sediment hot spots.

### 3.3.2 Sediment/Dredging Reduction

**a.** Sediment/dredging reduction focuses on the *amount* of sediment that settles within the navigation channels and must be subsequently dredged. Sediment reduction would reduce the frequency of dredging and disposal operations necessary to maintain channels at authorized depths. Sediment reduction strategies takes four forms: watershed sediment reduction controls, channel design optimization, advanced maintenance dredging and structural modification.

**b.** Watershed sediment reduction controls are specific strategies to reduce the amount of sediment reaching a waterbody. Techniques include the implementation of Best Management Practices (BMPs) and Total Maximum Daily Loads (TMDLs) which are designed to reduce the volume of sediment laden runoff from agricultural lands, redirecting runoff to collection basins or to previous surfaces where infiltration to the groundwater can occur and protecting and reinforcing steep slopes and stream banks.

**c.** Channel design optimization involves decreasing the sedimentation rate within the channel by re-engineering and straightening the channels. This process, called channel realignment, increases water velocity within the channel. As a result, a larger amount of suspended sediments are entrained in the water column, causing a decrease in the amount of material that settles out.

**d.** Advanced maintenance dredging is a means of reducing dredging cost and frequency over the short term by dredging below the authorized channel depth. Sediment settling in the channel will eventually fill the channel to authorized depth, increasing the time between required maintenance dredging activities. A reduction in frequency of deployment of dredging equipment reduces costs. The decreased frequency of dredging may also reduce short term, localized environmental impacts likely to be associated with more frequent dredging.

**e.** Structural modifications are physical or mechanical devices designed to keep sediment moving through (instead of settling in) a channel, or even to prevent sediment from entering the channel or berth area. Typical structures include flow training dikes and sills, gates and curtains, pneumatic sediment suspension systems, and sedimentation basins.

### 3.3.3 Beneficial Uses

## 3.3.3.1 Ocean Remediation

### 3.3.3.1.1 Historic Area Remediation Site

**a.** On August 28, 1997, USEPA closed the Mud Dump Site (MDS) and designated it as part of the Historic Area Remediation Site (HARS). The HARS consists of the former MDS and surrounding areas that have been impacted by previous disposal actions (Fig. 3-1).

**b.** Remediation of the HARS will be through the use of dredged materials that meet the current Category I standards (HARS suitable material) and that will cause no significant undesirable effects, including bioaccumulation. USEPA is now performing a public and scientific peer review process of the HARS dredged material testing evaluation framework. Although this may result in the revision of standards, for the purposes of the DMMP, it is assumed that current criteria for the suitability of dredged material for HARS will remain unchanged through the DMMP timeframe.

**c.** Based on the placement of a one meter thick cap in the priority remediation area, the HARS has a remaining capacity of at least 38.3 MCY. On the basis of current DMMP projections, HARS remediation could be completed by the end of the next decade. Monitoring of the site by NYD and EPA could result in expanding the capacity of HARS due to a number of factors including consolidation of the cap material or the need for a thicker cap in selected areas. Other management factors might also warrant future adjustments.

### 3.3.3.1.2 Additional Ocean Remediation

**a.** As contaminant reduction progresses, the volume of HARS suitable material will increase. A portion of this material may be appropriate for other beneficial use alternatives such as beach nourishment, or nearshore and inland habitat restoration. However, in time, the volume of HARS suitable material might exceed the capacity for these uses.

**b.** In response to such an increase and the successful use of dredged material for remediation at the HARS, consideration may be given to the identification of other degraded areas (e.g., acid waste, sewage sludge) of the Bight for remediation with HARS suitable material.

## 3.3.3.2 Habitat Creation, Enhancement, and Restoration

**a.** Many types of dredged material from the Port of New York/New Jersey (including selected use of non-HARS material) can be used for habitat improvement. Although these beneficial uses may not have the capacity for handling all of the dredged material derived from the harbor, the volume used (if all feasible applications were exploited fully) is significant. Examination of sites would determine suitability. Only if analyses determined that a net habitat benefit would result from an application, would implementation be pursued.

**b.** Potentially feasible applications in the estuary include upland restoration (particularly landfill cover and intermediate fill, brownfield remediations and mine and quarry reclamation), filling degraded basins and pits, creating or restoring wetlands for water quality treatment and habitat, and creating or restoring other aquatic habitats, such as artificial reefs with dredged rock. Dredged material may also be used to create oyster reefs, bird habitat, shellfish habitat and mud flats.

**c.** These options provide an important opportunity to improve or restore environmental resources that have been severely impacted by over 300 years of human manipulation of local ecosystems. The beneficial use of dredged material is one of the primary goals of the HEP, as is habitat creation and restoration. However, for this option to make use of a substantial portion of dredged material, it would require the acceptance of containment to safely isolate non-HARS material under a cap of HARS suitable material. In some cases it would also require selective conversion among habitat types, that is, the elimination of an existing habitat and replacement with a restored habitat that is more valuable to the local ecosystem.

**d.** Any use of non-HARS suitable dredged material for habitat creation, enhancement, and restoration will be limited to appropriate habitat improvement applications. Non-HARS material will not be considered for reef construction, oyster or other shellfish habitat creation. When the use of non-HARS material is possible (i.e., treatment and habitat wetlands, borrow pit restoration, upland habitat restoration, mud flats, recontouring, filling dead-end basins, bird habitat) special conditions would apply to prevent exposure of the non-HARS material to the environment. Non-HARS material would only be used for base material in these cases and would be adequately contained and capped with HARS suitable material (or other material such as Pleistocene sediments determined by EPA to be acceptable for that use). Small scale test projects would be conducted to validate the application technique prior to widespread use of a selected methodology.

**e.** The restoration of dredged borrow pits in Jamaica Bay and Lower Bay has the potential to accommodate a large volume of dredged material, but the environmental impacts of such filling needs to be determined. Studies involving Norton Basin and Little Bay in Jamaica Bay (Fig. 3-2) are included as preferred options within beneficial use to permit an evaluation of this approach. These areas and any other pits subsequently proposed for use, would have to be surveyed first to establish their level of use and community type. Further work would only take place if it were confirmed that the pit habitat was degraded and could benefit from filling. The projects would entail the use of HARS suitable material at Norton Basin then, after successful implementation, the use of non-HARS material at Little Bay incorporating capping with HARS suitable material. Intensive biological and physical investigations of both baseline and post-filling conditions would be conducted. The results of the Jamaica Bay projects would be evaluated and successful placement and containment as well as a net environmental benefit would have to be shown before expansion of the concept to larger pits in Jamaica Bay. The results of the Jamaica Bay tests would provide a baseline for evaluating this concept for degraded pits in the more open-waters of Lower Bay. The first application of this concept in Lower Bay would involve surveys to establish current levels of use and value of the two Hoffman-Swinburne pits. These small pits are ideal for test purposes and initial surveys show they contain stressed benthic communities. Only after surveys confirm their degraded condition would there be a project with HARS suitable material in the northern pit at Hoffman-Swinburne Islands. This would be followed by a project using non-HARS material at the southern pit in this area, if the test at the northern pit was successful. Additionally, consideration has been given to the West Bank and CAC pits (Fig. 3-3; see DMMP Table 2-2 for preference and status) for restoration in the future.

### 3.3.3.3 Landfill, Brownfield, and Mine Remediation

**a.** Land remediation combines the beneficial use of treated non-HARS material with the environmental and economic restoration of degraded lands. Land remediation would use treated dredged material for landfill and brownfield cover, and for reclamation of quarries and abandoned mines. Brownfields are former industrial/commercial facilities where expansion or redevelopment is complicated by environmental contamination. Examples include the New Jersey Garden Mall site and the Seaboard site in Kearny, New Jersey.

**b.** Land remediation, including mine reclamation, is a desirable option for several reasons: (1) it would target sites that in their present condition pose a risk to the environment and human health; (2) it would lead to a reduction in material that would otherwise have to be disposed of without beneficial use; and (3) the dredged material would be confined to a site that is already impacted and that is monitored for water quality and other environmental parameters. In addition, these sites generally incorporate other environmental controls, such as leachate collection systems, slurry walls and pump and treat systems as part of an overall remediation plan.

**c.** Due to its inherent high water content, use of dredged material requires that some treatment action be taken prior to its use to lower the amount of water in the material. Methods to accomplish this include natural drying, mechanical drying, or amending or processing with binding agents. Also, the use of binding agents prevents loss of contaminants off site, and other additives may improve the ability of the material to meet design criteria if the site is to be developed after remediation is complete.

**d.** Quarries were investigated as part of the land remediation aspect of beneficial use. These types of sites have substantial capacities because of the large excavated areas at most locations. Six potential quarry sites were located along the Hudson River waterfront between New York City and Albany, but these sites had permitting and environmental limitations that relegated them to non-preferred status. The Hunterdon Quarry in New Jersey has a large potential capacity, but only for HARS suitable, sandy material. Hunterdon has a preferred status pending evaluation and design studies. The sand would be washed to remove salts prior to transportation to the quarry.

## 3.3.4 Decontamination Technologies

**a.** The goal of decontamination technologies is the reduction, removal or immobilization of contaminants. This may be achieved through physical, chemical, thermal and/or biological processes. Not all non-HARS dredged material requires decontamination because the vast majority of sediments are generally not hazardous. Decontaminated material can have broader applications at a wider variety of placement sites than processed dredged material.

**b.** Developing processes that will be cost-effective is one of the challenges of this option. Low-end processes are relatively simple and inexpensive. They include solidification/stabilization and manufactured topsoil production and are generally applied to materials used for land remediation. High-end processes are typically more expensive, complex, and energy-intensive. These include solvent extraction, sediment washing, and thermal processes. Expanding the scope of a process beyond small-scale pilot studies will help drive down costs. High end processes create a value added market product (e.g., lightweight aggregate), which would tend to offset the higher costs of these processes. Other concerns related to this option include the ability to process and use the large volumes of material in a manner that is compatible with the environment and acceptable to the local communities where facilities would be located.

**c.** Two high-end processes were selected by EPA and USACE for commercial-scale demonstrations under the Section 405 of WRDA 1992, as amended in WRDA 1996 decontamination program: a sediment-washing process that makes clean fill or soil, and a thermochemical process that makes blended cement. These demonstrations are expected to expand from initial pilot scale volumes of 700 and 500 CY to full-scale volumes of 250,000 and 150,000 CY/yr, respectively.

**d.** PANY/NJ and New Jersey Maritime Resources (NJMR) are also conducting test programs on sediment decontamination technologies. The PANY/NJ is currently evaluating treatability studies of four processes that produce construction materials such as aggregate and flowable fill. In late 1999, NJMR will commence pilot testing (30,000-150,000 CY) and a demonstration of five selected technologies. The volume target set by NJMR is to treat and stabilize 500,000 CY per year. This is the same target set for the EPA and NYD Section 405 program, which is coordinating closely with the NJMR effort. Achievement of these targets would substantially reduce the annual volumes of non-HARS material and open up substantial opportunities for beneficial uses.

**e.** The decontamination option will generally require a treatment facility and storage/ handling areas to hold material while it awaits processing or before it is shipped to its final use destination. Decontamination facilities can be sited at or near dredging sites and could be portable or permanent. A permanent facility provides for a greater processing capability and would be expected to offer the most cost-effective operation.

## 3.3.5 Confined Aquatic Disposal Facilities

**a.** A confined aquatic disposal (CAD) facility is a depression excavated into the bottom of a body of water for the purposes of disposing and confining dredged material. This option includes the construction of CAD facilities either outside channels or within channels (sub-channel CAD facilities) (Fig.s 3-4, 3-5, and 3-6).

### 3.3.5.1 CAD Facilities Outside of Channels

**a.** Sequencing the use of CAD facilities over many years instead of excavating one large pit could provide the flexibility to respond to shortfalls in the availability of other options, as well as responding to changes in sediment quality that may come about as a result of contaminant reduction or decontamination. This approach would ensure that the area disturbed was kept to a minimum and that the recovery of each pit site after capping would be underway as additional pits are added on an as needed basis. The first such facility in the harbor was constructed in Newark Bay by the PANY/NJ and is capable of holding up to 1.5 MCY of non-HARS material. Two other smaller pits were permitted but have not yet been constructed.

**b.** Other areas have been identified with a potential added capacity of up to 7 MCY for Upper Bay pits outside channels, while in Newark Bay, the potential capacity for out-of-channel pits is 16 MCY. Establishing CAD facilities in nearshore areas such as these can help reduce substrate contamination and keep contaminated sediments close to their existing source. For this reason they serve as contingency option in the event one or more of the preferred beneficial use options are not available (see DMMP Table 2-2 for the Preference and Status ranking of these potential CAD facilities). Constraints include the depth of contaminated sediment and the depth to bedrock, both of which can severely restrict the capacity of the sites.

**c.** The potential for this type of CAD facility has also been investigated in both Lower Bay and Raritan Bay. Zone 2 at roughly 12 square miles in Lower Bay (Fig. 3-4), has been identified as a potential new pit area with a capacity for 100 MCY or more (see DMMP Table 2-2 for preference and status). Based on feedback from various resource agencies, CAD facilities in Raritan Bay (Zone 1) are not considered feasible, due to concerns about biological impacts. Zone 2 while located some distance from the significant habitat complex of the Raritan and Sandy Hook Bays, is of concern regarding permanent loss of bay bottom with no in-kind mitigation for the loss. This option, therefore, is considered the least desirable of feasible CAD alternatives. The feasibility of using Zone 2 would be evaluated further before it would be implemented.

#### 3.3.5.2 Sub-Channel CAD Facilities

**a.** A variation on the CAD option is the construction of pits within (beneath) an existing channel. This option involves placing dredged material in an area excavated below currently authorized or maintained depths within an existing channel or berthing area. Once the material has been placed, it can be left to be capped by natural sedimentation processes, or it can be capped with a suitable material brought from elsewhere. Sub-channel CAD facilities for the DMMP would be used as a contingency only if no other cost-effective disposal methods with comparable production rates were available.

**b.** Several advantages of sub-channel CAD facilities include: (1) habitat disturbance to other areas would be minimized because it would be limited to areas already subject to periodic disturbance from maintenance dredging; (2) introduction of non-HARS material to other areas would be reduced; (3) dredging operations can be optimized and costs reduced because transportation distances would be shortened. Potential disadvantages are: (1) effects on future channel deepening and turbidity associated with heavy vessel traffic including deep draft vessel disturbance to material placed in those facilities and (2) side slope excavation if very deep pits are needed which have potential adverse impacts on the biota and cultural resources.

**c.** The total volume available for sub-channel facilities within the Upper Bay is estimated at 8.5 MCY. In Newark Bay there is a potential capacity of 10 MCY in sub-channel facilities.

## 3.3.6 Confined Disposal Facilities

**a.** A confined disposal facility (CDF) involves the construction of dikes or other retention structures to contain dredged material, thereby isolating it from exposure to the environment. Once filled, a CDF is typically capped with clean material that permanently isolates it from the environment. A CDF may be built on land, nearshore (attached to the shoreline), or as an island.

### 3.3.6.1 Upland CDFs

**a.** Construction of an upland CDF would require the construction of dikes or other retention structures. Material placed in an upland CDF would be placed for disposal only, not for site remediation. A liner and stormwater runoff collection system may be required, depending on the characteristics of the chosen site.

**b.** Tests would be carried-out as required on the liquid fraction of the dredged material. Adjacent surface and ground water would be monitored as necessary, to ensure that the material is properly contained. Based on feedback received from the public, local officials, and state representatives, all potential upland CDF previously identified sites have been dropped from further consideration at the present time.

### 3.3.6.2 Nearshore CDFs

**a.** Nearshore CDFs have at least one side contiguous to land. Nearshore CDFs may be used for the purposes of habitat remediation in existing degraded areas or for Port development. The cost of nearshore CDFs is dependent upon the site, its end use, and its level of required mitigation. Environmental concerns with this option include the permanent loss of nearshore aquatic habitat.

**b.** Given the limited available area in the inner harbor, the total nearshore CDF capacity currently under consideration is less than 5 MCY. Only four sites have been identified for potential nearshore CDF construction. These sites include: Long Slip Canal (Hoboken, New Jersey), River Terminals (Kearny, NJ), Atlantic Basin (Brooklyn, NY) and South Brooklyn Piers (Brooklyn, NY). Of these sites, Atlantic Basin has the highest potential capacity, approximately 1.77 MCY.

### 3.3.6.3 Island CDFs

**a.** Islands CDFs result in the loss of ocean and bay bottom and the water column occupied by the fill and retaining structure. Due to the potential for significant coastal storms in this region, the containing structure of an island CDF would be designed to withstand extreme conditions so as to prevent loss of placed material. Because this type of CDF is relatively expensive to construct, it is generally used for dredged material disposal over many decades in order to increase cost-effectiveness.

**b.** A preliminary engineering and environmental siting process has identified potential island CDF sites in the Lower Bay of New York Harbor and in the New York Bight Apex (Figs. 3-7 and 3-8). However, given the substantial environmental, social, and institutional concerns likely to be associated with construction of an island CDF in either location, it has been classified as a non-preferred option and is no longer under consideration as a feasible DMMP option.

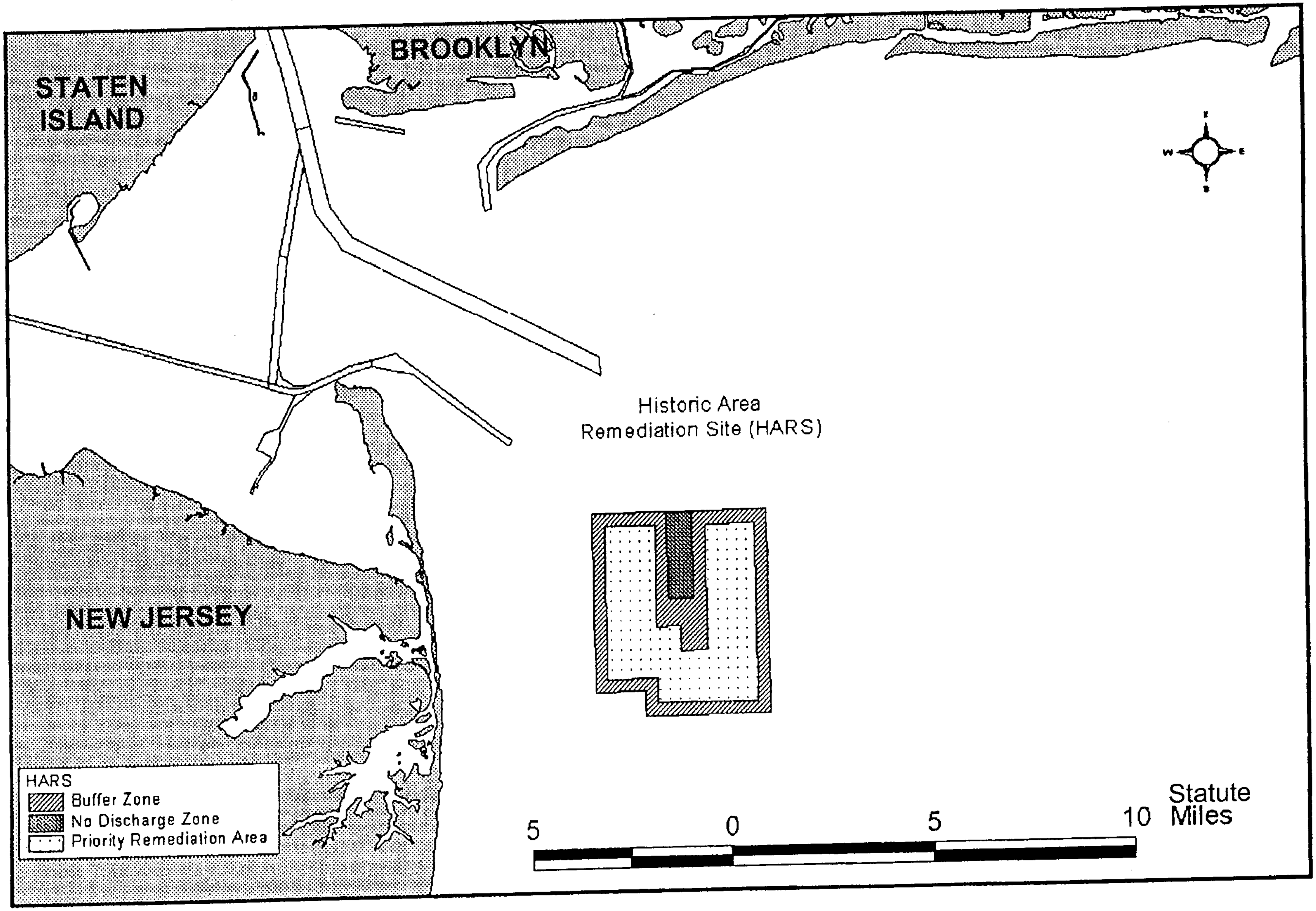


Figure 3-1. Historic Area Remediation Site

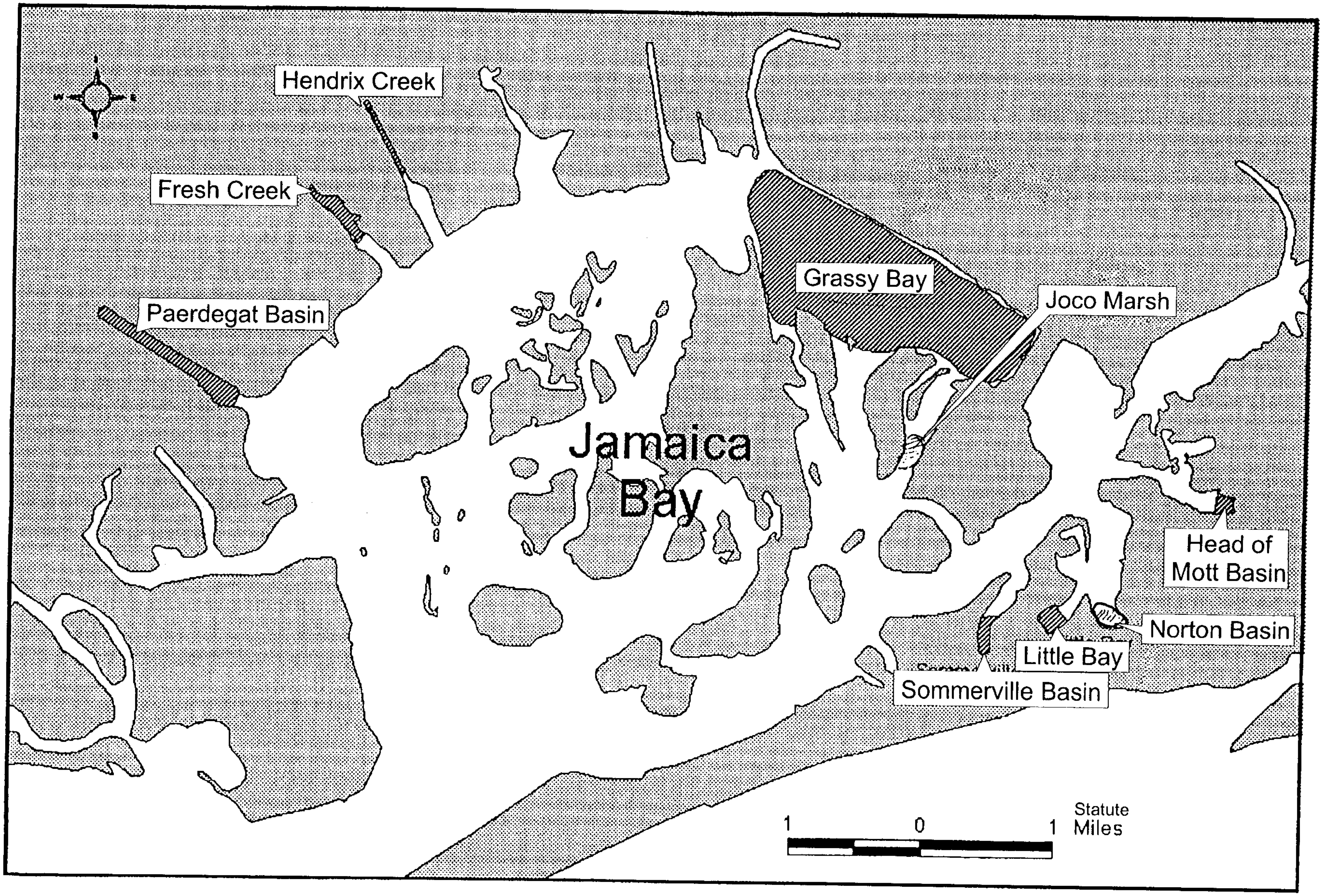


Figure 3-2. Jamaica Bay Zones for Potential Aquatic Restoration

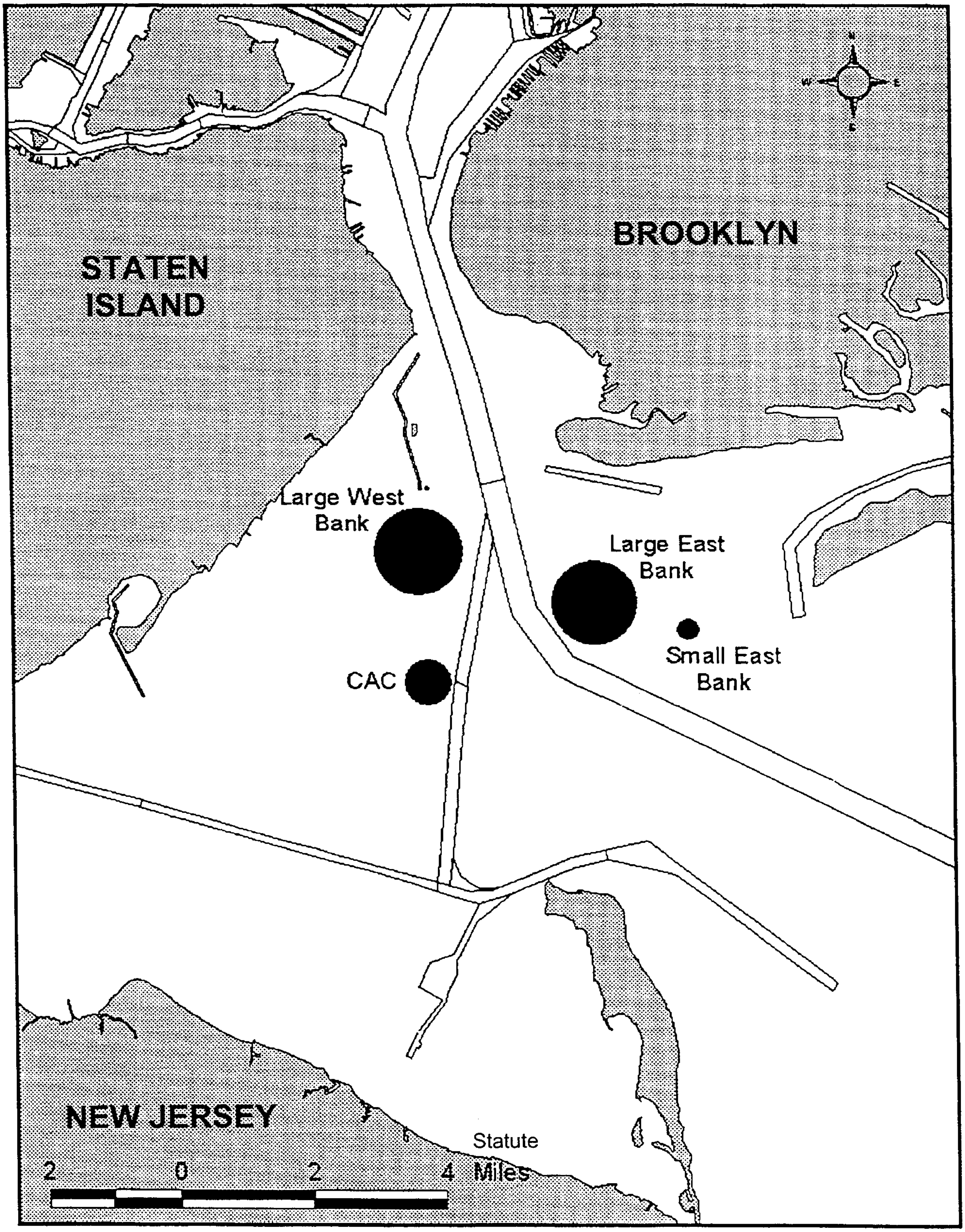


Figure 3-3. Existing Pits in the Lower Bay Complex

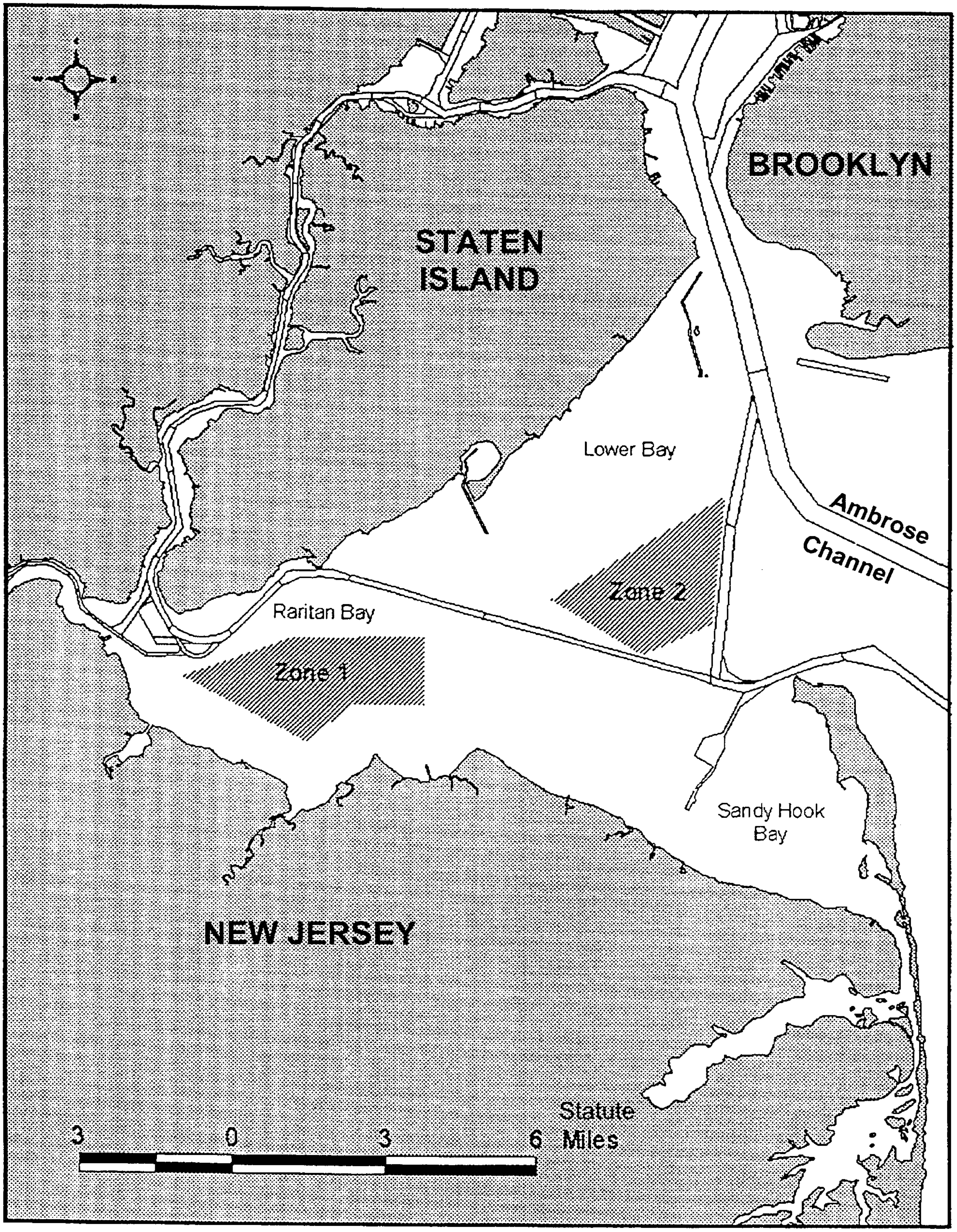


Figure 3-4. Siting Zones for New Pits in the Lower Bay Complex

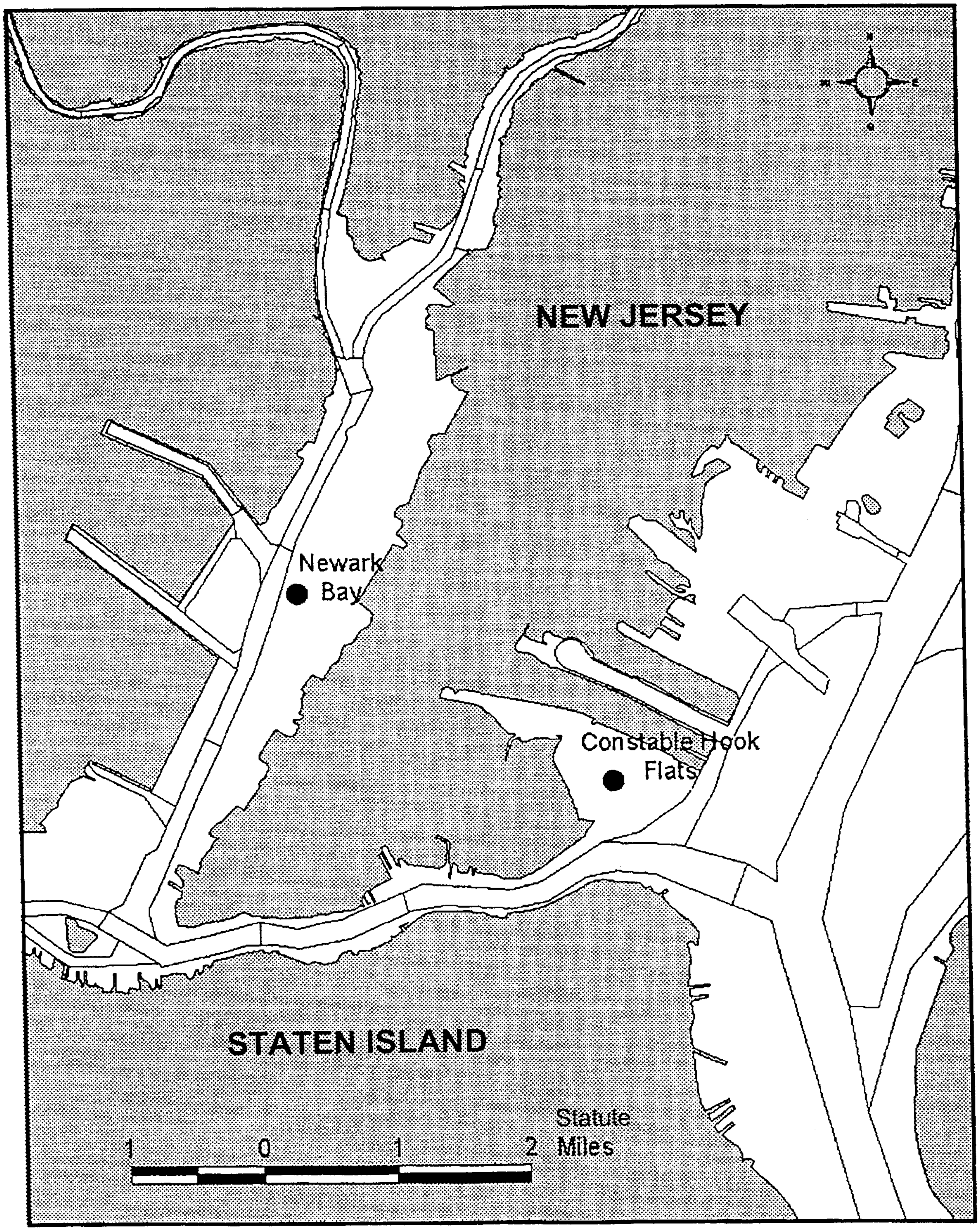


Figure 3-5. Siting Zones for New Pits in the Upper Bay Complex

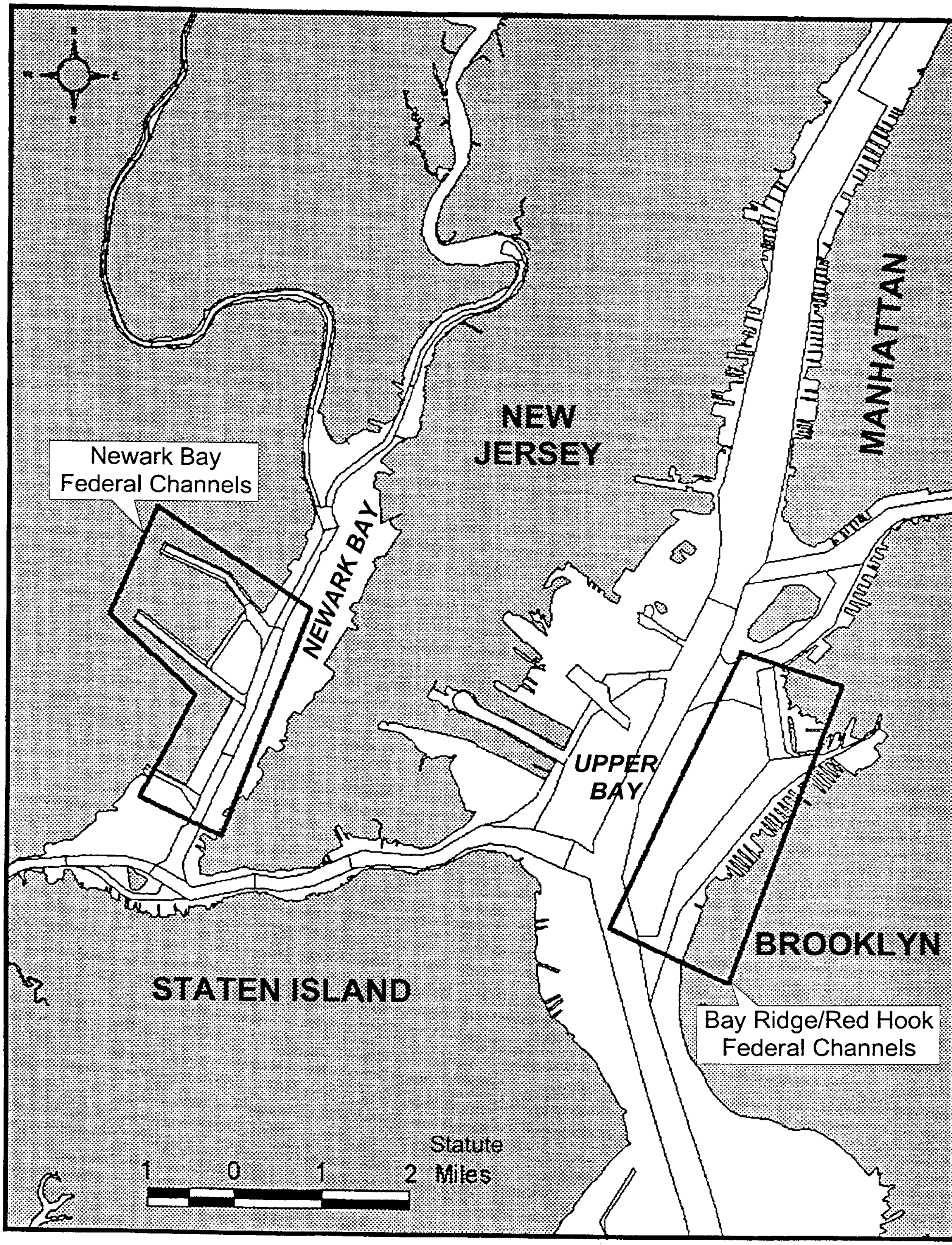


Figure 3-6. Potential In-channel Placement Pits – Upper Bay Complex

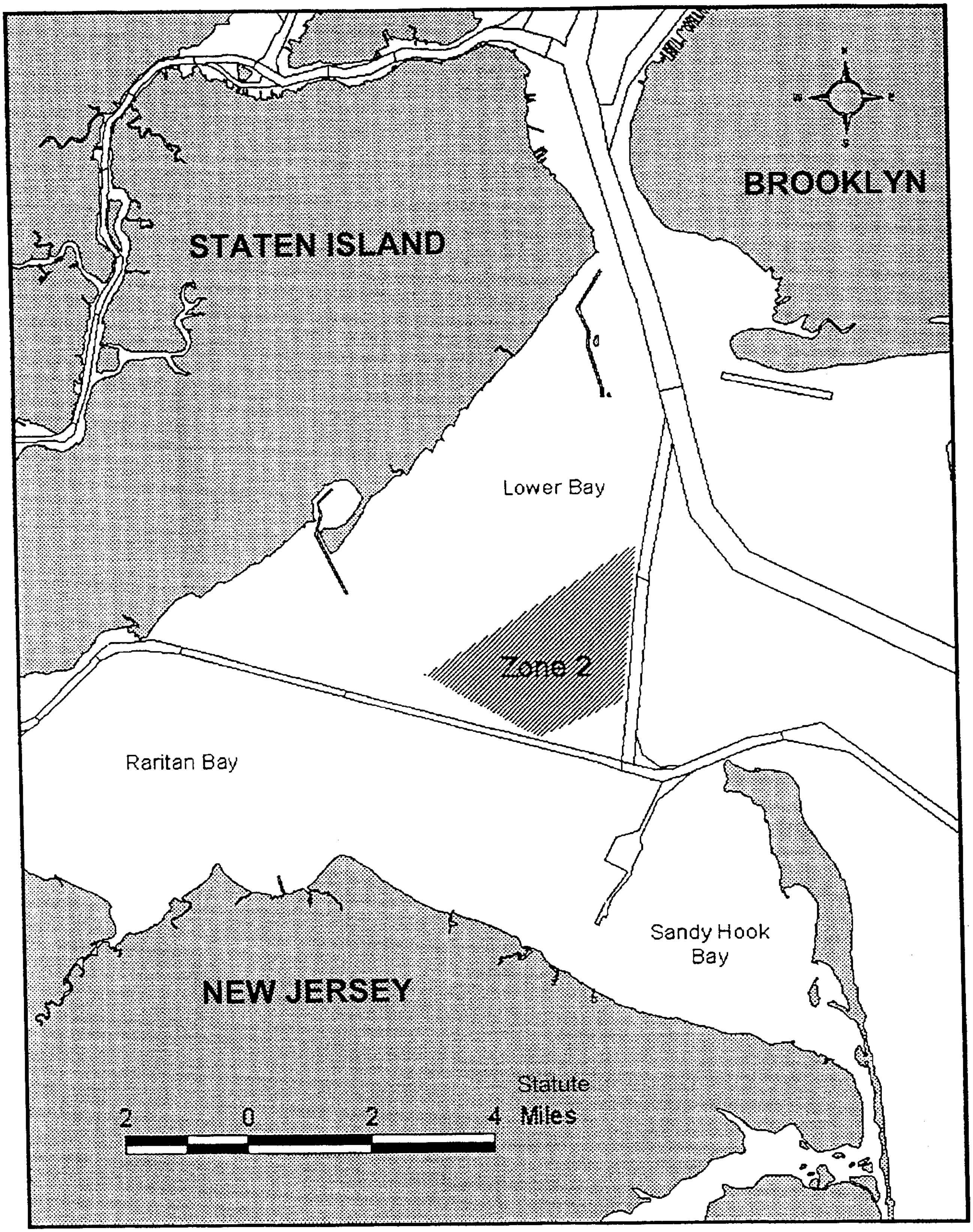


Figure 3-7. Siting Zone for a Bay Island

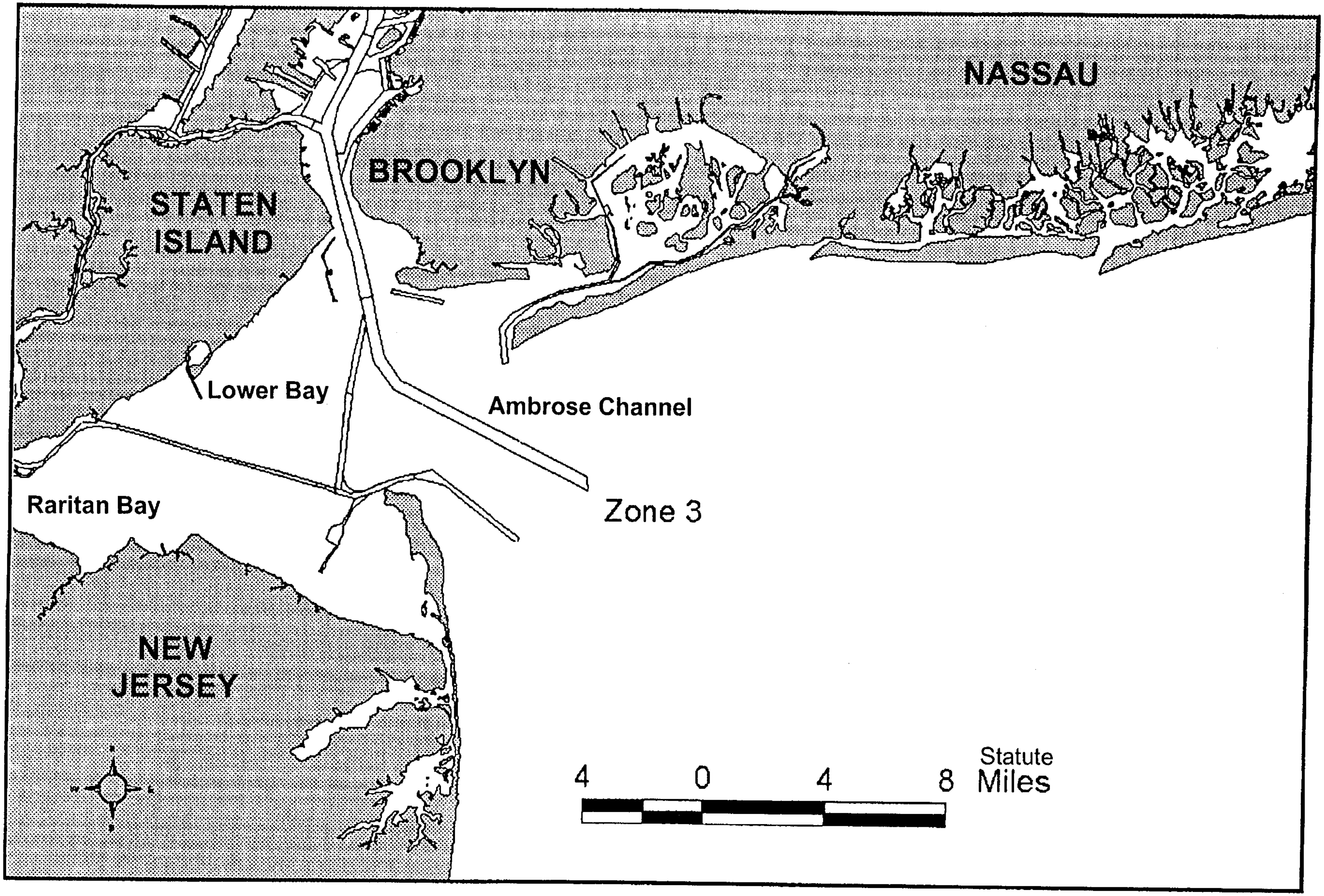


Figure 3-8. Siting Zone for an Ocean Island