PUBLIC NOTICE

US Army Corps
of Engineers
New York District
Jacob K. Javits Federal Building
New York, N.Y. 10278-0090
ATTN: Regulatory Branch

In replying refer to:
Public Notice Number: 2004-01167-OD
Issue Date: 18 February 2005
Expiration Date: 23 March 2005

To Whom It May Concern:

The New York District of the U.S. Army Corps of Engineers has received an application for a Department of the Army authorization pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403), Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 103 of the Marine Protection, Research & Sanctuaries Act of 1972, as amended (33 USC 1413).

APPLICANT: State of New Jersey
Department of Transportation
Office of Maritime Resources
1035 Parkway Avenue
3rd Floor MOB,
P.O. Box 837
Trenton, NJ 08625

ACTIVITY: Mechanical dredging to deepen the existing Port Jersey navigation channel to provide a fifty-foot channel. Dredged materials will be beneficially used in different ways. Some will be used as remediation materials for the Historic Area Remediation Site (HARS) in the Atlantic Ocean. Rock dredged material will be used to enhance the existing Axel Carlson artificial reef site in the Atlantic Ocean. Some of the dredged material will be used to create a habitat enhancement area located within the existing unused portion of the navigation channel on the south side of the former Military Ocean Terminal at Bayonne (former MOTBY), now known as The Peninsula at Bayonne Harbor. Dredged materials inappropriate for aquatic placement will be beneficially used on a State of New Jersey approved upland site.

WATERWAY: Port Jersey Navigation Channel; Upper Bay of New York and New Jersey Harbor-Estuary; Historic Area Remediation Site (HARS) in Atlantic Ocean;

LOCATION: Jersey City and the City of Bayonne, Hudson County, New Jersey.

A detailed description of the proposed work and drawings of the applicant's proposed activity are enclosed to assist in your review.

The U.S. Army Corps of Engineers neither favors nor opposes permit issuance for the applicant's proposed activity. The purpose of this public notice is to solicit comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order

for the U.S. Army Corps of Engineers to acquire information which will be considered in our evaluation of the impacts of this proposed activity. Any comments received will be considered by the U.S. Army Corps of Engineers to determine whether to issue, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an environmental assessment and/or an environmental impact statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

The decision whether to issue a Department of the Army permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general the needs and welfare of the people. This activity is also being evaluated to determine that the proposed placement of dredged material will not unreasonably degrade or endanger human health, welfare or amenities, the marine environment, ecological systems or economic potentialities. The decision of whether to issue a Department of the Army Permit for placement of dredged materials as Remediation Materials at the Historic Area Remediation Site (HARS) in the Atlantic Ocean, and at the ocean reef site, will also be based on whether the material meets the requirements of applicable implementing regulations.

On September 26, 2000, the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers signed a joint Memorandum of Agreement outlining the steps to be undertaken to ensure that remediation of the Historic Area Remediation Site (HARS) continues in a manner appropriately protective of human health and the aquatic environment. In making the determination for evaluating placement of dredged material, the criteria established by the U.S. Environmental Protection Agency will be applied, including the interim change to one matrix value for polychlorinated biphenyls (PCB's) as described in the joint Memorandum of Agreement. In addition, based upon an evaluation of the potential effect which the failure to utilize this ocean site will have on navigation, economic, and industrial development, and foreign and domestic commerce of the United States, an independent determination will be made regarding the need to place the dredged material in ocean waters, other possible methods of disposal, and other appropriate locations.

ALL COMMENTS REGARDING THE PERMIT APPLICATION MUST BE PREPARED IN WRITING AND MAILED TO REACH THIS OFFICE BEFORE THE EXPIRATION DATE OF THIS NOTICE, otherwise, it will be presumed that there are no objections to the activity.

Any person may request, in writing, before this public notice expires, that a public hearing be held to collect information necessary to consider this application. Requests for public hearings shall

state, with particularity, the reasons why a public hearing should be held. It should be noted that information submitted by mail is considered just as carefully in the permit decision process and bears the same weight as that furnished at a public hearing.

The proposed action was reviewed based upon the "Biological Assessment for the Closure of the Mud Dump Site and Designation of the Historic Area Remediation Site (HARS) in the New York Bight and Apex," (USEPA, 1997). Based upon this review, and a review of the latest public listing of threatened and endangered species, it has been preliminarily determined that the proposed placement activities for which authorization is sought herein, are not likely to adversely affect the following federally threatened or endangered species (humpback whales, finback whales, right whales, loggerhead turtles, leatherback turtles, green turtles, and Kemp's ridley turtles), or their critical habitat pursuant to Section 7 of the Endangered Species Act (ESA; 16 USC 1531). It is our preliminary determination that the dredging and habitat enhancement activities in the Upper Bay of the New York and New Jersey Harbor-Estuary are not likely to affect the shortnose sturgeon (Acipenser brevirostrum) or its critical habitat. The U.S. Army Corps of Engineers New York District Regulatory (Permits) Branch is currently conducting informal consultations with the National Marine Fisheries Service in accordance with Section 7 of the Endangered Species Act. Those consultations will be completed before a final permit decision is made.

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Information on conditions at the project sites and on the proposed work that would be undertaken is given in the attached Description of Proposed Work. A preliminary review of the proposal and information submitted by the applicant indicates that the overall potential impact on Essential Fish Habitat for designated species is very small because of the temporary nature of the disturbance, the lack of specialized habitat in the area, and that most Essential Fish Habitat designated species are in low abundance in the project area because they are normally in transit through the area. Among the list of Essential Fish Habitat (EFH) designated species known to occur at the dredging and habitat enhancement sites, the most likely species to be impacted would be spawning and early-life stage development (nursery) habitat for winter flounder. The primary effects on Essential Fish Habitat (EFH) (and EFH-managed species) would be a temporary increase in turbidity due to dredging and habitat enhancement activities and disruption of demersal and pelagic habitat. Upland beneficial reuse of dredged materials would not have any effect on Essential Fish Habitat (EFH).

Impacts to Essential Fish Habitat (EFH) species at the Historic Area Remediation Site (HARS) would most likely emanate from the settling of the dredged material for remediation through the water column to the bottom. These events would also be short-lived and be episodic in nature over the several months the proposed placement at the Historic Area remediation Site (HARS) would take. The overall potential impact for all the work proposed at the Historic Area Remediation Site (HARS) on Essential Fish Habitat (EFH) for designated species is small because of the temporary nature of the disturbance, the low abundance of most species for which this region is designated as Essential Fish Habitat (EFH), and the apparent lack of viable existing conditions.

Based upon the foregoing, the U.S. Army Corps of Engineers New York District Regulatory (Permits) Branch has made the preliminary determination that the site-specific adverse effects are not likely to be substantial. Therefore, the Essential Fish Habitat (EFH) Assessment does not recommend mitigation for the proposed impacts. However, consultation with the National Marine Fisheries Service regarding Essential Fish Habitat (EFH) impacts and conservation recommendations is being conducted and will be concluded prior to a final permit decision.

Even though Essential Fish Habitat (EFH) mitigation does not appear to be required, studies of existing, unused segments of the navigation channel on the south side of the former Military Ocean Terminal at Bayonne (former MOTBY) indicates that an opportunity exists there to beneficially use some of the Historic Area Remediation Site (HARS) suitable dredged material from the navigation channel deepening to enhance the habitat conditions there for the Upper Bay of the Harbor-Estuary. The proposed use of Historic Area Remediation Site (HARS) suitable dredged material for habitat enhancement in the navigation channel on the south side of the former Military Ocean Terminal at Bayonne (former MOTBY) will not negatively impact any Essential Fish Habitat (EFH) or designated Essential Fish Habitat (EFH) species. It has been designed to be beneficial to winter flounder when compared to the existing conditions presently found there. The applicant includes in their project this practicable beneficial use alternative for some of the Historic Area Remediation Site (HARS) suitable dredged material in order to enhance habitat for winter flounder. The ongoing consultation with the National Marine Fisheries Service regarding Essential Fish Habitat (EFH) mentioned above includes this habitat enhancement element of the applicant's project.

Based upon a review of the latest published version of the National Register of Historic Places, the only known wrecks on or eligible for inclusion on the National Register are two located in Primary Remediation Area Number 1 of the Historic Area Remediation Site (HARS). As noted in the designation of the Historic Area Remediation Site (HARS), dredged material for remediation will not be allowed to be placed within 0.27 nautical miles of the identified wrecks or other wrecks that might be found. Otherwise, there are no known sites eligible for, or included in, the National Register within the proposed permit area.

The U.S. Army Corps of Engineers New York District Regulatory (Permits) Branch has completed a draft Clean Air Act Statement of Conformity (draft SOC) and has determined that the proposed permitting action will meet general conformity requirements (pursuant to 40 CFR §93.150-160) and that the nitrogen oxide (NOx) emissions associated with the federal action (permitting) will be fully offset by reductions coming from the repowering of local New York and New Jersey Harbor-Estuary based tugboats with cleaner operating engines. The Port Authority of New York & New Jersey is performing the tugboat repowering for the permit applicant. The draft Clean Air Act Statement of Conformity (draft SOC) is available at www.nan.usace.army.mil, and by mail from the U.S. Army Corps of Engineers, New York District, Regulatory (Permits) Branch [CENAN-OP-RW] ATTN: Mr. Brian Orzel, 26 Federal Plaza, New York, N.Y. 10278-0090, facsimile machine number 212-264-4260.

Reviews of the activity pursuant to Section 404 of the Clean Water Act will include application of the guidelines announced by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act. The applicant will obtain a water quality certificate or waiver from the appropriate state agency in accordance with Section 401 of the Clean Water Act prior to any final permit decision.

Pursuant to Section 307(c) of the Coastal Zone Management Act of 1972 as amended [16 USC 1456(c)], for activities under consideration that are located within the coastal zone of a state which has a federally approved coastal zone management program, the applicant is responsible for ensuring that the proposed activities are undertaken in a manner that is consistent with, to the maximum extent practicable, the approved state coastal zone management program. By this public notice, we are requesting the state's views on the consistency of this project with the State's approved CZM Program. For activities within the coastal zone of the State of New Jersey, the applicant's certification and accompanying information is available from the New Jersey Department of Environmental Protection, Bureau of Coastal Regulation, CN 401, 501 East State Street, Second Floor, Trenton, New Jersey 08625-0401, Telephone Number (609) 633-2289. Comments regarding the applicant's certification and copies of any letters addressed to this office commenting on this proposal should be so addressed.

In addition to any required water quality certificate and coastal zone management program concurrence, the applicant has obtained or requested the following governmental authorization for the proposed activity under consideration:

A Waterfront Development Permit
from the State of New Jersey Department of Environmental Protection

It is requested that you communicate the foregoing information concerning this activity to any persons known by you to be interested and who did not receive a copy of this notice.

If you have any questions concerning this permit application, you may contact this office by telephone at 917-790-8413 or 212-264-0183 and ask for Mr. Brian Orzel. Comments or questions may also be FAXED to 212-264-4260, ATTN: Mr. Brian Orzel.

Questions about the Historic Area Remediation Site (HARS) can be addressed to Mr. Douglas Pabst, Team Leader, Dredged Material Management Team, U.S. Environmental Protection Agency Region 2 at 212-637-3797.

For more information on the U.S. Army Corps of Engineers New York District programs, please visit our website at http://www.nan.usace.army.mil

Thomas H. Creamer
for Richard L. Tomer
Chief, Regulatory Branch

Enclosures

DESCRIPTION OF PROPOSED WORK

The permit applicant, the State of New Jersey Department of Transportation, Office of Maritime Resources, is requesting a Department of the Army permit to deepen the Port Jersey navigation channel by mechanical dredging to provide a 50-foot navigation channel from the Anchorage Channel westward to the existing berths at Global Marine Terminal and the former Military Ocean Terminal at Bayonne (former MOTBY), now named The Peninsula at Bayonne Harbor, as shown on the attached figures 2 through 7.

The dredging operations would entail removing approximately 3,661,000 cubic yards of dredged materials, all of which would be beneficially used in different ways. Approximately 720,000 cubic yards is Holocene black slit and it would be processed and beneficially used on State of New Jersey approved upland sites. The remaining 2,941,000 cubic yards of dredged material would be made up of approximately 319,000 cubic yards of Pleistocene red clay; approximately 507,000 cubic yards of Pleistocene glacial till; approximately 597,000 cubic yards of gray sandy silt; approximately 1,496,000 cubic yards of sandy material; and approximately 22,000 cubic yards of rock. The approximate 2,941,000 cubic yards of dredged material is acceptable for open water placement for the reasons discussed later in this Description of Proposed Work. Approximately 1,300,000 cubic yards of this dredged material would be used in the creation of a habitant enhancement area in the unused navigation channel on the south side of the former Military Ocean Terminal at Bayonne (former MOTBY) now known as The Peninsula at Bayonne. The habitat enhancement area is discussed later in this Description of Proposed Work and is shown on the attached Figures 2, 8, 9, and 10. The balance of the dredged materials, approximately 1,641,000 cubic yards, would be placed in the Atlantic Ocean at the Historic Area Remediation Site (HARS) as Material for Remediation, with any rock not used in the creation of the habitat enhancement area being placed at the Alex Carlson artificial reef site in the Atlantic Ocean.

The maximum dredging depth requested is 53.5 feet below the plane of Mean Low Water (MLW) datum. This dredging depth consists of the 50 feet for the navigation channel, plus a 2-foot safety and future maintenance allowance because of the hard channel bottom sediments that must be removed, plus a final 1.5-foot allowable dredging overdepth.

The applicant states that the purpose and need for requesting a Department of the Army permit for this deepening work is to advance the construction of the Congressionally authorized 50-foot Port Jersey navigation channel in order to gain the documented transportation benefits sooner; eliminate the unnecessary deepening dredging of a large turning basin at the landward end of the Port Jersey 41-foot channel; reduce the overall dredging area for the channel flair connection with the Anchorage Channel; and realize substantial economic and environmental benefits of executing, at the same time, the 50-foot channel deepening dredging with the ongoing joint Federal - State 41-foot channel deepening work as a single continuous effort.

The applicant believes that undertaking all the deepening dredging in a single sequential fashion (i.e. one-stage, without a time lag) will not only minimize any environmental effects, but also produce substantial overall cost savings. This would result in the permanent deferral of both a portion of the outer channel flair channel connection to the Anchorage Channel, as well as the landward turning basin required in the current 41-foot channel design for safe ship movements.

These two elements are not required for safe ship movements in the 50-foot channel design. These two areas will not be constructed nor maintenance dredged in the future. The applicant reports it is the elimination of these two dredging areas that is the primary source of expected cost savings.

The 50-foot Port Jersey Channel segment of the New York and New Jersey Harbor Deepening (50-foot) Project cannot proceed into construction as a Federal-funded action at this time until specific non-federal actions relating to the development of multiple beneficiaries, operating terminal users, for the deepened channel are accomplished. Those efforts are proceeding, but the applicant is seeking to undertake the deepening now for the economic and environmental reasons mentioned above while those efforts come to successful fruition over the coming years.

For the purposes of understanding the relationship of the ongoing 41-foot channel deepening dredging and the 50-foot channel footprint and current bottom elevations, the following is provided. The Port Jersey navigation channel area was divided into four basic Corps of Engineers dredging contract areas as shown in the attached drawings. Contract Area 1A has already been dredged by a Corps of Engineers contract to a depth of approximately 44.5 feet below MLW (41 feet plus the required overdepth). Contract Area 1B is not dredged in yet as it lies largely outside the authorized 41-foot channel footprint. Currently, Contract Area 1B is an average of 35 feet below MLW datum. Contract Area 2A is currently being dredged by a Corps of Engineers contractor to a depth of approximately 44.5 feet below MLW (41 feet plus required overdepth). Contract Area 2B is also not yet dredged, and it currently has an average depth of 12 feet below MLW datum. The permit applicant intends to advance construction of the deepening of the Port Jersey 50-foot Channel by dredging the additional 9 feet within the two contract areas that the Corps of Engineers contractor has either completed to 44.5 feet below MLW (Area 1A) or is currently deepening to 44.5 feet below MLW (Area 2A); and dredging the two other contract areas from existing depths to the 53.5 feet below MLW datum.

INTRODUCTION TO THE HISTORIC AREA REMEDEATION SITE (HARS):

In 1972, Congress enacted the Marine Protection Research and Sanctuaries Act (MPRSA) to address and control the dumping of materials into ocean waters. Title I of the Act authorized the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers to regulate dumping in ocean waters. The U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers share responsibility for the Marine Protection, Research, and Sanctuaries Act (MPRSA) permitting and ocean disposal site management. The U.S. Environmental Protection Agency regulations implementing the Marine Protection, Research, and Sanctuaries Act (MPRSA) are found at 40 CFR Sections 220 through 229. With few exceptions, the Marine Protection, Research, and Sanctuaries Act (MPRSA) prohibits the transportation of material from the United States for the purpose of ocean dumping except as may be authorized by a permit issued under the Marine Protection, Research, and Sanctuaries Act (MPRSA). The Marine Protection, Research, and Sanctuaries Act (MPRSA) divides permitting responsibility between the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers. Under Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), the U.S. Environmental Protection Agency has responsibility for issuing permits for all materials other than dredged material. Under Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), the Secretary of the Army has the responsibility for issuing permits for dredged material, subject to the U.S. Environmental Protection Agency's concurrence.

In the fall of 1997, the U.S. Environmental Protection Agency de-designated and terminated the use of the New York Bight Dredged Material Disposal Site (commonly known as the Mud Dump Site or MDS). The Mud Dump Site (MDS) had been designated in 1984 for the disposal of up to 100 million cubic yards of dredged material from navigation channels and other port facilities within the Port of New York and New Jersey. Simultaneous with the closure of the Mud Dump Site (MDS), the site and surrounding areas that had been used historically as disposal sites for dredged materials were redesignated as the Historic Area Remediation Site (HARS) (Figures 3 & 4) under authority of Section 102[c] of Marine Protection, Research, and Sanctuaries Act (MPRSA) at 40 CFR Sections 228.15(d)(6) (See 62 Fed. Reg. 46142 (August 29, 1997); 62 Fed. Reg. 26267 (May 13, 1997)). The Historic Area Remediation Site (HARS) will be managed to reduce impacts of historical disposal activities at the site to acceptable levels in accordance with 40 CFR Sections 228.11(c). The need to remediate the Historic Area Remediation Site (HARS) is supported by the presence of toxic effects, dioxin bioaccumulation exceeding Category 1 levels in worm tissue, as well as TCDD/PCB contamination in area lobster stocks. Individual elements of those data do not establish that sediments within the Study Area are imminent hazards to the New York Bight Apex ecosystem, living resources, or human health. However, the collective evidence presents cause for concern, and justifies the need for remediation. Further information on the surveys performed and the conditions in the Historic Area Remediation Site (HARS) Study Area may be found in the Supplemental Environmental Impact Statement (U.S. Environmental Protection Agency Region 2, 1997).

The designation of the Historic Area Remediation Site (HARS) identifies an area in and around the former Mud Dump Site (MDS) that has exhibited the potential for adverse ecological impacts. The Historic Area Remediation Site (HARS) will be remediated with dredged material that meets current Category 1 standards and it will not cause significant undesirable effects including through bioaccumulation or unacceptable toxicity, in accordance with 40 CFR 227.6. This dredged material is referred to as "Material for Historic Area Remediation Site (HARS) Remediation" or " Historic Area Remediation Site (HARS) Remediation Material".

As of the end of January 2005, dredged materials from at least thirty-eight different completed and ongoing private and federal dredging projects in the Port of New York and New Jersey has been dredged and placed as Remediation Material in the ocean at the Historic Area Remediation Site (HARS) since the closure of the Mud Dump Site (MDS) and designation of the Historic Area Remediation Site (HARS) in 1997. This represents approximately 22,404,000 cubic yards of Remediation Material.

The Historic Area Remediation Site (HARS), which includes the 2.2 square nautical mile area of the former Mud Dump Site (MDS), is an approximately 15.7 square nautical mile area located approximately 3.5 nautical miles east of Highlands, New Jersey and 7.7 nautical miles south of Rockaway, New York. The former Mud Dump Site (MDS) is located approximately 5.3 nautical miles east of Highlands, New Jersey and 9.6 nautical miles south of Rockaway, New York. When determined by bathymetry that capping is complete, the U.S. Environmental Protection Agency will undertake any necessary rulemaking to de-designate the Historic Area Remediation Site (HARS). The Historic Area Remediation Site (HARS) includes the following three areas:

Priority Remediation Area (PRA): A 9.0 square nautical mile area to be remediated with at least 1 meter of Remediation Material. The Priority Remediation Area (PRA) encompasses an area of degraded sediments as described in greater detail in the SEIS.

Buffer Zone: An approximately 5.7 square nautical mile area. It is a 0.27 nautical mile wide band around the Priority Remediation Area (PRA) in which no placement of the Material for Remediation will be allowed, but which may receive Material for Remediation that incidentally spreads out of the Priority Remediation Area (PRA).

No Discharge Zone: An approximately 1.0 square nautical mile area in which no placement or incidental spread of the Material for Remediation is allowed.

To improve management and monitoring of placement activities at the Historic Area Remediation Site (HARS), electronic monitoring equipment is used on-board vessels carrying Remediation Material to the Historic Area Remediation Site (HARS). This equipment records vessel positions and scow draft throughout the duration of each trip to the Historic Area Remediation Site (HARS) and during remediation operations. To improve communication reliability between tugs and scows, a prescribed formal communication procedure has been put in place (copies of this procedure are available upon request).

Over the past years, the U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineers New York District have been refining the approach to the technical review and scientific and regulatory analysis of dredging projects' dredged materials proposed for placement at the Historic Area Remediation Site (HARS). Sediment testing evaluation processes are evolving, which establish a responsible framework for assessing results of physical, chemical and bioaccumulation test results, to include tissue analysis from bioaccumulation testing of dredged materials proposed for ocean placement. The bioaccumulation framework defines a standard approach for assessing each analyte (an item to be analyzed for as part of the testing), in relation to regulatory standards and human health and environmental risk factors. The framework's purpose is to facilitate decision, and final decision making, in accordance with the Marine Protection, Research and Sanctuaries Act of 1972. The U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineer New York District utilize these testing evaluation processes for identifying Historic Area Remediation Site (HARS)-suitable dredged materials for remediation of the Historic Area Remediation Site (HARS).

Additional information concerning the Historic Area Remediation Site (HARS) itself can be obtained from Mr. Douglas Pabst of the U.S. Environmental Protection Agency Region 2, Dredged Material Management Team Leader, at telephone number (212) 637-3797.

SEDIMENT TESTING:

Please refer to the attached Figures 2 through 7 for maps of the dredging areas as discussed in the following paragraphs.

The sediments within contract Areas 1A (between 44.5 and 53.5 feet below MLW) and 1B (between 35 and 53.5 feet below MLW) consist of Holocene black silt material considered suitable for placement at state-approved upland sites, overlying Pleistocene clay and glacial till which is suitable for Historic Area Remediation Site (HARS) placement.

The sediments within Area 2A (between 44.5 and 53.5 feet below MLW) consist of Holocene black silt material considered suitable for state-approved upland sites, overlying Historic Area Remediation Site (HARS) suitable sand material.

The sediments within Area 2B area have been subdivided into 5 stratum, of which Reaches 1, 2, 3 and 5 (as described below) have been tested and found to be suitable for placement at the Historic Area Remediation Site (HARS). The remaining layer occurs between elevations 44.5 and 53.5 feet below MLW at the eastern-most portion of Area 2B, and consists of Holocene black silt material that is not suitable for Historic Area Remediation Site (HARS) placement.

No barge overflow is anticipated during the dredging of the material that is not suitable for placement at the Historic Area Remediation Site (HARS). After dewatering and amendment using Portland cement, fly ash and/or other approved substances, it would be beneficially used upland at a state-approved location.

The total Historic Area Remediation Site (HARS) suitable sediments (as discussed below) consist of approximately 319,000 cubic yards of Pleistocene red clay, approximately 507,000 cubic yards of Pleistocene glacial till, approximately 597,000 cubic yards of gray sandy silt, and approximately 1,496,000 cubic yards of sandy material. There is also approximately 22,000 cubic yards of rock in the project area. A total of approximately 1,300,000 cubic yards of material (HARS-suitable material and rock) would be beneficially used to enhance Essential Fish Habitat (EFH) spawning opportunities in the channel south of the former Military Ocean Terminal (former MOTBY) in Bayonne, New Jersey. The remaining 1,641,000 cubic yards of Historic Area Remediation Site (HARS) suitable materials would be placed at the Historic Area Remediation Site (HARS). Rock that is not used beneficially to enhance Essential Fish Habitat (EFH) spawning opportunities would be placed at the Axel Carlson artificial reef site in the Atlantic Ocean or at a similar permitted ocean artificial reef. Bottom-opening barges would transport to the placement site within the Historic Area Remediation Site (HARS) the Historic Area Remediation Site (HARS) suitable material. Barge overflow is proposed during the dredging of this material to maximize barge loading.

Approximately 507,000 cubic yards of the proposed dredged material from the Port Jersey deepening area have been demonstrated to be Pleistocene age glacial till. The joint U.S. Environmental Protection Agency Region 2 and U.S. Army Corps of Engineers New York District August 26, 2003 Memorandum For The Record titled Joint Federal Position on Testing of Glacial Till Dredged Materials from Selected Areas of New York and New Jersey Harbor concluded that Pleistocene age glacial till is removed from sources of contaminants and has been adequately characterized by previous testing in the vicinity. As such, further additional project-specific testing of glacial till, including these 507,000 cubic yards, is not required.

In accordance with geological testing and assessment procedures set forth in the July 17, 2004 joint U.S. Environmental Protection Agency Region 2 and U.S. Army Corps of Engineers New York District standardized operating procedures, these 507,000 cubic yards are glacial till because the material (1) lacks detectible fossils or shells, (2) has a low organic carbon content, (3) has a reddish or red-brown color, (4) is comprised of a poorly sorted layer of clay particles, silts, sands, gravels and boulders, and (5) has a stratigraphic setting consistent with other Pleistocene age deposits in the vicinity of this Port Jersey dredging area. A copy of the January 14, 2005 glacial till determination for this construction contract area may be requested from Mr. Brian Orzel, manager for this permit application review process, at 917-790-8413 or 212-264-0183.

Pleistocene age glacial till in the vicinity of this Port Jersey dredging area was previously tested to determine suitability for use as Remediation Material at the Historic Area Remediation Site

(HARS). This testing of glacial till was conducted in accordance with test protocols for ocean placement established by the U.S. Environmental Protection Agency Region 2 and U.S. Army Corps of Engineers New York District. Public notice of previous Pleistocene age glacial till chemical analysis, toxicity, and 28-day bioaccumulation test results for a determination of suitability for Historic Area Remediation Site (HARS) remediation purposes was provided in U.S. Army Corps of Engineers New York District Public Notice FP63-PJCA1-2003 issued on April 7, 2003 for the Port Jersey Channel first construction contract area. Those chemical analyses, toxicity, and 28-day bioaccumulation test results are included in this public notice (attached Tables 4A-4C) for informational purposes only.

This deepening project also includes approximately 319,000 cubic yards of Pleistocene age red-brown clay dredged material (from the Newark Bay complex) for placement as Remediation Material at the Historic Area Remediation Site (HARS). Pleistocene age red-brown clay dredged materials (from the Newark Bay complex) were previously tested to determine their suitability for use as Remediation Material at the Historic Area Remediation Site (HARS). Testing was conducted in accordance with test protocols for ocean placement established by the U.S. Environmental Protection Agency Region 2 and U.S. Army Corps of Engineers New York District. Notification of the previous Pleistocene age red-brown clay test results for a determination of suitability for Historic Area Remediation Site (HARS) remediation purposes were provided in U.S. Army Corps of Engineers New York District Public Notice Supplement FP63-345678CC issued on July 14, 2000. Those test results are included in this public notice (attached Tables 5A-5C) for informational purposes only. A Joint Memorandum for Record (MFR) signed by both agencies on January 26, 2000, concluded that the Pleistocene age red-brown clay found throughout the Newark Bay Complex, including the Port Jersey Channel, was suitable for Historic Area Remediation Area (HARS) placement and would not require further testing.

The testing evaluation memos for the Port Jersey 50-foot Deepening Project 3, which includes reaches from Port Jersey Contract Area 2A (Reach 4) and Port Jersey Contract Area 2B (Reaches 1, 2, 3, and 5), may be obtained by contacting Mr. Douglas Pabst, U.S. Environmental Protection Agency Region 2's Team Leader of the Dredged Material Management Team at (212-637-3797).

Sediment Grain Size Analysis:

As depicted in the attached drawings, the proposed dredging area has been characterized by using 5 sediment-testing reaches with 87 sediment core samples. Samples were taken to 53.5 feet — 50 feet project depth plus 2 feet allowance for hard bottom plus 1.5 feet allowable overdepth. The 87 core samples were then combined into five composite samples that were subjected to chemical and biological testing. Based upon an analysis of sediment samples from the project area submitted by the applicant and their contract laboratory, the grain size characteristics of the proposed dredged material are:

Reach 1: 0.24% gravel; 34.46% sand; 39.9% silt; and 25.4% clay
Reach 2: 0.53% gravel; 27.07% sand; 40.7% silt; and 31.7% clay
Reach 3: 4.8% gravel; 85.65% sand; 5.6% silt; and 3.95% clay
Reach 4: 5.9% gravel; 61.7% sand; 19.6% silt; and 12.8% clay
Reach 5: 0.27% gravel; 44.07% sand; 43.86% silt; and 11.8% clay.

Evaluation of the liquid phase: Chemistry

Under the requirements of 40 CFR 227.6(c)(1) and 227.27(a), chemical analysis was conducted on project area site water and elutriate. Results of this evaluation are summarized in Table 1 for each reach. Please note in reading Table 1 that detection limits have been listed for only those constituents that the laboratory reported as non-detected (ND) in the concentration column (this reporting convention was similarly applied in reporting the results of bioaccumulation potential testing discussed below). If the constituents were detected (above the detection limit), the measured value would appear.

Expected concentrations of chemical constituents in the water column following ocean placement, after allowing for initial mixing, were calculated using the Automated Dredging and Disposal Alternatives Management System (ADDAMS), a mixing model developed by the U.S. Army Corps of Engineers (USACE) Waterways Experiment Station (WES) and described in the joint U.S. Environmental Protection Agency and U.S. Army Corps of Engineers implementation manual entitled "Evaluation of Dredged Material Proposed for Ocean Disposal" (commonly referred to as the National "Green Book"). The material can be considered suitable for ocean disposal only if the concentration of the Suspended Particulate Phase (SPP) of the dredged material, after allowance for the initial mixing, will not exceed the Limiting Permissible Concentration (LPC) beyond the boundaries of the disposal site within the first four hours following dumping or at any point in the marine environment after the first four hours. The ADDAMS Model predicted that applicable marine water quality criteria for listed constituents were not exceeded after allowance for initial mixing [40 CFR 227.29(a)]. Results of this analysis indicate that the LPC will be met for the proposed dredged material from the project area.

Bioassays:

In accordance with 40 CFR Part 227 of the Ocean Dumping regulations, bioassays were performed to assess the toxicities of the suspended particulate, liquid, and solid phases of the proposed dredged material from the proposed project area.

Evaluation of the liquid phase:

Liquid phase bioassays run as part of the suspended particulate phase on three appropriate sensitive marine organisms: a crustacean (a mysid shrimp, *Mysidopsis bahia*), a finfish (*Menidia beryllina*), and the planktonic larvae of a bivalve (the blue mussel, *Mytilus edulis*), show that after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the liquid phase of the material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms. Accordingly, it is concluded that the liquid phase of the material would be in compliance with 40 CFR Sections 227.6(c)(1) and 227.27(a). The specific test results and technical analysis of the data underlying this conclusion are described and evaluated in a joint U.S. Army Corps of Engineers New York District and U.S. Environmental Protection Agency Region 2 memorandum for the Port Jersey deepening project. (copies available upon request).

Evaluation of the suspended particulate phase:

The suspended particulate phase of the material was evaluated for compliance with 40 CFR

Sections 227.6(c)(2) and 227.27(b). Bioassay testing of the suspended particulate phase of the material has been conducted using three appropriate sensitive marine organisms: the mysid shrimp, *Mysidopsis bahia*; a finfish, *Menidia beryllina*; and the planktonic larvae of a blue mussel, *Mytilus edulis*. Median lethal concentrations (LC50), those concentrations of suspended particulate phase resulting in 50% mortality, were determined for all three-test species. In addition, the median effective concentration (EC50) based on normal larval development to the D-cell stage, was determined for bivalve larvae. The Limiting Permissible Concentration (LPC) was then calculated as 0.01 of the LC50 or EC50 of the most sensitive organism. In this case, the LPC for Reach 1 was calculated at 1.00 percent based on the EC50 of *M. edulis*. The LPC for Reach 2 was calculated at 0.22 percent based on the EC50 of *M. edulis*. The LPC for Reach 3 was calculated at 1.00 percent based on the EC50 of *M. edulis*. The LPC for Reach 4 was calculated at 0.94 percent based on the EC50 of *M. edulis*, and the LPC for Reach 5 was calculated at 1.00 percent based on the EC50 of *M. edulis*.

This information shows that when placed in the Historic Area Remediation Site (HARS), and after initial mixing (as determined under 40 CFR Sections 227.29(a)(2)), the suspended particulate phase of this material would not exceed a toxicity threshold of 0.01 of a concentration shown to be acutely toxic in the laboratory bioassays, and thus would not result in significant mortality. Moreover, the fact that after placement, the suspended particulate phase would only exist in the environment for a short time, means the suspended particulate phase of each reach would not cause significant undesirable effects, including the possibility of danger associated with bioaccumulation, since these impacts require long exposure durations (see USEPA, 1994). Accordingly, it is concluded that the suspended phase of the material would be in compliance with 40 CFR Sections 227.6(c)(2) and 227.27(b). The results of bioassay tests conducted on proposed dredged sediments are presented in Table 2 of this public notice.

Evaluation of the solid phase:

The solid phase tests the whole dredged material before it has undergone processing that might alter its chemical or toxicological properties. The solid phase was evaluated for compliance with 40 CFR Sections 227.6(c)(3) and 227.27(b). This evaluation was made using the results of two specific types of evaluations on the solid phase of the material, one focusing on the acute (10-day) toxicity of the material, and the other focusing on the potential for the material to cause significant adverse effects due to bioaccumulation. Both types of tests used appropriate sensitive benthic marine organisms according to procedures approved by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers. The following sections address the results of those tests and further analyze compliance with the regulatory criteria of 40 CFR Sections 227.6(c)(3), 227.27(b), and 228.15 and with the U.S. Environmental Protection Agency Region 2 and U.S. Army Corps of Engineers New York District joint guidance.

1. **Toxicity**:

Ten-day toxicity tests were conducted on proposed project dredged material using a filter feeding mysid shrimp *(Mysidopsis bahia)* and a deposit feeding, burrowing amphipod (*Ampelisca abdita*), which are appropriate sensitive benthic marine organisms. The results from the proposed project material are then compared to results for the same organisms that are exposed to reference sediments. The reference sediments represent existing background conditions in the vicinity of

the Historic Area Remediation Site (HARS), removed from the influence of any placement operations. These organisms are good predictors of adverse effects to benthic marine communities (see USEPA, 1996). The toxicity of project sediments was not statistically greater than reference sediments for either mysid, or for amphipods, and the difference between percent survivals in test and reference sediments was less than 10% for mysid shrimp and less than 20% for amphipods.

These results show that the solid phase of the material would not cause significant mortality and meets the solid phase toxicity criteria of Sections 227.6 and 227.27. The results of the ten-day toxicity test are summarized in Table 2 of this public notice for each reach.

2. Bioaccumulation:

Bioaccumulation tests for the sediment were conducted on the solid phase of proposed dredged material for contaminants of concern using two appropriate sensitive benthic marine organisms: a burrowing, deposit-feeding polychaete, *Nereis virens,* and a filter-feeding bivalve, *Macoma nasuta* for Reaches 1, 2, 3, and 5. *Nereis virens* and the bivalve *Tapes japonica* were used for Reach 4. These species are considered to be good representatives of the phylogenetically diverse base of the marine food chain. Contaminants of concern were identified for the regional testing manual from the New York and New Jersey Harbor-Estuary Program Toxics Characterization report (Squibb, *et al.* 1991). Table 3 of this public notice addresses the bioaccumulation of contaminants of concern. Additional information on more rigorous evaluations conducted on individual contaminant values may be found in the testing evaluation memos for this area. Table 3 of this public notice indicates that several contaminants bioaccumulated above reference in the clam and/or worm. All constituents identified in worm and clam tissue were compared to existing Food and Drug Administration (FDA) action levels for poisonous or deleterious substances in fish and shellfish for human food, regional disposal criteria, background concentrations, and risk-based criteria provided by the U.S. Environmental Protection Agency. The testing memos further evaluate these contaminants, and conclude that any contaminant that exceeded reference did not exceed any existing regional matrix or dioxin values. Several contaminants that did not have matrix values did exceed background levels, but in no case did any contaminant accumulate to toxicologically important concentrations, even when very conservative assumptions were used in the analysis. Any contaminants that exhibited bioaccumulation test results above reference were all below the acceptable human health risk range and acceptable aquatic effects range, again using conservative approaches and analyses. A discussion of this determination is available in the testing evaluation memos for this area. The bioaccumulation test results were used in evaluating the potential impacts of the material. The determination is that the combined results of the toxicity and bioaccumulation tests indicate that the material meets the criteria of 40 CFR Sections 227.6(c)(3) and 227.27(b) and 228.15(d)(6)(v)(A) of the Regulations, and that the material is suitable for placement at the Historic Area Remediation Site (HARS).

ALTERNATIVES TO HARS PLACEMENT:

Regarding ocean placement of dredged material, the Ocean Dumping Regulations [Title 40 CFR Sections 227.16(b)] states that ". . . alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the costs of ocean dumping, taking into account the environmental impacts associated with

the use of alternatives to ocean dumping . . ." U.S Army Corps of Engineers New York District has evaluated the regional practicability of potential disposal alternatives in the September, 1999 Draft "Implementation Report for the Dredged Material Management Plan for the Port of New York and New Jersey." The Recommended Plan within the report addresses both the long and short term dredged material placement options in two specific timeframes, heretofore referred to as the 2010 Plan and the 2040 Plan, respectively.

The 2010 Plan relies heavily on the creation, remediation, and restoration of a variety of existing degraded or impacted habitats in the region with dredged material that would be considered unsuitable for Historic Area Remediation Site (HARS) restoration. The remaining material is treated and stabilized, as needed, and then applied to remediate degraded and potentially polluting areas such as brownfields, landfills, and abandoned strip mines. Nearly all of the options considered in the 2010 Plan have a placement cost of $29/cubic yard or higher.

Similar to the 2010 Plan, the 2040 Plan relies heavily upon the use of land remediation and decontamination methods for the management of Historic Area Remediation Site (HARS) unsuitable dredged material. As in the 2010 Plan, maximum use of all practicable alternatives to the Historic Area Remediation Site (HARS) is envisioned.

Many of the dredged material management options presented in the 2010 Plan however, are not presently permitted and/or are presently under construction at this time and therefore considered unavailable for the purposes of this application. To minimize ocean placement and to enhance aquatic habitat the subject applicant has included in their project and permit application placement of approximately 1,300,000 cubic yards of Historic Area Remediation Site (HARS) suitable material at the aforementioned habitat enhancement area, located just south of the former MOTBY site. As this area has a capacity of approximately 1,300,000 cubic yards, no more material could be placed there. Other options are not available at reasonable incremental costs, thus leaving Historic Area Remediation Site (HARS) placement as material for remediation as the only other preferred alternative.

CONCLUSIONS:

Based upon the results of testing of the sediments proposed for dredging and ocean placement from the Port Jersey 50-foot deepening project, the U.S. Army Corps of Engineers New York District and the U.S. Environmental Protection Agency Region 2 have determined that the material is Category 1 meeting the criteria for ocean placement as described in 40 CFR Sections 227.6, 227.27, and 228.15, and is a Remediation Material as defined under the U.S Environmental Protection Agency Region 2 and U.S. Army Corps of Engineer New York District guidance. The specific test results and technical analysis of the data underlying this conclusion are described in the joint U.S. Army Corps of Engineers New York District and U.S. Environmental Protection Agency Region 2 memoranda mentioned previously.

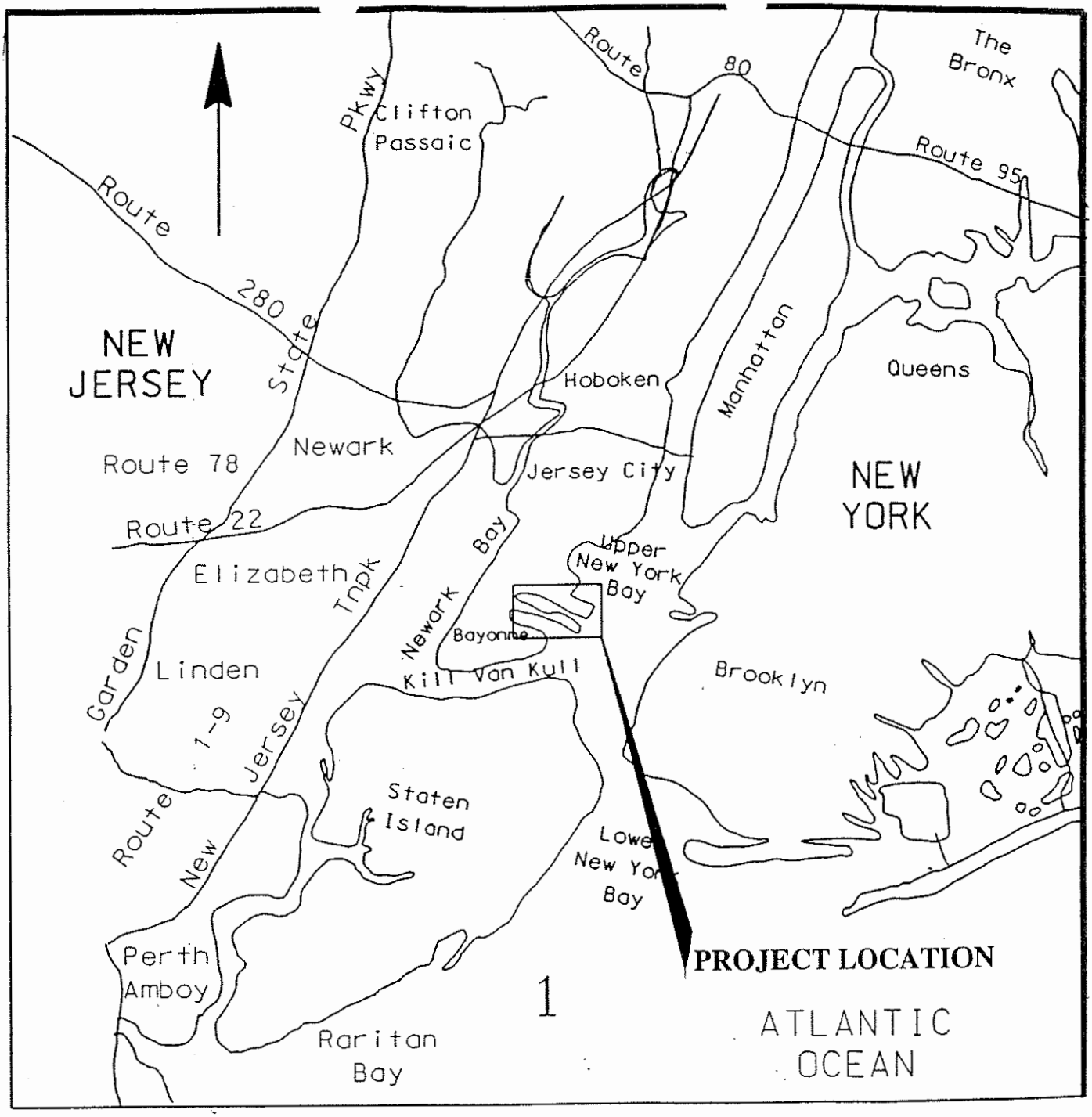
Placement of this remediation material at the Historic Area Remediation Site (HARS) will serve to reduce impacts to acceptable levels and improve benthic conditions. Sediments in the Historic Area Remediation Site (HARS) have been found to be acutely toxic to sensitive benthic marine organisms in laboratory tests, whereas project sediments used in laboratory acute toxicity tests with the same species were determined not to be toxic. Placement of project material over

existing toxic sediments would serve to remediate those areas for toxicity. In addition, by covering the existing sediments in the site with this project material, surface dwelling organisms will be exposed to sediments exhibiting Category 1 qualities whereas the existing sediments exceed these levels.

STATUS OF THE FEDERAL-STATES- PORT AUTHOITY OF NEW YORK & NEW JERSEY CHANNEL DEEPENING WORK RELATIVE TO PERMIT APPLICANT'S REQUEST

As context and to understand the proposed permit work as it relates to the ongoing federal navigation channel construction program ongoing in the Port of New York and New Jersey, the U.S. Army Corps of Engineers, as part of its civil works mission, has been authorized by Congress to construct two different federal navigation channel deepening projects in Port Jersey channel. The authorized depths for the two projects are 41-feet and a 50-feet. Currently, both channel improvement projects have completed all necessary evaluations and have executed project cooperation agreements with their respective non-federal project sponsors. In July 2002, the Corps of Engineers executed a project cooperation agreement with the State of New Jersey Department of Transportation, Office of Maritime Resources, the current permit applicant, and the Port Authority of New York and New Jersey to construct the 41-foot deepening project. Construction of the 41-foot deepening project began later in 2002 and is ongoing. In May of 2004, the Corps of Engineers executed a project cooperation agreement with the Port Authority of New York and New Jersey to construct the 50-foot New York and New Jersey Harbor Deepening (50-foot) Project.

By federal law, the 50-foot Port Jersey Channel segment of the New York and New Jersey Harbor Deepening (50-foot) Project cannot proceed into construction as a federal-funded action until specific non-federal actions relating to the development of multiple beneficiaries of the Port Jersey Channel are performed. Plans for performing these actions have been proposed and accepted by the U.S Army for meeting this condition in approximately the next three years. Given the differences in channel design between the 41-foot and 50-foot Port Jersey navigation channels and as directed by Congress, the Corps of Engineers evaluated consolidated construction of the two separately authorized channel deepening projects for the potential of saving construction costs, reducing environmental impact, and advancing reaping the transportation benefits. This evaluation culminated in a Limited Reevaluation Report (LRR) and Environmental Assessment on Consolidated Implementation of the New York New Jersey Harbor Deepening Project dated January 2004 and approved by the U.S. Army Corps of Engineers Headquarters in April 2004. The State of New Jersey Department of Transportation, Office of Maritime Resources expressed interest in advancing construction of the consolidated construction of the 50-foot Port Jersey Channel in part to implement the habitat enhancement option and to advance the construction of the consolidated Port Jersey Channel Project. Consequently, the action described earlier in this public notice is described and recommended within the LRR, subject to this regulatory permit review.

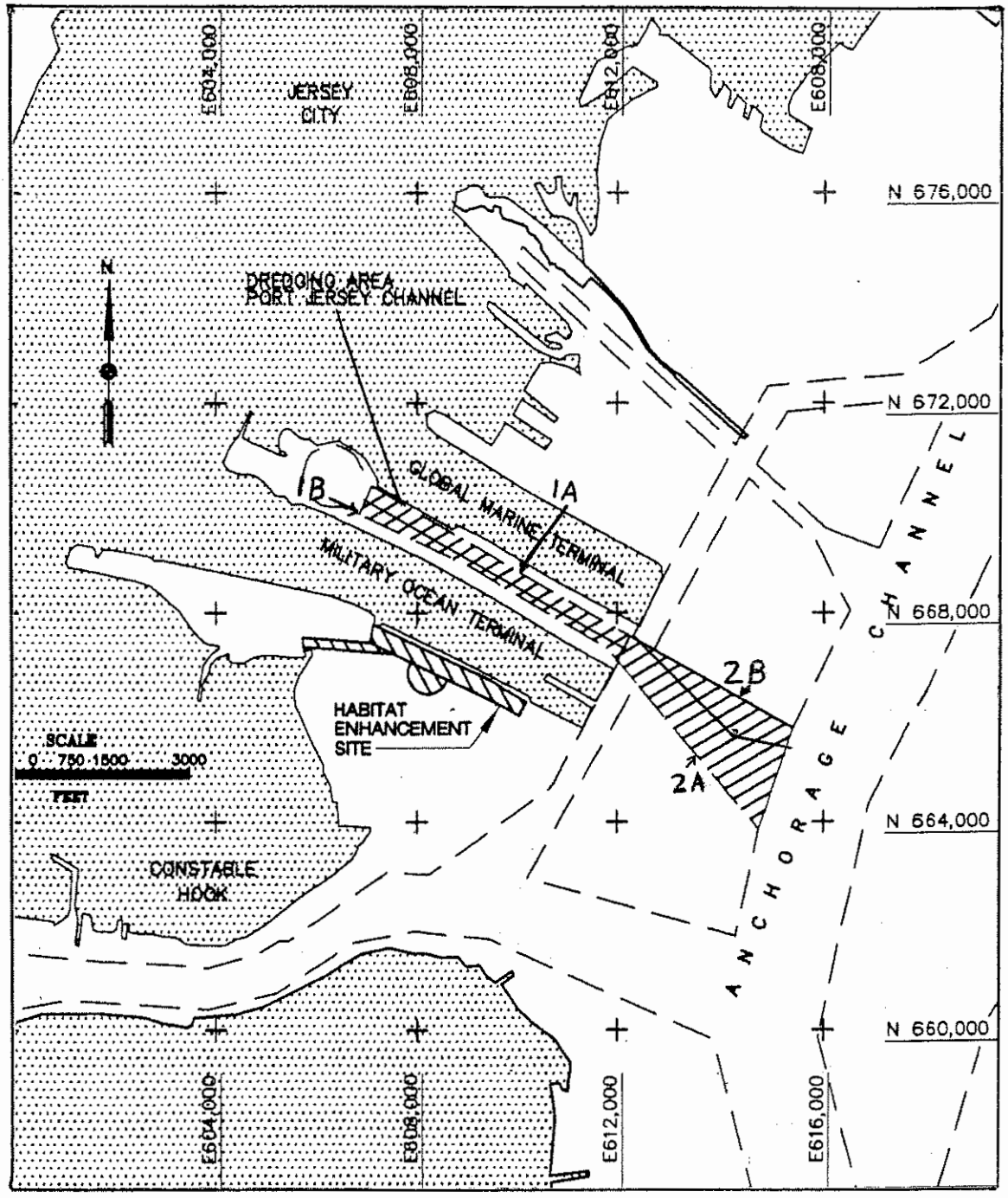


New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

LOCATION PLAN

Sheet 1 of 13 September 8, 2004

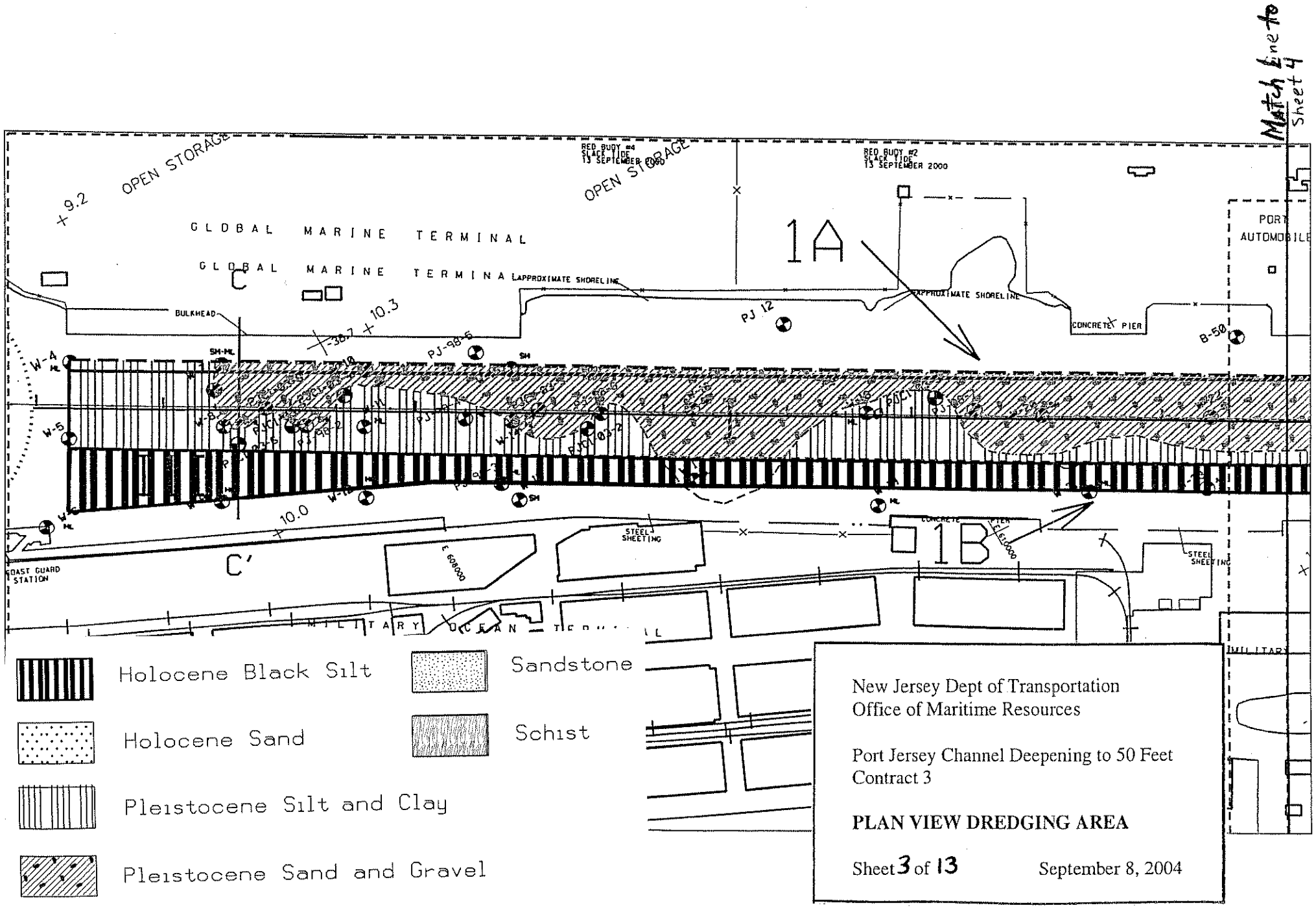


New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

PLAN VIEW DREDGING AREA

Sheet 2 of 13 September 8, 2004

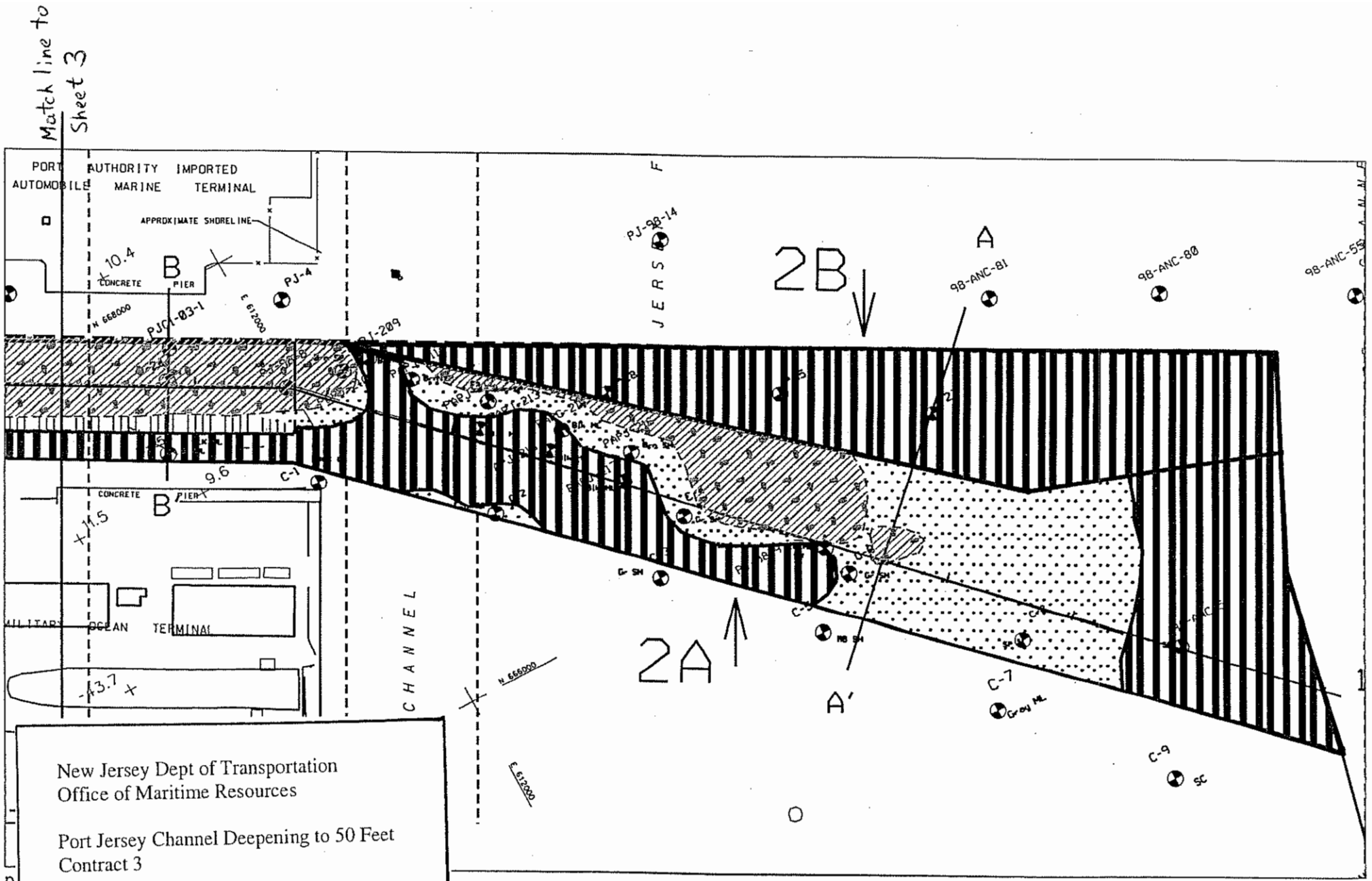


New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

PLAN VIEW DREDGING AREA

Sheet 3 of 13 September 8, 2004

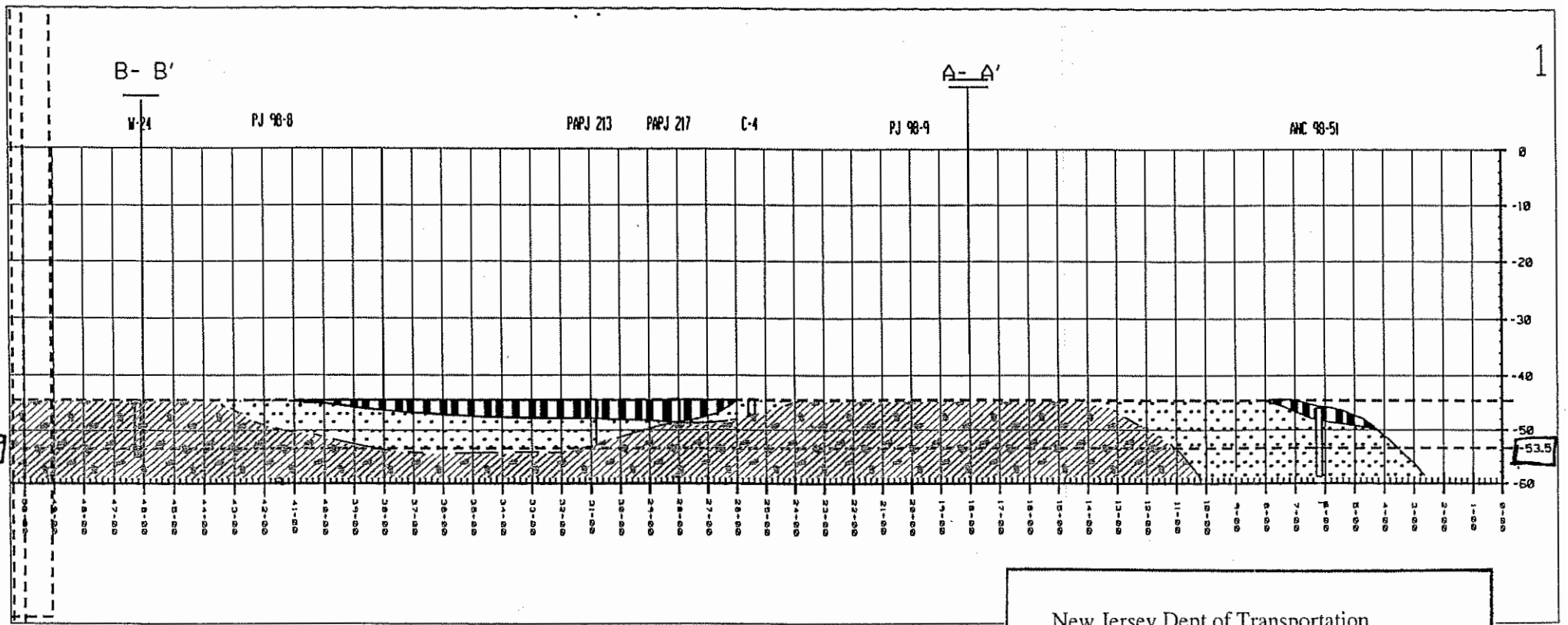


New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

PLAN VIEW DREDGING AREA

Sheet 4 of 13 September 8, 2004



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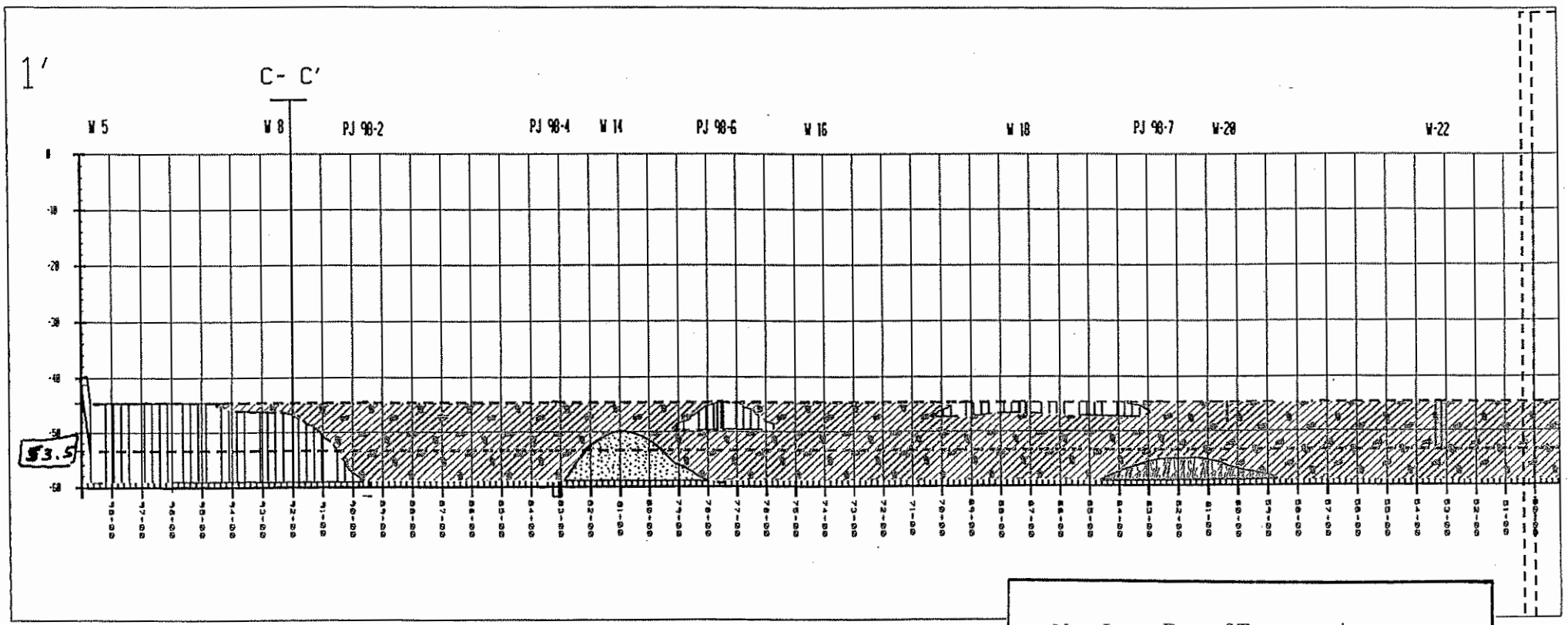
New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

LONGITUDINAL
VIEW DREDGING AREA

Sheet 5 of 13 September 8, 2004



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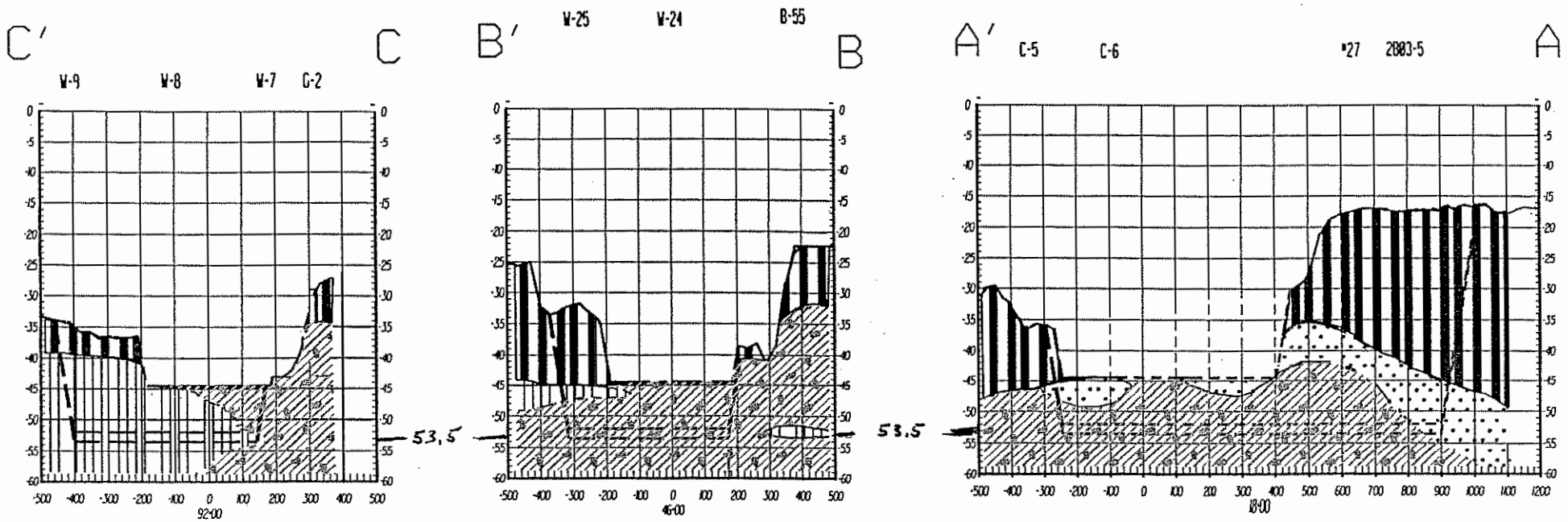
New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

LONGITUDINAL
VIEW DREDGING AREA

Sheet 6 of 13 September 8, 2004



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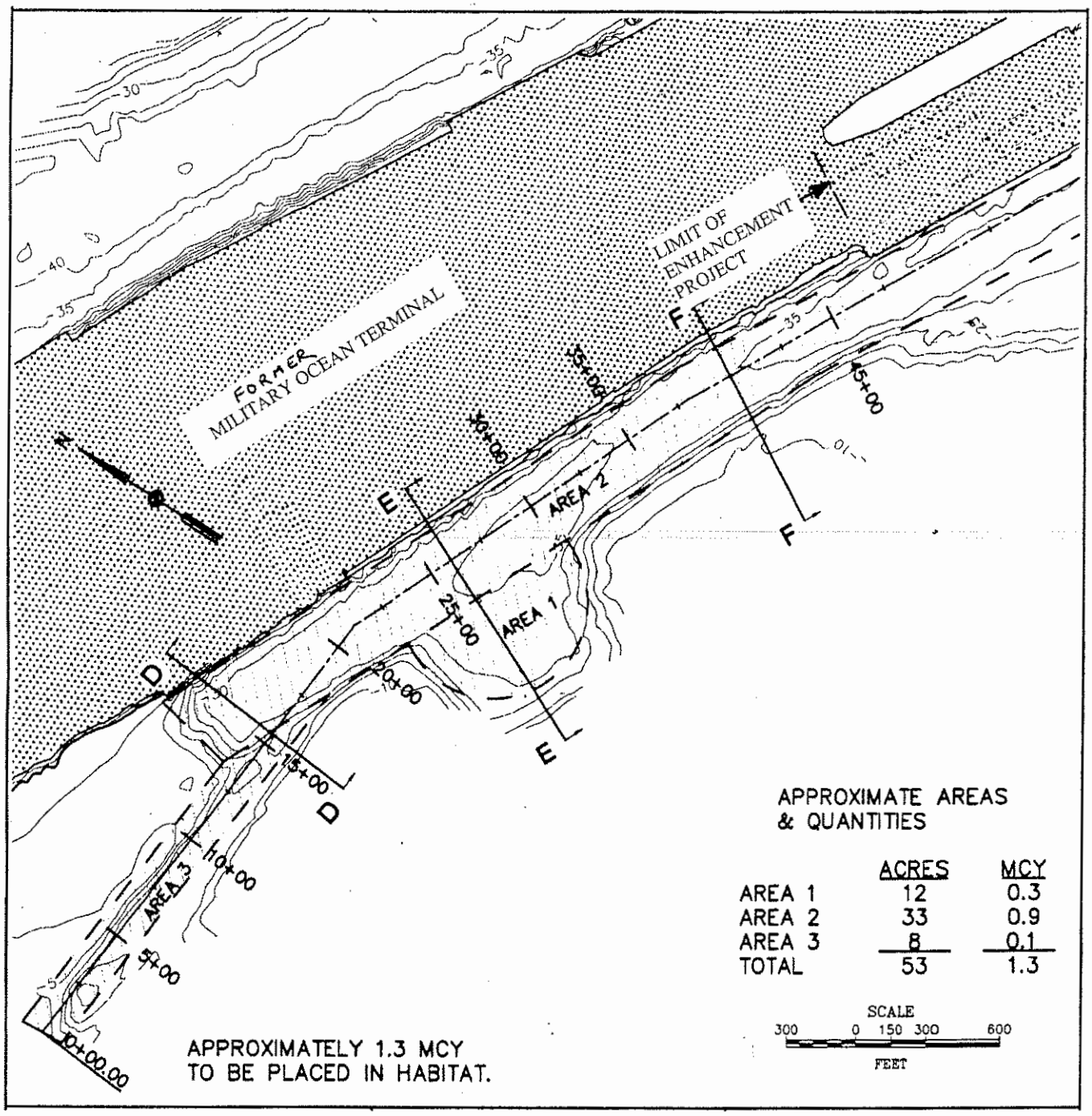
New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

SECTION
VIEW DREDGING AREA

Sheet 7 of 13 September 8, 2004

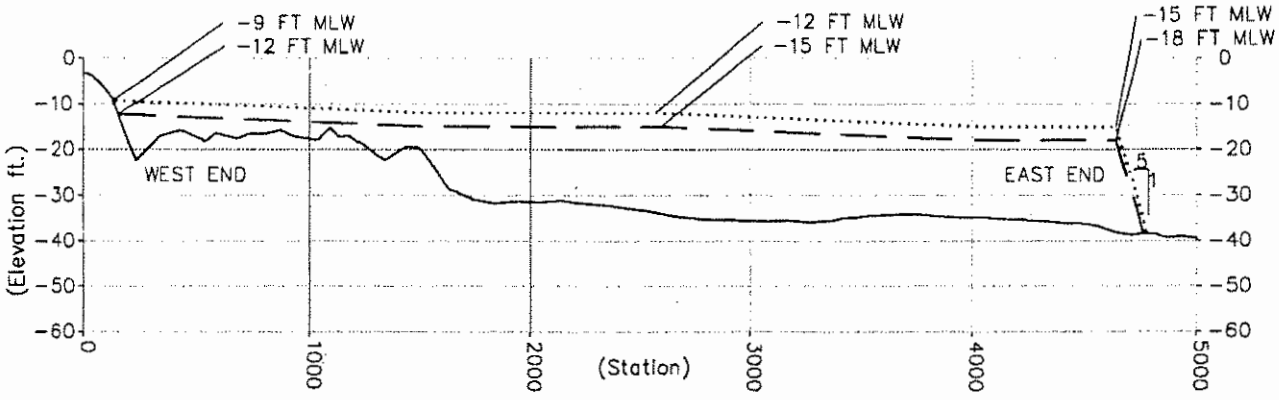


New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

PLAN VIEW ENHANCEMENT SITE

Sheet 8 of 13 September 8, 2004



HABITAT ENHANCEMENT SITE PROFILE

LEGEND

3 ft. TOLERANCE

DESIGN PLACEMENT DEPTH (VARIES)

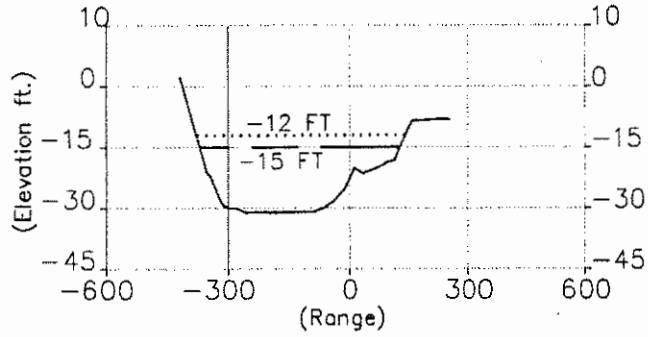
EXISTING BOTTOM

New Jersey Dept of Transportation
Office of Maritime Resources

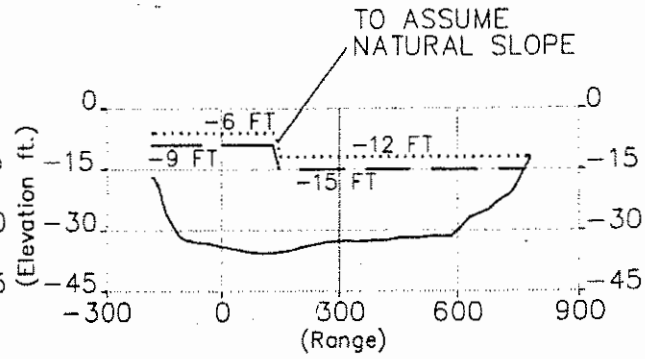
Port Jersey Channel Deepening to 50 Feet
Contract 3

PROFILE ENHANCEMENT SITE

Sheet 9 of 13 September 8, 2004



SECTION D-D



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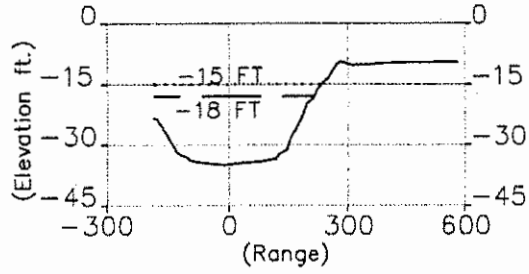


SECTION F-F

LEGEND

..... 3 ft. TOLERANCE

— — DESIGN PLACEMENT DEPTH (VARIES)

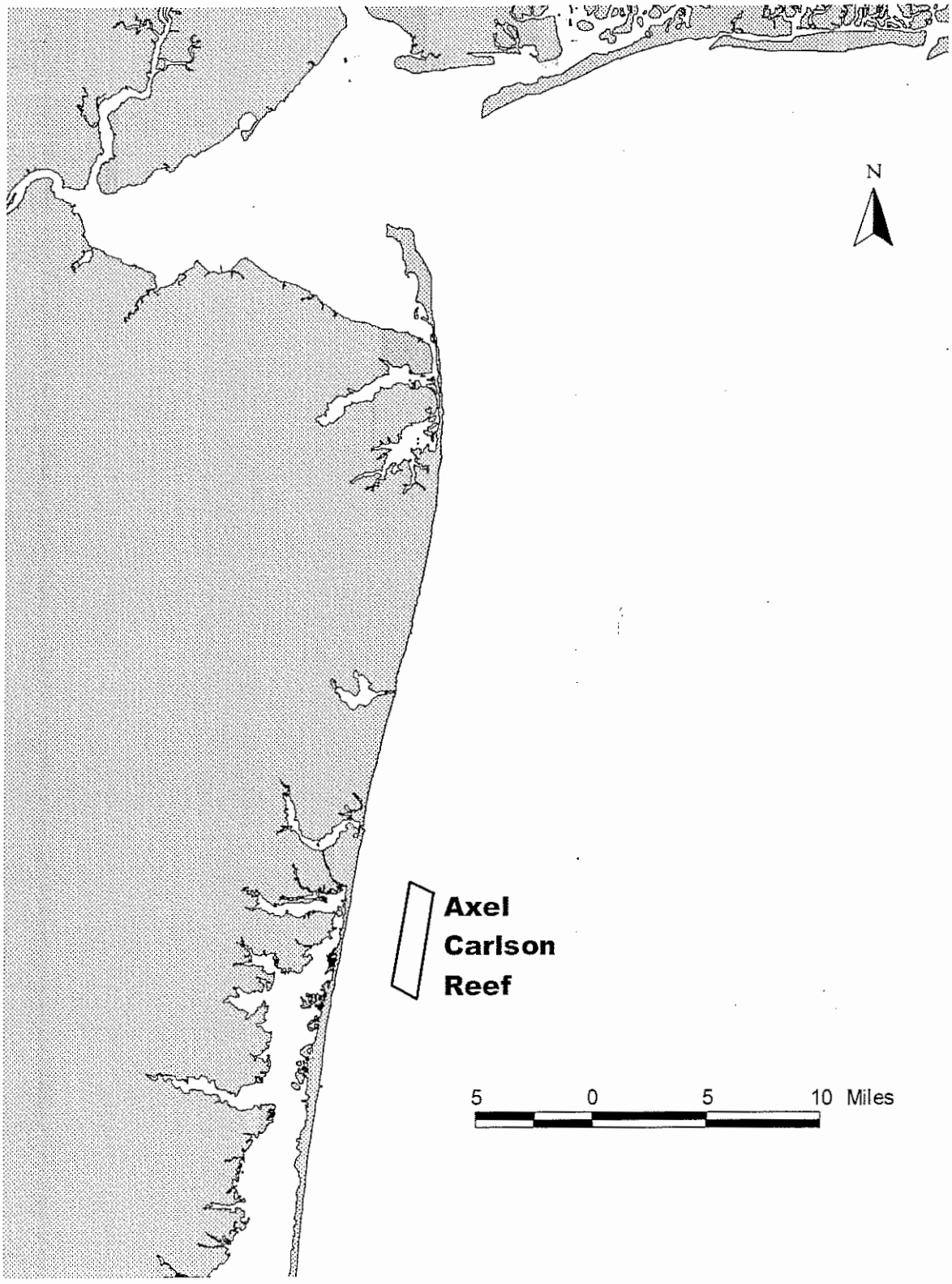
——— EXISTING BOTTOM

New Jersey Dept of Transportation
Office of Maritime Resources

Port Jersey Channel Deepening to 50 Feet
Contract 3

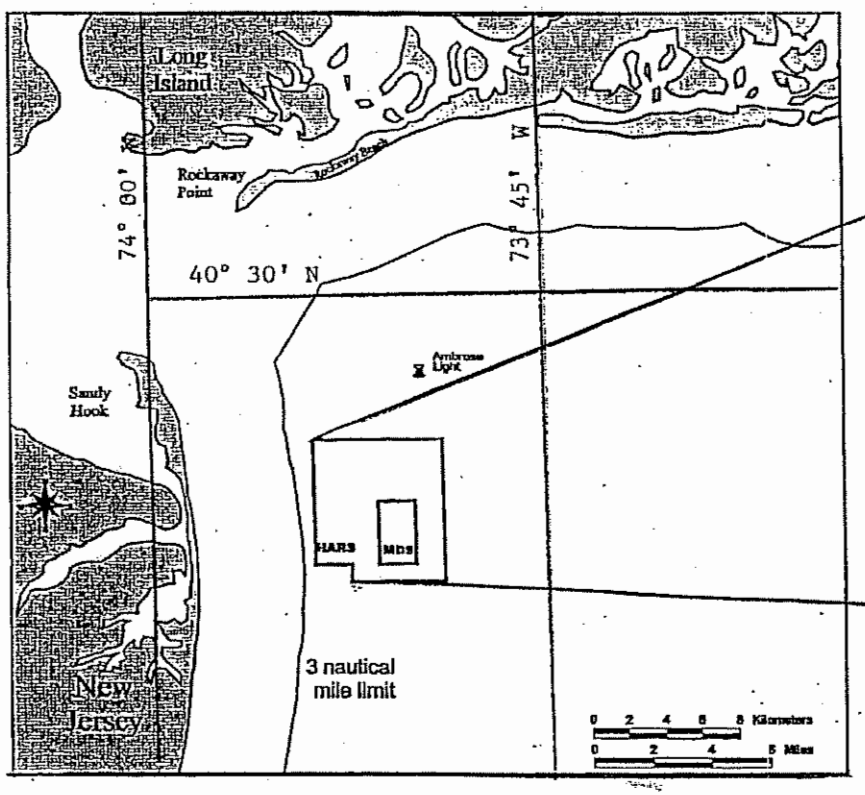
SECTIONS ENHANCEMENT SITE

Sheet 10 of 13 September 8, 2004



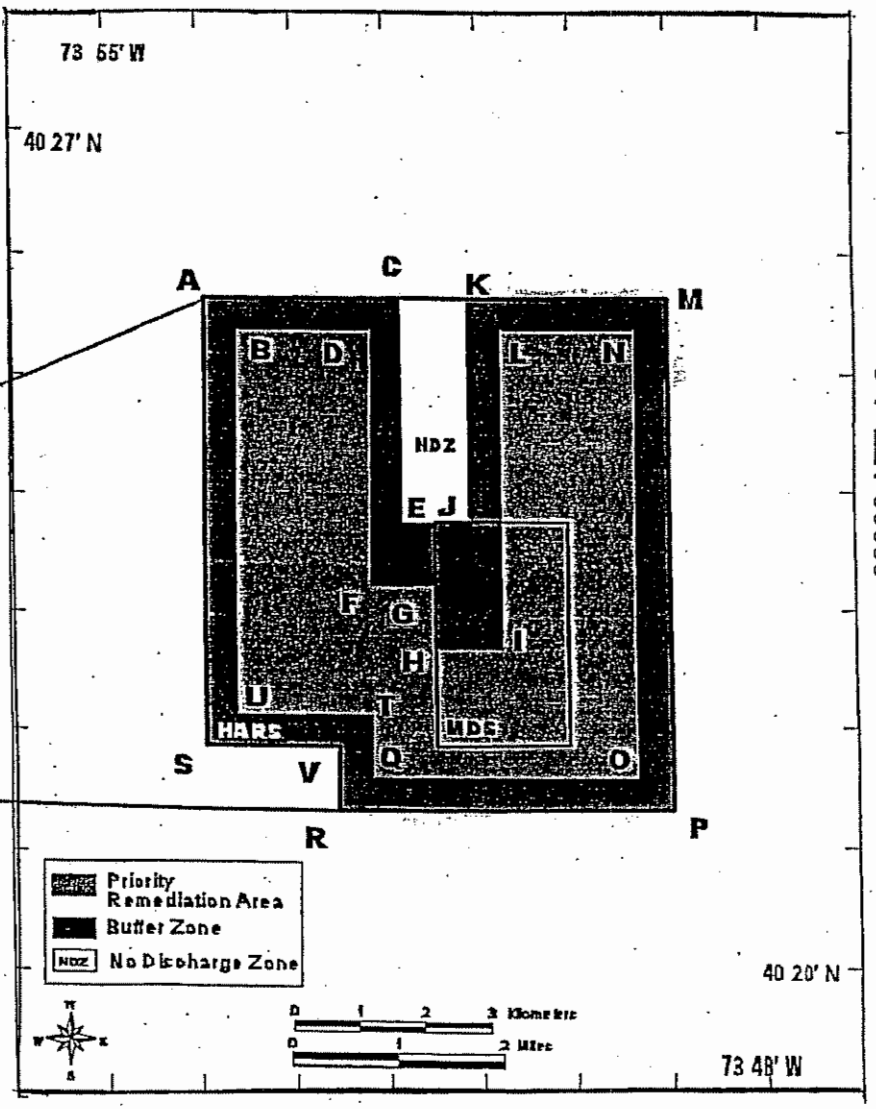
Location of Axel Carlson Reef offshore of the New Jersey coastline.

HISTORIC AREA REMEDIATION SITE LOCATION MAP



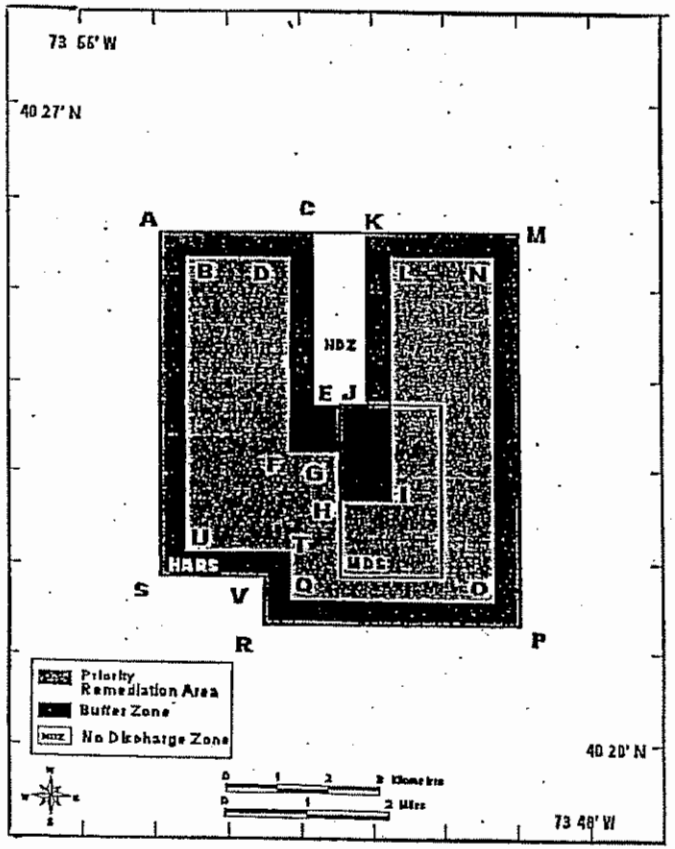
A

LOCATION OF PRIMARY REMEDIATION AREA WITHIN THE HISTORIC AREA REMEDIATION SITE



B

00900 ATT. A-2



Priority Remediation Area (PRA): 9.0 square nautical mile area to be remediated with at least one meter of Remediation Material, bounded by the following coordinates:

Point	Latitude DMS *	Longitude DMS	Latitude DDM **	Longitude DDM
B	40° 25' 23" N	73° 53' 34" W	40° 25.38' N	73° 53.57' W
D	40° 25' 22" N	73° 52' 08" W	40° 25.37' N	73° 52.13' W
F	40° 23' 13" N	73° 52' 09" W	40° 23.22' N	73° 52.15' W
G	40° 23' 13" N	73° 51' 28" W	40° 23.22' N	73° 51.47' W
H	40° 22' 41" N	73° 51' 28" W	40° 22.68' N	73° 51.47' W
I	40° 22' 41" N	73° 50' 43" W	40° 22.68' N	73° 50.72' W
L	40° 25' 22" N	73° 50' 44" W	40° 25.37' N	73° 50.73' W
N	40° 25' 22" N	73° 49' 19" W	40° 25.37' N	73° 49.32' W

* — DMS = Degrees, Minutes, Seconds

** — DDS = Degrees, Decimal Minutes

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
Port Jersey Contract Area 2B - Reach 1

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.039		0.053
Cd		0.044		0.032
Cr		0.828		3.797
Cu		7.29		2.680
Hg		0.007		0.019
Ni		1.23		2.27
Pb		1.06		2.01
Zn		31.60		7.98
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.24	ND	0.24	ND
a-Chlordane	0.23	ND		0.307
trans Nonachlor	0.24	ND	0.24	ND
Dieldrin	0.46	ND	0.46	ND
4,4'-DDT	0.35	ND	0.35	ND
2,4'-DDT	0.29	ND	0.29	ND
4,4'-DDD	0.57	ND		1.41
2,4'-DDD	0.49	ND		0.53
4,4'-DDE	0.41	ND		2.97
2,4'-DDE	0.41	ND	0.41	ND
Total DDT		**1.3**		**5.4**
Endosulfan I	0.17	ND	0.17	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.39	ND	0.39	ND
Heptachlor	0.35	ND	0.35	ND
Heptachlor epoxide	0.95	ND	0.95	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.24	ND		1.870
PCB 18	0.48	ND		3.34
PCB 28	0.36	ND		3.1
PCB 44	0.28	ND		2.23
PCB 49	0.23	ND		1.93
PCB 52	0.29	ND		3.42
PCB 66	0.25	ND		2.27
PCB 87	0.42	ND	0.42	ND
PCB 101	0.23	ND		2.56
PCB 105	0.44	ND		0.78
PCB 118	0.41	ND		1.76
PCB 128	0.38	ND		0.22
PCB 138	0.39	ND		1.86
PCB 153	0.39	ND		2.79
PCB 170	0.34	ND		1.03
PCB 180	0.26	ND		1.47
PCB 183	0.39	ND		0.34
PCB 184	0.44	ND	0.44	ND
PCB 187	0.34	ND		0.94
PCB 195	0.28	ND		0.34
PCB 206	0.23	ND		0.44
PCB 209	0.25	ND		0.66
Total PCB		**7.34**		**67.6**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
Port Jersey Contract Area 2B - Reach 2

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.039		0.071
Cd		0.044		0.033
Cr		0.828		2.830
Cu		7.29		3.053
Hg		0.007		0.048
Ni		1.23		1.66
Pb		1.06		3.76
Zn		31.60		5.39
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.24	ND	0.24	ND
a-Chlordane	0.23	ND		0.320
trans Nonachlor	0.24	ND		0.307
Dieldrin	0.46	ND	0.46	ND
4,4'-DDT	0.35	ND	0.35	ND
2,4'-DDT	0.29	ND	0.29	ND
4,4'-DDD	0.57	ND		2.10
2,4'-DDD	0.49	ND		1.32
4,4'-DDE	0.41	ND		9.16
2,4'-DDE	0.41	ND	0.41	ND
Total DDT		**1.3**		**13.1**
Endosulfan I	0.17	ND	0.17	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.39	ND	0.39	ND
Heptachlor	0.35	ND	0.35	ND
Heptachlor epoxide	0.95	ND	0.95	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.24	ND		3.459
PCB 18	0.48	ND		6.75
PCB 28	0.36	ND		6.7
PCB 44	0.28	ND		4.69
PCB 49	0.23	ND		4.59
PCB 52	0.29	ND		7.93
PCB 66	0.25	ND		6.23
PCB 87	0.42	ND	0.42	ND
PCB 101	0.23	ND		6.04
PCB 105	0.44	ND		1.49
PCB 118	0.41	ND		3.96
PCB 128	0.38	ND		0.69
PCB 138	0.39	ND		4.94
PCB 153	0.39	ND		6.50
PCB 170	0.34	ND		2.23
PCB 180	0.26	ND		3.81
PCB 183	0.39	ND		1.26
PCB 184	0.44	ND	0.44	ND
PCB 187	0.34	ND		2.35
PCB 195	0.28	ND		1.31
PCB 206	0.23	ND		1.78
PCB 209	0.25	ND		1.73
Total PCB		**7.34**		**157.8**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
Port Jersey Contract Area 2B - Reach 3

	SITE WATER		ELUTRIATE	
CONSTITUENTS	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.062		0.026
Cd		0.050		0.138
Cr		1.370		1.307
Cu		14.53		2.537
Hg		0.010		0.002
Ni		1.37		4.69
Pb		3.35		0.43
Zn		122.67		3.72
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.24	ND	0.24	ND
a-Chlordane	0.23	ND	0.23	ND
trans Nonachlor	0.24	ND	0.24	ND
Dieldrin	0.46	ND	0.46	ND
4,4'-DDT	0.35	ND	0.35	ND
2,4'-DDT	0.29	ND	0.29	ND
4,4'-DDD	0.57	ND	0.57	ND
2,4'-DDD	0.49	ND	0.49	ND
4,4'-DDE	0.41	ND	0.41	ND
2,4'-DDE	0.41	ND	0.41	ND
Total DDT		**1.3**		**1.3**
Endosulfan I	0.17	ND	0.17	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.39	ND	0.39	ND
Heptachlor	0.35	ND	0.35	ND
Heptachlor epoxide	0.95	ND	0.95	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.29	ND	0.29	ND
PCB 18	0.48	ND	0.48	ND
PCB 28		1.23	0.36	ND
PCB 44		0.54	0.28	ND
PCB 49		0.61	0.23	ND
PCB 52		1.12		0.75
PCB 66		0.60		0.14
PCB 87	0.42	ND	0.42	ND
PCB 101		0.43		0.27
PCB 105		0.35	0.44	ND
PCB 118		0.25	0.41	ND
PCB 128	0.38	ND	0.38	ND
PCB 138	0.39	ND	0.39	ND
PCB 153		0.16	0.39	ND
PCB 170	0.34	ND	0.34	ND
PCB 180	0.26	ND	0.26	ND
PCB 183	0.39	ND	0.39	ND
PCB 184	0.44	ND	0.44	ND
PCB 187	0.34	ND	0.34	ND
PCB 195	0.28	ND	0.28	ND
PCB 206	0.23	ND	0.23	ND
PCB 209	0.25	ND	0.25	ND
Total PCB		**15.09**		**8.9**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
PORT JERSEY CHANNEL
CONTRACT AREA 2A - REACH 4

	SITE WATER		ELUTRIATE	
CONSTITUENTS	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.046		0.022
Cd		0.052		0.024
Cr		0.731		3.233
Cu		2.19		4.643
Hg		0.005		0.015
Ni		1.06		8.00
Pb		0.95		1.70
Zn		4.90		7.07
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	1.13	ND	1.13	ND
a-Chlordane	0.43	ND	0.43	ND
trans Nonachlor	0.41	ND	0.41	ND
Dieldrin	0.39	ND	0.39	ND
4,4'-DDT	0.22	ND	0.22	ND
2,4'-DDT	0.79	ND	0.79	ND
4,4'-DDD	0.24	ND		0.96
2,4'-DDD	0.30	ND	0.30	ND
4,4'-DDE	0.34	ND	0.34	ND
2,4'-DDE	0.68	ND	0.68	ND
Total DDT		**1.3**		**2.1**
Endosulfan I	0.44	ND	0.44	ND
Endosulfan II	0.20	ND	0.20	ND
Endosulfan sulfate	0.23	ND	0.23	ND
Heptachlor	0.47	ND	0.47	ND
Heptachlor epoxide	0.38	ND	0.38	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	6.40	ND	6.40	ND
PCB 18	0.55	ND		0.77
PCB 28	0.69	ND	0.69	ND
PCB 44	0.58	ND		0.28
PCB 49	0.59	ND		0.84
PCB 52	0.57	ND		0.96
PCB 66	0.60	ND	0.60	ND
PCB 87	0.45	ND	0.45	ND
PCB 101	0.46	ND		0.30
PCB 105	0.23	ND	0.23	ND
PCB 118	0.35	ND	0.35	ND
PCB 128	0.56	ND	0.56	ND
PCB 138	0.53	ND	0.53	ND
PCB 153	0.43	ND		0.25
PCB 170	0.41	ND	0.41	ND
PCB 180	0.38	ND		0.24
PCB 183	0.37	ND	0.37	ND
PCB 184	0.37	ND	0.37	ND
PCB 187	0.34	ND		0.15
PCB 195	0.43	ND		0.19
PCB 206	0.49	ND		0.27
PCB 209	0.51	ND	0.51	ND
Total PCB		**27.9**		**29.2**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
Port Jersey Contract Area 2B - Reach 5

	SITE WATER		ELUTRIATE	
CONSTITUENTS	**DETECTION LIMITS**	**CONCENTRATION**	**DETECTION LIMITS**	**CONCENTRATION**
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.062		0.055
Cd		0.050		0.227
Cr		1.370		0.864
Cu		14.53		3.987
Hg		0.010		0.015
Ni		1.37		6.90
Pb		3.35		0.59
Zn		122.67		3.37
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	0.24	ND	0.24	ND
a-Chlordane	0.23	ND	0.23	ND
trans Nonachlor	0.24	ND	0.24	ND
Dieldrin	0.46	ND	0.46	ND
4,4'-DDT	0.35	ND	0.35	ND
2,4'-DDT	0.29	ND	0.29	ND
4,4'-DDD	0.57	ND	0.57	ND
2,4'-DDD	0.49	ND	0.49	ND
4,4'-DDE	0.41	ND	0.41	ND
2,4'-DDE	0.41	ND	0.41	ND
Total DDT		**1.3**		**1.3**
Endosulfan I	0.17	ND	0.17	ND
Endosulfan II	0.41	ND	0.41	ND
Endosulfan sulfate	0.39	ND	0.39	ND
Heptachlor	0.35	ND	0.35	ND
Heptachlor epoxide	0.95	ND	0.95	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	0.29	ND	0.29	ND
PCB 18	0.48	ND	0.48	ND
PCB 28		1.23	0.36	ND
PCB 44		0.54		0.26
PCB 49		0.61	0.23	ND
PCB 52		1.12		0.82
PCB 66		0.60	0.25	ND
PCB 87	0.42	ND	0.42	ND
PCB 101		0.43		0.28
PCB 105		0.35	0.44	ND
PCB 118		0.25	0.41	ND
PCB 128	0.38	ND	0.38	ND
PCB 138	0.39	ND	0.39	ND
PCB 153		0.16	0.39	ND
PCB 170	0.34	ND	0.34	ND
PCB 180	0.26	ND	0.26	ND
PCB 183	0.39	ND	0.39	ND
PCB 184	0.44	ND	0.44	ND
PCB 187	0.34	ND	0.34	ND
PCB 195	0.28	ND	0.28	ND
PCB 206	0.23	ND	0.23	ND
PCB 209	0.25	ND	0.25	ND
Total PCB		**15.09**		**9.3**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 2. PORT JERSEY CHANNEL - CONTRACT AREA 2B - REACH 1

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	(b) >100%	1.00
Mysidposis bahia	96 hours	(b) >100%	1.00
Mytilus edulis (larval survival)	48 hours	(b) >100%	1.00
Mytilus edulis (larval normal develop.)	48 hours	(c) 100%	1.00

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} times 0.01.

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortality at test termination.

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	94%	99%	-5%	No
Mysidopsis bahia	95%	94%	1%	No

TABLE 2. PORT JERSEY CHANNEL - CONTRACT AREA 2B - REACH 2

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	(b) 47.8%	0.48
Mysidposis bahia	96 hours	(b) 70.7%	0.71
Mytilus edulis (larval survival)	48 hours	(b) 72.9%	0.73
Mytilus edulis (larval normal develop.)	48 hours	(c) 22.4%	0.22

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} times 0.01.

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination.

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	68%	80%	-12%	No
Mysidopsis bahia	98%	97%	1%	No

TABLE 2. PORT JERSEY CHANNEL - CONTRACT AREA 2B - REACH 3

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	(b) >100%	1.00
Mysidposis bahia	96 hours	(b) >100%	1.00
Mytilus edulis (larval survival)	48 hours	(b) >100%	1.00
Mytilus edulis (larval normal develop.)	48 hours	(c) >100%	1.00

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} times 0.01.

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortality at test termination.

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	86%	94%	-8%	No
Mysidopsis bahia	94%	96%	-2%	No

TABLE 2. PORT JERSEY CHANNEL - CONTRACT AREA 2A - REACH 4

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	(b) >100%	1.00
Mysidposis bahia	96 hours	(b) >100%	1.00
Mytilus edulis (larval survival)	48 hours	(b) >100%	1.00
Mytilus edulis (larval normal develop.)	48 hours	(c) 93.5%	0.94

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} times 0.01.

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortatlity at test termination.

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	97%	94%	3%	No
Mysidopsis bahia	98%	96%	2%	No

TABLE 2. PORT JERSEY CHANNEL - CONTRACT AREA 2B - REACH 5

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC_{50}/EC_{50}	LPC (a)
Menidia beryllina	96 hours	(b) >100%	1.00
Mysidposis bahia	96 hours	(b) >100%	1.00
Mytilus edulis (larval survival)	48 hours	(b) >100%	1.00
Mytilus edulis (larval normal develop.)	48 hours	(c) >100%	1.00

(a) Limiting Permissible Concentration (LPC) is the LC_{50} or EC_{50} times 0.01.

(b) Median Lethal Concentration (LC_{50}) resulting in 50% mortality at test termination.

(c) Median Effective Concentration (EC_{50}) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is difference statistically significant? (a=0.05)
Ampelisca abdita	61%	89%	-28%	No
Mysidopsis bahia	97%	98%	-1%	No

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
PORT JERSEY CONTRACT AREA 2B REACH 1
Wet weight concentrations

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.05		0.06		0.03		0.03
As		2.98		3.07		3.27		2.93
Cd		0.03		0.03		0.04	*	0.05
Cr		0.30	*	0.40		0.18	*	0.20
Cu		1.94	*	2.43		1.38		1.41
Hg		0.01		0.01		0.04		0.03
Ni		0.26	*	0.40		0.26	*	0.31
Pb		0.23	*	0.44		0.09	*	0.14
Zn		12.74		12.94		19.28		16.04
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.04	ND	0.04	ND	0.05	ND	*	0.04
a-Chlordane		0.06	*	0.08		0.09	*	0.23
trans Nonachlor		0.03	*	0.04		0.24	*	0.30
Dieldrin		0.09	*	0.17		0.18	*	0.60
4,4'-DDT	0.06	ND	0.06	ND		0.03	0.10	* ND
2,4'-DDT	0.05	ND	*	0.04		0.04	*	0.08
4,4'-DDD		0.09	*	0.31		0.11	*	0.74
2,4'-DDD		0.04	*	0.12		0.12	*	0.31
4,4'-DDE		0.22	*	0.92		0.03	*	0.46
2,4'-DDE	0.03	ND	*	0.21	0.03	ND	*	0.11
Total DDT		**0.42**	*	**1.63**		**0.34**	*	**1.74**
Endosulfan I	0.05	ND	0.06	* ND	0.07	ND	0.09	* ND
Endosulfan II		0.02	*	0.03		0.11	0.08	ND
Endosulfan sulfate		0.03	*	0.11		0.18		0.20
Heptachlor		0.03	0.05	ND	0.06	ND	0.09	* ND
Heptachlor epoxide	0.04	ND	0.04	ND		0.04	0.06	ND
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.09	ND	0.09	ND	0.11	ND	0.14	* ND
PCB 18		0.04	*	0.63	0.06	ND	*	1.94
PCB 28		0.09	*	0.90		0.04	*	1.58
PCB 44	0.05	ND	*	0.44		0.07	*	1.03
PCB 49		0.06	*	0.69		0.20	*	1.30
PCB 52		0.07	*	1.06		0.38	*	3.06
PCB 66		0.13	*	0.76		0.05	*	1.00
PCB 87		0.05	*	0.32		0.03	*	0.37
PCB 101		0.09	*	0.79		0.34	*	1.55
PCB 105		0.04	*	0.22		0.13	*	0.47
PCB 118		0.10	*	0.58		0.16	*	0.83
PCB 128		0.03	*	0.08		0.16		0.25
PCB 138		0.17	*	0.57		0.89	*	1.82
PCB 153		0.18	*	0.83		1.18	*	2.56
PCB 170		0.02	*	0.08		0.18	*	0.34
PCB 180		0.07	*	0.19		0.39	*	0.85
PCB 183		0.02	*	0.08		0.26	*	0.38
PCB 184	0.04	ND	0.04	ND	0.05	ND	0.07	* ND
PCB 187		0.04	*	0.16		0.47	*	0.82
PCB 195		0.02	*	0.03		0.12	*	0.18
PCB 206		0.02	*	0.04		0.22	*	0.29
PCB 209		0.12		0.06		0.21		0.28
Total PCB		**2.88**	*	**17.12**		**11.21**	*	**42.01**
1,4-Dichlorobenzene		0.45		0.42		0.14	*	0.61

TABLE 3. (Continued) PORT JERSEY CONTRACT AREA 2B REACH 1

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.35		* 0.60		0.62		* 0.78
Acenaphthylene		0.04		* 0.31		0.06		* 0.17
Acenaphthene		0.05		* 0.14		0.08		0.08
Fluorene		0.08		* 0.16		0.04	0.05	ND
Phenanthrene		0.40		* 1.06		0.08		* 0.15
Anthracene	0.07	ND		* 0.79		0.04	0.12	* ND
Fluoranthene		1.89		* 6.88		0.15		* 1.41
Pyrene		1.43		* 11.94		0.13		* 4.09
Benzo(a)anthracene		0.23		* 2.90		0.06		0.09
Chrysene		0.77		* 3.96		0.15		* 1.28
Benzo(b)fluoranthene		0.38		* 1.72	0.10	ND	0.14	* ND
Benzo(k)fluoranthene		0.41		* 2.36	0.07	ND	0.09	* ND
Benzo(a)pyrene		0.31		* 2.03		0.08	0.12	ND
Indeno(1,2,3-cd)pyrene		0.15		* 0.83		0.05	0.09	ND
Dibenzo(a,h)antracene		0.04		* 0.16	0.06	ND	0.08	* ND
Benzo(g,h,i)perylene		0.16		* 0.66		0.06	0.07	ND
Total PAH's		**6.73**		* **36.50**		**1.72**		* **8.42**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD		0.07		* 0.40		0.22		* 0.72
12378 PeCDD	0.26	ND		0.19		0.25		0.22
123478 HxCDD		0.14		0.23		0.32		0.42
123678 HxCDD		0.32		0.39		0.91		1.06
123789 HxCDD		0.27		0.29		0.60		0.73
1234678 HpCDD		8.91		4.21		15.40		20.06
1234789 OCDD		82.14		30.51		110.88		152.61
2378 TCDF		0.17		0.21		1.14		1.18
12378 PeCDF		0.08		* 0.19		0.32		0.28
23478 PeCDF		0.07		0.18		0.28		* 0.36
123478 HxCDF		0.18		0.33		0.40		0.47
123678 HxCDF		0.09		0.21		0.50		0.29
234678 HxCDF		0.08		0.23		0.24		0.30
123789 HxCDF		0.06		* 0.20		0.19		0.17
1234678 HpCDF		1.03		1.06		3.12		4.27
1234789 HpCDF		0.25		0.29		0.50		0.66
12346789 OCDF		4.76		3.41		9.25		16.54

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
PORT JERSEY CONTRACT AREA 2B REACH 2
Wet weight concentrations

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.05		* 0.06		0.03		0.02
As		2.98		* 3.27		3.27		2.70
Cd		0.03		0.04		0.04	*	0.04
Cr		0.30		0.36		0.18		0.17
Cu		1.94		2.30		1.38		1.37
Hg		0.01		* 0.01		0.04		0.03
Ni		0.26		* 0.38		0.26		0.28
Pb		0.23		* 0.54		0.09	*	0.14
Zn		12.74		13.14		19.28		22.82
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.04	ND	0.04	ND	0.05	ND		0.03
a-Chlordane		0.06		* 0.08		0.09	*	0.23
trans Nonachlor		0.03		* 0.05		0.24	*	0.30
Dieldrin		0.09		* 0.17		0.18	*	0.60
4,4'-DDT	0.06	ND	0.06	ND		0.03	*	0.05
2,4'-DDT	0.05	ND		* 0.03		0.04	*	0.08
4,4'-DDD		0.09		* 0.39		0.11	*	0.86
2,4'-DDD		0.04		* 0.23		0.12	*	0.31
4,4'-DDE		0.22		* 1.03		0.03	*	0.49
2,4'-DDE	0.03	ND		* 0.25	0.03	ND	0.03	ND
Total DDT		**0.42**		* **1.96**		**0.34**	*	**1.80**
Endosulfan I	0.05	ND		* 0.34	0.07	ND	0.07	ND
Endosulfan II		0.02		* 0.06		0.11	*	0.42
Endosulfan sulfate		0.03		* 0.12		0.18		0.22
Heptachlor		0.03		0.03	0.06	ND		0.29
Heptachlor epoxide	0.04	ND	0.04	ND		0.04	*	0.12
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.09	ND		* 0.26	0.11	ND	0.10	ND
PCB 18		0.04		* 0.93	0.06	ND	*	1.54
PCB 28		0.09		* 1.31		0.04	*	1.71
PCB 44	0.05	ND		* 0.62		0.07	*	1.02
PCB 49		0.06		* 0.93		0.20	*	1.28
PCB 52		0.07		* 1.27		0.38	*	2.51
PCB 66		0.13		* 0.98		0.05	*	1.06
PCB 87		0.05		* 0.35		0.03	*	0.31
PCB 101		0.09		* 0.90		0.34	*	1.30
PCB 105		0.04		* 0.22		0.13	*	0.42
PCB 118		0.10		* 0.61		0.16	*	0.75
PCB 128		0.03		* 0.08		0.16		0.23
PCB 138		0.17		* 0.61		0.89	*	1.54
PCB 153		0.18		* 0.82		1.18	*	1.87
PCB 170		0.02		* 0.19		0.18	*	0.29
PCB 180		0.07		* 0.18		0.39	*	0.74
PCB 183		0.02		* 0.07		0.26	*	0.34
PCB 184	0.04	ND	0.04	ND	0.05	ND	0.05	ND
PCB 187		0.04		* 0.16		0.47	*	0.68
PCB 195		0.02		* 0.04		0.12	*	0.17
PCB 206		0.02		* 0.04		0.22		0.25
PCB 209		0.12		0.06		0.21		0.21
Total PCB		2.88		* **21.25**		**11.21**	*	**36.52**
1,4-Dichlorobenzene		0.45		0.42		0.14		0.14

TABLE 3. (Continued) PORT JERSEY CONTRACT AREA 2B REACH 2

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.35		* 1.20		0.62		0.62
Acenaphthylene		0.04		* 1.60		0.06		* 0.56
Acenaphthene		0.05		* 2.17		0.08		* 2.36
Fluorene		0.08		* 1.81		0.04		* 0.50
Phenanthrene		0.40		* 25.56		0.08		* 3.46
Anthracene	0.07	ND		* 14.90		0.04		* 1.06
Fluoranthene		1.89		* 119.97		0.15		* 38.53
Pyrene		1.43		* 145.41		0.13		* 61.06
Benzo(a)anthracene		0.23		* 53.38		0.06		* 4.07
Chrysene		0.77		* 57.70		0.15		* 15.43
Benzo(b)fluoranthene		0.38		* 18.33	0.10	ND		* 2.25
Benzo(k)fluoranthene		0.41		* 23.62	0.07	ND		* 2.65
Benzo(a)pyrene		0.31		* 25.22		0.08		* 3.24
Indeno(1,2,3-cd)pyrene		0.15		* 5.36		0.05		* 0.40
Dibenzo(a,h)antracene		0.04		* 1.34	0.06	ND		* 0.16
Benzo(g,h,i)perylene		0.16		* 5.68		0.06		* 0.56
Total PAH's		**6.73**		* **503.26**		**1.72**		* **136.90**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD		0.07		* 0.38		0.22		* 0.67
12378 PeCDD	0.26	ND		0.13		0.25		0.27
123478 HxCDD		0.14		* 0.35		0.32		0.40
123678 HxCDD		0.32		0.53		0.91		1.09
123789 HxCDD		0.27		0.45		0.60		0.79
1234678 HpCDD		8.91		7.90		15.40		21.00
1234789 OCDD		82.14		69.24		110.88		140.49
2378 TCDF		0.17		0.19		1.14		1.55
12378 PeCDF		0.08		* 0.16		0.32		0.29
23478 PeCDF		0.07		* 0.20		0.28		* 0.39
123478 HxCDF		0.18		* 0.42		0.40		0.51
123678 HxCDF		0.09		* 0.27		0.50		0.28
234678 HxCDF		0.08		* 0.31		0.24		0.23
123789 HxCDF		0.06		* 0.28		0.19		0.09
1234678 HpCDF		1.03		1.45		3.12		4.62
1234789 HpCDF		0.25		* 0.51		0.50		0.59
12346789 OCDF		4.76		4.64		9.25		17.35

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
PORT JERSEY CONTRACT AREA 2B REACH 3
Wet weight concentrations

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.05		0.04		0.01	0.01	ND
As		2.98		* 3.12		3.70		3.52
Cd		0.03		0.03		0.04		0.05
Cr		0.30		* 0.67		0.17		0.16
Cu		1.94		2.18		1.83		1.70
Hg		0.01		0.01		0.04		0.04
Ni		0.26		* 0.70		0.34		* 0.48
Pb		0.23		0.25		0.10		0.80
Zn		12.74		12.48		26.48		29.26
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.04	ND	0.04	ND	0.05	ND	0.04	ND
a-Chlordane		0.06		0.03		0.11		0.08
trans Nonachlor		0.03	0.05	ND		0.27		0.27
Dieldrin		0.09		0.06		0.24		0.23
4,4'-DDT	0.06	ND	0.06	ND		0.05		0.04
2,4'-DDT	0.05	ND	0.05	ND		0.14		0.07
4,4'-DDD		0.09	0.05	ND		0.16		0.13
2,4'-DDD		0.04	0.04	ND		0.13		0.12
4,4'-DDE		0.22		0.14		0.04		0.03
2,4'-DDE	0.03	ND	0.03	ND	0.04	ND	0.03	ND
Total DDT		**0.42**		**0.26**		**0.54**		**0.40**
Endosulfan I	0.05	ND	0.06	* ND	0.07	ND	0.06	ND
Endosulfan II		0.02	0.04	ND		0.06	0.04	ND
Endosulfan sulfate		0.03		0.03		0.29		0.21
Heptachlor		0.03	0.05	ND	0.07	ND	0.05	ND
Heptachlor epoxide	0.04	ND		0.02		0.05		0.05
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8	0.09	ND	0.09	ND	0.12	ND	0.10	ND
PCB 18		0.04		* 0.15	0.06	ND	0.05	ND
PCB 28		0.09	0.06	ND		0.05		0.04
PCB 44	0.05	ND		* 0.19		0.09		0.09
PCB 49		0.06	0.05	ND		0.11		0.09
PCB 52		0.07	0.04	ND		0.25		0.18
PCB 66		0.13		0.12		0.13		0.12
PCB 87		0.05		0.02		0.07		0.04
PCB 101		0.09	0.05	ND		0.40		0.33
PCB 105		0.04	0.04	ND		0.17		0.14
PCB 118		0.10	0.05	ND		0.27		0.25
PCB 128		0.03	0.06	ND		0.17		0.16
PCB 138		0.17		0.05		1.33		1.29
PCB 153		0.18		0.03		2.14		2.13
PCB 170		0.02	0.04	ND		0.28		0.27
PCB 180		0.07		0.03		0.73		0.75
PCB 183		0.02	0.03	ND		0.34		0.34
PCB 184	0.04	ND	0.04	ND	0.05	ND	0.04	ND
PCB 187		0.04	0.03	ND		0.74		0.76
PCB 195		0.02	0.04	ND		0.16		0.16
PCB 206		0.02	0.04	ND		0.26		0.24
PCB 209		0.12	0.04	ND		0.22		0.21
Total PCB		**2.88**		**1.89**		**16.06**		**15.40**
1,4-Dichlorobenzene		0.45		0.31		0.60		0.53

TABLE 3. (Continued) PORT JERSEY CONTRACT AREA 2B REACH 3

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.35		0.40		0.58		0.58
Acenaphthylene		0.04		0.02		0.10		0.11
Acenaphthene		0.05		* 0.13	0.06	ND		* 0.19
Fluorene		0.08		* 0.13	0.04	ND	0.03	ND
Phenanthrene		0.40		* 0.70		0.05		* 0.13
Anthracene	0.07	ND		* 0.17	0.09	ND	0.07	ND
Fluoranthene		1.89		1.44		0.05		* 0.13
Pyrene		1.43		1.28		0.06		* 0.15
Benzo(a)anthracene		0.23		0.17	0.09	ND	0.07	ND
Chrysene		0.77		0.52		0.13		0.11
Benzo(b)fluoranthene		0.38		0.15	0.11	ND	0.09	ND
Benzo(k)fluoranthene		0.41		0.15	0.07	ND	0.06	ND
Benzo(a)pyrene		0.31		0.14	0.10	ND	0.08	ND
Indeno(1,2,3-cd)pyrene		0.15		0.06	0.07	ND	0.05	ND
Dibenzo(a,h)antracene		0.04		0.03	0.06	ND	0.05	ND
Benzo(g,h,i)perylene		0.16		0.05	0.06	ND	0.04	ND
Total PAH's		**6.73**		**5.54**		**1.35**		**1.70**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD		0.07		0.07		0.22		0.18
12378 PeCDD	0.26	ND		0.12		0.16		* 0.39
123478 HxCDD		0.14		0.10		0.23		* 0.45
123678 HxCDD		0.32		0.14		0.77		0.96
123789 HxCDD		0.27		0.12		0.48		* 0.72
1234678 HpCDD		8.91		1.41		15.22		13.04
1234789 OCDD		82.14		11.56		153.10		84.11
2378 TCDF		0.17		0.11		1.47		1.15
12378 PeCDF		0.08		0.10		0.36		0.41
23478 PeCDF		0.07		0.08		0.39		0.45
123478 HxCDF		0.18		0.16		0.46		0.51
123678 HxCDF		0.09		0.07		0.20		* 0.36
234678 HxCDF		0.08		0.09		0.18		* 0.36
123789 HxCDF		0.06		0.07		0.08		0.24
1234678 HpCDF		1.03		0.36		2.88		2.67
1234789 HpCDF		0.25		0.18		0.42		0.50
12346789 OCDF		4.76		1.33		9.57		7.26

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.

PORT JERSEY CHANNEL - CONTRACT AREA 2A - REACH 4

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE

Wet weight concentrations

CONSTITUENTS	*Tapes japonica*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.09		0.10		0.04		0.04
As		2.11		2.15		3.19		2.58
Cd		0.19		* 0.21		0.05		* 0.05
Cr		0.09		* 0.13		0.14		* 0.17
Cu		0.77		0.79		1.53		1.75
Hg		0.01		0.01		0.04		0.03
Ni		0.92		0.97		0.52		0.47
Pb		0.03		0.03		0.11		* 0.15
Zn		7.93		8.00		30.86		21.36
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.07	ND	0.07	ND		0.03	0.07	ND
a-Chlordane		0.02		0.03		0.09		0.05
trans Nonachlor		0.02		0.02		0.25		0.20
Dieldrin		0.11		0.12		0.28		0.26
4,4'-DDT	0.11	ND	0.11	ND		0.04		0.04
2,4'-DDT	0.10	ND	0.10	ND		0.04	0.10	ND
4,4'-DDD		0.04		* 0.06		0.12		0.12
2,4'-DDD		0.03		0.02		0.10		0.07
4,4'-DDE		0.03		* 0.08		0.03		0.03
2,4'-DDE		0.02		* 0.03	0.05	ND	0.05	ND
Total DDT		**0.22**		* **0.29**		**0.35**		**0.33**
Endosulfan I	0.10	ND	0.10	ND	0.11	ND	0.11	ND
Endosulfan II	0.08	ND	0.08	ND	0.09	ND	0.09	ND
Endosulfan sulfate		0.02		0.02		0.07		0.05
Heptachlor	0.10	ND	0.10	ND		0.04		0.03
Heptachlor epoxide		0.02		0.02		0.06		0.04
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.39		0.27		0.80		0.39
PCB 18		0.04		* 0.08		0.03		0.04
PCB 28		0.03		* 0.08		0.03		* 0.05
PCB 44		0.02		* 0.07		0.18		0.39
PCB 49		0.06		* 0.12		0.10		0.09
PCB 52		0.15		* 0.20		0.21		* 0.56
PCB 66	0.12	ND	0.12	ND		0.02		0.02
PCB 87		0.04		* 0.05		0.04		* 0.11
PCB 101		0.05		* 0.07		0.21		* 0.36
PCB 105		0.02		0.03		0.13		0.14
PCB 118		0.05		* 0.06		0.16		* 0.19
PCB 128		0.02		* 0.05		0.16		0.15
PCB 138		0.11		0.11		1.00		1.11
PCB 153		0.10		* 0.15		1.50		1.68
PCB 170		0.01		0.01		0.21		* 0.26
PCB 180		0.09		0.10		0.57		* 0.73
PCB 183		0.02		* 0.03		0.28		* 0.35
PCB 184	0.08	ND	0.08	ND	0.08	ND	0.08	ND
PCB 187		0.04		* 0.05		0.61		* 0.79
PCB 195		0.01		* 0.02		0.11		* 0.24
PCB 206		0.01		* 0.02		0.24		* 0.45
PCB 209		0.01		* 0.03		0.17		* 0.39
Total PCB		**2.73**		* **3.38**		**13.57**		* **17.08**
1,4-Dichlorobenzene		0.19		0.19		0.26		0.32

TABLE 3. (Continued) PORT JERSEY CHANNEL - CONTRACT AREA 2A - REACH 4

CONSTITUENTS	*Tapes japonica*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.38		0.39		0.76		1.54
Acenaphthylene		0.09	0.05	ND		0.12		* 0.35
Acenaphthene		0.07		0.05		0.21		* 0.31
Fluorene		0.11		0.10		0.10		0.13
Phenanthrene		0.50		0.44		0.11		* 0.20
Anthracene		0.19		0.09		0.05		* 0.18
Fluoranthene		1.17		0.85		0.16		* 1.19
Pyrene		1.21		1.61		0.16		* 3.00
Benzo(a)anthracene		0.79		0.72		0.04		* 0.30
Chrysene		1.02		1.15		0.15		* 2.67
Benzo(b)fluoranthene		0.22		0.17	0.16	ND		* 0.21
Benzo(k)fluoranthene		0.21		0.11	0.11	ND		* 0.24
Benzo(a)pyrene		0.30	0.14	ND	0.14	ND		* 0.31
Indeno(1,2,3-cd)pyrene		0.17	0.10	ND	0.10	ND		0.06
Dibenzo(a,h)antracene		0.08	0.09	ND	0.09	ND		0.06
Benzo(g,h,i)perylene		0.20		0.10		0.07		* 0.17
Total PAH's		**6.71**		**5.96**		**2.23**		* **10.93**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2,3,7,8 TCDD	0.07	ND	0.04	ND		0.11		0.10
1,2,3,7,8 PeCDD	0.15	ND	0.13	ND		0.09	0.28	* ND
1,2,3,4,7,8 HxCDD	0.05	ND	0.02	ND		0.04		0.06
1,2,3,6,7,8 HxCDD	0.05	ND		0.03		0.22		0.17
1,2,3,7,8,9 HxCDD	0.05	ND		0.01		0.12		0.09
1,2,3,4,6,7,8 HpCDD		0.16		0.37		1.16		0.88
1,2,3,4,7,8,9 OCDD		1.20		2.59		6.13		4.44
2,3,7,8 TCDF		0.10		0.12		0.75		0.79
1,2,3,7,8 PeCDF	0.12	ND		0.04		0.13		* 0.22
2,3,4,7,8 PeCDF	0.11	ND		0.05		0.21		* 0.33
1,2,3,4,7,8 HxCDF		0.07		0.10		0.18		* 0.85
1,2,3,6,7,8 HxCDF		0.02		0.02		0.09		* 0.37
2,3,4,6,7,8 HxCDF		0.03	0.02	ND		0.08		0.11
1,2,3,7,8,9 HxCDF		0.01	0.02	ND		0.03		* 0.06
1,2,3,4,6,7,8 HpCDF	0.15	ND		0.08	0.15	ND		* 0.59
1,2,3,4,7,8,9 HpCDF	0.18	ND		0.08		0.07		* 0.16
1,2,3,4,6,7,8,9 OCDF		0.16		0.24		0.46		* 0.98

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
PORT JERSEY CONTRACT AREA 2B REACH 5
Wet weight concentrations

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.03		0.02		0.02		0.01
As		2.68		3.03		3.11		2.50
Cd		0.04		0.04		0.04		0.04
Cr		0.21		* 0.41		0.17		0.16
Cu		1.69		* 2.03		1.36		* 1.45
Hg		0.01		0.01		0.04		0.04
Ni		0.32		* 0.63		0.20		* 0.28
Pb		0.16		* 0.18		0.12		0.09
Zn		14.75		15.32		14.82		21.72
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.04	ND		0.02	0.06	ND	0.05	ND
a-Chlordane		0.04		0.03		0.07		0.06
trans Nonachlor		0.02		0.02		0.19		0.17
Dieldrin		0.09		0.05		0.14		0.13
4,4'-DDT	0.06	ND	0.06	ND	0.09	ND	0.08	ND
2,4'-DDT	0.05	ND	0.05	ND	0.08	ND	0.07	ND
4,4'-DDD		0.06		0.03		0.19		0.15
2,4'-DDD		0.02	0.04	ND		0.14		0.12
4,4'-DDE		0.43		0.48		0.05		0.05
2,4'-DDE	0.03	ND	0.03	ND	0.04	ND	0.04	ND
Total DDT		**0.59**		**0.60**		**0.49**		**0.40**
Endosulfan I	0.06	ND	0.06	ND	0.09	ND	0.07	ND
Endosulfan II		0.03		0.02		0.06		0.07
Endosulfan sulfate		0.04		0.05		0.07		0.08
Heptachlor	0.05	ND		0.09	0.08	ND	0.07	ND
Heptachlor epoxide		0.02		0.02	0.06	ND		0.03
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.09		0.09		1.79		1.16
PCB 18	0.05	ND		0.19	0.07	ND	0.06	ND
PCB 28		0.17		0.23	0.10	ND	0.08	ND
PCB 44	0.05	ND		0.03	0.08	ND	0.07	ND
PCB 49		0.04		0.03	0.08	ND	0.07	ND
PCB 52		0.07		0.06	0.07	ND		0.05
PCB 66		0.13		0.15		0.11		0.07
PCB 87		0.02		0.02		0.03		0.02
PCB 101		0.07		0.03		0.37		0.29
PCB 105		0.04		0.03		0.10		0.09
PCB 118		0.10		0.09		0.18		0.16
PCB 128	0.06	ND		0.03		0.12		0.11
PCB 138		0.16		0.13		1.07		0.96
PCB 153		0.12		0.06		1.54		1.40
PCB 170	0.04	ND		0.02		0.26		0.25
PCB 180		0.03		0.05		0.55		0.50
PCB 183	0.03	ND	0.03	ND		0.23		0.22
PCB 184	0.04	ND	0.04	ND	0.06	ND	0.05	ND
PCB 187	0.03	ND		0.03		0.60		0.57
PCB 195	0.04	ND		0.02		0.14		0.13
PCB 206		0.02		0.02		0.24		0.23
PCB 209	0.04	ND		0.04		0.25		0.24
Total PCB		**2.51**		**2.77**		**15.61**		**13.18**
1,4-Dichlorobenzene		0.09		0.09		0.18		0.15

TABLE 3. (Continued) **PORT JERSEY CONTRACT AREA 2B REACH 5**

CONSTITUENTS	*Macoma nasuta*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.36		0.37		1.29		1.15
Acenaphthylene	0.03	ND	0.03	ND		0.12		0.10
Acenaphthene		0.10		0.10		0.19		0.19
Fluorene		0.10		0.11		0.11		0.09
Phenanthrene		0.52		0.61		0.24		0.18
Anthracene		0.05	0.07	ND		0.07		0.05
Fluoranthene		1.26		1.30		0.21		0.11
Pyrene		1.08		1.12		0.21		0.11
Benzo(a)anthracene		0.16		0.08		0.06		0.03
Chrysene		0.64		0.45		0.19		0.11
Benzo(b)fluoranthene		0.27		0.11		0.07	0.11	ND
Benzo(k)fluoranthene		0.26		0.11		0.05	0.07	ND
Benzo(a)pyrene		0.16		0.05	0.12	ND	0.09	ND
Indeno(1,2,3-cd)pyrene		0.07	0.05	ND	0.08	ND	0.07	ND
Dibenzo(a,h)antracene	0.05	ND	0.05	ND	0.07	ND	0.06	ND
Benzo(g,h,i)perylene		0.10	0.04	ND		0.05		0.03
Total PAH's		**5.18**		**4.53**		**2.98**		**2.35**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD	0.11	ND		0.06		0.10		0.06
12378 PeCDD		0.10	0.14	ND		0.09	0.10	ND
123478 HxCDD		0.09	0.10	ND		0.11		0.07
123678 HxCDD		0.11	0.10	ND		0.24		0.21
123789 HxCDD		0.10	0.09	ND		0.22		0.15
1234678 HpCDD		0.39		0.25		1.89		1.36
1234789 OCDD		2.00		1.19		9.29		7.22
2378 TCDF	0.09	ND		0.04		0.88		0.81
12378 PeCDF		0.11	0.16	ND		0.16		0.12
23478 PeCDF		0.10	0.14	ND		0.21		0.17
123478 HxCDF		0.13		0.09		0.16		0.13
123678 HxCDF		0.08		0.05		0.07		0.08
234678 HxCDF		0.09		0.05		0.09		0.09
123789 HxCDF		0.10	0.11	ND		0.09	0.18	ND
1234678 HpCDF		0.13		0.07		0.68		0.49
1234789 HpCDF		0.11		0.05		0.14		0.10
12346789 OCDF		0.33		0.20		0.80		0.71

ND = Not detected
Total PAH = Sum of all PAH's.
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level.

TABLE 4A. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE
PORT JERSEY - CONTRACT AREA 1

	SITE WATER		ELUTRIATE	
CONSTITUENTS	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	**ppb**	**ppb**	**ppb**	**ppb**
Ag		0.032		0.016
Cd		0.068		0.084
Cr		0.522		0.918
Cu		2.10		2.070
Hg		0.005		0.001
Ni		1.30		2.94
Pb		0.69		0.39
Zn		5.45		3.98
Pesticides	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
Aldrin	2.83	ND	2.83	ND
a-Chlordane	1.08	ND	1.08	ND
trans Nonachlor	1.01	ND	1.01	ND
Dieldrin	0.98	ND	0.98	ND
4,4'-DDT	0.56	ND	0.56	ND
2,4'-DDT	1.99	ND	1.99	ND
4,4'-DDD	0.60	ND	0.60	ND
2,4'-DDD	0.75	ND	0.75	ND
4,4'-DDE	0.84	ND	0.84	ND
2,4'-DDE	1.71	ND	1.71	ND
Total DDT		**3.2**		**3.2**
Endosulfan I	1.11	ND	1.11	ND
Endosulfan II	0.51	ND	0.51	ND
Endosulfan sulfate	0.57	ND	0.57	ND
Heptachlor	1.17	ND	1.17	ND
Heptachlor epoxide	0.95	ND	0.95	ND
Industrial Chemicals	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**	**pptr (ng/L)**
PCB 8	16.00	ND	16.00	ND
PCB 18	1.39	ND	1.39	ND
PCB 28	1.73	ND	1.73	ND
PCB 44	1.45	ND	1.45	ND
PCB 49	1.49	ND	1.49	ND
PCB 52	1.44	ND	1.44	ND
PCB 66	1.49	ND	1.49	ND
PCB 87	1.13	ND	1.13	ND
PCB 101	1.15	ND	1.15	ND
PCB 105	0.58	ND	0.58	ND
PCB 118	0.87	ND	0.87	ND
PCB 128	1.40	ND	1.40	ND
PCB 138	1.33	ND	1.33	ND
PCB 153	1.07	ND	1.07	ND
PCB 170	1.02	ND	1.02	ND
PCB 180	0.96	ND	0.96	ND
PCB 183	0.93	ND	0.93	ND
PCB 184	0.92	ND	0.92	ND
PCB 187	0.86	ND	0.86	ND
PCB 195	1.09	ND	1.09	ND
PCB 206	1.22	ND	1.22	ND
PCB 209	1.27	ND	1.27	ND
Total PCB		**81.5**		**81.5**

ND = Not detected
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = sum of congeners reported x 2
Concentrations shown are the mean of three replicate analyses.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.

TABLE 4B. **PORT JERSEY - CONTRACT AREA 1**

TOXICITY TEST RESULTS

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
Menidia beryllina	96 hours	(b) >100%	1.00
Mysidposis bahia	96 hours	(b) >100%	1.00
Mytilus edulis (larval survival)	48 hours	(b) >100%	1.00
Mytilus edulis (larval normal development)	48 hours	(c) >100%	1.00

(a) Limiting Permissible Concentration (LPC) is the LC 50 or EC 50 times 0.01.

(b) Median Lethal Concentration (LC50) resulting in 50% mortatlity at test termination.

(c) Median Effective Concentration (EC50) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days)

Test Species	% Survival in Reference	% Survival	% Difference |Reference -Test|	Is difference statistically significant? (a=0.05)
Ampelisca abdita	99%	100%	1%	No
Mysidopsis bahia	95%	99%	4%	No

PORT JERSEY- CONTRACT AREA 1
TABLE 4C. 28 DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE
Wet weight concentrations

CONSTITUENTS	*Tapes japonica*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION	DETECTION LIMITS	CONCEN TRATION
Metals	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)	ppm (mg/kg)
Ag		0.11		0.09		0.01		0.01
As		1.92		1.80		3.43		3.01
Cd		0.22		0.21		0.04		0.05
Cr		0.27		0.62		0.50		0.52
Cu		1.09		1.21		1.75		* 2.46
Hg		0.01		0.01		0.04		0.04
Ni		0.68		0.73		0.25		0.30
Pb		0.02		0.02		0.12		0.10
Zn		8.33		7.99		19.38		21.53
Pesticides	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Aldrin	0.02	ND	0.02	ND	0.02	ND	0.03	ND
a-Chlordane		0.03		0.02		0.12		0.12
trans Nonachlor		0.03		0.02		0.29		0.29
Dieldrin		0.04		0.04		0.12		0.16
4,4'-DDT		0.03		0.03		0.03		0.03
2,4'-DDT	0.03	ND	0.03	ND	0.04	ND	0.04	ND
4,4'-DDD		0.04		0.04		0.15		0.13
2,4'-DDD		0.04		0.06		0.14		0.13
4,4'-DDE		0.03		0.04		0.06		0.05
2,4'-DDE	0.09	ND	0.09	ND	0.10	ND	0.10	ND
Total DDT		**0.20**		**0.23**		**0.44**		**0.42**
Endosulfan I	0.03	ND	0.03	ND	0.04	ND	0.04	ND
Endosulfan II	0.05	ND	0.05	ND	0.05	ND	0.05	ND
Endosulfan sulfate	0.05	ND	0.05	ND	0.06	ND	0.06	ND
Heptachlor	0.03	ND	0.03	ND	0.03	ND	0.03	ND
Heptachlor epoxide		0.02		0.02		0.06		0.05
Industrial Chemicals	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
PCB 8		0.41		0.42		0.88		0.81
PCB 18		0.04		0.05		0.03		* 0.08
PCB 28		0.15		0.19		0.20		0.13
PCB 44	0.03	ND	0.03	ND	0.03	ND	0.03	ND
PCB 49		0.02		* 0.04		0.06		* 0.08
PCB 52		0.05		* 0.09		0.14		* 0.24
PCB 66	0.03	ND	0.03	ND		0.05		0.04
PCB 87		0.03		0.04		0.04		0.05
PCB 101		0.11		0.13		0.48		0.49
PCB 105		0.04		0.04		0.20		0.19
PCB 118		0.05		0.04		0.21		0.20
PCB 128		0.09		0.08		0.30		0.25
PCB 138		0.17		0.36		1.48		1.35
PCB 153		0.11		0.11		2.18		1.99
PCB 170		0.04		* 0.08		0.43		0.41
PCB 180		0.04		* 0.05		0.93		0.86
PCB 183		0.02		0.02		0.38		0.35
PCB 184	0.05	ND	0.05	ND	0.05	ND	0.05	ND
PCB 187		0.03		* 0.14		0.79		0.79
PCB 195		0.02		0.01		0.16		0.16
PCB 206		0.03		0.04		0.30		0.30
PCB 209		0.04		0.04		0.37		0.33
Total PCB		**3.09**		* **4.00**		**19.31**		**18.25**
1,4-Dichlorobenzene		0.39		0.37		0.33		0.28

TABLE 4C. (Continued) **PORT JERSEY - CONTRACT AREA 1**

CONSTITUENTS	*Tapes japonica*				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
PAH's	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)
Naphthalene		0.72		0.71		2.49		2.77
Acenaphthylene		0.05		0.04		0.14		0.13
Acenaphthene		0.11		0.11		0.42		0.45
Fluorene		0.18		0.16		0.09		0.11
Phenanthrene		0.80		0.80		0.29		0.31
Anthracene		0.07		0.08		0.05		0.06
Fluoranthene		0.77		0.75		0.26		0.22
Pyrene		0.40		* 0.51		0.22		* 0.27
Benzo(a)anthracene		0.44		0.39		0.05		0.05
Chrysene		0.53		0.48		0.15		0.14
Benzo(b)fluoranthene		0.12		0.01		0.03		0.03
Benzo(k)fluoranthene		0.08	0.02	ND		0.03		0.03
Benzo(a)pyrene	0.02	ND	0.02	ND		0.17		0.02
Indeno(1,2,3-cd)pyrene	0.01	ND		0.01	0.01	ND		0.01
Dibenzo(a,h)antracene	0.02	ND	0.02	ND	0.02	ND		0.01
Benzo(g,h,i)perylene	0.01	ND		0.01		0.04		0.01
Total PAH's		**4.29**		**4.09**		**4.45**		**4.62**
Dioxins	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)	pptr(ng/kg)
2378 TCDD		0.42	0.98	ND		0.28		0.20
12378 PeCDD		0.95		* 2.41		0.14		0.12
123478 HxCDD		0.03		* 5.10		0.08		0.05
123678 HxCDD		0.06		* 1.33		0.27		0.19
123789 HxCDD		0.05		* 1.79		0.17		0.13
1234678 HpCDD		0.18		0.21		1.47		1.03
1234789 OCDD		1.41		1.34		8.28		6.02
2378 TCDF		0.14		0.10		1.66		1.41
12378 PeCDF		0.08		* 1.45		0.19		0.18
23478 PeCDF		0.08		* 1.40		0.31		0.27
123478 HxCDF		0.11		0.55		0.17		0.14
123678 HxCDF		0.05		0.92		0.09		0.08
234678 HxCDF		0.41		* 1.84		0.80		1.19
123789 HxCDF		0.52		* 1.81		0.08		0.06
1234678 HpCDF		0.08		0.47		0.59		0.41
1234789 HpCDF		0.04		* 1.20		0.06		1.50
12346789 OCDF		0.17		0.17		0.60		0.38

ND = Not detected
Total PAH = Sum of all PAHs
Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT
Total PCB = 2(x), where x = sum of PCB congeners
Concentrations shown are the mean of 5 replicate analyses in wet weight.
Means were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.
* = Statistically significant at the 95% confidence level

TABLE 5A. NEWARK BAY/STATEN ISLAND KILLS COMPLEX - NATURAL CLAYS
RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)	ppb (ug/L)
Cadmium		0.093		0.267
Chromium		1.42		1.11
Copper		2.45		6.42
Lead		1.46		0.259
Mercury		0.011		0.002
Nickel		1.58		1.70
Silver		0.054		0.016
Zinc		11.7		3.56
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.8	ND	0.8	ND
alpha-Chlordane		1.9		1.1
trans-Nonachlor		3.7		1.8
Dieldrin	0.3	ND		3.1
4,4'-DDT		4.6		3.1
2,4'-DDT	0.7	ND	0.7	ND
4,4'-DDD		2.5		5.0
2,4'-DDD		1.7		1.0
4,4'-DDE		4.6		6.0
2,4'-DDE	1.4	ND	1.4	ND
Total DDT		14.45		16.15
Endosulfan I		2.0		1.2
Endosulfan II	0.5	ND		1.8
Endosulfan sulfate	2.4	ND		2.7
Heptachlor		3.3		4.0
Heptachlor epoxide		11		5.3
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB BZ-8		0.9	0.2	ND
PCB BZ-18		7.6	0.1	ND
PCB BZ-28	0.1	ND	0.1	ND
PCB BZ-44	0.1	ND	0.1	ND
PCB BZ-49	0.1	ND	0.1	ND
PCB BZ-52	0.1	ND	0.1	ND
PCB BZ-66		0.6	0.1	ND
PCB BZ-87	0.1	ND	0.1	ND
PCB BZ-101		0.7	0.1	ND
PCB BZ-105	0.1	ND	0.1	ND
PCB BZ-118	0.1	ND	0.1	ND
PCB BZ-128	0.1	ND	0.1	ND
PCB BZ-138	0.1	ND	0.1	ND
PCB BZ-153	0.1	ND	0.1	ND
PCB BZ-170	0.1	ND	0.1	ND
PCB BZ-180	0.1	ND	0.1	ND
PCB BZ-183	0.1	ND	0.1	ND
PCB BZ-184	0.1	ND	0.1	ND
PCB BZ-187	0.1	ND	0.1	ND
PCB BZ-195	0.2	ND	0.2	ND
PCB BZ-206	0.2	ND		0.5
PCB BZ-209	0.1	ND	0.1	ND
Total PCB		21.6		3.3

ND = Not detected
Total PCB = sum of all congeners * 2.
Total DDT = sum of 2,4' and 4,4' DDD, DDE, and DDT.

NEWARK BAY/STATEN ILAND KILLS COMPLEX - NATURAL CLAYS

TABLE 5B. TOXICITTEST RESULTS

Suspended Particulate Phase - Raw Clay

Test Species	Test Duration	LC50/EC50	LPC (a)
Menidia beryllina	96 hours	>100% (b)	> 1
Mysidposis bahia	96 hours	>100% (b)	> 1
Mytilus sp. (larval survival)	48 hours	>100% (b)	> 1
Mytilus sp. (larval normal development)	48 hours	>100% (c)	> 1

(a) Limiting Permissible Concentration (LPC) is the LC50 or EC50 times 0.01.

(b) Median Lethal Concentration (LC50) resulting in 50% mortatlity at test termination.

(c) Median Effective Concentration (EC50) based on normal development to the D-cell, prodissoconch 1 stage.

Whole Sediment (10 days) - Raw Clay

Test Species	% Survival in Reference	% Survival in Test	% Difference Reference -Test	Is Difference statistically significant? (a=0.05)
Ampelisca abdita	89%	86%	3%	No
Mysidopsis bahia	93%	95%	0%[(a)]	No

(a) Survival in the test material was greater than in the Reference.

TABLE 5C. NEWARK BAY / STATEN ISLAND KILLS COMPLEX - NATURAL CLAYS
28-DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE (in wet weight concentration)

	Macoma nasuta				*Nereis virens*			
	REFERENCE		TEST		REFERENCE		TEST	
Constituents	Detection Limits	Mean Concentration	Detection Limits	Mean Concentration	Detection Limits	Mean Concentration	Detection Limits	Mean Concentration
Metals	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
Arsenic		3.5		3.36		3.26		3.2
Cadmium		0.05		0.048		0.068		0.064
Chromium		0.948		0.768		0.338		0.328
Copper		8.84		10.18		2.32		2.14
Lead		0.536		0.47		0.704		0.558
Mercury		0.16		0.088		0.13		0.138
Nickel		1.18		1.176		0.648		0.666
Silver		0.08		0.072		0.036	0.04	ND
Zinc		23.68		22.52		24		14.56
Pesticides	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
Aldrin		1.793	0.164	ND		4.36		5
alpha-Chlordane		0.601		0.16		0.2		0.625
trans-Nonachlor		0.469		0.445	0.18	ND	0.182	ND
Dieldrin		1.234		1.314		1.814		1.278
4,4'-DDT		0.185		0.27		1.108		0.521
2,4'-DDT		1.224		0.634	0.532	ND		* 0.908
4,4'-DDD		2.82		2.52		3.88		5.92
2,4'-DDD		0.738		0.493		0.67		0.616
4,4'-DDE		3.98		4.66		1.505		0.589
2,4'-DDE	0.14	ND	0.138	ND		0.762		0.77
Total DDT		9.152		8.646		7.925		9.324
Endosulfan I		1.96		1.6		1.88		2.08
Endosulfan II		0.175		0.127	0.216	ND		0.196
Endosulfan sulfate		0.36	1.106	* ND	1.16	ND	1.16	* ND
Heptachlor	0.252	ND		0.157	0.258	ND		* 0.582
Heptachlor epoxide		1.62		1.92		1.128		1.04
Industrial Chemicals	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
PCB BZ-08		1.542		0.976		1.235		1.563
PCB BZ-18		1.404		0.902		0.62		0.798
PCB BZ-28	0.54	ND	0.508	* ND		0.22		* 0.738
PCB BZ-44		0.738		0.498		0.486		0.397
PCB BZ-49		0.959	0.36	ND		0.974	0.36	ND
PCB BZ-52		0.134	0.47	* ND	0.486	ND		* 0.628
PCB BZ-66		1.04	1.008	ND	1.06	ND	1.012	* ND
PCB BZ-101		1		0.798		0.906		0.614
PCB BZ-105	0.394	ND	0.37	ND		0.363		0.324
PCB BZ-118	0.578	ND	0.544	* ND		0.812		0.604
PCB BZ-87		0.138	0.46	* ND	0.476	ND	0.46	* ND
PCB BZ-128	0.658	ND	0.618	* ND	0.642	ND	0.616	* ND
PCB BZ-138	0.412	ND	0.386	* ND		1.144		0.848
PCB BZ-153	0.384	ND	0.36	ND		1.94		1.634
PCB BZ-170	0.354	ND	0.334	ND	0.346	ND	0.332	ND
PCB BZ-180	0.344	ND	0.324	ND		0.382		0.244
PCB BZ-183	0.422	ND	0.376	* ND	0.412	ND	0.396	ND
PCB BZ-184	0.568	ND	0.534	* ND		1.2		0.928
PCB BZ-187	0.304	ND	0.286	ND	0.296	ND		0.239
PCB BZ-195	0.254	ND	0.238	ND		0.306		0.298
PCB BZ-206	0.254	ND	0.238	ND	0.248	ND	0.238	ND
PCB BZ-209	0.206	ND	0.194	ND	0.2	ND	0.194	ND
Total PCB		16.562		20.536		22.424		25.58
1,4-Dichlorobenzene	0.2	ND	0.2	ND	0.2	ND	0.2	ND

Dioxins and Furans	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
2378-TCDD	0.115	ND	0.105	ND		0.237		0.177
12378-PeCDD	0.172	ND	0.134	ND		0.431		0.252
123478-HxCDD		0.197	0.177	ND		0.296		0.172
123678-HxCDD		3.250		1.632		3.230		1.580
123789-HxCDD		1.410		0.665		1.423		0.661
1234678-HpCDD		16.250		7.424		10.308		5.255
OCDD		12.441		7.929		11.220		6.714
2378-TCDF	0.239	ND	0.145	ND		1.001		0.691
12378-PeCDF		0.650		0.317		1.130		0.442
23478-PeCDF	0.874	ND		0.336		0.713		0.259
123478-HxCDF		0.410		0.282		0.631	0.347	ND
123678-HxCDF		0.689		0.348		0.919		0.384
123789-HxCDF	0.668	ND	0.310	ND	0.155	ND	0.407	* ND
234678-HxCDF		0.900		0.476		1.145		0.279
1234678-HpCDF		4.140		2.194		2.473		1.515
1234789-HpCDF		0.276	0.273	ND	0.347	ND	0.446	ND
OCDF		2.022		2.355		0.809		0.731
PAHs	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g	ng/g
Acenaphthene		4.29		3.84	3.75	ND	3.78	ND
Acenaphthylene	56.4	ND	56.2	* ND	56.5	ND	56.4	* ND
Anthracene	1.98	ND	2.0	ND	2.0	ND	2.0	ND
Fluorene	3.56	ND	3.6	ND	3.55	ND	3.58	ND
Naphthalene	1.7	ND	1.7	ND	1.7	ND	1.7	ND
Phenanthrene		0.78	1.3	ND	1.3	ND	1.3	ND
Benzo[a]anthracene	1.6	ND	1.6	ND	1.6	ND	1.6	ND
Benzo[a]pyrene		0.8	1.3	ND	1.3	ND	1.3	ND
Benzo[g,h,i]perylene	1.4	ND	1.4	ND	1.4	ND	1.4	ND
Benzo[b]fluoranthene	1.4	ND	1.4	ND	1.4	ND	1.4	ND
Benzo[k]fluoranthene	1.2	ND	1.2	ND	1.2	ND	1.2	ND
Chrysene		2.44	2	ND	2	ND	2	ND
Dibenz[a,h]anthracene	1.6	ND	1.6	ND	1.6	ND	1.6	ND
Fluoranthene	3.16	ND	3.2	ND	3.15	ND	3.18	ND
Indeno[1,2,3-cd]pyrene	0.822	ND	0.822	ND	0.812	ND	0.822	ND
Pyrene		2.12		1.68		1.263		1.1
Total PAHs		19.64		* 73.281		11.72		* 70.931

Concentrations shown are the mean of 5 replicate analyses in wet weight with the following exceptions:
PAH concentrations for *Nereis virens* Reference tissue are the mean of 4 replicate analyses;
1,4 dichlorobenzene concentration for *Nereis virens* Test tissue is the mean of 4 replicate analyses due to limited tissue volume;
1,4 dichlorobenzene concentration for *Nereis virens* Reference tissue is the result of one set of analyses due to limited tissue volume.

*** Significantly higher than reference at 95% confidence.**

ND = Not Detected
Total PAHs = sum of all PAHs
Total PCB = sum of congeners reported * 2
Total DDT = sum of 2.4'- and 4,4'-DDD, DDE, and DDT
Means and statistical comparisons were determined using conservative estimates of concentrations of constituents that were at concentrations below the detection limit.