

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: **NAN-2016-01736-EYR**
Issue Date: October 26, 2017
Expiration Date: November 25, 2017

To Whom It May Concern:

The New York District, Corps of Engineers has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 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 U.S.C. 1413).

APPLICANT: Maher Terminals, LLC
Attn: Louis J. Allora
1210 Corbin Street
Elizabeth, NJ 07201

ACTIVITY: Dredge Holocene sediment with upland placement followed by dredging of HARS-suitable Pleistocene sediments with placement at the Historic Area Remediation Site

WATERWAY: South Elizabeth Channel, a tributary of Newark Bay

LOCATION: Berths 64 & 66, Port Elizabeth, North Fleet Street, Elizabeth, Union County, NJ

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

The decision whether to issue a 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 which 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. The decision of whether to issue a Department of the Army Permit for dredging and placement of the dredged material at an upland facility and the Historic Area Remediation Site (HARS) will also be based on whether the material meets the requirements of applicable implementing regulations. 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.

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. On September 26, 2000, the US Environmental Protection Agency (USEPA) and US Army Corps of Engineers signed a Memorandum of Agreement (MOA) outlining the steps to be taken to ensure that remediation of the HARS continues in a manner appropriately protective of human health and the aquatic environment. In making the determination evaluating placement of dredged material, the criteria established by the USEPA will be applied, including the interim change to one matrix value for PCB's as described

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in the MOA. 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 of the need to place the dredged material in ocean waters, other possible methods of disposal, and other appropriate locations.

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 to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers during the public interest review for this permit application to determine whether to issue, modify, 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. All written comments, including names and addresses, will be made a part of the administrative record, available to the public under the Freedom of Information Act. The Administrative Record, or portions thereof, may also be posted on a Corps of Engineers internet web site. Due to resource limitations, this office will normally not acknowledge the receipt of comments or respond to individual letters of comment.

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 project 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 affect the following federally threatened or endangered species (humpback whales, finback whales, right whales, loggerhead turtles, leatherback turtles, green turtles, Kemp's Ridley turtles, and Shortnose sturgeon) or their critical habitat pursuant to Section 7 of the Endangered Species Act (ESA; 16 USC 1531). The USACE New York District is conducting informal consultations with the National Marine Fisheries Service in accordance with Section 7 of the Endangered Species Act.

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). Consultation with the National Marine Fisheries Service regarding EFH impacts and conservation recommendations is being conducted and will be concluded prior to the final decision.

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 at the HARS are located in

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Primary Remediation Area Number 1. As noted in the designation of the HARS, Remediation Material would 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.

Reviews of the activity pursuant to Section 404 of the Clean Water Act will include application of the guidelines announced by the Administrator, US 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: Waterfront Development Permit and Dredged Material Acceptable Use Determination from the New Jersey Department of Environmental Protection.

The proposed work is being coordinated with the following federal, state, and local agencies:

US Environmental Protection Agency;
US Department of Commerce, National Marine Fisheries Service;
US Coast Guard, and
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 application, you may contact this office at (917) 790-8715 and ask for Dr. Stephen Knowles. Comments or questions may be FAXED to (212) 264-4260, ATTN: Dr. Knowles. Questions about the HARS can be addressed to Mr. Charles LoBue, Chief, Dredging, Sediments, and Oceans Section, US Environmental Protection Agency, Region 2 at (212) 637-3798. For more information on the New York District Corps of Engineers programs, visit our website at <http://www.nan.usace.army.mil> A detailed description and plans of the applicant's activity are enclosed to assist in your review.


For and In behalf of
Stephan A. Ryba
Chief, Regulatory Branch

Enclosures

WORK DESCRIPTION

The applicant, Maher Terminals, LLC, has requested Department of the Army authorization to perform regulated construction work in waters of the United States to increase the berthing depths to safely accommodate Super Post Panamax ships in their berthing areas. The proposed regulated activities within waters of the United States would include the following:

New Work Dredging: The permit applicant proposes to deepen berths 64 & 66, an area approximately 151-feet wide by 1,385-feet long, to -50-feet below the Plane of Mean Low Water plus 2-feet of overdepth dredging, for a maximum of -52-feet below the Plane of Mean Low Water.

Non-HARS Suitable Dredged Material: Approximately 6,500 cubic yards of the upper layer of non-HARS suitable dredged material consisting of mud would be dredged with an environmental closed-bucket clamshell dredge to minimize turbidity and prevent excess sediments from entering the water column. The material would then be loaded, without barge overflow, into barges. Excess water would be decanted from the barges while located in close proximity to the dredging area, and the decanting would be performed in accordance with the requirement of the water quality certificate issued by the New Jersey Department of Environmental Protection for this project. The applicant is concurrently seeking an Acceptable Use Determination from the New Jersey Department of Environmental Protection Office of Dredging and Sediment Technology in order to dispose of the material at a State-approved upland disposal site.

HARS Suitable Dredged Material: Approximately 22,500 cubic yards of the lower layer of the dredged material consists of HARS-suitable Pleistocene sediments (glacial till and red clay) would be dredged and transported for placement in the HARS. A mechanical dredge would be used to excavate Pleistocene sediments and place dredged sediments into split-hull scows. Scows would be towed to the HARS for placement at designated locations determined by NY District and EPA.

Dredged Material Separation Plan: The dredging would be performed in accordance with an approved Dredged Material Separation Plan to ensure that only HARS-suitable dredged material is placed at the HARS.

The stated purpose of this project is to perform regulated construction work in waters of the United States to safely accommodate Super Post Panamax ships, an economic necessity to maintain market share of the NY/NJ shipping industry.

INTRODUCTION TO THE HISTORIC AREA REMEDIATION SITE (HARS):

In 1972, the Congress of the United States 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 US Environmental Protection Agency (USEPA) and the US Army Corps of Engineers (USACE) to regulate dumping in ocean waters. The USEPA and the USACE share responsibility for MPRSA permitting and ocean disposal site management. Regulations implementing MPRSA can be found at 40 CFR Sections 220 through 229. With few exceptions, 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 MPRSA. The MPRSA divides permitting responsibility between the USEPA and USACE. Under Section 102 of the MPRSA, USEPA has responsibility for issuing permits for all materials other than dredged material. Under Section 103 of MPRSA, the Secretary of the Army has the responsibility for issuing permits for dredged material. Determinations to issue MPRSA permits for dredged material are subject to USEPA concurrence.

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In the fall of 1997, the USEPA 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 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 MDS, the site and surrounding areas that had been used historically as disposal sites for dredged materials were redesignated as the HARS under authority of Section 102(c) of 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 HARS will be managed to reduce impacts of historic disposal activities at the site to acceptable levels in accordance with 40 CFR Section 228.11(c). The need to remediate the HARS is supported by the presence of toxic effects, dioxin bioaccumulation exceeding Category 1 levels in worm tissue (a definition of which appears in a memorandum reviewing the results of the applicant's testing), 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 conditions in the Study Area and the surveys performed may be found in the Supplemental Environmental Impact Statement (USEPA, 1997).

The designation of the HARS identifies an area in and around the former Mud Dump Site (MDS) that has exhibited the potential for adverse ecological impacts. The HARS will be remediated with dredged material that meets current Category 1 standards and 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)" or "HARS Material."

As of the end of August 2011, dredged materials from seventy-eight different completed and ongoing private and federal dredging projects in the Port of New York and New Jersey have been dredged and placed as Remediation Material in the ocean at the HARS since the closure of the Mud Dump Site and designation of the HARS in 1997. This represents approximately 47,767,000 cubic yards of Remediation Material.

The HARS, which includes the 2.2 square nautical mile area of the 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 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 (a map depicting the relative depths of water in a particular area) that capping is complete, the USEPA will take any necessary rulemaking to de-designate the HARS. The 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 PRA encompasses the area of degraded sediments as described in greater detail in the SEIS.

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

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

To improve management and monitoring of placement activities at the HARS, electronic monitoring equipment will be on-board any barges carrying Remediation Material to the HARS. This equipment records vessel positions and scow drafts throughout the duration of each trip to the HARS and

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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).

Additional information concerning the HARS can be obtained from Mr. Charles LoBue, Chief, Dredging, Sediments, and Oceans Section, US Environmental Protection Agency, Region 2 at (212) 637-3798.

HARS SUITABILITY TESTING FOR PLEISTOCENE RED-BROWN CLAY:

Pleistocene red-brown clay (from the Newark Bay complex) and Pleistocene glacial till (from the New York Harbor area) were previously tested to determine their suitability for use as remediation material at the 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 Pleistocene red-brown clay test results and a determination of suitability for 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 1-3) for informational purposes only. A Joint Memorandum for Record (MFR) signed by both agencies on January 26, 2000 concluded that the Pleistocene red-brown clay found throughout the Newark Bay Complex, including the Port Jersey Channel, was suitable for HARS placement and would not require further testing.

Notification of Pleistocene glacial till test results and a determination of suitability for HARS remediation purposes were 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 Federal Navigation Channel, Contract Area 1. Those test results are included in this public notice (Tables 1-3) for informational purposes only. A Joint MFR signed by both agencies on July 29, 2003, concluded that the Pleistocene glacial till from selected area of New York Harbor (including the Port Jersey Channel) was suitable for HARS placement and would not require further testing.

ALTERNATIVES TO HARS PLACEMENT:

Regarding ocean placement of dredged material, the Ocean Dumping Regulations [Title 40 CFR Sections 227.16(b)] state 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 . . ." USACE, 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 material that would be considered unsuitable for 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.

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Similar to the 2010 Plan, the 2040 Plan relies heavily upon the use of land remediation and decontamination methods for the management of HARS unsuitable material. As in the 2010 Plan, maximum use of all practicable alternatives to the 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. Other options are not available at reasonable incremental costs, thus leaving HARS placement as the preferred alternative. For more information on the New York District Corps of Engineers programs, visit our website at <http://www.nan.usace.army.mil>

CONCLUSIONS:

The U.S. Army Corps of Engineers New York District and the U.S. Environmental Protection Agency Region 2 have determined that this Pleistocene clay proposed for dredging and ocean placement from the Port Authority of New York and New Jersey's facility is Category I under USEPA Region 2/CENAN guidance, and is suitable for placement at the HARS under Section 228.15(d)(6) as Remediation Material, without need for further site-specific testing, in accordance with the January 26, 2000 Memorandum for the Record (MFR) signed by USACE and USEPA, that concluded that the Pleistocene red-brown clay found throughout the Newark Bay Complex, including the Kill Van Kull, was suitable for HARS placement and would not require further testing.

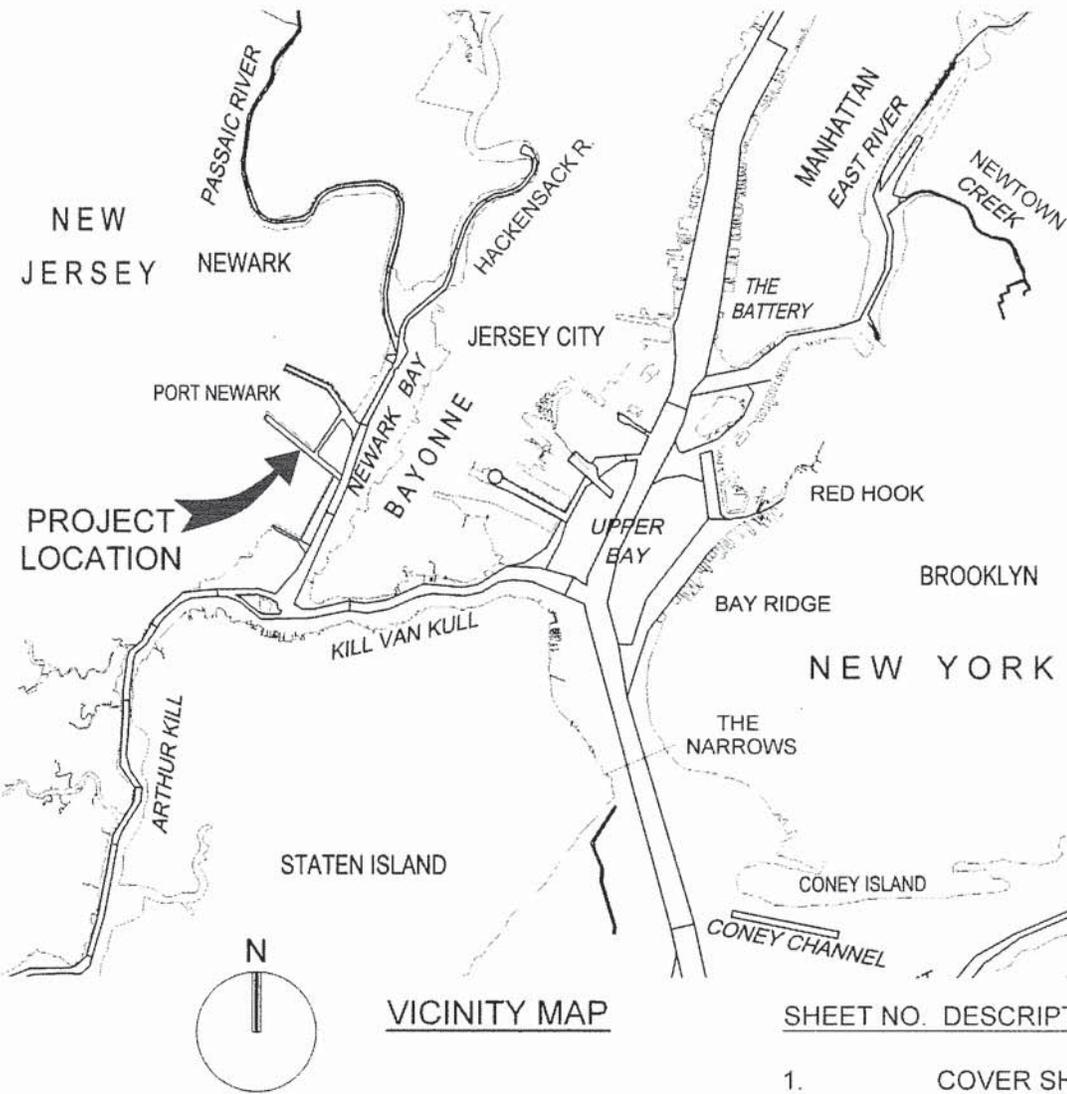
Placement of this material at the HARS will serve to reduce impacts at the HARS to acceptable levels and improve benthic conditions. Unremediated sediments in the HARS have been found to adversely impact benthic marine organisms. Placement of project material over existing, unremediated HARS sediments would serve to remediate those areas. In addition, by covering the existing sediments at the HARS with this project material, surface dwelling organisms will be exposed to sediments exhibiting Category 1 qualities, which will ameliorate the existing sediment conditions.

COMMUNICATIONS:

For additional information regarding this project or the HARS contact Dr. Stephen Knowles, Regulatory Project Manager, USACE, New York District at (917) 790-8715 or Mr. Charles LoBue, Chief, Dredging, Sediments, and Oceans Section, US Environmental Protection Agency, Region 2 at (212) 637-3798. If the determination is made to issue a permit, the permittee will contact the US Coast Guard with the details of the authorized work.

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MAHER TERMINALS, INC
 ELIZABETH, NJ
 BERTH 64 AND 66 DEEPENING
 CONTRACT TAA-EP-3019



VICINITY MAP

SHEET NO. DESCRIPTION

- | | |
|----|----------------------------|
| 1. | COVER SHEET |
| 2. | LOCATION MAP |
| 3. | PLAN VIEW & PROJECT LIMITS |
| 4. | PROPOSED CROSS SECTION |

PURPOSE:
BERTH DEEPENING

PREPARED BY:



MAHER TERMINALS, LLC.
 ELIZABETH, NEW JERSEY

COVER SHEET

PROPOSED: BERTHS 64 AND 66 DEEPENING

WATERWAY: PORT NEWARK

CITY: ELIZABETH

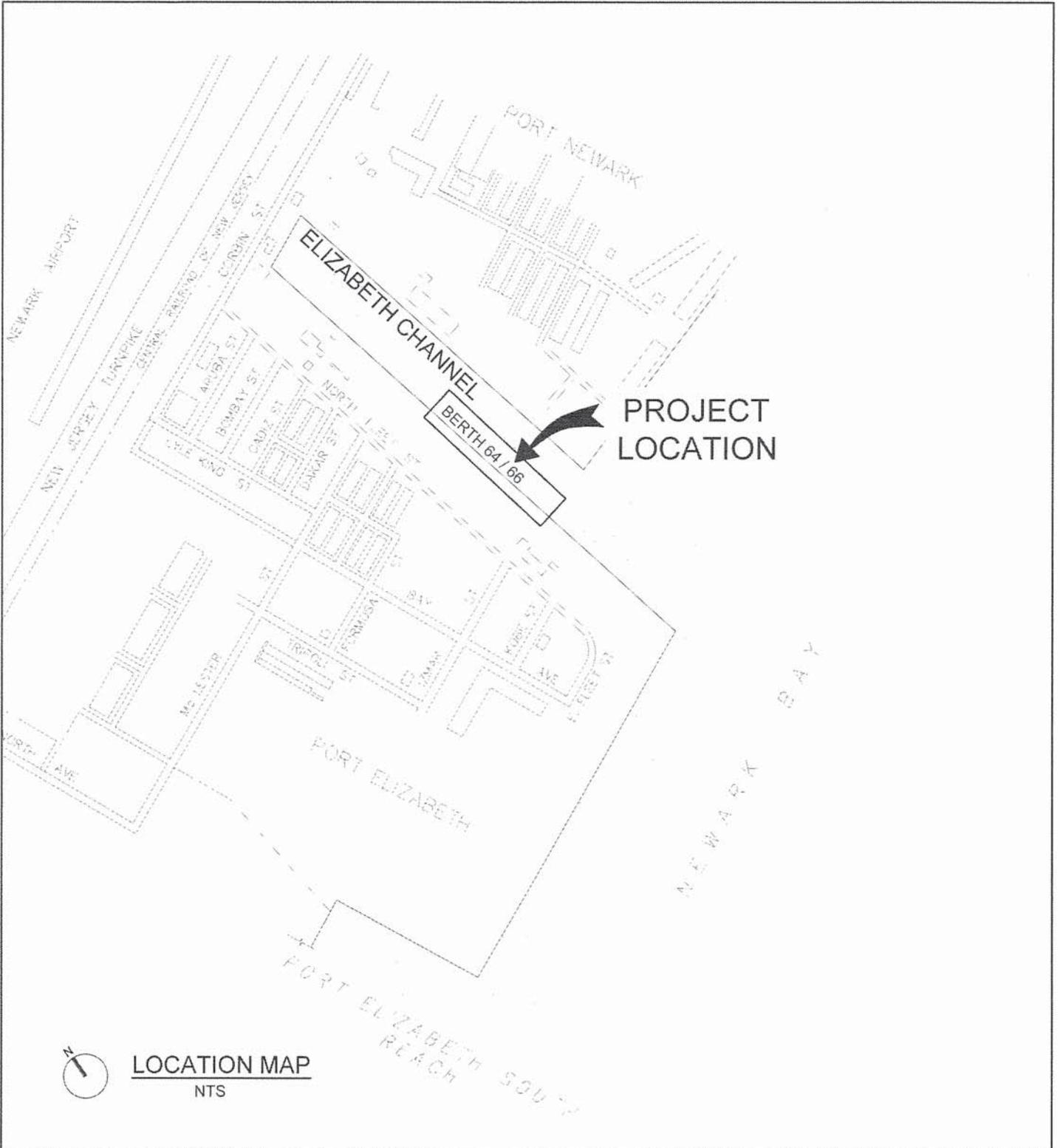
COUNTY: UNION

APPLICANT: MAHER TERMINALS, INC.

SHEET 1 OF 4

DATE: JUNE 2017

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LOCATION MAP

NTS

PURPOSE:
BERTH DEEPENING

PREPARED BY:

ch2m
PHILADELPHIA, PA

MAHER TERMINALS, LLC.
ELIZABETH, NEW JERSEY

LOCATION MAP

Signature of Stephen J. Mullaney

PROPOSED: BERTHS 64 AND 66 DEEPENING

WATERWAY: PORT NEWARK

CITY: ELIZABETH

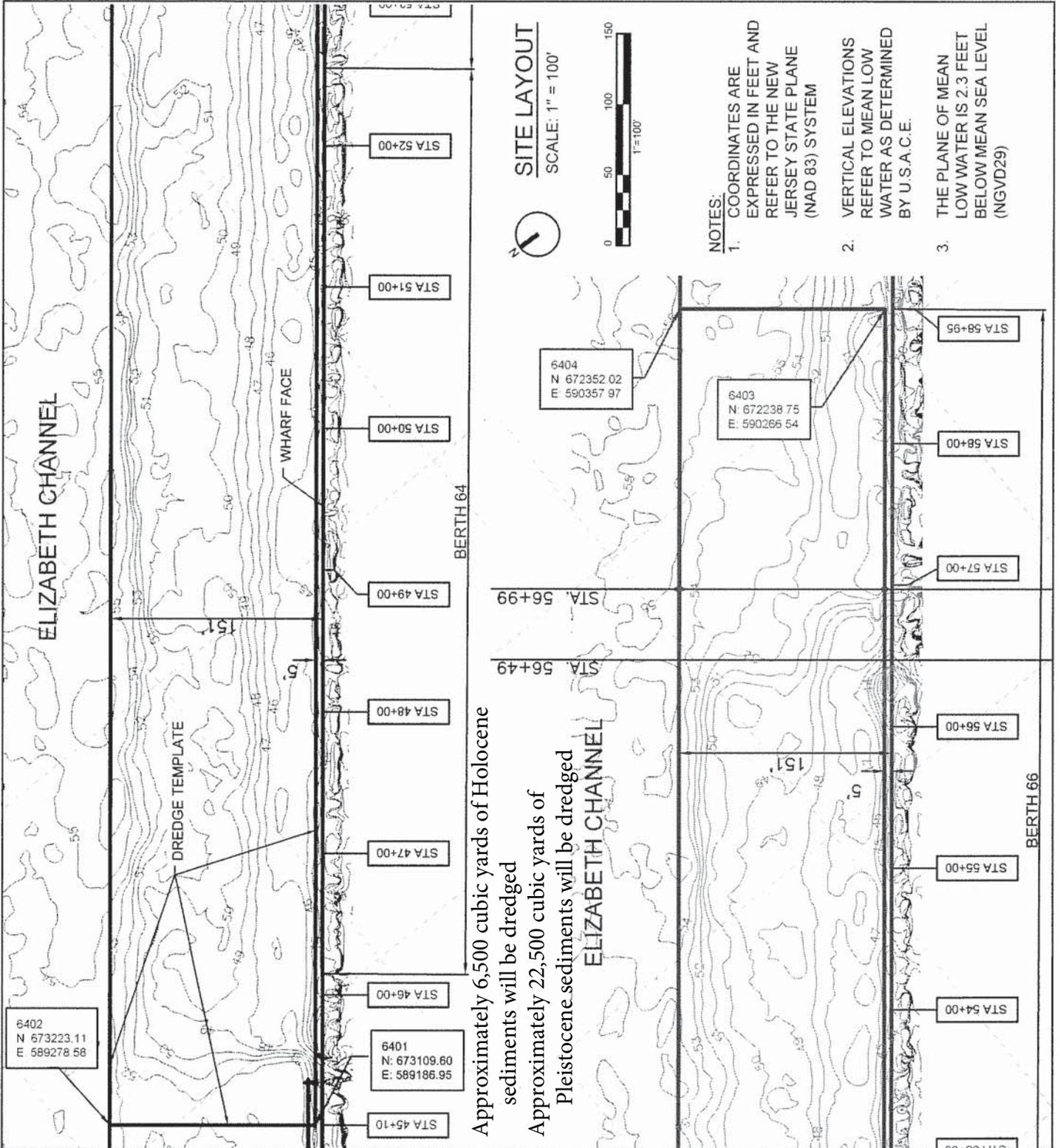
COUNTY: UNION

APPLICANT: MAHER TERMINALS, INC.

SHEET 2 OF 4

DATE: JUNE 2017

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SITE LAYOUT
SCALE: 1" = 100'



- NOTES:**
- COORDINATES ARE EXPRESSED IN FEET AND REFER TO THE NEW JERSEY STATE PLANE (NAD 83) SYSTEM
 - VERTICAL ELEVATIONS REFER TO MEAN LOW WATER AS DETERMINED BY U.S.A.C.E.
 - THE PLANE OF MEAN LOW WATER IS 2.3 FEET BELOW MEAN SEA LEVEL (NGVD29)

Approximately 6,500 cubic yards of Holocene sediments will be dredged
 Approximately 22,500 cubic yards of Pleistocene sediments will be dredged

ELIZABETH CHANNEL

PURPOSE:
BERTH DEEPENING

PREPARED BY:
ch2m
PHILADELPHIA, PA

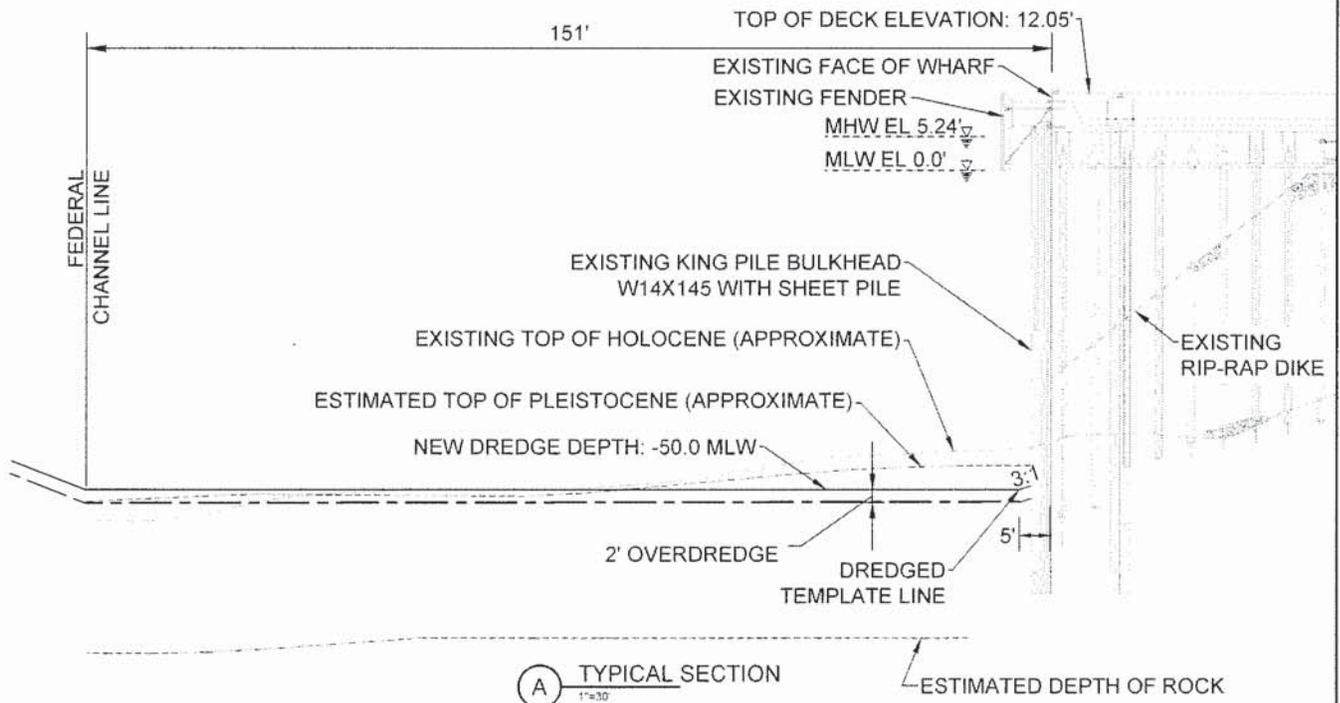
MAHER TERMINALS, LLC.
ELIZABETH, NEW JERSEY

PLAN VIEW AND
PROJECT LIMITS

PROPOSED: BERTHS 64 & 66 DEEPENING

WATERWAY: PORT NEWARK
 CITY: ELIZABETH
 COUNTY: UNION
 APPLICANT: MAHER TERMINALS, INC.

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NOTES:

1. COORDINATES ARE EXPRESSED IN FEET AND REFER TO THE NEW JERSEY STATE PLANE (NAD 83) SYSTEM
2. VERTICAL ELEVATIONS REFER TO MEAN LOW WATER AS DETERMINED BY U.S.A.C.E.
3. THE PLANE OF MEAN LOW WATER IS 2.3 FEET BELOW MEAN SEA LEVEL (NGVD29)

PURPOSE:
BERTH DEEPENING

PREPARED BY:



MAHER TERMINALS, LLC.
ELIZABETH, NEW JERSEY

PROPOSED CROSS SECTION

Signature of Michael A. Pruthi

PROPOSED: BERTHS 64 & 66 DEEPENING

WATERWAY: PORT NEWARK

CITY: ELIZABETH

COUNTY: UNION

APPLICANT: MAHER TERMINALS, INC.

SHEET 4 OF 4

DATE: JUNE 2017

**TABLE 1. 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 ISLAND KILLS COMPLEX - NATURAL CLAYS

TABLE 2. TOXICITY TEST RESULTS

Suspended Particulate Phase - Raw Clay

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Menidia beryllina</i>	96 hours	>100% (b)	> 1
<i>Mysidopsis bahia</i>	96 hours	>100% (b)	> 1
<i>Mytilus sp.</i> (larval survival)	48 hours	>100% (b)	> 1
<i>Mytilus sp.</i> (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% mortality 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)
<i>Ampelisca abdita</i>	89%	86%	3%	No
<i>Mysidopsis bahia</i>	93%	95%	0% ^(a)	No

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

**TABLE 3. NEWARK BAY / STATEN ISLAND KILLS COMPLEX - NATURAL CLAYS
28-DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE (in wet weight concentration)**

Constituents	<i>Macoma nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	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

**TABLE 3. NEWARK BAY / STATEN ISLAND KILLS COMPLEX - NATURAL CLAYS
28-DAY BIOACCUMULATION TEST RESULTS: CHEMICAL ANALYSIS OF TISSUE (in wet weight concentration)**

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	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.