



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-2011-00278-WMI
Issue Date: February 27, 2015
Expiration Date: March 30, 2015

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 permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), and Section 103 of the Marine Protection, Research & Sanctuaries Act of 1972, as amended (33 U.S.C. 1413).

APPLICANT: Department of the Navy
Naval Weapons Station Earle
201 Route 34 South
Colts Neck, New Jersey 07722

ACTIVITY: New dredging of areas of approach channels and a turning basin, associated with the Naval Weapons Station Earle, to a depth of -45 feet MLLW (plus 2 feet allowable overdepth); maintenance dredging of other such areas previously authorized to that depth; and maintenance dredging of the new dredging areas and the previously authorized dredging areas for a period of three years; with the subsequent placement of the dredged material at the Atlantic Ocean Historic Area Remediation Site (HARS) for the purpose of remediation

WATERWAY: Sandy Hook Bay and the Atlantic Ocean

LOCATION: Township of Middletown, Monmouth County, New Jersey

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 placement of the dredged material at 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.

On September 26, 2000, the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE) signed a joint 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 polychlorinated biphenyls (PCB's) as described in the joint MOA. In addition, based upon an evaluation of the potential effect which the failure to utilize this ocean site will have on navigation,

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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 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 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 dredging and 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, two known wrecks, believed to be the HLW LEW and the ORMOND, were found in 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.

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 activity complies with, and will be conducted in a manner that is consistent with, the approved state coastal zone management program. By this public notice, we are requesting the States' view on the consistency of this project with the State CZM Program. For activities within the coastal zone of New Jersey State, the applicant's certification and accompanying information is available from the New Jersey Department of Environmental Protection, Coastal Management Program, P.O. Box 418, 401 E. State Street, Trenton, NJ, 08625, Telephone (609) 633-2201. Comments regarding the applicant's certification, and copies of

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any letters to this office commenting upon this proposal, should be so addressed.

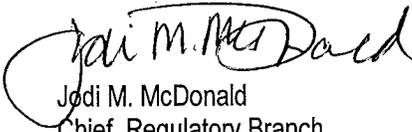
In addition to any required water quality certificate and coastal zone management program concurrence, the applicant has obtained or requested the following governmental authorization for the proposed activity under consideration: A Waterfront Development Permit from the New Jersey Department of Environmental Protection

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

- US Environmental Protection Agency;
- US Department of the Interior, Fish and Wildlife Service;
- 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 Ms. Rosita Miranda at (917) 790-8420 or rosita.miranda@usace.army.mil. Comments or questions may be FAXED to (212) 264-4260, ATTN: R. Miranda. Questions about the HARS can be addressed to Mr. Douglas Pabst, Dredging, Sediments and Ocean Section, US Environmental Protection Agency, Region 2 at (212) 637-3797. For more information on the New York District Corps of Engineers programs, visit our website at <http://www.nan.usace.army.mil>


Jodi M. McDonald
Chief, Regulatory Branch

Enclosures

DESCRIPTION OF PROPOSED WORK

The permit applicant, the Department of the Navy, has requested a Department of the Army permit to perform the following activities located in Sandy Hook Bay and the Atlantic Ocean, at Middletown Township, Monmouth County, New Jersey:

- New dredging of areas of approach channels and a turning basin, associated with the Naval Weapons Station Earle, to a depth of -45 feet MLLW (plus 2 feet allowable overdepth);
- Maintenance dredging of other such areas previously authorized to that depth;
- Maintenance dredging of the new dredging areas and the previously authorized dredging areas for a period of three years; and,
- Subsequent placement of the dredged material at the Atlantic Ocean Historic Area Remediation Site (HARS) for the purpose of remediation.

The proposed new dredging work and the maintenance dredging work would be conducted via two clamshell dredges to a depth of -45 feet Mean Lower Low Water (MLLW) Datum, plus the standard 2 feet of overdepth dredging for a maximum dredging depth of -47 feet Mean Lower Low Water (MLLW) Datum including the shipping berth, the turning basin, the terminal channel and a portion of the Sandy Hook Federal Channel, producing a total volume of dredged material of approximately 2,082,261 cubic yards (CY) of dredged material. The dredged material would be placed into split-hull and/or bottom dumping scows maneuvered using a tugboat. Dewatering and barge overflow are not anticipated, as proposed at this time. The permit applicant requests that all the proposed dredged material be permitted for placement as Remediation Material at the HARS in the Atlantic Ocean off of Sandy Hook, New Jersey.

The proposed dredging operation has been divided into nine (9) proposed dredging areas, Dredging Areas B1, B2, C1, C2, D, E, F, G and H, and would be conducted in two phases. During Phase I, the piers, turning basin, and part of the Sandy Hook Channel (Areas B1, B2 and C1) would be dredged in the Summer 2015; and Phase II, the remainder of the Sandy Hook Channel (Areas C2, D, E, F, G and H) would be dredged in the Summer 2016.

- Dredging Area B1 is located within the ship turning basin and totals 626,699 CY of sediment including a 2-foot overdepth over an area of 365,630 square yards (SY);
- Dredging Area B2 is located within the ship turning basin, and at Pier 3A and Pier4, and totals 501,005 CY of sediment including a 2-foot overdepth over an area of 257,794 SY;
- Dredging Area C1 is located within the Sandy Hook Federal Channel and begins at Station 413+21.70 and extends to Station 383+61.23, totaling 53,008 CY of sediment, including a 2-foot overdepth, over an area of 344,073 SY;
- Dredging Area C2 is located within the Sandy Hook Federal Channel and begins at Station 383+61.23 and extends to Station 365+22.25 and totals 56,855 CY of sand, including a 2-foot overdepth, over an area of 161,070 SY;
- Dredging Area D is located within the Sandy Hook Federal Channel and starts at Sta. 365+22.25 and extends to Sta. 292+31.21, totaling 292,092 CY of sand, including a 2-foot overdepth, over an area of 256,417 SY;
- Dredging Area E is located within the Sandy Hook Federal Channel and starts at Sta. 292+31.21 and goes to Sta. 236+19.74 and totals 252,037 CY of sand, including a 2-foot overdepth, over an area of 494,490 SY;
- Dredging Area F is located within the Sandy Hook Federal Channel and starts at Sta. 236+19.74 and goes to Sta. 200+77.53 and totals 60,591 CY of sand, including a 2-foot overdepth, over an area of 233,053 SY;
- Dredging Area G is also located within the Sandy Hook Federal Channel and starts at Sta. 189+03.31 and goes

to Sta. 62+82.73 and totals 192,368 CY of sand, including a 2-foot overdepth, over an area of 397,566 SY; and,

- Dredging Area H is located within the Sandy Hook Federal Channel and starts at Sta. 134+13.88 and goes to Station 62+00 and totals 46,606 CY of sand, including a 2-foot overdepth, over an area of 88,882 SY.

These proposed nine dredging areas have a total volume of 2,081,261 CY of dredged material, of which a total of 900,549 CY of dredged material is comprised of sand. The total area is approximately 2,598,975 square yards (536.98 acres).

Two phases of sampling were conducted to determine if the dredged material was suitable for placement at the Historic Area Remediation Site (HARS). Phase 1 of the sampling program was conducted in July 2013, and included physical characterization of sediments from 29 locations from Dredging area C2 through H and a digital geophysical mapping (DGM) survey of the proposed dredge areas. The purpose of the Phase 1 sampling program was to determine the need for additional (Tier II and Tier III) testing for channel reaches offshore of the installation, and purpose of the DGM survey was to detect debris and magnetic anomalies that could represent a munitions-related hazard during future sediment sampling efforts. It was anticipated that the material in Dredging Areas C2 through H would meet the exclusionary criteria for placement at the HARS, with a composition of greater than 90% sand. Results of the Phase 1 physical analysis of Dredging Areas C2 through H were submitted to US Army Corps of Engineers (USACE) and Environmental Protection Agency (USEPA) to determine if the Dredging Areas C2 through H met the exclusionary requirement of greater than 90% sand.

The U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineers New York District have evaluated bathymetric surveys, bottom sediment core logs and ocean currents data from Dredging Areas C2 through H to determine whether the proposed dredged material meets the criteria for ocean placement without additional testing as described in the Ocean Dumping Regulations at 40 CFR 227.13(b)(1). As specified in the regulations, the proposed dredged material satisfies these criteria if it is composed predominantly of sand, gravel, rock or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels. The U.S. Environmental Protection Agency Region 2 and the U.S. Army Corps of Engineers New York District evaluation has shown that sand to be dredged from Dredging Areas C2 through H meets the requirements of 40 CFR 227.13(b)(1) and is suitable for placement in the ocean at the Historic Area Remediation Site (HARS) as Remediation Material without additional evaluation.

Phase 2 sampling efforts were conducted in January 2014 to obtain the necessary volume of project sediments from the three dredging areas, Dredging Areas B1, B2 and C1, to support Tier 3 testing. The overall purpose of the Phase 2 sampling efforts was to obtain replicate cores to provide a complete representative cross-section of the proposed dredging prism and to provide requisite volume of sediments to perform the physical, chemical and ecotoxicological testing in accordance with USACE-New York District/USEPA Region 2 RTM requirements. Sediment cores obtained from each location were advanced to the proposed project depth of -45 feet MLLW plus 2 feet of overdepth. Results of the Phase 2 analysis of Dredging Areas B1, B2 and C1 are discussed in this public notice.

Should approval of the requested permit be issued, consideration is being given to issuance of a three-year permit for the maintenance of the new dredging areas and the previously authorized dredging areas. Subsequent to an initial dredging cycle, the applicant would have to request authorization to perform maintenance dredging during the remaining life of the permit. Such authorization is dependent on the applicant demonstrating that each maintenance event requiring placement at the HARS is in compliance with the Ocean Dumping Regulations cited at 40 CFR Sections 220 - 229 in effect at that time, and will be dependent upon the availability of an approved disposal or remediation site.

The purpose of this proposed dredging is to allow for safe navigation of the US Navy ships to and from the installation.

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.

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 October 2014, dredged materials from one hundred five 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 68,349,000 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 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. Douglas Pabst of the USEPA, Dredging, Sediments and Ocean Section, US Environmental Protection Agency, Region 2 at (212) 637-3797.

PHASE 2 TESTING:

Over the past year, the USEPA and USACE have been refining the approach to the technical review and scientific and regulatory analysis of dredging projects proposed for the HARS. A testing evaluation process was developed, which established a basic framework for assessing results of tissue analysis from bioaccumulation testing of dredged material proposed for ocean placement. The 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, to facilitate decisions in accordance with the Marine Protection, Research, and Sanctuaries Act of 1972. USEPA and USACE utilize this testing evaluation process for identifying Category 1 dredged material in determining suitability of dredged materials as material for remediation at the HARS. The Testing Evaluation Memo for this project may be obtained by contacting Mr. Douglas Pabst, Dredging, Sediments and Ocean Section, US Environmental Protection Agency, Region 2 at (212) 637-3797.

Sediment Grain Size Analysis:

As depicted on the attached drawings, the proposed maintenance dredging was divided into nine areas for purposes of sampling and testing. The dredged material proposed for placement at the HARS was characterized by five (5) sediment core samples taken in Dredging Area B1, ten (10) sediment core samples taken in B2, three (3) sediment core samples taken in C1, two (2) sediment core samples taken in C2, six (6) sediment core samples taken in D, six (6) sediment core samples taken in E, three (3) sediment core samples taken in F, eight (8) sediment core samples taken in G and four (4) sediment core samples taken in H. The five samples from Dredging Area B1, ten samples from B2 and three samples from C1 were then combined into three separate composite samples which were subject to physical, 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 is:

Area B1:	<u>0.8</u> % gravel	<u>9.0</u> % sand	<u>69.1</u> % silt	<u>21.1</u> % clay
Area B2:	<u>0.3</u> % gravel	<u>10.7</u> % sand	<u>52.9</u> % silt	<u>36.1</u> % clay
Area C1:	<u>6.0</u> % gravel	<u>70.0</u> % sand	<u>12.2</u> % silt	<u>11.9</u> % clay
Area C2:	<u>1.5</u> % gravel	<u>92.4</u> % sand	<u>3.5</u> % silt	<u>2.6</u> % clay
Area D :	<u>8.1</u> % gravel	<u>89.0</u> % sand	<u>1.2</u> % silt	<u>1.6</u> % clay
Area E :	<u>1.4</u> % gravel	<u>96.9</u> % sand	<u>0.6</u> % silt	<u>1.1</u> % clay
Area F :	<u>5.3</u> % gravel	<u>93.6</u> % sand	<u>0.4</u> % silt	<u>0.8</u> % clay
Area G :	<u>2.2</u> % gravel	<u>95.6</u> % sand	<u>1.1</u> % silt	<u>1.0</u> % clay
Area H :	<u>1.2</u> % gravel	<u>93.5</u> % sand	<u>3.0</u> % silt	<u>2.3</u> % clay

Results of the chemical and biological testing for Dredging Areas B1, B2 and C1 are summarized below.

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. Please note in reading Table 1 that detection

limits have been listed for only those constituents which 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 USEPA/USACE 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 liquid, suspended particulate, 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, *Americamysis bahia*), a finfish (*Menidia beryllina*), and the planktonic larvae of a bivalve (the blue mussel, *Mytilus galloprovincialis*), 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 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 USACE New York District/US Environmental Protection Agency Region 2 memorandum (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, *Americamysis bahia*; a finfish, *Menidia beryllina*; and the planktonic larvae of a blue mussel, *Mytilus galloprovincialis*. 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 the suspended particulate phase of the Naval Weapon Station Earle composite was calculated as 0.2% for Dredging Areas B1 and B2, and 0.3% for Area C1 based on the EC50 of *M. galloprovincialis*.

This information shows that when placed in the 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 (Dredging Areas B1, B2 and C1) 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 USEPA and the USACE. 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 USEPA Region 2/USACE New York District guidance.

1. Toxicity:

Ten-day toxicity tests were conducted on proposed project dredged material using a filter feeding mysid shrimp (*Americamysis bahia*) and a deposit feeding, burrowing amphipod (*Leptocheirus plumulosus*), 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 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 (Dredging Areas B1, B2 and C1).

2. Bioaccumulation:

Bioaccumulation tests for the sediment were conducted on the solid phase of the project 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*. 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 NY/NJ Harbor Estuary Program Toxics Characterization report (Squibb, *et al.* 1991). Table 3 (Dredging Areas B1, B2 and C1) 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 Memo for this project. Table 3 (Dredging Areas B1, B2 and C1) indicates that several contaminants bioaccumulated above reference in the clam and/or water. 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 USEPA. The testing memo further evaluates these contaminants, and concludes that any contaminant that exceeded reference did not exceed any existing regional matrix or dioxin values. Several contaminants which 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 Memo for this permit applicant's dredging and disposal project. 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 from Dredging Areas B1, B2 and C1 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 HARS.

CONCLUSIONS:

Based upon the grain size results of the sediments proposed for dredging from Dredging Areas C2, D, E, F, G and H, the USACE and the USEPA have determined that the material meets the criteria for ocean placement as described in 40 CFR parts 227.13(b)(1), and is acceptable for placement at the HARS.

Based upon the results of testing of the sediments from Dredging Areas B1, B2 and C1 proposed for dredging in the permit applicant's facility and ocean placement the USACE and USEPA 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 USEPA Region 2/USACE, New York District guidance. The specific test results and technical analysis of the data underlying this conclusion are described in the joint USACE, New York District/USEPA Region 2 Testing Evaluation memo mentioned previously.

Placement of this material at the HARS will serve to reduce impacts to acceptable levels and improve benthic conditions. Sediments in the 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.

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 . . ." The US Navy reports investigations of the use of alternative placement sites for the dredged material that includes upland placement, beneficial use, and open water placement.

Upland placement of the dredged material was considered by the US Navy. However, the cost to initially place 2,081,261 cubic yards of dredged material at an upland site was found to be excessive by the US Navy.

Beneficial uses were considered such as landfill cover and creation of wetlands, but no sites were identified by the US Navy as currently available to accept the material.

Alternatives sites for the placement of the dredged material are either not currently available or not currently available at reasonable incremental costs, thus leaving HARS placement as the applicant's remaining practicable alternative.

Beach nourishment was considered as the granular dredged material (900,549 cubic yards of sand) would be suitable for the beneficial use of beach replenishment. Although no relevant placement sites of this nature were identified by the US Navy in the permit application, it is probable that alternate sites for the placement of the sand will be reviewed, if additional potential opportunities emerge during the further processing of the permit application.

COMMUNICATIONS:

For additional information regarding this project or the HARS contact Ms. Rosita Miranda, Regulatory Project Manager, USACE, New York District at (917) 790-8516, rosita.miranda@usace.army.mil, or Mr. Douglas Pabst, Dredging, Sediments and Ocean Section, US Environmental Protection Agency, Region 2 at (212) 637-3797. If the determination is made to issue a permit, the permittee will contact the US Coast Guard with the details of the authorized work.

TABLE 1. RESULTS OF CHEMICAL ANALYSIS OF SITE WATER AND ELUTRIATE

Naval Weapons Station Earle Reach B1

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb	ppb	ppb	ppb
Ag		0.01		0.02
Cd		0.05		0.01
Cr		0.37		1.22
Cu		1.77		0.84
Hg		0.003		0.010
Ni		0.99		1.45
Pb		0.42		1.84
Zn		6.22		2.09
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.56	ND	0.56	ND
a-Chlordane	0.63	ND	0.63	ND
trans-Nonachlor	1.04	ND	1.04	ND
Dieldrin	1.30	ND	1.30	ND
4,4'-DDT	1.27	ND	1.27	ND
2,4'-DDT	1.23	ND	1.23	ND
4,4'-DDD	1.21	ND	1.21	ND
2,4'-DDD	1.21	ND	1.21	ND
4,4'-DDE	0.88	ND	0.88	ND
2,4'-DDE	0.62	ND	0.62	ND
Total DDT		3.21		3.21
Endosulfan I	0.67	ND	0.67	ND
Endosulfan II	1.21	ND	1.21	ND
Endosulfan sulfate	1.15	ND	1.15	ND
Heptachlor	0.85	ND	0.85	ND
Heptachlor epoxide	1.38	ND	1.38	ND
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	0.64	ND	0.64	ND
PCB 18	0.86	ND	0.86	ND
PCB 28	0.88	ND	0.88	ND
PCB 44	0.71	ND	0.71	ND
PCB 49	0.79	ND	0.79	ND
PCB 52	0.43	ND	0.43	ND
PCB 66	0.71	ND	0.71	ND
PCB 87	0.94	ND	0.94	ND
PCB 101	0.82	ND	0.82	ND
PCB 105	0.69	ND	0.69	ND
PCB 118	0.63	ND	0.63	ND
PCB 128	0.93	ND	0.93	ND
PCB 138	1.09	ND	1.09	ND
PCB 153	1.02	ND	1.02	ND
PCB 170	0.82	ND	0.82	ND
PCB 180	1.36	ND	1.36	ND
PCB 183	0.91	ND	0.91	ND
PCB 184	1.14	ND	1.14	ND
PCB 187	0.80	ND	0.80	ND
PCB 195	0.56	ND	0.56	ND
PCB 206	0.64	ND	0.64	ND
PCB 209	0.74	ND	0.74	ND
Total PCB		18.11		18.11

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

Naval Weapons Station Earle Reach B2

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb	ppb	ppb	ppb
Ag		0.00		0.03
Cd		0.05		0.01
Cr		0.35		1.72
Cu		1.67		1.43
Hg		0.002		0.017
Ni		0.89		1.40
Pb		0.38		1.68
Zn		5.63		3.26
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.56	ND	0.70	ND
a-Chlordane	0.63	ND	0.79	ND
trans-Nonachlor	1.04	ND	1.30	ND
Dieldrin	1.30	ND	1.63	ND
4,4'-DDT	1.27	ND	1.59	ND
2,4'-DDT	1.23	ND	1.54	ND
4,4'-DDD	1.21	ND		0.39
2,4'-DDD	1.21	ND	1.51	ND
4,4'-DDE	0.88	ND		0.84
2,4'-DDE	0.62	ND	0.78	ND
Total DDT		3.21		3.94
Endosulfan I	0.67	ND	0.83	ND
Endosulfan II	1.21	ND	1.51	ND
Endosulfan sulfate	1.15	ND	1.43	ND
Heptachlor	0.85	ND	1.06	ND
Heptachlor epoxide	1.38	ND	1.73	
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	0.64	ND	0.80	ND
PCB 18	0.86	ND	1.07	ND
PCB 28	0.88	ND	1.10	ND
PCB 44	0.71	ND	0.89	ND
PCB 49	0.79	ND	0.98	ND
PCB 52	0.43	ND	0.54	ND
PCB 66	0.71	ND	0.89	ND
PCB 87	0.94	ND	1.17	ND
PCB 101	0.82	ND	1.03	ND
PCB 105	0.69	ND	0.86	ND
PCB 118	0.63	ND	0.79	ND
PCB 128	0.93	ND	1.16	ND
PCB 138	1.09	ND	1.37	ND
PCB 153	1.02	ND	1.28	ND
PCB 170	0.82	ND	1.03	ND
PCB 180	1.36	ND	1.70	ND
PCB 183	0.91	ND	1.14	ND
PCB 184	1.14	ND	1.43	ND
PCB 187	0.80	ND	1.01	ND
PCB 195	0.56	ND	0.70	ND
PCB 206	0.64	ND	0.80	ND
PCB 209	0.74	ND	0.92	ND
Total PCB		18.11		22.66

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
Naval Weapons Station Earle Reach C1

CONSTITUENTS	SITE WATER		ELUTRIATE	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb	ppb	ppb	ppb
Ag		0.00		0.02
Cd		0.04		0.02
Cr		0.38		0.98
Cu		1.45		1.10
Hg		0.002		0.007
Ni		0.73		1.02
Pb		0.41		1.58
Zn		3.75		3.16
Pesticides	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
Aldrin	0.56	ND	0.56	ND
a-Chlordane	0.63	ND	0.63	ND
trans-Nonachlor	1.04	ND	1.04	ND
Dieldrin	1.30	ND	1.30	ND
4,4'-DDT	1.27	ND	1.27	ND
2,4'-DDT	1.23	ND	1.23	ND
4,4'-DDD	1.21	ND	1.21	ND
2,4'-DDD	1.21	ND	1.21	ND
4,4'-DDE	0.88	ND	0.88	ND
2,4'-DDE	0.62	ND	0.62	ND
Total DDT		3.21		4.98
Endosulfan I	0.67	ND	0.67	ND
Endosulfan II	1.21	ND	1.21	ND
Endosulfan sulfate	1.15	ND	1.15	ND
Heptachlor	0.85	ND	0.85	ND
Heptachlor epoxide	1.38	ND	1.38	ND
Industrial Chemicals	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)	pptr (ng/L)
PCB 8	0.64	ND	0.64	ND
PCB 18	0.86	ND	0.86	ND
PCB 28	0.88	ND	0.88	ND
PCB 44	0.71	ND	0.71	ND
PCB 49	0.79	ND	0.79	ND
PCB 52	0.43	ND	0.43	ND
PCB 66	0.71	ND	0.71	ND
PCB 87	0.94	ND	0.94	ND
PCB 101	0.82	ND	0.82	ND
PCB 105	0.69	ND	0.69	ND
PCB 118	0.63	ND	0.63	ND
PCB 128	0.93	ND	0.93	ND
PCB 138	1.09	ND	1.09	ND
PCB 153	1.02	ND	1.02	ND
PCB 170	0.82	ND	0.82	ND
PCB 180	1.36	ND	1.36	ND
PCB 183	0.91	ND	0.91	ND
PCB 184	1.14	ND	1.14	ND
PCB 187	0.80	ND	0.80	ND
PCB 195	0.56	ND	0.56	ND
PCB 206	0.64	ND	0.64	ND
PCB 209	0.74	ND	0.74	ND
Total PCB		18.11		18.11

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.

TOXICITY TEST RESULTS
Naval Weapons Station Earle Reach B1

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Americamysis bahia</i>	96 hours	30%	0.3
<i>Menidia beryllina</i>	96 hours	24%	0.2
<i>Mytilus galloprovincialis (b)</i>	48 hours	54%	0.5
<i>Mytilus galloprovincialis (c)</i>	48 hours	22%	0.2

(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	% Difference Reference-Test	Is difference statistically significant? (a=0.05)
<i>Americamysis bahia</i>	96%	92%	4%	No
<i>Leptocheirus plumulosus</i>	92%	98%	-6%	No

TABLE 2.

TOXICITY TEST RESULTS
Naval Weapons Station Earle Reach B2

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Americamysis bahia</i>	96 hours	29%	0.3
<i>Menidia beryllina</i>	96 hours	22%	0.2
<i>Mytilus galloprovincialis (b)</i>	48 hours	45%	0.4
<i>Mytilus galloprovincialis (c)</i>	48 hours	19%	0.2

(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	% Difference Reference-Test	Is difference statistically significant? (a=0.05)
<i>Americamysis bahia</i>	96%	96%	0%	No
<i>Leptocheirus plumulosus</i>	92%	94%	-2%	No

TABLE 2.

**TOXICITY TEST RESULTS
Naval Weapons Station Earle Reach C1**

Suspended Particulate Phase

Test Species	Test Duration	LC50/EC50	LPC (a)
<i>Americamysis bahia</i>	96 hours	>100%	1.0
<i>Menidia beryllina</i>	96 hours	95%	0.9
<i>Mytilus galloprovincialis (b)</i>	48 hours	>100%	1.0
<i>Mytilus galloprovincialis (c)</i>	48 hours	32%	0.3

(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	% Difference Reference-Test	Is difference statistically significant? (a=0.05)
<i>Americamysis bahia</i>	96%	97%	-1%	No
<i>Leptocheirus plumulosus</i>	92%	94%	-2%	No

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS:CHEMICAL ANALYSIS OF TISSUE
Wet Weight Concentrations
Naval Weapons Station Earle Reach B1

CONSTITUENTS	<i>Macoma Nasuta</i>					<i>Nereis virens</i>				
	REFERENCE		TEST			REFERENCE		TEST		
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION		DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	
Metals	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)		ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	
Ag		0.03		0.04	*		0.03		0.03	
As		4.55		4.89			3.33		2.54	
Cd		0.04		0.04			0.05		0.04	
Cr		0.28		0.60	*		0.12		0.12	
Cu		2.95		4.02	*		11.31		5.34	
Hg		0.03		0.03			0.05		0.04	
Ni		0.44		0.57	*		0.15		0.21	*
Pb		0.16		0.64	*		0.15		0.14	
Zn		19.3		20.4			29.2		31.6	
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	0.03	ND	0.03	ND		0.05	ND	0.03	ND	
a-Chlordane		0.18		0.22			0.096		0.21	*
trans-Nonachlor		0.04		0.11	*		0.206		0.26	
Dieldrin		0.05		0.23	*		0.12		0.28	*
4,4'-DDT	0.07	ND	0.07	ND		0.10	ND		0.08	
2,4'-DDT	0.07	ND	0.07	ND		0.10	ND	0.07	ND	
4,4'-DDD		0.13		0.59	*		0.106		0.26	
2,4'-DDD	0.05	ND		0.34	*		0.13		0.27	*
4,4'-DDE		0.87		1.39			0.108		0.20	
2,4'-DDE	0.03	ND		0.14	*	0.04	ND	0.03	ND	
Total DDT		1.11		2.53	*		0.46		0.86	*
Endosulfan I	0.06	ND		0.05		0.08	ND	0.06	ND	
Endosulfan II		0.12	0.09	ND		0.13	ND	0.10	ND	
Endosulfan sulfate	0.02	ND	0.02	ND			0.098		0.15	
Heptachlor		0.09	0.05	ND		0.07	ND	0.05	ND	
Heptachlor epoxide	0.04	ND	0.04	ND		0.06	ND	0.04	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	0.02	ND		0.09	*	0.03	ND	0.02	ND	
PCB 18		0.014		0.14	*	0.04	ND		0.14	*
PCB 28	0.03	ND		0.71	*	0.04	ND		0.30	*
PCB 44	0.02	ND		0.12	*	0.03	ND		0.12	
PCB 49		0.03		0.68	*		0.03		0.36	*
PCB 52		0.03		0.71	*		0.08		0.65	*
PCB 66		0.03		0.67	*	0.05	ND		0.33	*
PCB 87	0.03	ND		0.21	*	0.04	ND	0.03	ND	
PCB 101		0.06		1.01	*		0.28		0.88	*
PCB 105	0.03	ND		0.18	*		0.04		0.19	*
PCB 118		0.05		0.55	*		0.06		0.35	*
PCB 128		0.01		0.12	*		0.08		0.16	*
PCB 138		0.10		0.78	*		0.87		1.21	*
PCB 153		0.09		0.76	*		1.22		1.45	
PCB 170	0.04	ND		0.08	*		0.20		0.21	
PCB 180		0.02		0.18	*		0.48		0.52	
PCB 183	0.03	ND		0.08	*		0.23		0.23	
PCB 184	0.03	ND	0.03	ND		0.05	ND	0.03	ND	
PCB 187		0.03		0.276	*		0.57		0.67	
PCB 195	0.03	ND	0.03	ND			0.06		0.03	
PCB 206	0.04	ND	0.04	ND			0.22		0.23	
PCB 209	0.02	ND	0.02	ND			0.19		0.19	
Total PCB		1.27		14.8	*		9.46		16.5	*
1,4-Dichlorobenzene		0.04		0.10	*		0.08		0.05	

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS:CHEMICAL ANALYSIS OF TISSUE
Wet Weight Concentrations
Naval Weapons Station Earle Reach B1

CONSTITUENTS	<i>Macoma Nasuta</i>					<i>Nereis virens</i>				
	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		0.29		0.60	*		0.38		0.39	
Acenaphthylene		0.05		0.37	*		0.08		0.15	*
Acenaphthene		0.14		0.44			0.21		0.43	
Flourene		0.28		0.68	*		0.21		0.22	
Phenanthrene		1.53		4.13	*		0.68		0.73	
Anthracene		0.15		1.97	*		0.09		0.13	
Fluoranthene		1.55		19.7	*		0.62		3.91	
Pyrene		1.04		24.5	*		0.53		4.33	
Banzo(a)anthracene		0.21		6.98	*		0.08		0.21	
Chrysene		0.73		10.4	*		0.19		1.66	*
Benzo(b)fluoranthene		0.47		8.26	*	0.19	ND		0.30	
Benzo(k)fluoranthene		0.46		7.79	*	0.18	ND		0.44	
Benzo(a)pyrene		0.26		6.29	*	0.12	ND		0.21	
Indeno(1,2,3-cd)pyrene		0.12		2.67	*	0.14	ND		0.10	
Dibenzo (a,h) anthracene		0.02		0.76	*	0.07	ND		0.04	
Benzo(g,h,i)Perylene		0.18		3.65	*		0.06		0.24	*
Total PAH's		7.48		99.1	*		3.48		13.5	
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	0.044	ND		0.042		0.020	ND	0.022	ND	
1,2,3,7,8-PeCDD	0.037	ND	0.012	ND		0.019	ND	0.029	ND	
1,2,3,4,7,8-HxCDD		0.051	0.015	ND		0.025	ND	0.025	ND	
1,2,3,6,7,8-HxCDD		0.222	0.015	ND		0.026	ND		0.031	
1,2,3,7,8,9-HxCDD	0.024	ND	0.015	ND		0.024	ND		0.028	
1,2,3,4,6,7,8-HpCDD		0.110		1.412	*	0.055	ND		0.428	
OCDD		2.634		17.08	*		4.443		7.606	*
2,3,7,8-TCDF		0.033		0.395			0.566		0.323	
1,2,3,7,8-PeCDF	0.126	ND	0.012	ND		0.023	ND	0.027	ND	
2,3,4,7,8-PeCDF	0.055	ND		0.049		0.029	ND	0.033	ND	
1,2,3,4,7,8-HxCDF	0.016	ND		0.047		0.014	ND	0.017	ND	
1,2,3,6,7,8-HxCDF	0.016	ND	0.009	ND		0.014	ND	0.016	ND	
2,3,4,6,7,8-HxCDF	0.019	ND	0.009	ND		0.127	ND	0.015	ND	
1,2,3,7,8,9-HxCDF	0.020	ND		0.013		0.011	ND	0.070	ND	
1,2,3,4,6,7,8-HpCDF		0.523		0.490			0.153	0.022	ND	
1,2,3,4,7,8,9-HpCDF		0.094		0.023		0.098	ND		0.076	
OCDF		0.982		0.114			0.136		0.328	

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 five 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
Wet Weight Concentrations
Naval Weapons Station Earle Reach B2

CONSTITUENTS	<i>Macoma Nasuta</i>					<i>Nereis virens</i>				
	REFERENCE		TEST			REFERENCE		TEST		
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION		DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	
Metals	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)		ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	
Ag		0.03		0.05	*		0.03		0.04	
As		4.55		5.32			3.33		2.67	
Cd		0.04		0.04			0.05		0.04	
Cr		0.28		0.62	*		0.12		0.10	
Cu		2.95		4.28	*		11.3		6.04	
Hg		0.03		0.03			0.05		0.03	
Ni		0.44		0.66	*		0.15		0.20	*
Pb		0.16		0.71	*		0.15		0.14	
Zn		19.3		20.7			29.2		29.1	
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	0.03	ND	0.04	ND		0.05	ND	0.03	ND	
a-Chlordane		0.18		0.25			0.10		0.21	*
trans-Nonachlor		0.04		0.12	*		0.21		0.27	
Dieldrin		0.05		0.29	*		0.12		0.24	*
4,4'-DDT	0.07	ND	0.09	ND	*	0.10	ND	0.07	ND	
2,4'-DDT	0.07	ND	0.09	ND	*	0.10	ND	0.07	ND	
4,4'-DDD		0.13		1.00	*		0.11		0.30	
2,4'-DDD	0.05	ND		0.43	*		0.13		0.29	*
4,4'-DDE		0.87		1.91	*		0.11		0.24	
2,4'-DDE	0.03	ND		0.22	*	0.04	ND	0.03	ND	
Total DDT		1.11		3.65	*		0.46		0.91	*
Endosulfan I	0.06	ND	0.07	ND		0.08	ND	0.06	ND	
Endosulfan II		0.12	0.11	ND		0.13	ND	0.09	ND	
Endosulfan sulfate	0.02	ND	0.02	ND			0.10		0.05	
Heptachlor		0.09	0.06	ND		0.07	ND	0.05	ND	
Heptachlor epoxide	0.04	ND	0.05	ND		0.06	ND	0.04	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	0.02	ND		0.10	*	0.03	ND	0.02	ND	
PCB 18		0.01		0.15	*	0.04	ND		0.20	*
PCB 28	0.03	ND		0.89	*	0.04	ND		0.37	*
PCB 44	0.02	ND		0.14	*	0.03	ND		0.14	
PCB 49		0.03		0.80	*		0.03		0.47	*
PCB 52		0.03		0.85	*		0.08		0.77	*
PCB 66		0.03		0.82	*	0.05	ND		0.42	*
PCB 87	0.03	ND		0.26	*	0.04	ND		0.05	
PCB 101		0.06		1.21	*		0.28		1.02	*
PCB 105	0.03	ND		0.21	*		0.04		0.22	*
PCB 118		0.05		0.69	*		0.06		0.46	*
PCB 128		0.01		0.14	*		0.08		0.20	*
PCB 138		0.10		0.89	*		0.87		1.51	*
PCB 153		0.09		0.88	*		1.22		1.83	*
PCB 170	0.04	ND		0.09	*		0.20		0.28	
PCB 180		0.02		0.21	*		0.48		0.69	
PCB 183	0.03	ND		0.10	*		0.23		0.29	
PCB 184	0.03	ND	0.04	ND		0.05	ND	0.03	ND	
PCB 187		0.03		0.30	*		0.57		0.82	
PCB 195	0.03	ND	0.04	ND			0.06		0.06	
PCB 206	0.04	ND	0.05	ND			0.22		0.27	
PCB 209	0.02	ND		0.02			0.19		0.22	
Total PCB		1.27		17.6	*		9.46		20.6	*
1,4-Dichlorobenzene		0.04		0.13	*		0.08		0.05	

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS:CHEMICAL ANALYSIS OF TISSUE
Wet Weight Concentrations
Naval Weapons Station Earle Reach B2

CONSTITUENTS	<i>Macoma Nasuta</i>					<i>Nereis virens</i>				
	REFERENCE		TEST			REFERENCE		TEST		
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION		DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	
	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)		ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	ppb (ug/kg)	
PAH's										
Naphthalene		0.29		0.75	*		0.38		0.46	
Acenaphthylene		0.05		0.45	*		0.08		0.20	*
Acenaphthene		0.14		1.24	*		0.21		0.98	*
Flourene		0.28		1.42	*		0.21		0.34	
Phenanthrene		1.53		11.9	*		0.68		1.17	*
Anthracene		0.15		4.84	*		0.09		0.34	*
Fluoranthene		1.55		121	*		0.62		19.1	*
Pyrene		1.04		159	*		0.53		19.7	*
Banzo(a)anthracene		0.21		22.9	*		0.08		0.84	*
Chrysene		0.73		22.1	*		0.19		3.29	*
Benzo(b)fluoranthene		0.47		14.5	*	0.19	ND		0.60	*
Benzo(k)fluoranthene		0.46		12.9	*	0.18	ND		0.78	*
Benzo(a)pyrene		0.26		10.6	*	0.12	ND		0.47	*
Indeno(1,2,3-cd)pyrene		0.12		3.34	*	0.14	ND		0.17	
Dibenzo (a,h) anthracene		0.02		0.98	*	0.07	ND	0.05	ND	
Benzo(g,h,i)Perylene		0.18		4.56	*		0.06		0.39	*
Total PAH's		7.48		392	*		3.48		48.9	*
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	0.044	ND		0.037		0.020	ND		0.112	
1,2,3,7,8-PeCDD	0.037	ND	0.024	ND		0.019	ND		0.059	
1,2,3,4,7,8-HxCDD		0.051	0.018	ND		0.025	ND		0.091	
1,2,3,6,7,8-HxCDD		0.222		0.044		0.026	ND		0.169	
1,2,3,7,8,9-HxCDD	0.024	ND		0.178		0.024	ND		0.143	
1,2,3,4,6,7,8-HpCDD		0.110		1.310	*	0.055	ND		1.146	*
OCDD		2.634		17.48	*		4.443		8.223	*
2,3,7,8-TCDF		0.033		0.387			0.566		0.382	
1,2,3,7,8-PeCDF	0.126	ND		0.038		0.023	ND	0.020	ND	
2,3,4,7,8-PeCDF	0.055	ND	0.022	ND		0.029	ND		0.093	
1,2,3,4,7,8-HxCDF	0.016	ND	0.012	ND		0.014	ND		0.129	
1,2,3,6,7,8-HxCDF	0.016	ND	0.012	ND		0.014	ND		0.123	
2,3,4,6,7,8-HxCDF	0.019	ND		0.022		0.127	ND		0.117	
1,2,3,7,8,9-HxCDF	0.020	ND		0.092		0.011	ND		0.114	
1,2,3,4,6,7,8-HpCDF		0.523		0.593			0.153		0.424	
1,2,3,4,7,8,9-HpCDF		0.094		0.190		0.098	ND		0.179	
OCDF		0.982		1.016			0.136		0.435	

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 five 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

Wet Weight Concentrations
 Naval Weapons Station Earle Reach C1

CONSTITUENTS	<i>Macoma Nasuta</i>				<i>Nereis virens</i>			
	REFERENCE		TEST		REFERENCE		TEST	
	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION	DETECTION LIMITS	CONCENTRATION
Metals	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)	ppb (mg/kg)
Ag		0.03		0.04	*	0.03		0.03
As		4.55		5.18		3.33		2.73
Cd		0.04		0.04		0.05		0.04
Cr		0.28		0.56	*	0.12		0.11
Cu		2.95		3.29		11.31		6.97
Hg		0.03		0.03		0.05		0.03
Ni		0.44		0.60	*	0.15		0.22
Pb		0.16		0.64	*	0.15		0.13
Zn		19.3		20.6		29.2		24.2
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	0.03	ND	0.03	ND	0.05	ND	0.03	ND
a-Chlordane		0.18		0.14		0.10		0.15
trans-Nonachlor		0.04		0.05		0.21		0.22
Dieldrin		0.05		0.16	*	0.12		0.18
4,4'-DDT	0.07	ND	0.07	ND	0.10	ND		0.04
2,4'-DDT	0.07	ND	0.07	ND	0.10	ND		0.06
4,4'-DDD		0.13		0.40		0.11		0.27
2,4'-DDD	0.05	ND		0.26	*	0.13		0.24
4,4'-DDE		0.87		1.25		0.11		0.18
2,4'-DDE	0.03	ND		0.11	*	0.04	0.03	ND
Total DDT		1.11		2.09	*	0.46		0.81
Endosulfan I	0.06	ND	0.06	ND	0.08	ND	0.06	ND
Endosulfan II		0.12	0.10	ND	0.13	ND	0.09	ND
Endosulfan sulfate	0.02	ND	0.02	ND		0.098	0.02	ND
Heptachlor		0.09	0.05	ND	0.07	ND	0.05	ND
Heptachlor epoxide	0.04	ND	0.04	ND	0.06	ND	0.04	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	0.02	ND		0.08	*	0.03	0.02	ND
PCB 18		0.01		0.14	*	0.04	ND	0.162
PCB 28	0.03	ND		0.67	*	0.04	ND	0.266
PCB 44	0.02	ND		0.14	*	0.03	ND	0.084
PCB 49		0.03		0.73	*		0.03	0.386
PCB 52		0.03		0.71	*		0.08	0.76
PCB 66		0.03		0.68	*	0.05	ND	0.348
PCB 87	0.03	ND		0.21	*	0.04	ND	0.03
PCB 101		0.06		1.03	*		0.28	0.882
PCB 105	0.03	ND		0.17	*		0.04	0.188
PCB 118		0.05		0.55	*		0.06	0.41
PCB 128		0.01		0.12	*		0.08	0.172
PCB 138		0.10		0.80	*		0.87	1.35
PCB 153		0.09		0.77	*		1.22	1.692
PCB 170	0.04	ND		0.08	*		0.20	0.248
PCB 180		0.02		0.18	*		0.48	0.628
PCB 183	0.03	ND		0.09	*		0.23	0.27
PCB 184	0.03	ND	0.03	ND		0.05	ND	0.03
PCB 187		0.03		0.27	*		0.57	0.76
PCB 195	0.03	ND	0.03	ND			0.06	0.055
PCB 206	0.04	ND	0.04	ND			0.22	0.262
PCB 209	0.02	ND	0.02	ND			0.19	0.212
Total PCB		1.27		15.0	*		9.46	18.4
1,4-Dichlorobenzene		0.04		0.09	*		0.08	0.05

TABLE 3. 28 DAY BIOACCUMULATION TEST RESULTS:CHEMICAL ANALYSIS OF TISSUE
Wet Weight Concentrations
Naval Weapons Station Earle Réach C1

CONSTITUENTS	<i>Macoma Nasuta</i>				<i>Nereis virens</i>			
	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		0.29		0.51	*	0.38		0.47
Acenaphthylene		0.05		0.30	*	0.08		0.17
Acenaphthene		0.14		0.22		0.21		0.32
Flourene		0.28		0.33		0.21		0.23
Phenanthrene		1.53		1.78		0.68		0.76
Anthracene		0.15		0.64		0.09		0.11
Fluoranthene		1.55		7.14		0.62		1.57
Pyrene		1.04		14.9	*	0.53		2.92
Banzo(a)anthracene		0.21		3.47	*	0.08		0.10
Chrysene		0.73		4.65	*	0.19		0.97
Benzo(b)fluoranthene		0.47		6.32	*	0.19	ND	0.21
Benzo(k)fluoranthene		0.46		6.28	*	0.18	ND	0.32
Benzo(a)pyrene		0.26		4.94	*	0.12	ND	0.15
Indeno(1,2,3-cd)pyrene		0.12		2.08	*	0.14	ND	0.07
Dibenzo (a,h) anthracene		0.02		0.60	*	0.07	ND	0.05
Benzo(g,h,i)Perylene		0.18		2.81	*	0.06		0.19
Total PAH's		7.48		57.0	*	3.48		8.59
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	0.044	ND		0.182	0.020	ND		0.065
1,2,3,7,8-PeCDD	0.037	ND	0.058	ND	0.019	ND	0.030	ND
1,2,3,4,7,8-HxCDD		0.051	0.040	ND	0.025	ND	0.019	ND
1,2,3,6,7,8-HxCDD		0.222	0.039	ND	0.026	ND	0.020	ND
1,2,3,7,8,9-HxCDD	0.024	ND		0.157	0.024	ND	0.020	ND
1,2,3,4,6,7,8-HpCDD		0.110		0.609	0.055	ND		0.942
OCDD		2.634		10.720	*	4.443		6.142
2,3,7,8-TCDF		0.033		0.178		0.566		0.938
1,2,3,7,8-PeCDF	0.126	ND		0.078	0.023	ND	0.022	ND
2,3,4,7,8-PeCDF	0.055	ND	0.042	ND	0.029	ND	0.030	ND
1,2,3,4,7,8-HxCDF	0.016	ND		0.065	0.014	ND	0.014	ND
1,2,3,6,7,8-HxCDF	0.016	ND		0.061	0.014	ND	0.014	ND
2,3,4,6,7,8-HxCDF	0.019	ND		0.086	0.127	ND	0.014	ND
1,2,3,7,8,9-HxCDF	0.020	ND		0.119	0.011	ND	0.015	ND
1,2,3,4,6,7,8-HpCDF		0.523		0.170		0.153		0.139
1,2,3,4,7,8,9-HpCDF		0.094		0.246	0.098	ND	0.018	ND
OCDF		0.982		0.930		0.136		0.278

ND = Not detected

Total PAH = Sum of all PAH's

Total DDT = sum of 2,4'- and 4,4'-DDD, DDE, and DDT

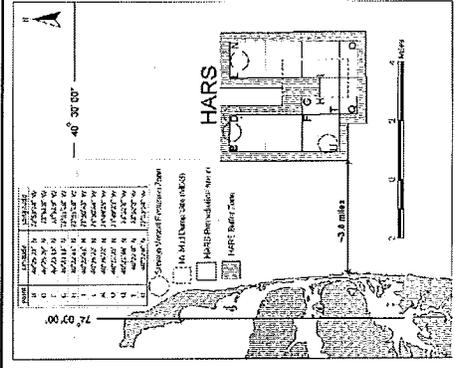
Total PCB = 2(x), where x = sum of PCB congeners

Concentrations shown are the mean of five 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.

DATE	DESCRIPTION	BY
4/11/13	DREDGE AREA B REVISED	
5/05/14	REVISIONS PER FINAL DESIGN	



HISTORIC AREA
REMEDIATION SITE
(HARS) COORDINATE
LOCATION

- NOTES FOR THIS TABLE:**
- QUANTITIES INCLUDE MATERIAL IN PRISMS TO FORM SLOPES.
 - NIC: ALL MATERIAL BELOW OVERDEPTH AND OUTSIDE DREDGE PRISM TEMPLATE.
 - PROJECTED SILTATION RATE APPLIED TO MAY 2013 SOUNDINGS TO ESTIMATE VOLUMES TO JUNE 2015 PROJECT EXECUTION.
 - ESTIMATED OVERDREDGE VOLUMES ARE BASED UPON AREAS WHERE PROJECTED DEPTHS ARE ABOVE REQUIRED PROJECT DEPTH.

TYPICAL ABBREVIATIONS

- CY CUBIC YARD
- DWGS DRAWINGS
- ELEV EL ELEVATION
- EXIST EXISTING
- MRHW MEAN HIGH WATER
- MLW MEAN LOWER WATER
- NAVD NORTH AMERICAN VERTICAL DATUM
- NIC NOT IN CONTRACT
- OD MAX. ALLOWABLE OVER DREDGE DEPTH
- PD MIN. REQUIRED PROJECT DREDGE DEPTH
- STA STATIONING
- TEMP TEMPORARY BENCHMARK
- T/S TOE OF SLOPE

DREDGE AREA ID	DREDGE AREA DESCRIPTION	DREDGE AREA (SQ)	PROJECT DEPTH (FT)	IN CONTRACT		NOT IN CONTRACT	
				VOLUME REQUIRED DEPTH (CY)	2' OVER DEPTH (CY)	VOLUME REQUIRED DEPTH (CY)	2' OVER DEPTH (CY)
A	PIER 2 EAST / WEST						
B1	TURNING BASIN	385,630	-45	412,371	214,328	626,999	
B2	PIERS 3A, 4 & TURNING BASIN	257,794	-45	333,636	167,369	501,005	
C1	CHANNEL (STA 413+21.70 - 383+61.23)	344,073	-45	21,393	31,615	53,008	
C2	CHANNEL (STA 383+61.23 - 355+22.25)	161,070	-45	35,997	19,858	56,855	
D	CHANNEL (STA 350+02.81 - 292+31.27)	256,417	-45	220,288	71,804	292,092	
E	CHANNEL (STA 292+31.21 - 236+19.74)	494,490	-45	135,621	116,416	252,037	
F	CHANNEL (STA 236+19.74 - 200+77.53)	233,053	-45	28,003	32,598	60,591	
G	CHANNEL (STA 189+03.31 - 62+82.73)	397,566	-45	96,645	93,723	192,368	
H	CHANNEL (STA 134+13.88 - 62+00)	89,882	-45	17,625	28,981	46,606	
EARLE NAVAL WEAPONS STATION VOLUME TOTALS				1,302,579	776,682	2,081,261	

DETAIL SHEET

FY-2014 MAINTENANCE DREDGING SITE PLAN

COLTS NECK, NJ

EARLE HNS

NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC

NAVAL FACILITIES ENGINEERING COMMAND

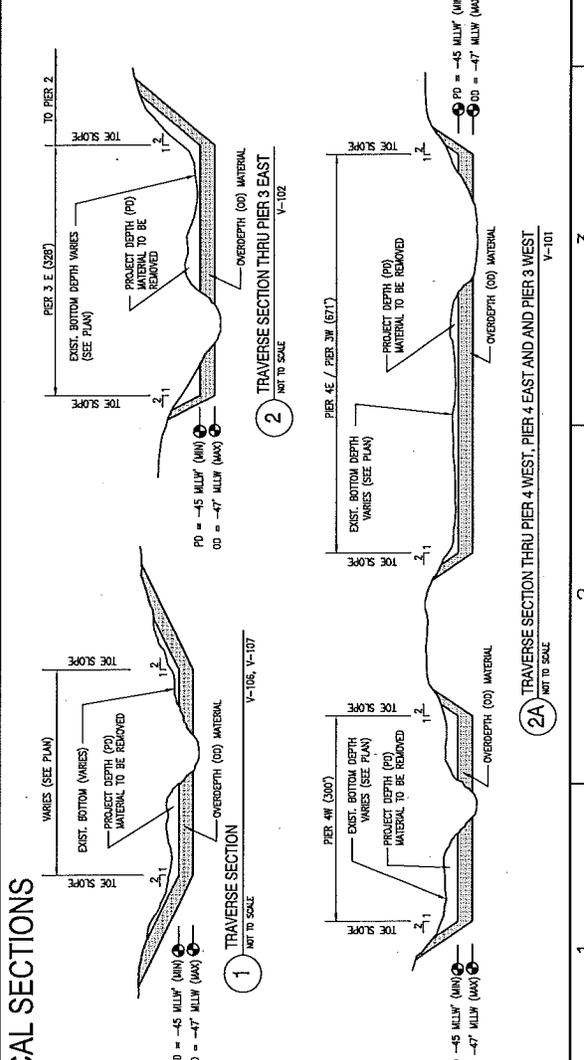
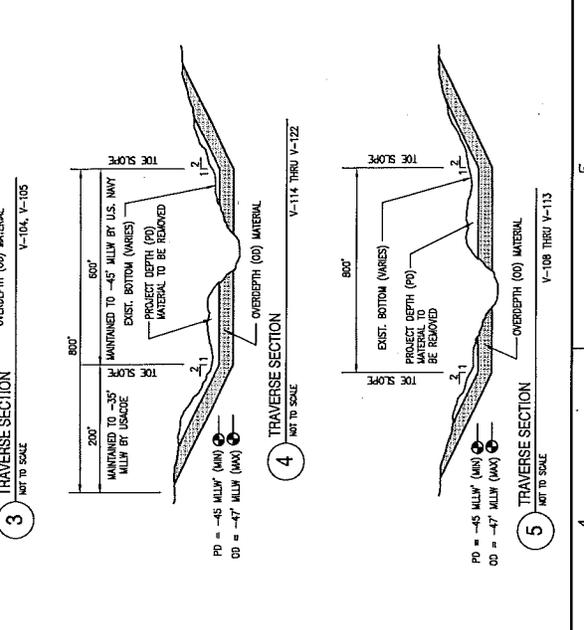
DEPARTMENT OF THE NAVY

12.672.421

12.672.421

2

V-002

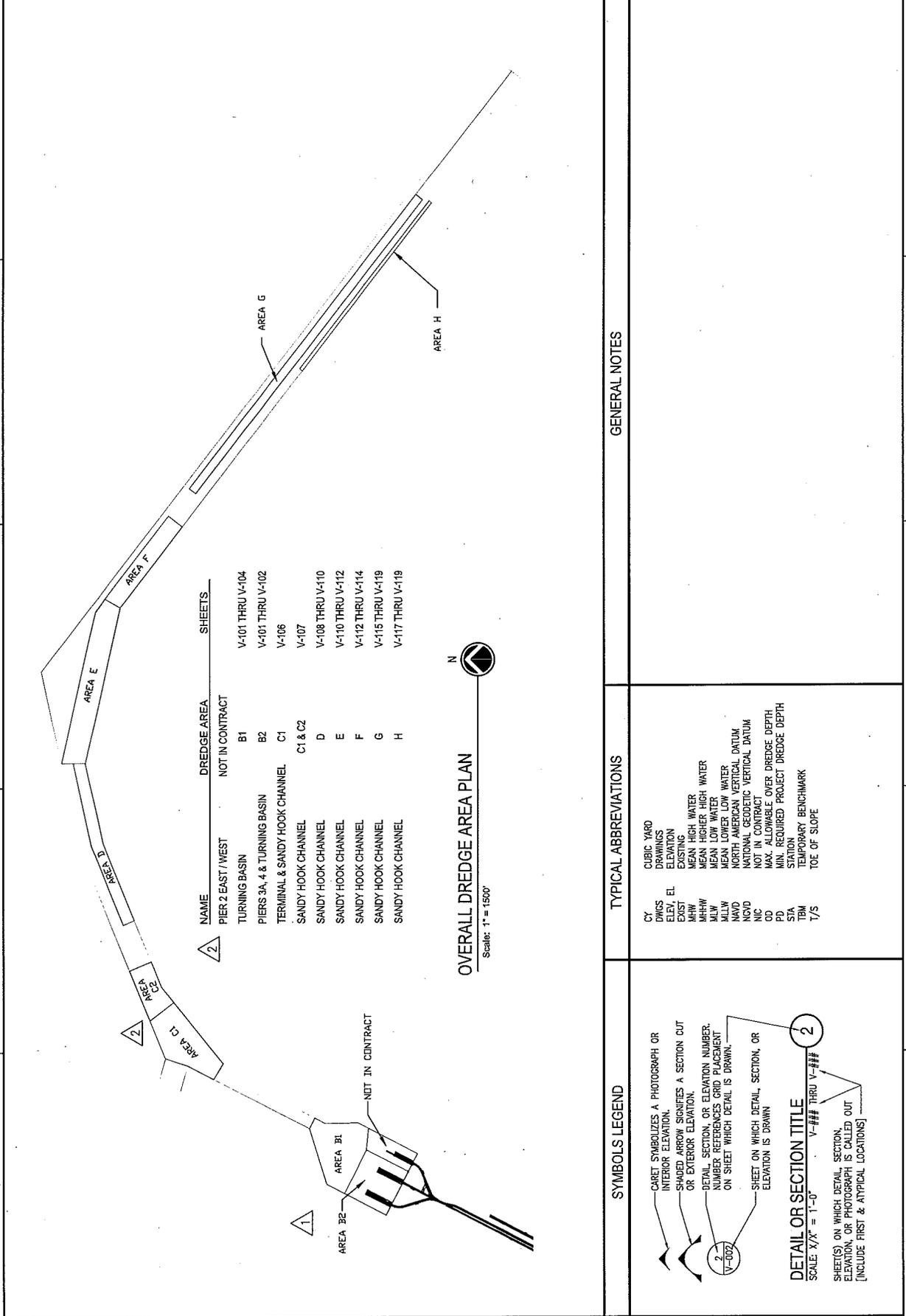


DATE	DESCRIPTION
4/11/13	DREDGE AREA B REVISED
5/05/14	REVISIONS PER FINAL DESIGN



NAVFAC
 NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
 COLTS NECK, NJ

GENERAL NOTES, LEGEND AND OVERALL DREDGE AREA PLAN	
FY-2014 MAINTENANCE DREDGING SITE PLAN	
DATE	12.672.422
BY	3 0 28
SCALE	1" = 1500'
PROJECT	V-003



NAME	DREDGE AREA	SHEETS
PIER 2 EAST / WEST	NOT IN CONTRACT	
TURNING BASIN	B1	V-101 THRU V-104
PIERS 3A, 4 & TURNING BASIN	B2	V-101 THRU V-102
TERMINAL & SANDY HOOK CHANNEL	C1	V-106
SANDY HOOK CHANNEL	C1 & C2	V-107
SANDY HOOK CHANNEL	D	V-108 THRU V-110
SANDY HOOK CHANNEL	E	V-110 THRU V-112
SANDY HOOK CHANNEL	F	V-112 THRU V-114
SANDY HOOK CHANNEL	G	V-115 THRU V-119
SANDY HOOK CHANNEL	H	V-117 THRU V-119

OVERALL DREDGE AREA PLAN
 Scale: 1" = 1500'

GENERAL NOTES

TYPICAL ABBREVIATIONS

- CY CUBIC YARD
- DMGS DRAWINGS
- ELEV ELEVATION
- EL ELEVATION
- HW HIGH WATER
- MHW MEAN HIGH WATER
- MLW MEAN LOW WATER
- MLLW MEAN LOWER LOW WATER
- NAVD NORTH AMERICAN VERTICAL DATUM
- NGVD NATIONAL GEODETIC VERTICAL DATUM
- NOT IN CONTRACT NOT IN CONTRACT
- OD MAX. ALLOWABLE OVER DREDGE DEPTH
- PD MIN. REQUIRED PROJECT DREDGE DEPTH
- STA STATION
- TBM TEMPORARY BENCHMARK
- T/S TOE OF SLOPE

SYMBOLS LEGEND

- CARET SYMBOLIZES A PHOTOGRAPH OR INTERIOR ELEVATION.
- SHADED ARROW SIGNIFIES A SECTION CUT OR EXTERIOR ELEVATION.
- DETAIL SECTION, OR ELEVATION NUMBER, NUMBER REFERENCE GRID ALIGNMENT ON SHEET WHICH DETAIL IS DRAWN.
- SHEET ON WHICH DETAIL, SECTION, OR ELEVATION IS DRAWN
- SCALE: X/X' = 1-0" V-### THRU V-###
- DETAIL OR SECTION TITLE
- SHEET(S) ON WHICH DETAIL, SECTION, ELEVATION, OR PHOTOGRAPH IS CALLED OUT [INCLUDE FIRST & ATYPICAL LOCATIONS]

NAN-2011-00278

Sheet 3 of 28

APP#	DATE	DESCRIPTION	REV#
	4/11/13	DREDGE AREA B REVISED	1
	5/05/14	REVISIONS PER FINAL DESIGN	2



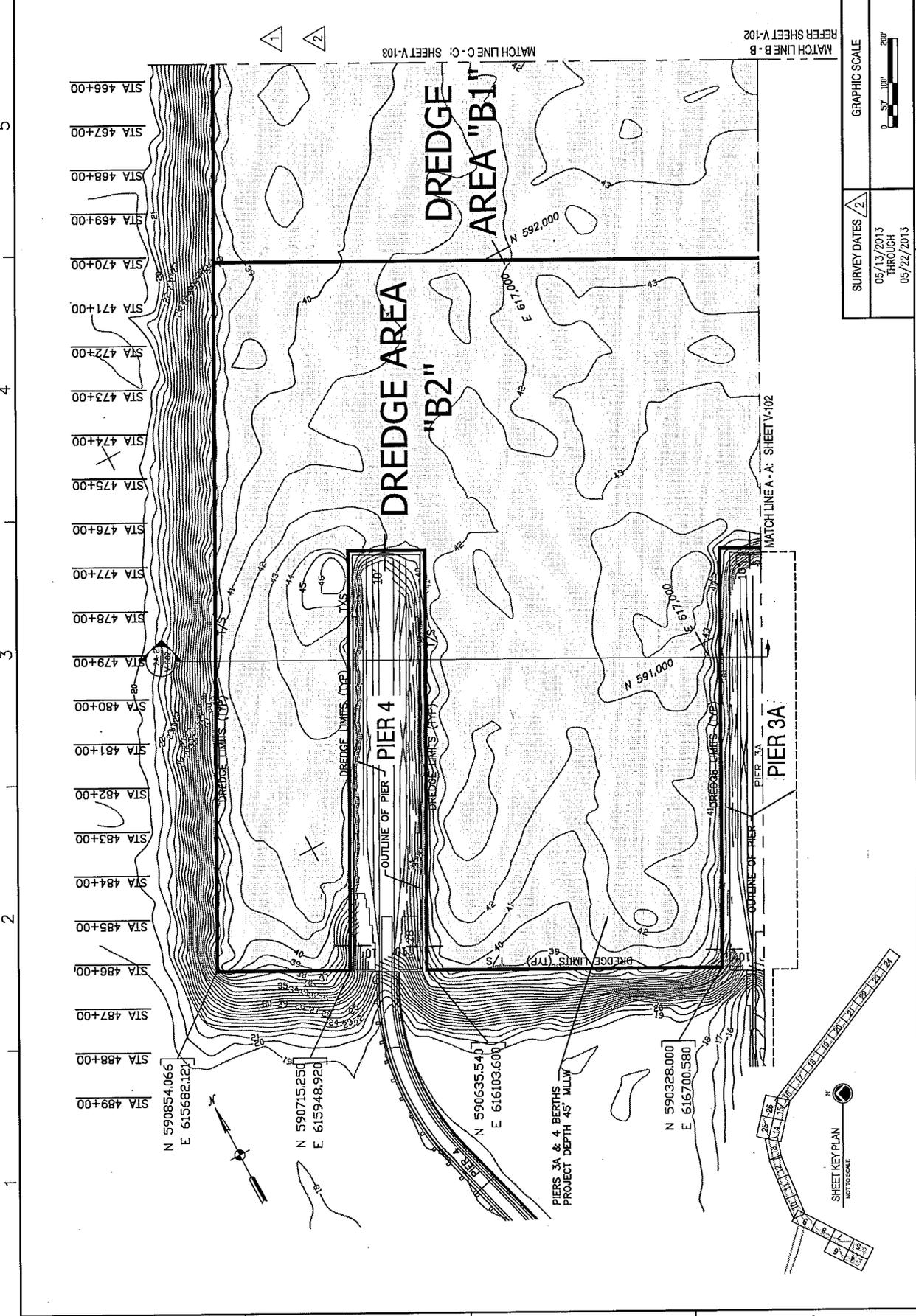
PROJECT: 08-20-2014

PROJECT NO. 110800-0001
 DRAWING NO. 110800-0001-0001
 SHEET NO. 28 OF 28

(488+17.60 THRU 465+62.48) DREDGE PLAN
 NAVY PIERS 3A WEST / 4 & TURNING BASIN
 FY-2014 MAINTENANCE DREDGING
 SITE PLAN
 COLTS NECK, NJ
 EARLE HNS
 NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
 NAVAL FACILITIES ENGINEERING COMMAND

DATE	BY	CHKD BY	APP'D BY
12.672.433			
12.672.433			
12.672.433			

SURVEY DATES	05/13/2013 THROUGH 05/22/2013
GRAPHIC SCALE	0 50' 100' 200'



Sheet 4 of 28

NAN-2011-00278

APP#	DATE	DESCRIPTION	BY
	4/11/13	DREDGE AREA B REVISED	
	5/05/14	FINAL DESIGN REVISION	

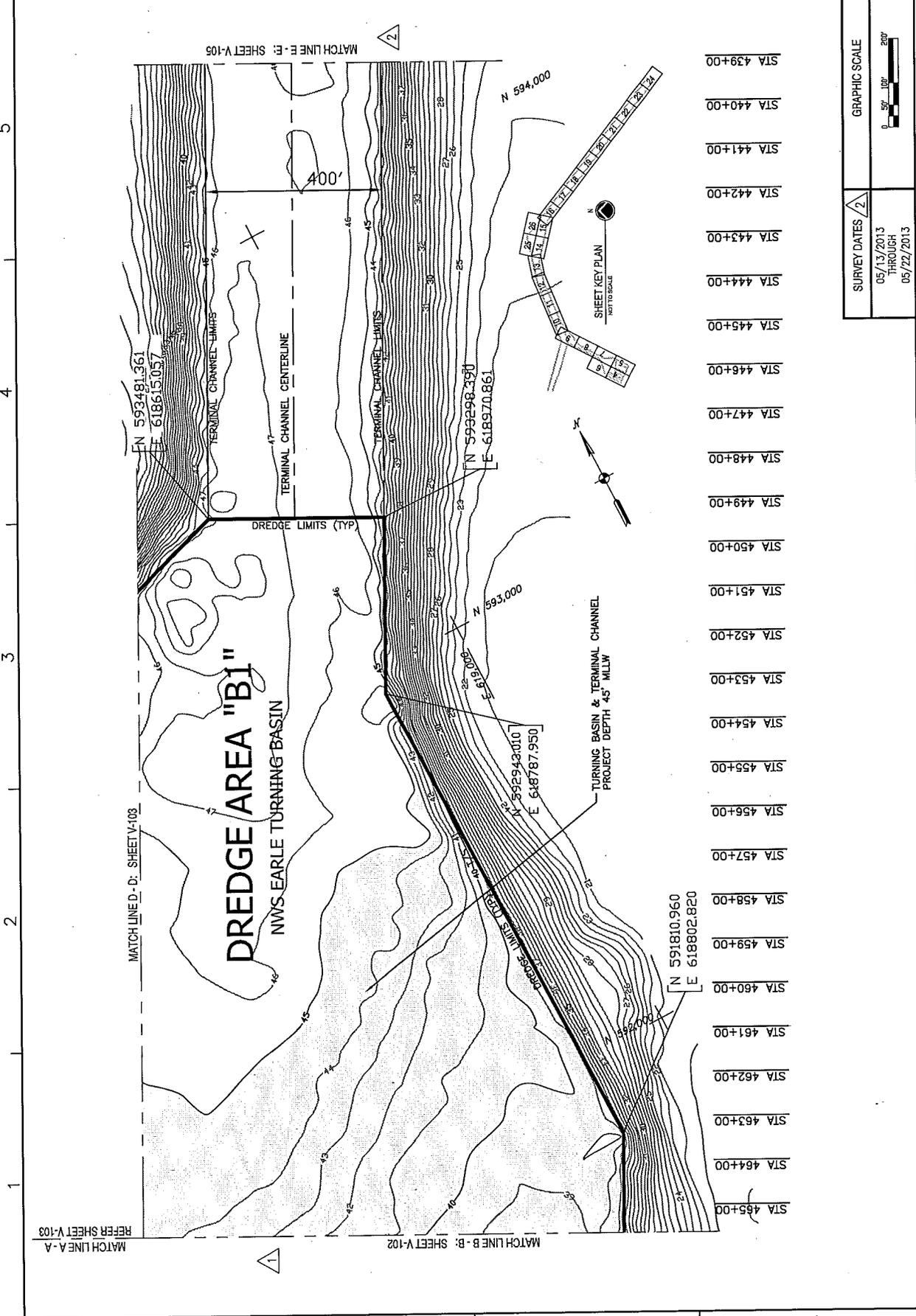


PROJECT # 08-23-2014

DATE PLOTTED: 05/13/2013
 PLOT SCALE: 1" = 100'
 PLOT SHEET: 7 OF 28
 PLOT DATE: 05/13/2013
 PLOT TIME: 10:12:14
 PLOT USER: J. J. BROWN
 PLOT DEVICE: HP PLOTTER
 PLOT FILE: D:\PROJECTS\08-23-2014\08-23-2014.dwg

DREDGE PLAN
 TURNING BASIN - EAST (465+56.48 THRU 439+06.89)
 FY-2014 MAINTENANCE DREDGING
 SITE PLAN
 COLTS NECK, NJ
 EARLE NWS
 NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
 NAVAL FACILITIES ENGINEERING COMMAND
 DEPARTMENT OF THE NAVY

DATE PLOTTED	05/13/2013
SCALE	AS NOTED
PROJECT NO.	08-23-2014
CONTRACT NO.	12-672-456
NAVY PROJECT NO.	12-672-456
NAVY SHEET NO.	7 OF 28
NAVY SHEET TOTAL	28
NAVY SHEET NO.	V-104



- STA 439+00
- STA 440+00
- STA 441+00
- STA 442+00
- STA 443+00
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- STA 463+00
- STA 464+00
- STA 465+00

SURVEY DATES: 05/13/2013 THROUGH 05/22/2013

GRAPHIC SCALE: 0 50' 100' 200'

Sheet 7 of 28

NAN-2011-00278

APP	DATE	DESCRIPTION	BY
	5/05/14	REVISIONS PER FINAL DESIGN	



PROJECT # 09-22-2011

FOR CONTRACTOR USE ONLY

DATE PLOTTED: 05/13/2013 12:07:42 PM

PROJECT: COLTS NECK, NJ

PROJECT: SANDY HOOK CHANNEL (413+40.36 THRU 389+55.97)

PROJECT: FY-2014 MAINTENANCE DREDGING SITE PLAN

PROJECT: EARLE MW

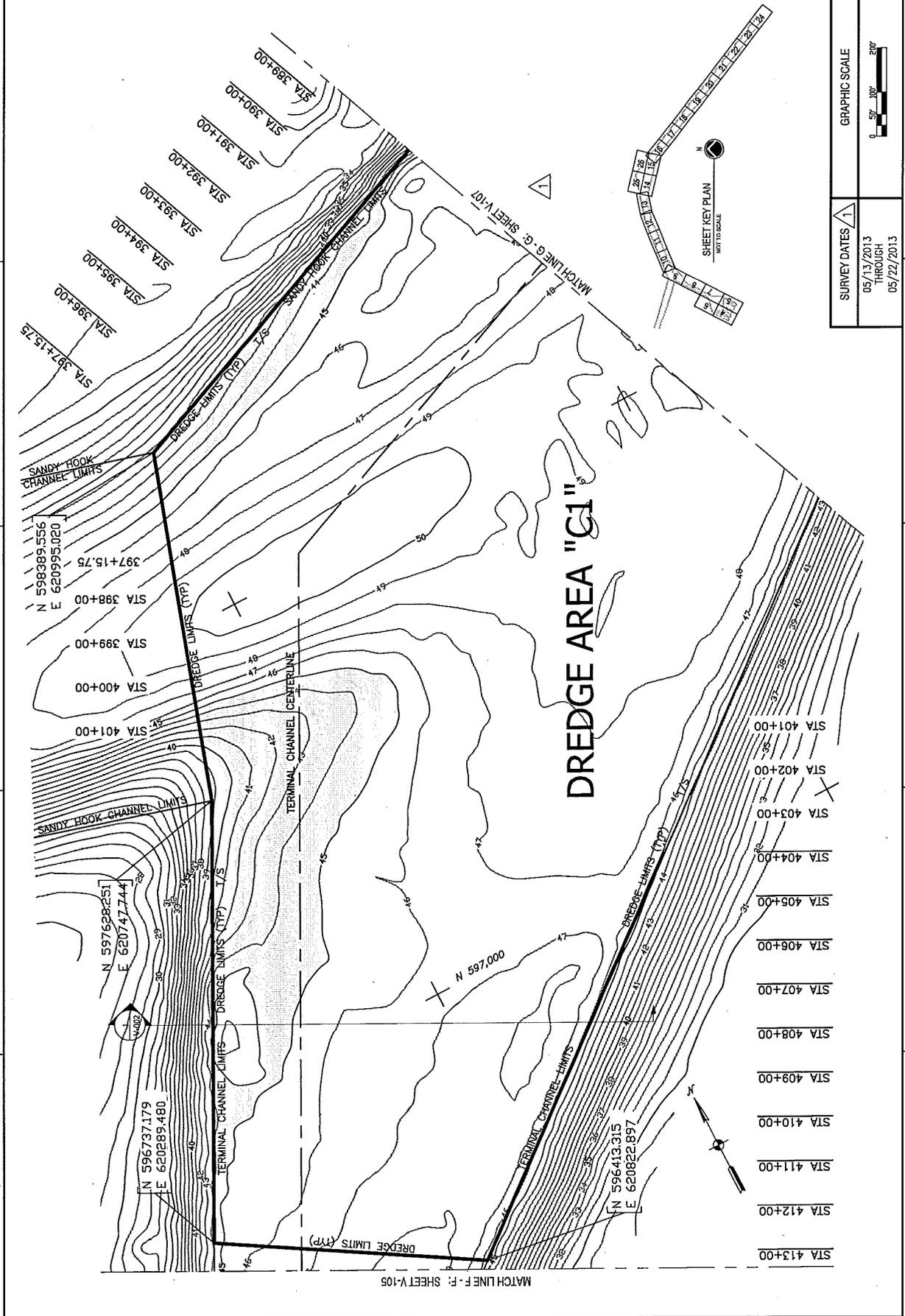
PROJECT: NAVAL FACILITIES ENGINEERING COMMAND -- MID ATLANTIC

PROJECT: NAVAL FACILITIES ENGINEERING COMMAND

DATE	BY	DESCRIPTION
05/13/2013		THROUGH
05/22/2013		

SURVEY DATES	05/13/2013 THROUGH 05/22/2013
GRAPHIC SCALE	0 50' 100' 200'

V-106



Sheet 9 of 28

NAN-2011-00278

APPN	DATE	DESCRIPTION	BY
	5/05/14	REVISIONS PER FINAL DESIGN	

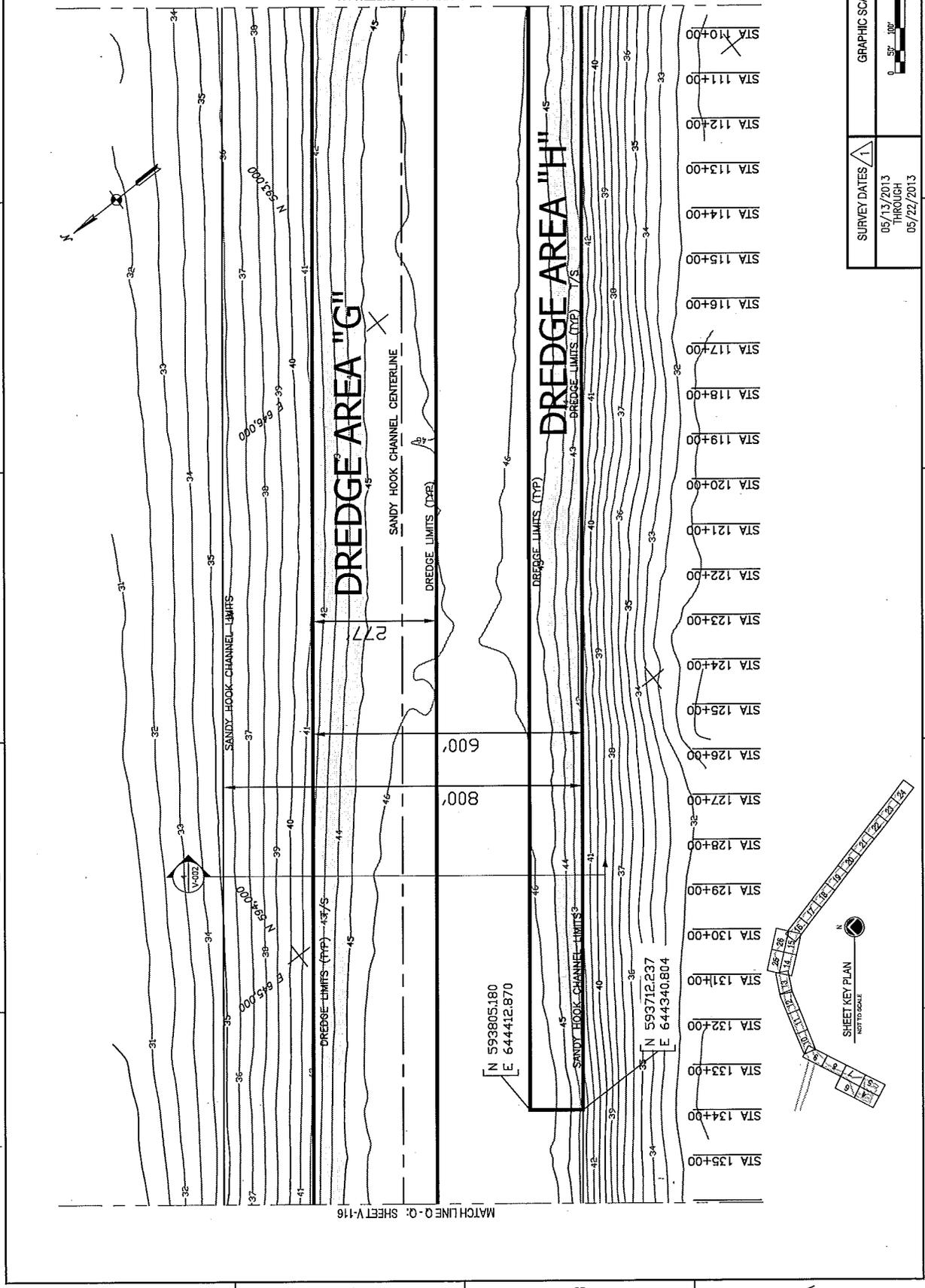


NAUTAC
PROJECT # 08-29-2014

PROJECT NO.	08-29-2014
DATE	05-12-14
SCALE	AS NOTED
DESIGNER	EARLE MWS
CHECKER	EARLE MWS
APPROVED	EARLE MWS

DREDGE PLAN
SANDY HOOK CHANNEL (138+05.19 THRU 109+49.60)
FY-2014 MAINTENANCE DREDGING
SITE PLAN
COLTS NECK, NJ
NAVAL FACILITIES ENGINEERING COMMAND -- MID ATLANTIC
DEPARTMENT OF THE NAVY

DATE	05/13/2013
THROUGH	05/22/2013
BY	EARLE MWS
SCALE	AS NOTED
PROJECT NO.	08-29-2014
DATE	05-12-14
SCALE	AS NOTED
DESIGNER	EARLE MWS
CHECKER	EARLE MWS
APPROVED	EARLE MWS



Sheet 20 of 28

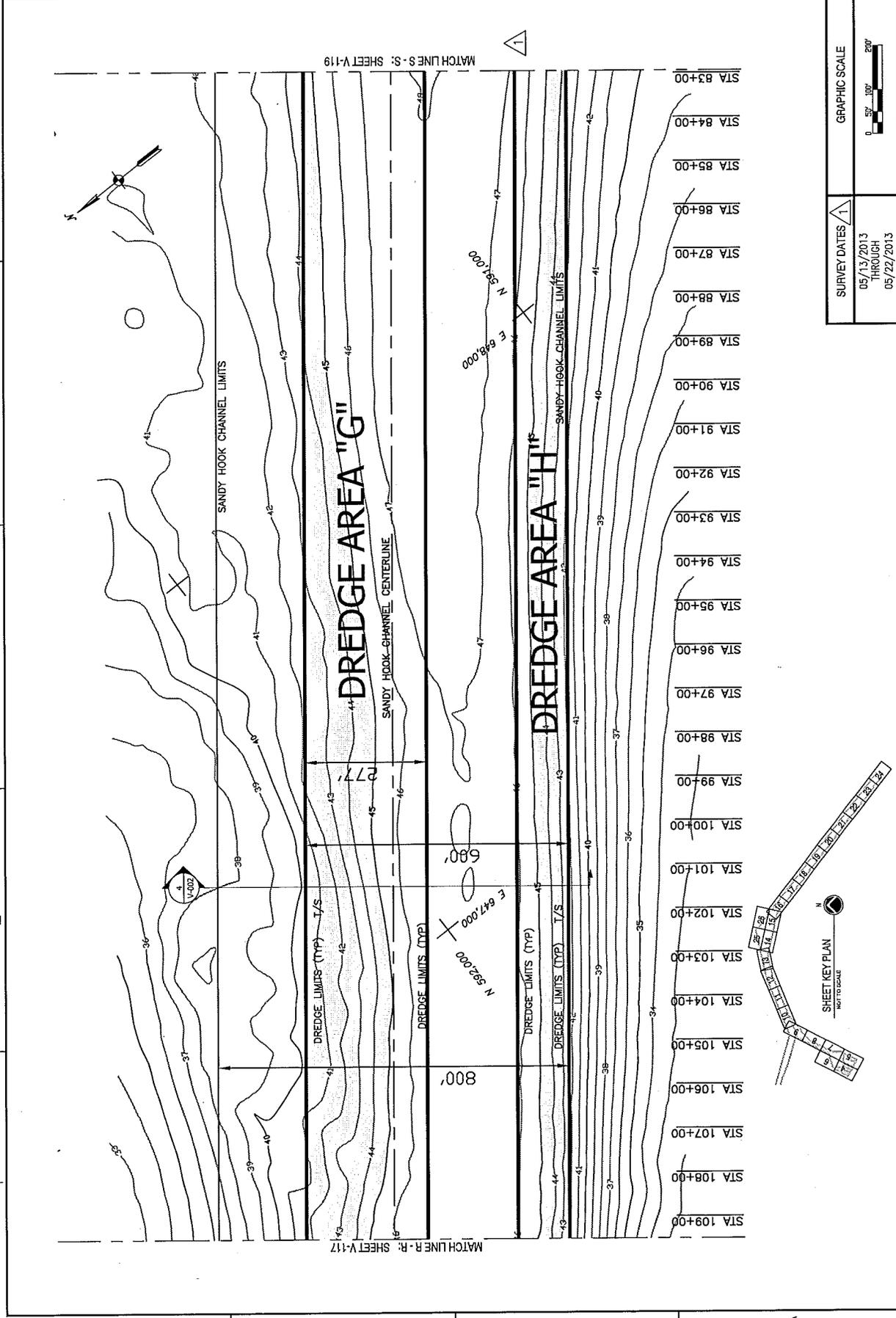
NAN-2011-00278

APPN	DATE	DESCRIPTION	REV
	5/05/14	REVISIONS PER FINAL DESIGN	1



PROJECT # 08-20-2014
 CONTRACT NUMBER
 DRAWING NO. 109+49.60 THRU 82+94.01
 DATE 05-12-14
 DRAWN BY
 CHECKED BY
 DESIGNED BY
 APPROVED BY

DREDGE PLAN
 SANDY HOOK CHANNEL (109+49.60 THRU 82+94.01)
 FY-2014 MAINTENANCE DREDGING
 SITE PLAN
 COLTS NECK, NJ
 EARLE MMS
 NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
 NAVAL FACILITIES ENGINEERING COMMAND
 DEPARTMENT OF THE NAVY
 DRAWING NO. 109+49.60 THRU 82+94.01
 DATE 05-12-14
 DRAWN BY
 CHECKED BY
 DESIGNED BY
 APPROVED BY
 SHEET # 21 OF 28
 V-118

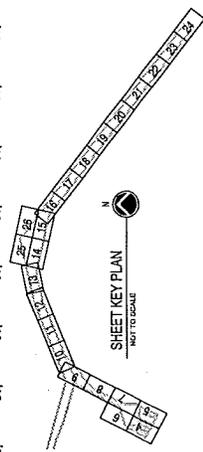


GRAPHIC SCALE

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SURVEY DATES

05/13/2013 THROUGH 05/22/2013

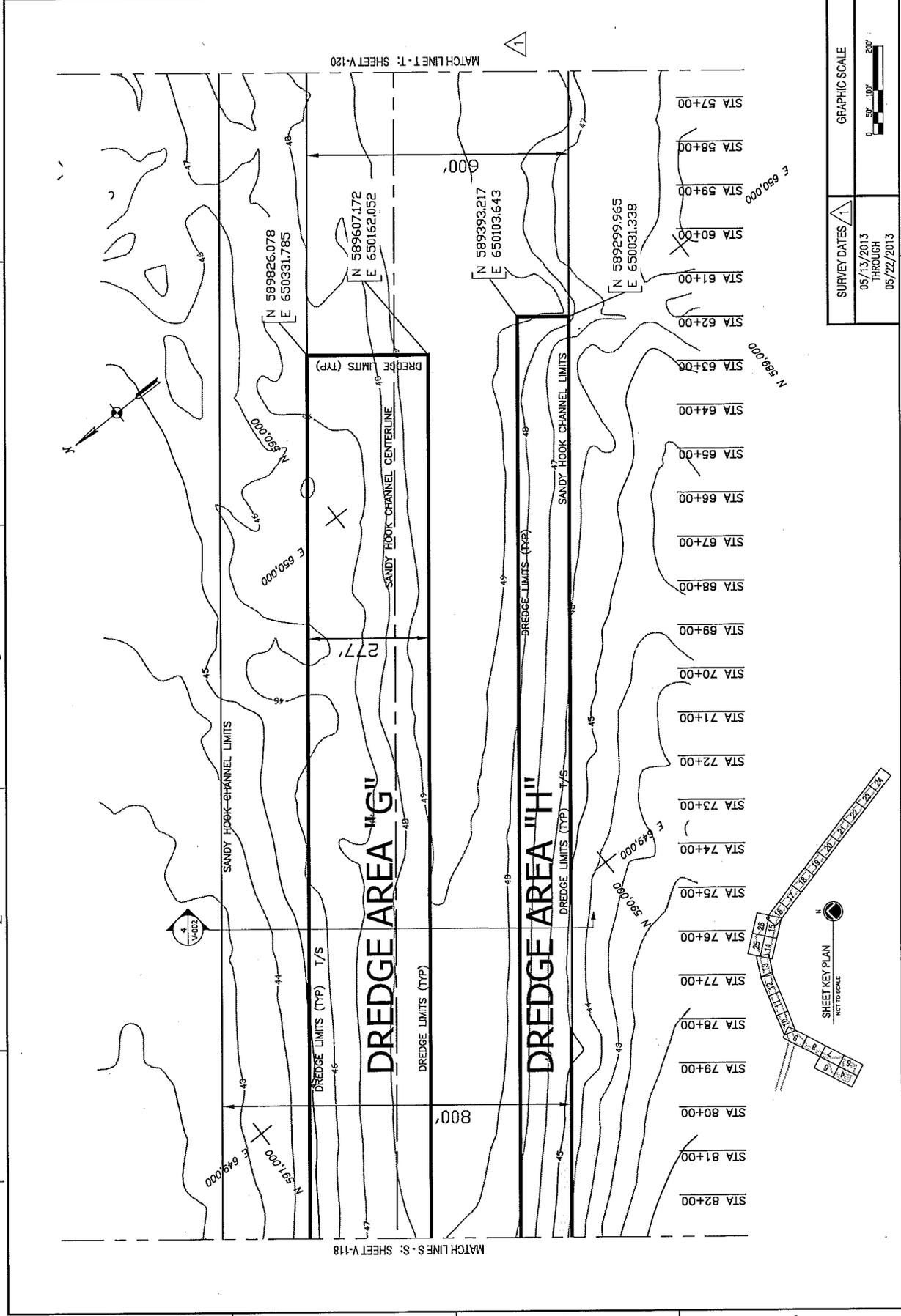


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NAN-2011-00278

THE NAVY FACILITIES ENGINEERING COMMAND (NAVFAC) IS AN EQUAL OPPORTUNITY AGENCY. IF YOU ARE DEAF OR HEARING IMPAIRED, PLEASE CONTACT THE NAVY FACILITIES ENGINEERING COMMAND AT (404) 462-1111 FOR ASSISTANCE. NAVY FACILITIES ENGINEERING COMMAND, 1100 N. FORT MONROE AVENUE, FORT MONROE, VA 23606-5000

NOV 14 2014	REVISIONS PER FINAL DESIGN	1
		
PROJECT NO. 06-25-2014 DRAWING NO. 1118 SHEET NO. 22 OF 28		
DREDGE PLAN SANDY HOOK CHANNEL (82+84.01 THRU 88+38.42) FY-2014 MAINTENANCE DREDGING SITE PLAN COLTS NECK, NJ EARLE MWS NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC NAVAL FACILITIES ENGINEERING COMMAND DEPARTMENT OF THE NAVY		
DATE	DESCRIPTION	BY
5/05/14	REVISIONS PER FINAL DESIGN	



Sheet 22 of 28

NAN-2011-00278

APP#	DATE	DESCRIPTION	BY
	5/05/14	REVISIONS PER FINAL DESIGN	

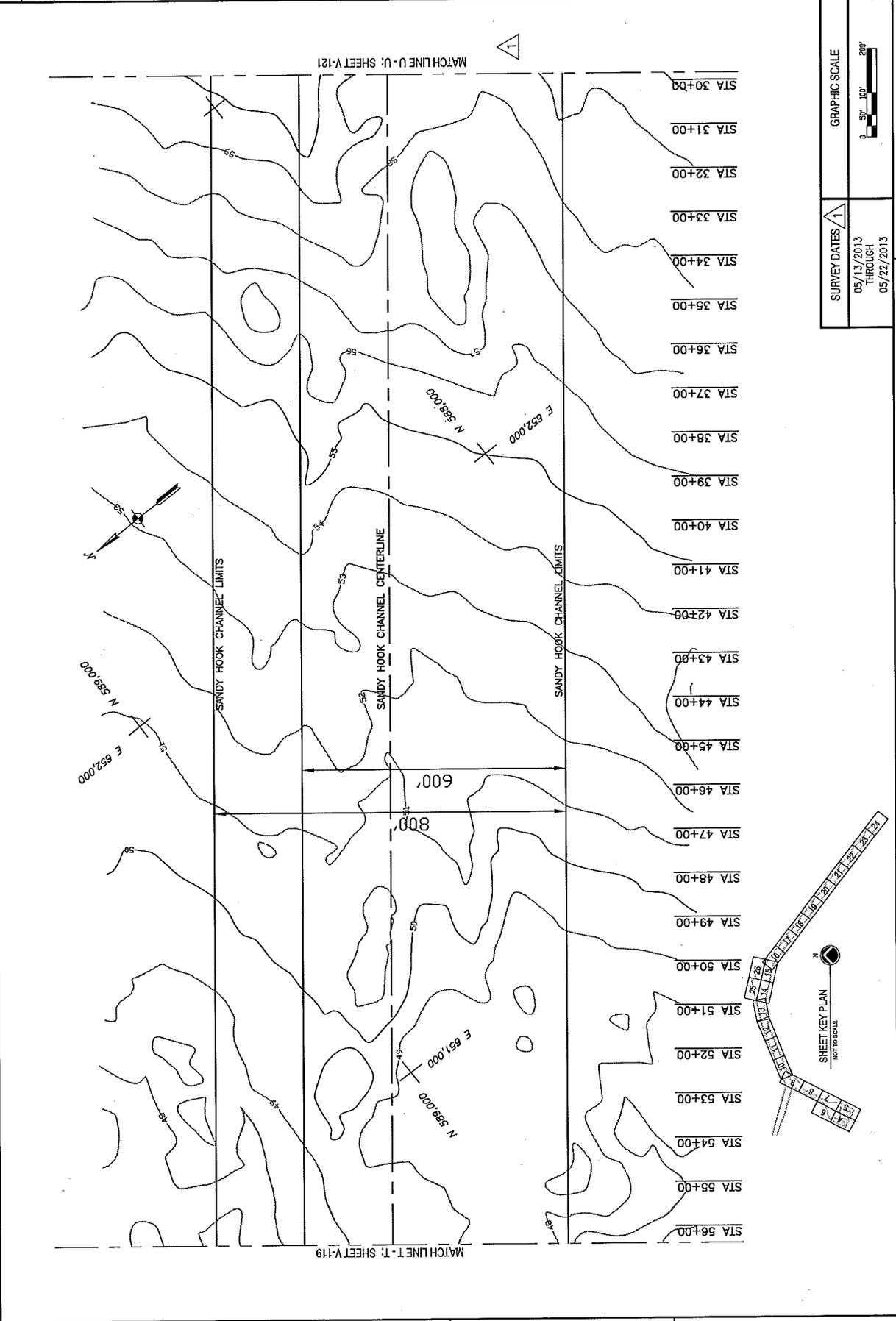


NAVFAC
PROJECT # 10-20-2014

PROJECT TITLE
SANDY HOOK CHANNEL
DREDGE PLAN
SANDY HOOK CHANNEL (56+38.42 THRU 29+82.83)
FY-2014 MAINTENANCE DREDGING
SITE PLAN
COLTS NECK, NJ
NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
NAVAL FACILITIES ENGINEERING COMMAND

DESIGNED BY
EARLE HWS
DRAWN BY
DATE
CHECKED BY
DATE
SCALE
GRAPHIC SCALE
SURVEY DATES
05/13/2013
THROUGH
08/22/2013
SHEET NO. 23 OF 28
V-120

5
4
3
2
1



GRAPHIC SCALE
0 50 100 200'

SURVEY DATES
05/13/2013
THROUGH
08/22/2013

SHEET KEY PLAN
NOT TO SCALE

Sheet 23 of 28

NAN-2011-00278

APP#	DATE	DESCRIPTION	BY
1	5/05/14	REVISIONS PER FINAL DESIGN	



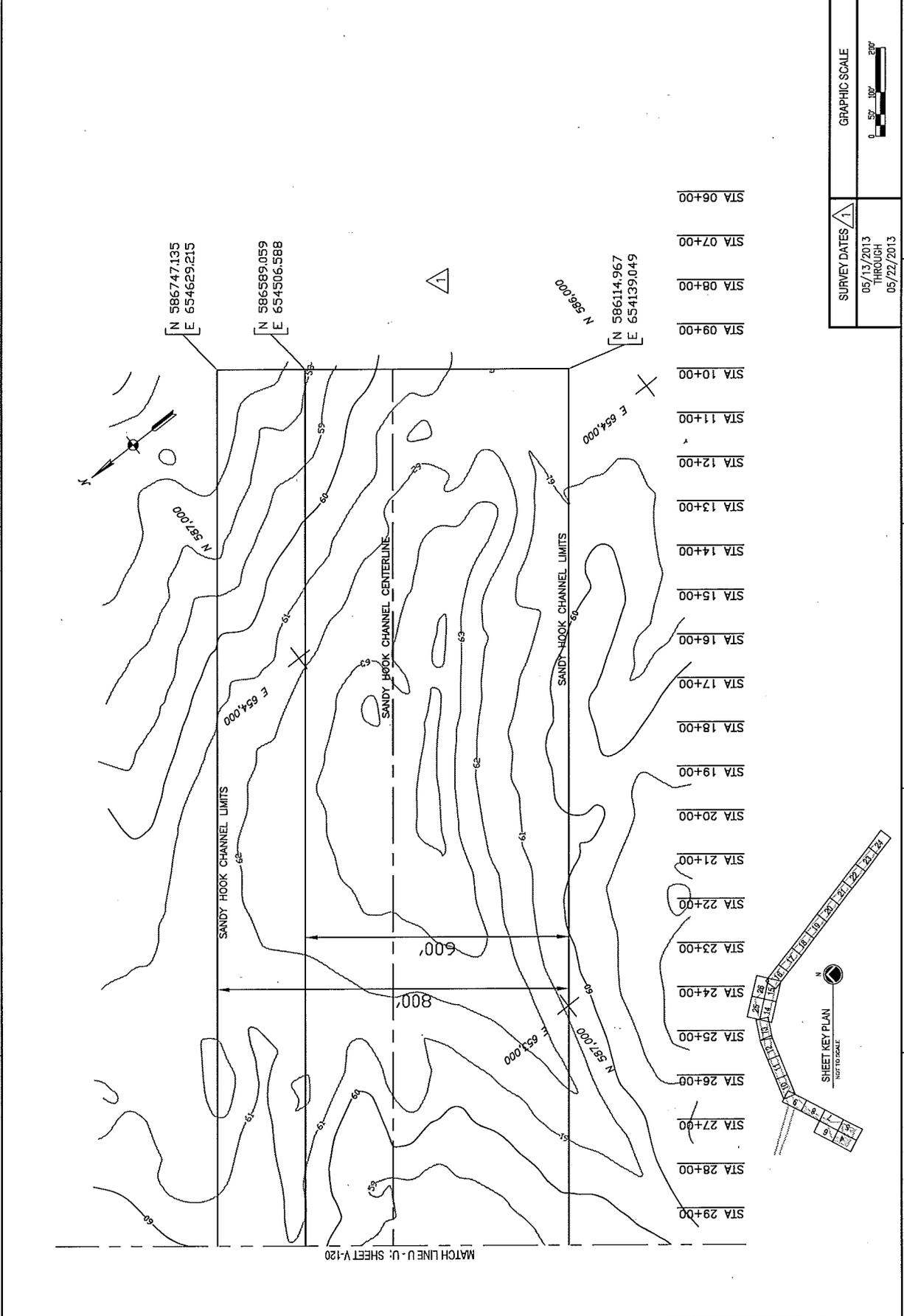
PROJECT # 11C-20-2014

DESIGNED BY: [Redacted]
 DRAWN BY: [Redacted]
 CHECKED BY: [Redacted]
 APPROVED BY: [Redacted]

DREDGE PLAN
 SANDY HOOK CHANNEL (29+82.83 THRU 10+00)
 FY-2014 MAINTENANCE DREDGING
 SITE PLAN
 EARLE NWS
 COLTS NECK, NJ
 NAVAL FACILITIES ENGINEERING COMMAND - MID ATLANTIC
 NAVAL FACILITIES ENGINEERING COMMAND
 DEPARTMENT OF THE NAVY

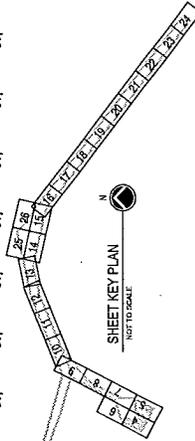
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SCALE	AS NOTED
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DRAWING NO.	12.672-4-3
DATE	24 OF 28
SHEET	V-121

5
4
3
2
1



SURVEY DATES
 05/13/2013
 THROUGH
 05/22/2013

GRAPHIC SCALE
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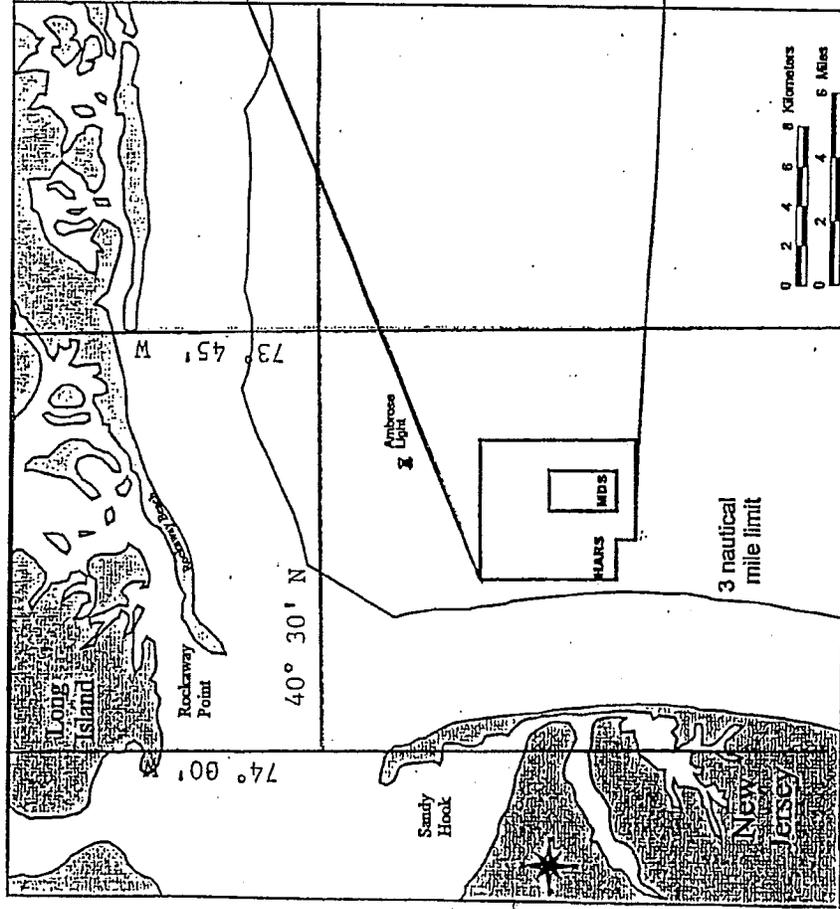


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NAN-2011-00 278

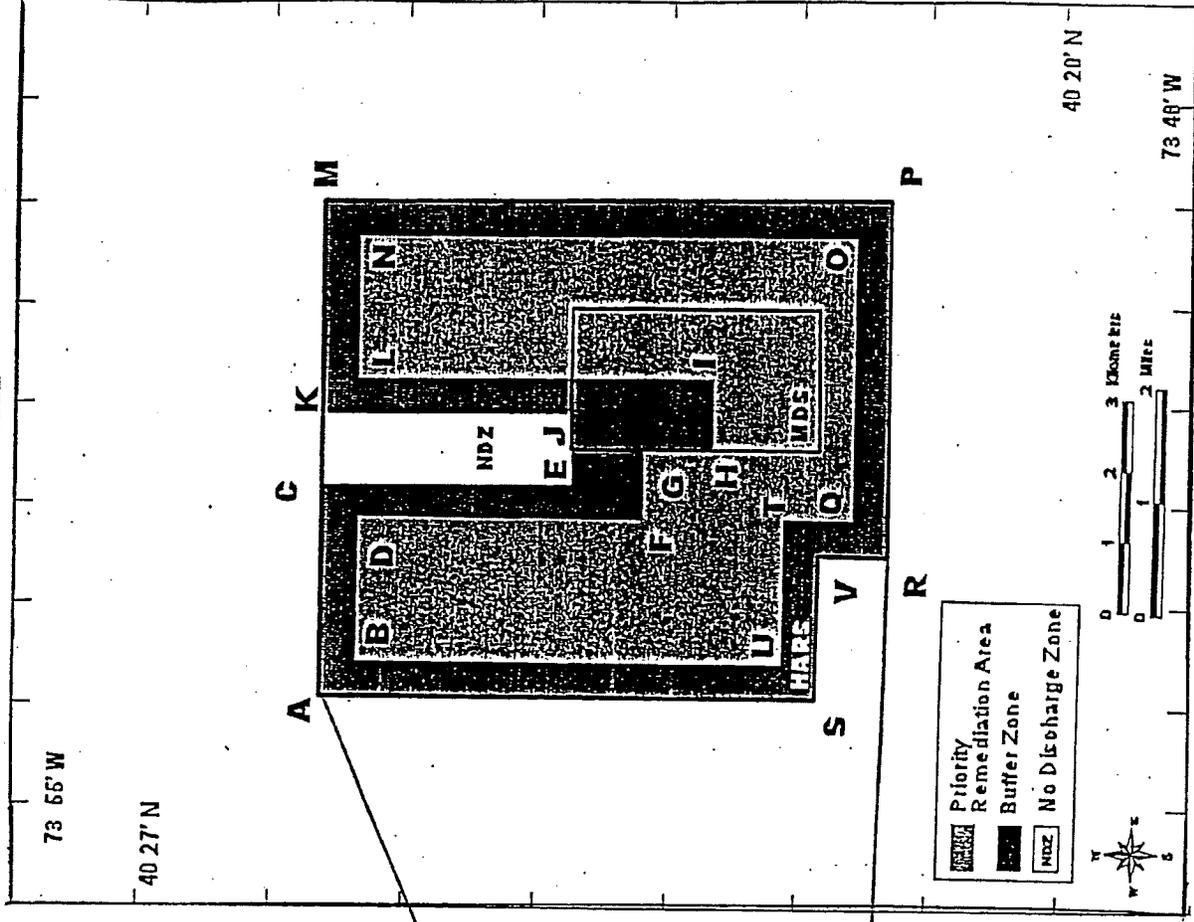
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HISTORIC AREA REMEDIATION SITE LOCATION MAP

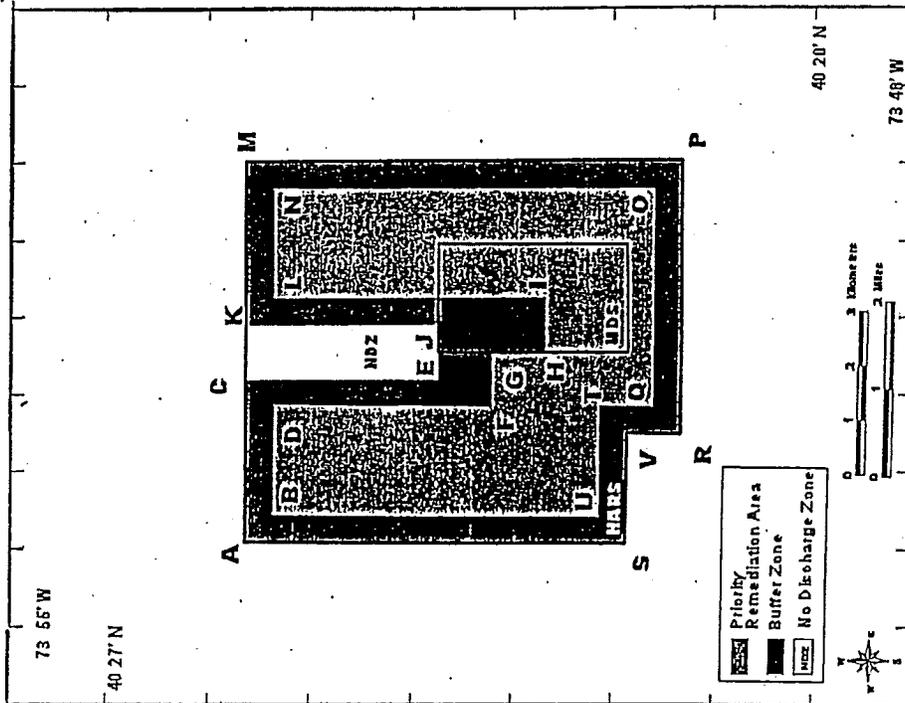


A

LOCATION OF PRIMARY REMEDIATION AREA WITHIN THE HISTORIC AREA REMEDIATION SITE



B



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

** -- DDM = Degrees, Decimal Minutes