Delaware Department of Natural Resources and Environmental Control
Delaware Coastal Management Program

Initial Review: _____
Updated On: _____
Complete: _____
Official Use Only

Coastal Zone Management Act Federal Consistency Form

This document provides the Delaware Coastal Management Program (DCMP) with a Federal Consistency Determination or Certification for activities regulated under the Coastal Zone Management Act of 1972, as amended, and NOAA's Federal Consistency Regulations, 15 C.F.R. Part 930. Federal agencies and other applicants for federal consistency are not required to use this form; it is provided to applicants to facilitate the submission of a Consistency Determination or Consistency Certification. In addition, federal agencies and applicants are only required to provide the information required by NOAA's Federal Consistency Regulations.

Project/Activity Name:	Maintenance Dredging of Energy Transfer's Marcus Hook Terminal

I. Federal Agency or Non-Federal Applicant Contact Information:

Contact Name/Title: Ryan Brown

Federal Agency Contractor Name (if applicable): Weston Solutions, Inc.

Federal Agency: United States Army Corps of Engineers
(either the federal agency proposing an action or the federal agency issuing a federal license/permit or financial assistance to a non-federal applicant)

Mailing Address: 205 Campus Drive

City: Edison State: NJ Zip Code: 08337

E-mail: Ryan.Brown@WestonSolutions.com Telephone #: 908-565-0888

II. Federal Consistency Category:

- ○ Federal Activity or Development Project (15 C.F.R. Part 930, Subpart C)
- ○ Outer Continental Shelf Activity (15 C.F.R. Part 930, Subpart E)
- ○ Federal Financial Assistance (15 C.F.R. Part 930, Subpart F)
- ○ Federal License or Permit Activity (15 C.F.R. Part 930, Subpart D)
- ● Federal License or Permit Activity which occurs wholly in another state (interstate consistency activities identified in DCMP's Policy document)

III. Detailed Project Description (attach additional sheets if necessary):

The applicant, Energy Transfer (formerly Sunoco), is seeking a consistency determination to conduct authorized maintenance dredging activities at the Marcus Hook Terminal in Marcus Hook, Pennsylvania. The Marcus Hook Terminal is located at 100 Green Street at coordinates 39.809106 N and -75.415676 W (Figure 1). The Marcus Hook Terminal is currently authorized for maintenance dredging under United States Army Corps of Engineers (USACE) Permit No. CENAP-OP- R-2013-0760-46, New Jersey Department of Environmental Protection (NJDEP) Water Quality Certificate/Coastal Zone Management approval 0809-03-0004.1 CDT 210001, and prior Pennsylvania Department of Environmental Protection (PADEP) Coastal Zone Management Consistency E23-035. Proposed maintenance dredge areas at Marcus Hook Terminal include Berths 1A, 1B, 2A, 2B, 3A, 3B, 3C, Water Intakes RW-5 and RW-7, and a firewater intake area adjacent to RW-5. Berthing areas at MHT are to be mechanically dredged to a maximum of depth of -42.0' MLLW with an additional 2 feet of allowable over-dredge for a total proposed depth range from -20.0' MLLW (-22.21 feet below mean low water) to -42.0' MLLW (-44.21 feet below mean low water. The location, area, and proposed depths for the berths and intake area are identified in the enclosed drawings. See attached Dredge Plan and Cross Section (Permit Drawings 6 through 9).

See attachments for full project description.

IV. General Analysis of Coastal Effects (attach additional sheets if necessary):

Mechanical dredging will be conducted utilizing a closed-clamshell environmental bucket. The dredge will be used to control the rate of descent of the bucket so as to maximize the vertical cut of the clamshell bucket while not penetrating the sediment beyond the vertical dimension of the open bucket. This will reduce the amount of free water in the dredged material, will avoid overfilling the bucket, and minimize the number of dredge bucket cycles needed to complete the dredging contract. Dredged material will be stored and transported in a watertight barge to the intended disposal facility.

Dredged material generated with mechanical dredging would be disposed of at the facility of either White's Basin or Biles Island (Figures 2 through 5). If a disposal area other than at White's Basin or Biles Island is planned, a permit modification will be requested from USACE and a State Section 401 Water Quality Certificate will be obtained.

In advance of any maintenance dredging event, the dredged material will be sampled and characterized according to procedures of the approved Sampling and Analysis Plan (by NJDEP and/or PADEP depending on disposal facility). Testing results and letters of dredged material acceptance from disposal facilities will be provided to NJDEP and/or PADEP with copy to USACE prior to commencement of dredging activities.

V. Detailed Analysis of Consistency with DCMP Enforceable Policies (attach additional sheets if necessary):

Policy 5.1: Wetlands Management

There are no wetlands associated with the project.

Policy 5.2: Beach Management

There are no beaches associated with the project.

Policy 5.3: Coastal Waters Management (includes wells, water supply, and stormwater management. Attach additional sheets if necessary)

Maintenance dredging of these areas will be performed within existing dredging timing windows so to protect water resources in the area. All maintenance dredging will be performed using BMPs to not impact water quality. These waters are not available public or recreational uses. Historic sediment sampling results from multiple sampling events at this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.

Policy 5.4: Subaqueous Land and Coastal Strip Management

Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels. Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18). The proposed disposal facility is White's Basin, owned and operated by Weeks Marine, Inc. Material will be loaded into scows, transported, bottom dumped and ultimately pumped into a confined disposal facility (White's Basin) or hydraulically pumped into the confined disposal facility (Biles Island). The only new dredging is the deepening at Berth 1A (outside of Delaware waters) from 40'+2' to 42'+2, and dredging will be conducted during current dredging windows to protect anadromous fish species.

Policy 5.5: Public Lands Management

The proposed project will not impact public lands.

Policy 5.6: Natural Lands Management

Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels. Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

Policy 5.7: Flood Hazard Areas Management

The proposed project does not have and will not impact any floodplain areas.

Policy 5.8: Port of Wilmington

The proposed project will not impact the Port of Wilmington.

Policy 5.9: Woodlands and Agricultural Lands Management

The proposed project does not have and will not impact any woodland or agricultural areas.

Policy 5.10: Historic and Cultural Areas Management

The proposed project will not impact historic or cultural resource areas.

Policy 5.11: Living Resources

The proposed project will not have any lasting adverse environmental effect on living resources within or adjacent to the project area. Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity and will be conducted during current dredging windows to protect resident and anadromous fish species. This is not a biologically productive area and no shellfish are present.

Policy 5.12 Mineral Resources Management

Not applicable.

Policy 5.13: State Owned Coastal Recreation and Conservation

The proposed project will not impact any state-owned coastal recreation or conservation efforts.

Policy 5.14: Public Trust Doctrine

The proposed project will not impact the public right of navigation or fisheries in the project area.

Policy 5.15: Energy Facilities

No new construction is proposed.

Policy 5.16: Public Investment

The proposed project is a private project and does not include public investment.

Policy 5.17: Recreation and Tourism

The proposed project will not impact local recreation or tourism.

Policy 5.18: National Defense and Aerospace Facilities

Not applicable.

Policy 5.19: Transportation Facilities

Maintenance dredging will be conducted utilizing BMPs to avoid contamination or spills.

Policy 5.20: Air Quality Management

The proposed project will not impact air quality.

Policy 5.21: Water Supply Management

The proposed project will not impact water supply.

Policy 5.22: Waste Disposal Management

Dredged material will be loaded into scows, transported, bottom dumped and ultimately pumped into a permitted confined disposal facility (White's Basin). Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.

Policy 5.23: Development

The proposed project does not involve new development.

Policy 5.24: Pollution Prevention

Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.

Policy 5.25: Coastal Management Coordination

Coordination for the proposed project is being conducted with USACE, NJDEP, PADEP and DNREC.

VI. JPP and RAS Review (Check all that apply)**:**

Has the project been reviewed in a monthly Joint Permit Processing and/or Regulatory Advisory Service meeting?

☐ JPP ☐ RAS ☒ None

*If yes, provide the date of the meeting(s): _____

VII. Statement of Certification/Determination and Signature (Check one and sign below)**:**

☒ **FEDERAL AGENCY CONSISTENCY DETERMINATION.** Based upon the information, data, and analysis included herein, the federal agency, or its contracted agent, listed in (I) above, finds that this proposed activity is consistent to the maximum extent practicable with the enforceable policies of the Delaware Coastal Management Program.

OR

☐ **FEDERAL AGENCY NEGATIVE DETERMINATION.** Based upon the information, data, and analysis included herein, the federal agency, or its contracted agent, listed in (I) above, finds that this proposed activity will not have any reasonably foreseeable effects on Delaware's coastal uses or resources (Negative Determination) and is therefore consistent with the enforceable policies of the Delaware Coastal Management Program.

OR

☐ **NON-FEDERAL APPLICANT'S CONSISTENCY CERTIFICATION.** Based upon the information, data, and analysis included herein, the non-federal applicant for a federal license or permit, or state or local government agency applying for federal funding, listed in (I) above, finds that this proposed activity complies with the enforceable policies of the Delaware Coastal Management Program and will be conducted in a manner consistent with such program.

Signature:			
Printed Name:	Ryan Brown	Date:	June 8, 2022

Pursuant to 15 C.F.R. Part 930, the Delaware Coastal Management Program must provide its concurrence with or objection to this consistency determination or consistency certification in accordance with the deadlines listed below. Concurrence will be presumed if the state's response is not received within the allowable timeframe.

Federal Consistency Review Deadlines:

Federal Activity or Development Project (15 C.F.R. Part 930, Subpart C)	60 days with option to extend an additional 15 days or stay review (15 C.F.R. § 930.41)
Federal License or Permit (15 C.F.R. Part 930, Subpart D)	Six months, with a status letter at three months. The six month review period can be stayed by mutual agreement. (15 C.F.R. § 930.63)
Outer Continental Shelf Activity (15 C.F.R. Part 930, Subpart E)	Six months, with a status letter at three months. If three month status letter not issued, then concurrence presumed. The six month review period can be stayed by mutual agreement. (15 C.F.R. § 930.78)
Federal Financial Assistance to State or Local Governments (15 C.F.R. Part 930, Subpart F)	State Clearinghouse schedule

OFFICIAL USE ONLY:

Reviewed By:	Fed Con ID:	Date Received:
Public notice dates: to	Comments Received: ☐ NO ☐ YES *[attach comments]*	
Decision type: *(objections or conditions attach details)*	_ Decision Date:	

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8 June 2022

Ms. Kimberly Cole
Administrator, Delaware Coastal Management Program
100 W. Water Street
Suite 7B
Dover, DE 19904

Re: Interstate Coastal Zone Consistency Certification
Energy Transfer's Marcus Hook Terminal (MHT)

Dear Ms. Cole,

Per the Delaware Department of Natural Resources and Environmental Conservation's (DNREC) Coastal Management Program, maintenance dredging of berths at the Marcus Hook Terminal (MHT), owned by Energy Transfer Partners Marketing and Terminals (Energy Transfer), requires an Interstate Coastal Zone Consistency Certification. Specifically, this certification request is in reference to Section 4.4.1.1.1 (Dredging and Dredged Material Disposal) and subparts, which require such certification of potential maintenance dredging activities of 50,000 or more cubic yards of material from the Pennsylvania section of the Delaware River from the Commodore Barry Bridge south to the Delaware state line (Section 4.4.1.1.1.1.1). The information included in this correspondence is provided per DNREC requirements and to assist with your determination.

It should be noted that maintenance dredging activities conducted within Delaware waters of the Delaware River have previously received Coastal Zone Consistency Certification (FC 2014.0021 and FC 2018.0080) (see Attachment A).

For clarification, the only change in the current submission from the previous authorization is the deepening of the dredge depth at Berth 1A from 40.0'+2'overdredge to 42.0'+2'overdredge.

<u>Description of the project:</u>

The applicant, Energy Transfer (formerly Sunoco), is seeking a consistency determination to conduct authorized maintenance dredging activities at the Marcus Hook Terminal in Marcus Hook, Pennsylvania. The Marcus Hook Terminal is located at 100 Green Street at coordinates 39.809106 N and -75.415676 W (Figure 1). The Marcus Hook Terminal is currently authorized for maintenance dredging under United States Army Corps of Engineers (USACE) Permit No. CENAP-OP- R-2013-0760-46, New Jersey Department of Environmental Protection (NJDEP) Water Quality Certificate/Coastal Zone Management approval 0809-03-0004.1 CDT 210001, and prior Pennsylvania Department of Environmental Protection (PADEP) Coastal Zone Management Consistency E23-035. Proposed maintenance dredge areas at Marcus Hook Terminal include Berths 1A, 1B, 2A, 2B, 3A, 3B, 3C, Water Intakes RW-5 and RW-7, and a firewater intake area adjacent to RW-5. Berthing areas at MHT are to be mechanically dredged to a maximum of depth of -42.0' MLLW with an additional 2 feet of allowable over-dredge for a total proposed depth range from -20.0' MLLW (-22.21 feet below mean low water) to -42.0' MLLW (-44.21 feet below mean low

water. The location, area, and proposed depths for the berths and intake area are identified in the enclosed drawings. See attached Dredge Plan and Cross Section (Permit Drawings 6 through 9).

Crude oil and some refined products enter the Marcus Hook Terminal primarily from marine vessels on the Delaware River. Three Marcus Hook berths are designed to handle crude oil from very large crude oil carrier class tankers and smaller crude oil vessels. The other berths can accommodate only smaller vessels.

Based on a March 2022 survey, the current maintenance dredging demand to deepen Berth 1A from 40.0'+2' to 42.0'+2' is approximately 35,000 cubic yards of material. Over the past ten years, approximately 50,000 cy of material has been removed per dredging event, depending on the seasonal sedimentation rates. Following a dredging event, Energy Transfer may request to conduct periodic maintenance dredging events throughout the duration of the permit. Based on the past 10 years of maintenance dredging at Marcus Hook Terminal, a reasonable approximation of the dredged sediment volume in any particular maintenance dredging event is 50,000 cubic yards. Based on an estimated 10 to 15 dredge events, we estimate a maximum of 750,000 cubic yards of material may be dredged over the proposed 10-year maintenance cycle.

General Analysis of Coastal Effects

Mechanical dredging will be conducted utilizing a closed-clamshell environmental bucket. The dredge will be used to control the rate of descent of the bucket so as to maximize the vertical cut of the clamshell bucket while not penetrating the sediment beyond the vertical dimension of the open bucket. This will reduce the amount of free water in the dredged material, will avoid overfilling the bucket, and minimize the number of dredge bucket cycles needed to complete the dredging contract. Dredged material will be stored and transported in a watertight barge to the intended disposal facility.

Dredged material generated with mechanical dredging would be disposed of at the facility of either White's Basin or Biles Island (Figures 2 through 5). If a disposal area other than at White's Basin or Biles Island is planned, a permit modification will be requested from USACE and a State Section 401 Water Quality Certificate will be obtained.

In advance of any maintenance dredging event, the dredged material will be sampled and characterized according to procedures of the approved Sampling and Analysis Plan (by NJDEP and/or PADEP depending on disposal facility). Testing results and letters of dredged material acceptance from disposal facilities will be provided to NJDEP and/or PADEP with copy to USACE prior to commencement of dredging activities.

Statement of Consistency:

Energy Transfer has determined that the proposed maintenance dredging of Berths 1A, 2A, 2B, 3A, 3B, 3C, RW5 and RW7 at the Marcus Hook Terminal (in Pennsylvania section of the Delaware River from the Commodore Barry Bridge south to the Delaware state line) complies with Delaware's approved Coastal Management Program (revised November 2018) and will be conducted in a manner consistent with such program.

Review of coastal zone management rules and applicability.

Per DNREC's requirements, Weston reviewed the Delaware Coastal Zone Management Program's Comprehensive Update and Routine Program Implementation Plan (November 2018). Applicable Coastal Zone Management Rules are listed below followed by a statement as to how Energy Transfer will comply with these rules. This statement is provided in ***bold italics.***

5. 3 COASTAL WATERS MANAGEMENT
5.3.1 GENERAL

5.3.1.2 The water resources of the State shall be protected from pollution which may threaten the safety and health of the general public. [7 *Del. C.* §6001 (a)(5), 6001(c)(2)]

> ***Maintenance dredging of these areas will be performed utilizing Best Management Practices (BMP). Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.***

5.3.1.3 The coastal water resources of the State shall be protected and conserved to assure continued availability for public recreational purposes and for the conservation of aquatic life and wildlife. [7 *Del. C.* §6001(a)(4)]

> ***Maintenance dredging of these areas will be performed within existing dredging timing windows so to protect water resources in the area. Note that these waters are not available for public or recreational uses.***

5.3.1.4 It is the policy of the DNREC to maintain within its jurisdiction surface waters of the State of satisfactory quality consistent with public health and public recreation purposes, the propagation and protection of fish and aquatic life, and other beneficial uses of the water. [7 DE Admin. Code 7401 subsection 1.1]

> ***Maintenance dredging of these areas will be performed within existing dredging timing windows so to protect water resources in the area. Note that these waters are not available public or recreational uses. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.***

5.3.1.6 Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Degradation of water quality in such a manner that results in reduced number, quality, or river or stream mileage of existing uses shall be prohibited. Degradation shall be defined for the purposes of this section as a statistically significant reduction, accounting for natural variations, in biological, chemical, or habitat quality as measured or predicted using appropriate assessment protocols. [7 DE Admin. Code 7401 subsection 5.1]

> ***All maintenance dredging will be performed using BMPs to not impact water quality. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.***

5.3.1.10 All surface waters of the State shall be free from substances that are attributable to wastes of industrial, municipal, agricultural or other human-induced origin.

Substances attributable to waste will not be created during dredging.

5.3.1.15 The discharge of oil from a vessel, truck, pipeline, storage, tank or tank car which causes or poses a threat of making a film on, emulsion in or sludge beneath the waters of the State or its shoreline shall be prohibited. [7 *Del. C.* §§6203, 6202(7)(5)(9)]

Maintenance dredging will be performed utilizing BMPs to ensure that oil is not discharged from the dredging vessel.

5.4 SUBAQUEOUS LANDS AND COASTAL STRIP MANAGEMENT
This project does not involve the permitting, construction, or operation of a new industrial facility.

5.4.15 Avoidable pollution or avoidable contamination of the ocean and of the waters covering submerged lands, avoidable pollution or avoidable contamination of the beaches or land underlying the ocean or waters covering submerged lands, or any substantial impairment of and interference with the enjoyment and use thereof, including but not limited to bathing, boating, fishing, fish and wildlife production, and navigation, shall be prohibited and the lessee shall exercise a high degree of care to provide that no oil, tar, residuary product of oil or any refuse of any kind from any well or works shall be permitted to be deposited on or pass into the waters of the ocean, any bay or inlet thereof, or any other waters covering submerged lands; provided, however, that this policy does not apply to the deposit on, or passing into, such water or waters not containing any hydrocarbons or vegetable or animal matter. [7 *Del. C.* §6119(a)]

Maintenance dredging will be conducted utilizing BMPs to avoid contamination or excessive turbidity. Furthermore, historic sediment sampling results from this facility have demonstrated that concentrations of constituents of concern exist in the dredging template are not elevated above applicable regulatory levels.

5.4.18 No person shall deposit material upon or remove or extract materials from, or construct, modify, repair or reconstruct, or occupy any structure or facility upon submerged lands or tidelands without first having obtained a permit, lease or letter of approval from the DNREC. Such permit, lease or letter of approval, if granted, may include reasonable conditions required in the judgment of the DNREC to protect the interest of the public. If it is determined that granting the permit, lease or approval will result in loss to the public of a substantial resource, the permittee may be required to take measures which will offset or mitigate the loss. [7 *Del. C.* §7205]

Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.19 The extent of jurisdictional authority over public or private subaqueous lands includes any activity in a navigable stream or waterbody, which have a hydrologic connection to natural waterbodies. "Activity" includes, but is not limited to, any human induced action, such as dredging, draining, filling, grading, bulkheading, mining, drilling, extraction of materials or excavation, or construction of any kind, including, but not limited to, construction of a boat ramp or slip, breakwater, residences, bridge, bulkhead, culvert, dam, derrick, deck, groin, jetty, lagoon, gabion, rip-rap, launching facility, marina, mooring facility, pier, seawall, walkway, or wharf. [7 DE Admin Code 7504 Section 1.0 and subsection 2.2.1.1]

Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.20 The following types of activities in, on, over, or under private subaqueous lands require a permit or letter of authorization from the DNREC:

5.4.20.1 Construction of a convenience structure or boat docking facility.
5.4.20.2 Construction of a shoreline erosion control structure or measure.
5.4.20.3 Dredging, filling, excavating or extracting of materials.
Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.20.4 Excavation, creation, or alteration of any channel, lagoon, turning basin, pond, embayment, or other navigable waterway on private subaqueous lands which will make connection with public subaqueous lands.
5.4.20.5 Dredging of existing channels, ditches, dockages, lagoons and other navigable waterways to maintain or restore the approved depth and width.
Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.20.6 Excavation of land which makes connection to public subaqueous lands.
5.4.20.7 The laying of any pipeline, electric transmission line, telephone line, or any other utility structure in, on, over, or under the beds of private subaqueous lands.
5.4.20.8 Installation of temporary or permanent mooring buoys or private marker buoys.
5.4.20.9 Establishment of an anchorage for the use of a mooring for more than two (2) boats or for appurtenant onshore services.
5.4.20.10 Anchoring or mooring a floating platform over private subaqueous lands and for a period of twenty-four (24) consecutive hours or more.
5.4.20.11 Anchoring or mooring any vessel or platform over private subaqueous lands for revenue generating purposes.
5.4.20.12 Repair and replacement of existing serviceable structures over private subaqueous lands, except no permit or letter is required for repairs or structural replacements which are above the mean low tide and which do not increase any dimensions or change the use of the structure. [7 DE Admin. Code 7504 subsection 2.3.3.1]

5.4.21 The following types of activities on public subaqueous lands require a lease, permit, or letter of authorization from the DNREC:

5.4.21.1 Construction or use of any structure on, in, under, or over public subaqueous lands, including but not limited to, any convenience structures, shoreline erosion control structure or measure, or boat docking facility.
5.4.21.2 Dredging, filling, excavating or extracting of materials.
Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.21.3 Continuous anchoring or mooring of a commercial vessel used in a commercial activity on or over public subaqueous lands for thirty (30) or more calendar days during any consecutive three (3) months.
5.4.21.4 The laying of any pipeline, electric transmission line, or telephone line in, on, over, or under the beds of public subaqueous lands.
5.4.21.5 Installation of temporary or permanent mooring buoys or private marker buoys.
5.4.21.6 Establishment of an anchorage for mooring more than two (2) boats or which serves as a permanent place for resident vessels.
5.4.21.7 Anchoring or mooring a floating platform over public subaqueous lands and for a period of twenty-four (24) consecutive hours or more.
5.4.21.8 Maintenance dredging of existing or new channels, ditches, dockages, lagoon and other waterways to maintain or restore the approach depth and width.
Energy Transfer has held permits (for dredging of Berth 3C and Intake RW-7 at the Marcus Hook Terminal (SP-257/15, SP-253/08; WQ-491/08), and current Subaqueous Lands Permit and Water Quality Certification (SP/WQ-201-18).

5.4.21.9 Anchoring or mooring any vessel or platform over public subaqueous lands for revenue generating purposes.
5.4.21.10 Repair and replacement of existing serviceable structures over private subaqueous lands, except no permit or letter is required for repairs or structural replacements which are above the mean low tide and which do not increase any dimensions or change the use of the structure.
5.4.21.11 New dredging activities of channels, ditches, dockage, or other waterways.
[Delaware Regulations Governing the Use of Subaqueous Lands, Section 1.04(B), amended September 2, 1992]
The only NEW dredging this project involves is the deepening of the dredge depth at Berth 1A from 40'+2'overdredge to 42.0'+2'overdredge.

5.4.23 The DNREC shall consider the impact on the environment, including but not limited to, the following:

5.4.23.1 Any impairment of water quality, either temporary or permanent, which may reasonably be expected to cause violation of the State Surface Water Quality Standards. This impairment may include violation of criteria or degradation of existing uses;
Dredging will be performed utilizing BMPs to reduce turbidity.

5.4.23.2 Any effect on shellfishing, finfishing, or other recreational activities and existing or designated water uses;
The area in front of or adjacent to the Marcus Hook Terminal is not used for shellfishing, finfishing or other recreational activities.

5.4.23.3 Any harm to aquatic or tidal vegetation, benthic organisms or other flora and fauna, and their habitats;
Dredging of this area is performed every 6-12 months and has been dredged for many years. Any species in the area are considered opportunistic and will re-populate after the completion of dredging.

5.4.25 The following concerns for protecting water quality shall be specifically considered by the DNREC in evaluating applications for dredging projects:

5.4.25.1 All dredging is to be conducted in a manner consistent with sound conservation and water pollution control practices. Spoil and fill areas are to be properly diked to contain the dredged material and prevent its entrance into any surface water. Specific requirements for spoils retention may be specified by the DNREC in the approval, permit or license.
Dredging will be performed utilizing BMPs. The proposed disposal facility is White's Basin, owned and operated by Weeks Marine, Inc. and is permitted by the USACE and the NJDEP to function as a disposal facility.

5.4.25.2 All material excavated shall be transported, deposited, confined, and graded to drain within the disposal areas approved by the DNREC. Any material that is deposited elsewhere than in approved areas shall be removed by the applicant and deposited where directed at the applicant's expense and any required mitigation shall also be at the applicant's expense.
The proposed disposal facilities are fully permitted to function as a disposal facility.

5.4.25.3 Materials excavated by hydraulic dredge shall be transported by pipeline directly to the approved disposal area. All pipelines shall be kept in good condition at all times and any leaks or breaks shall be immediately repaired.
Hydraulic dredging is not proposed at this time, however, should it be employed, the pipeline will transport material directly to the disposal facility, and all pipelines will be kept in good conditions and any leaks/breaks would be immediately repaired.

5.4.25.4 Materials excavated and not deposited directly into an approved disposal area shall be placed in scows or other vessels and transported to either an approved enclosed basin, dumped, and then rehandled by hydraulic dredge to an approved disposal area, or to a mooring where scows or other vessels shall be unloaded by pumping directly to an approved disposal area.
The proposed disposal facility is White's Basin, owned and operated by Weeks Marine, Inc. Material will be loaded into scows, transported, bottom dumped and ultimately pumped into a confined disposal facility (White's Basin).

5.4.25.5 When scows or other vessels are unloading without dumping, they shall have their contents pumped directly into an approved disposal area by a means sufficient to preclude any loss of material into the body of water.
5.4.25.6 In approved disposal areas, the applicant may construct any temporary structures or use any means necessary to control the dredge effluent, except borrowing from the outer slopes of existing embankments and/or hydraulic placing of perimeter embankments. For bermed disposal sites, a minimum freeboard of two (2) feet, measured vertically from the retained materials and water to the top of the adjacent
The disposal facilities are maintained by Weeks Marine, Inc. (White's Basin) or Waste Management, Inc. (Biles Island).

5.4.25.7 The applicant shall not obstruct drainage or tidal flushing on existent wetlands or upland areas adjacent thereto. The applicant shall leave free, clear, and unobstructed outfalls of sewers, drainage ditches, and other similar structures affected by the disposal operations. The dredged materials shall be distributed within the disposal area in a reasonably uniform manner to permit full drainage without ponding during and after fill operations.
The disposal facilities are maintained by Weeks Marine, Inc. (White's Basin) or Waste Management, Inc. (Biles Island).

5.4.25.8 The dredging operation must be suspended if water quality conditions deteriorate in the vicinity of dredging or spoil disposal site. Minimum water quality standards may be included as an element of the permit and shall be monitored by the applicant. Violation of these conditions shall be cause for immediate suspension of activity and notification of the DNREC. Dredging shall not be resumed until water quality conditions have improved and the DNREC has authorized the resumption. [7 DE Admin. Code 7504 subsection 4.11.3]

5.4.26 The following types of dredging projects are prohibited:

5.4.26.1 Dredging of biologically productive areas, such as nursery areas, shellfish beds, and submerged aquatic vegetation, if such dredging will have a significant or lasting impact on the biological productivity of the area.
This is not a biologically productive area.

5.4.26.2 Dredging of new dead-end lagoons, new basins and new channels, which have a length to width ratio greater than 3:1. This subsection shall not apply to marina projects governed by the Marina Regulations.
The only NEW dredging this project involves is the deepening of the dredge depth at Berth 1A from 40'+2'overdredge to 42.0'+2'overdredge.

5.4.26.3 Dredging channels, lagoons or canals deeper than the existing controlling depth of the connecting or controlling waterway.
The area will be dredged to the existing permitted dredge depth, with the exception of Berth 1A to a new depth of 42.0'+2', both of which are not deeper than the existing Federal Channel.

5.4.26.4 Dredging channels, cleaning marinas or other subaqueous areas by using propeller wash from boats. [Delaware Regulations Governing the Use of Subaqueous Lands, Section 3.05(D), amended September 2, 1992]
Prop-wash dredging will not be performed.

5.11.2 Fish and Wildlife

5.11.2.1 All forms of protected wildlife shall be managed and protected from negative impacts [7 Del. C 102(a)]
Dredging will be conducted during current dredging windows to protect resident and anadromous fish species.

5.11.2.2 State shellfish resources shall be protected from further impairment and improved when possible [7 Del. C. 1902 (a)(1)(2)(5)]
This area does not contain shellfish resources.

Energy Transfer and Weston are available at any time to clarify or address issues the Department may have regarding this request. Please call me at (908) 565-08888 with questions.

Sincerely,

Weston Solutions, Inc.

Ms. Kimberly Cole
Delaware Coastal Management Program

Ryan H. Brown
Project Manager

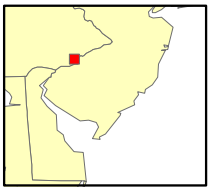
cc: D. Monk (Energy Transfer)

Figures

Quad Source: ESRI, Mapping Service
USGS 2013. Marcus Hook PA, NJ, Del
USGS Quad, 1967. Revised 1970

N
W E
S

0 2,500 5,000 Feet



Quadrangle Location

Figure 1
Site Location Map - Energy Transfer
Marcus Hook Terminal
Delaware River
Marcus Hook, Pennsylvania

File: \\fsfed01\tig\sunoco\mxd\site_loc.mxd, 16-Dec-10 11:17, ricksc

FIGURE 2 - WHITE'S REHANDLING BASIN
Scale: 1:24,000

Source: Bridgeport, NJ-PA, USGS Quadrangle 1987, Photorevealed 1994, DMA 5963 IV SW Series V822. Downloaded from www.Maptech.com.

Attachment 1

TABLE No. 1

MARCUS HOOK TERMINAL

DREDGE VOLUME SUMMARY

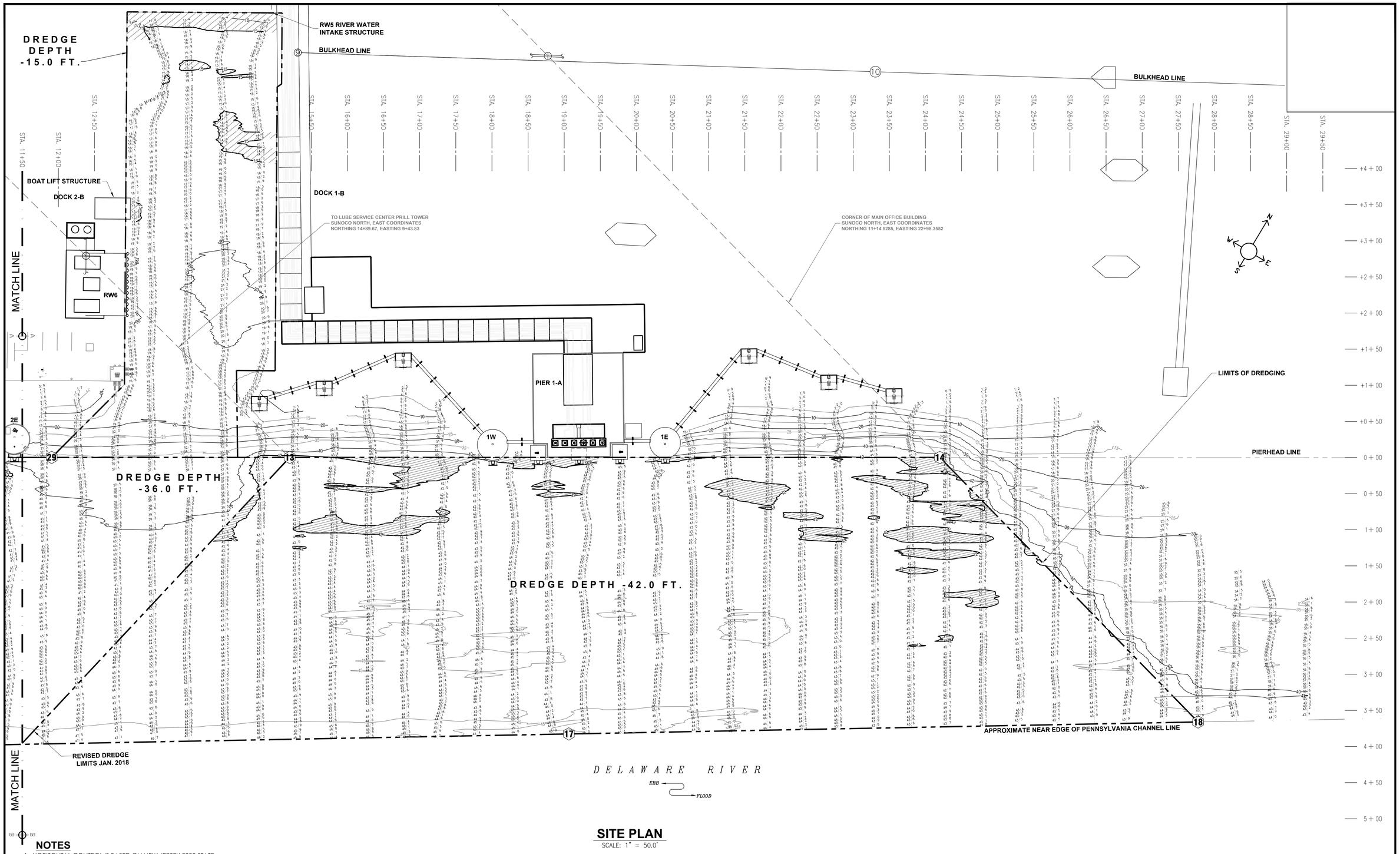
MARCH 2022

SITE: Energy Transfer • Marcus Hook Dock 1A

Marcus Hook, Pennsylvania
Dock 1A Dredging Analysis
22-056 • March 25, 2022

DESCRIPTION	DREDGE VOLUME SUMMARY Materials within pay prism							REMARKS
	DESIGN DEPTH (MLLW)	SURVEY DATES	42' DESIGN (C.Y.)	OVERDEPTH (C.Y.)	3 : 1 Side Slope DESIGN (C.Y.)	3: 1 Side Slope 2' Over-Depth (C.Y.)	TOTAL (C.Y.)	
Dock 1A 42' + 2'	42.0'	3/14/2022	393	11,429	18,085	4,653	34,560	

S. T. Hudson Engineers, Inc.
900 Dudley Avenue • Suite 100
Cherry Hill, New Jersey 08002



SITE PLAN

SCALE: 1" = 50.0'

0 50 100 150

NOTES

1. HORIZONTAL CONTROL IS BASED ON NEW JERSEY 2900 STATE PLANE COORDINATES, NAD83, AS ESTABLISHED IN THE FIELD AND SOLELY FOR THE USE OF THIS HYDROGRAPHIC SURVEY.
2. ALL SOUNDINGS WERE TAKEN USING A TRIMBLE SPS 855 WITH RTK, HYPACK 16A SOFTWARE, A TELEDYNE ODOM HYDROTRAC CONTINUOUS RECORDING SURVEY FATHOMETER.
3. VERTICAL CONTROL WAS OBTAINED FROM KEYNET GPS (TRIMBLE VIRTUAL REFERENCE STATION [VRS] NETWORK) REAL-TIME KINEMATIC (RTK) CORRECTIONS TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), AND CONVERTED TO MEAN LOWER LOW WATER (M.L.L.W.) WHICH IS 3.00' BELOW NAVD88. NAVD88 CONVERSION OF 3.00' OBTAINED FROM THE ARMY CORP OF ENGINEERS.
4. SOUNDINGS WERE TAKEN ON TUESDAY, MARCH 15, 2022 AND WEDNESDAY, MARCH 16, 2022.
5. THE INFORMATION DEPICED ON THIS MAP REPRESENTS THE RESULTS OD SURVEYS CONDUCTED ON THE DATES INDICATED, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
6. THE DECIMAL POINT (.) DENOTES THE SOUNDING LOCATION.
7. SOUNDINGS ARE REFERENCED TO MEAN LOWER LOW WATER (M.L.L.W.) AND ARE EXPRESSED IN FEET AND TENTHS OF A FOOT.
8. CONTOURS WERE INTERPOLATED WITH TRIMBLE NAVIGATION LIMITED SOFTWARE, TERRAMODEL VERSION 10.11.
9. CROSS HATCHING INDICATES AREAS THAT ARE ABOVE THE SPECIFIED MINIMUM DREDGE DEPTH.
10. DREDGE LIMITS WERE PROVIDED BY SUNOCO LOGISTICS' DRAWING "E_MHRF_C580001R00".
11. CHANNEL LOCATIONS WERE PROVIDED BY THE UNITED STATES ARMY CORPS OF ENGINEERS' DRAWINGS, "AAOA11PS.dwg" & "AAOA12PS.dwg".

LEGEND

LIMITS OF DREDGING

DATUM CHART

LOCAL BENCHMARK – BRASS DISK AT MOORING CELL 3W	+12.07 (M.L.L.W.)	12.07'
NAVD 88	+3.0 (M.L.L.W.)	
MEAN LOWER LOW WATER	0.0	

REV.	DATE	DESCRIPTION	APPROVAL
1	4/28/22	REVISED DREDGE DEPTH TO -42 FT. FOR DREDGE SAMPLING PERMIT	DJD

"Drawings issued in electronic form are provided for the convenience of the recipient and are used at the sole risk of the user. Reliance may be placed only on hard copies of drawings issued by S.T. Hudson Engineers. in the event of any discrepancy, the hard copy will govern."

S. T. HUDSON ENGINEERS, INC.
PROFESSIONAL ENGINEERS & CONSULTANTS
900 Dudley Avenue
Cherry Hill, N.J. 08002
856-342-6600
Fax No. 856-342-8323

seal

drawn DJD	date 3/18/2022	contract	
checked SD	FILE E-1173	22-056	
drftg. approval AS/TK			
MARCUS HOOK INDUSTRIAL COMPLEX		dwg. no.	rev.
POST-DREDGE HYDROGRAPHIC SURVEY		4of4	1

ENGINEERING RECORD

DRAWN BY	GMN
CHECKED BY	
APPROVED BY	
DATE	9/12/01
SCALE	1" = 50'x10'

OLD DRAWING NO.

ENERGY TRANSFER PARTNERS

MARCUS HOOK INDUSTRIAL COMPLEX
SURVEY TEMPLATE
SHEET 4

TOWNSHIP OF MARCUS HOOK

DWG. NO.

Attachment 2

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

WETLANDS & SUBAQUEOUS
LANDS SECTION

TELEPHONE (302) 739-9943
FAX (302) 739-6304

Sunoco Partners Marketing & Terminals L.P.
C/o: Michael Nesbitt
4041 Market Street
Aston, PA 19014
Tax Parcel: Adjacent to 0607400001

Subaqueous Lands Permit: SP-201/18
Water Quality Certification: WQ-201/18
Date of Issuance: August 27, 2018
Construction Expiration Date: August 27, 2023
Amended Date: N/A

SUBAQUEOUS LANDS PERMIT AND WATER QUALITY CERTIFICATION

GRANTED TO:

Sunoco Partners Marketing & Terminals L.P.

FOR THE FOLLOWING ACTIVITIES:

- **To conduct maintenance dredging at Berth C, the RW-7 intake and associated fish screen area, removing up to 100,000 cubic yards of sediment over a 5-year period to achieve the following depths below mean low water:**
    - **Berth C - 40 feet**
    - **RW-7 intake - 20 feet**
    - **RW-7 fish screen - 17 feet**

LOCATED:

In the Delaware River
South of the Pennsylvania/Delaware state line
At the Sunoco Marcus Hook Refinery
Claymont, New Castle County, Delaware

Pursuant to the provisions of 7 Del. C., §7205, and the Department's Regulations Governing the Use of Subaqueous Lands, 7 Del. C., Section 6003, the Department's Regulations Governing the Control of Water Pollution and Section 401 of the Clean Water Act, permission is hereby granted on this 27th day of August A.D. 2018, to perform the above-referenced activities in accordance with the approved plans (3 sheets), as approved on August 22, 2018; and the application dated May 15, 2018, and received by this Division on May 16, 2018, and with subsequent information received on June 7, 2018.

WHEREAS, Sunoco Partners Marketing & Terminals L.P., have applied for permission to conduct the above-referenced activities; and;

WHEREAS, pursuant to the provisions of 7 Del. C., §7203, the Secretary of the Department of Natural Resources and Environmental Control through his duly authorized representative finds that it is not contrary to the public interest if this project is approved subject to the terms and conditions herein set forth.

WHEREAS, in accordance with Section 401 of the Clean Water Act 33 U.S.C Section 1341 and 7 Del. C., §6003, the State of Delaware, by and through the Department of Natural Resources and Environmental Control, certifies that the permitted activity will be conducted in a manner which will not violate the applicable water quality standards of the State of Delaware subject to the terms and conditions of this approval.

NOW THEREFORE, this Permit/Certification is issued subject to the attached Subaqueous Lands Permit General Conditions and the following special conditions:

SPECIAL CONDITIONS

1. This approval is in accordance with the approved plans and application submitted to the Department of Natural Resources and Environmental Control, a copy of which is attached hereto and made a part hereof.
2. This Permit/Certification authorizes Sunoco Partners Marketing & Terminal L.P. to conduct maintenance dredging activities at Berth C, RW-7 intake and associated fish screen area at the Sunoco Marcus Hook Refinery, removing up to 100,000 cubic yards of sediment over a 5-year period to achieve water depths required for refinery operations. Any other use without prior approval shall constitute reason for this Permit/Certification being revoked.
3. In accordance with fees established by 68 Del. Laws, Chapter 86, Section 14, a fee of $1,000 must be submitted to the Wetlands and Subaqueous Lands Section, payable to the State of Delaware for the maintenance dredging of more than 500 cubic yards of material in public subaqueous lands. The fee must be submitted prior to the commencement of each dredging event.
4. Pre and post-bathymetric surveys of the dredged areas must be submitted to the Wetlands and Subaqueous Lands Section within 6 weeks of the completion of each dredging event. This documentation must include the volume of material dredged in the Delaware portion of the Delaware River.
5. This Permit/Certification authorizes the depths below mean low water specified on page 1, with an allowable, maximum 2-foot over-dredge.
6. In order to minimize impacts to federally-endangered Atlantic Sturgeon (*Acipenser oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*), and other anadromous species, no dredging or other in-water work shall occur between March 15 through June 30. If possible, it is highly recommended that dredging activities take place from August through October to protect sturgeon.
7. The application identified multiple, **potential** methods of dredging and disposal locations. The primary method is mechanical clamshell dredging. If this method is employed, the dredged material will be loaded onto watertight barges and transported to Weeks White Basin in Logan Township, Gloucester County, New Jersey for permanent disposal. If hydraulic dredging is employed, the following disposal sites are identified as potentials: an on-site confined disposal facility (located in Pennsylvania) at the Sunoco Marcus Hook Refinery, Weeks White Basin or the Army Corp. of Engineers confined disposal facility in Pedricktown, New Jersey. For the intake

areas and/or smaller dredging events, diver-assisted hydraulic dredging may be employed. Disposal options for this method include temporary, on-site placement of the dredged material at the Sunoco Marcus Hook Refinery (located in Pennsylvania). Temporary, on-site placement locations include the confined disposal area, a cleaned, decommissioned petroleum tank, or in a sealed scow moored in one of the berths to be transported to Weeks White Basin for permanent disposal. Other potential disposal options for smaller dredged quantities include pumping the dredged material into geotubes to be used for petroleum storage tank containment berms, erosion protection or grading fill on Sunoco property (located in Pennsylvania).

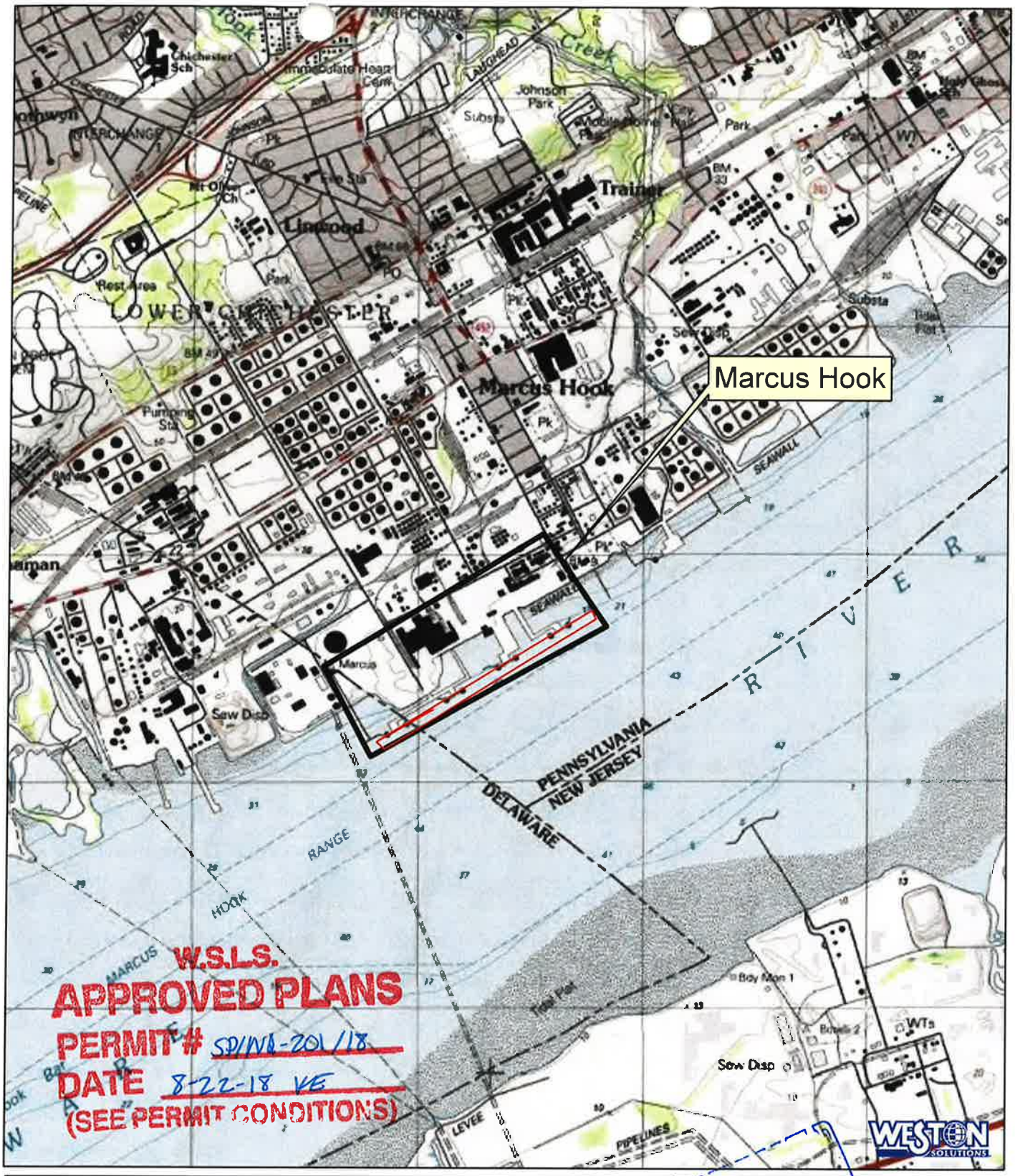
8. Prior to the commencement of each dredging event, written notification of the dredging methodology and the disposal site location must be submitted to the Wetlands and Subaqueous Lands Section for review and approval. No dredging shall take place without written approval from the Wetlands and Subaqueous Lands Section.
9. Dredged materials from the fish screen area, resulting in smaller quantities of material that are used on-site at the Sunoco Marcus Hook Refinery (located in Pennsylvania) for beneficial reuse, shall not discharge dredged materials or effluent into Delaware stream channels or the Delaware River.
10. Watertight barges shall be used for transporting dredged material off-site.
11. This Permit/Certification does not authorize economic loading.
12. All dredging and disposal shall be conducted in a manner consistent with sound conservation and water pollution control practices.
13. Spoil areas are to be properly diked to contain the dredged material and prevent its entrance into surface water.
14. For hydraulic dredging events, the pipeline transporting dredged material shall be kept in good condition at all times and be placed in a manner that avoids causing navigation hazards.
15. This Permit/Certification shall be valid for a period of five (5) years from the date of issuance.
16. The work authorized by this Permit/Certification is subject to the terms and conditions of Department of the Army Permit number CENAP-OP-R-2011-0760-46.

IN WITNESS WHEREOF, I, Tyler Brown, the duly authorized representative of Shawn M. Garvin, Secretary of the Department of Natural Resources and Environmental Control, have hereunto set my hand this 27th day of August, 2018.

By Tyler Brown, Section Manager
the duly authorized representative of the Secretary of the Department of Natural Resources and Environmental Control

Katie Esposito

Katie Esposito, Environmental Scientist
Wetlands and Subaqueous Lands Section



Quad Source: ESRI, Mapping Service
USGS 2013. Marcus Hook PA, NJ, Del
USGS Quad, 1967. Revised 1970

N
W E
S

0 2,500 5,000 Feet

Quadrangle Location

MAY 16 2018
BY:

Figure 1
Site Location Map - Sunoco Logistics
Marcus Hook Industrial Complex
Delaware River
Marcus Hook, Pennsylvania

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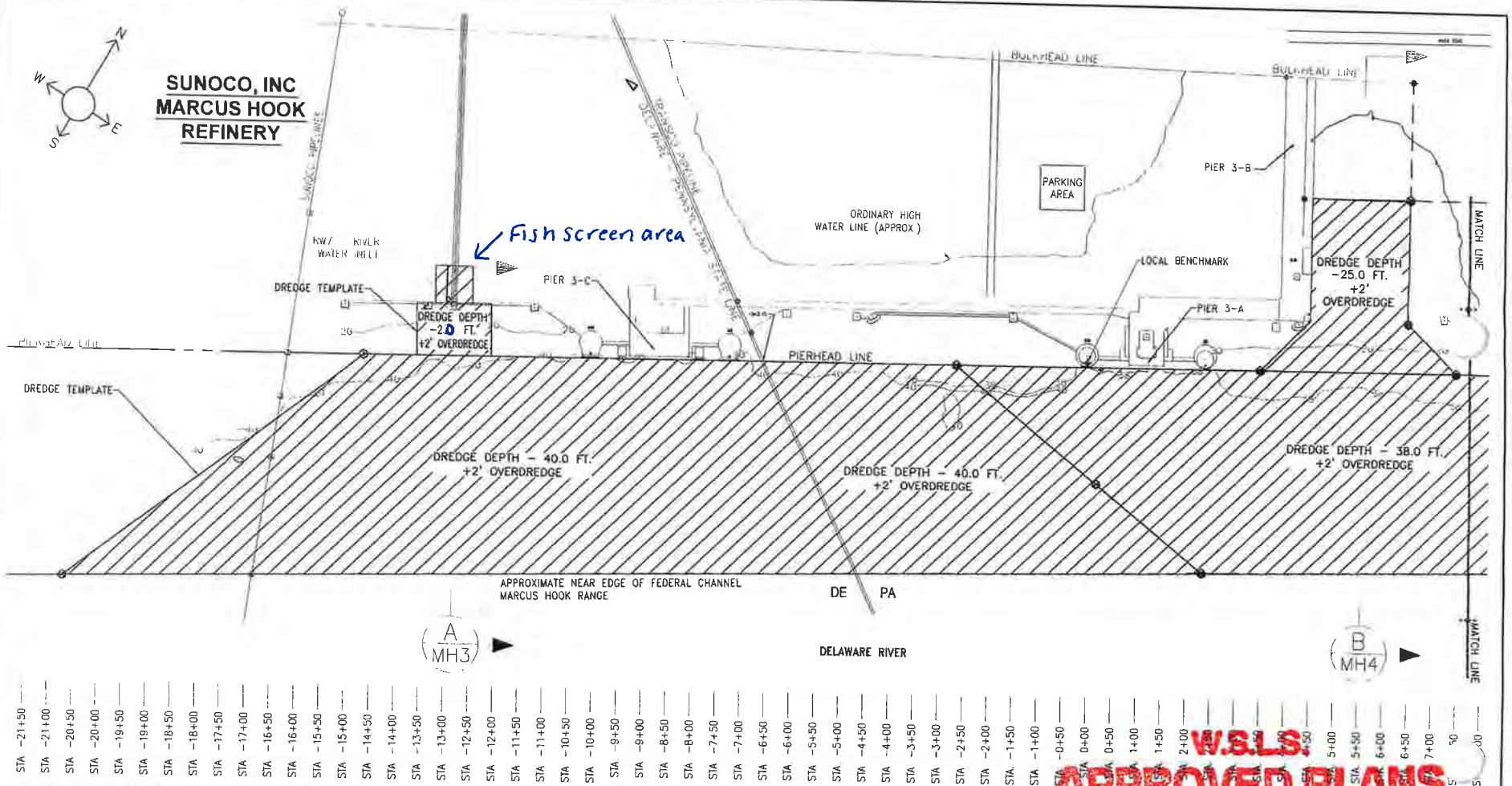


1. THE HORIZONTAL AND VERTICAL LIMITS OF THE DREDGE TEMPLATE ARE THE SAME FOR OBSTRUCTION LEVELING AND WILL BE ADHERED TO FOR ALL OBSTRUCTION LEVELING ACTIVITIES.
2. SEDIMENT MATERIAL MOVED BY OBSTRUCTION LEVELING WILL ORIGINATE FROM SHALLOW AREAS OF THE BERTH AND BE MOVED TO DEEPER AREAS WITHIN THE BERTH TO CREATE EVEN DEPTHS THROUGHOUT THE BERTH.
3. NO MATERIAL WILL BE MOVED TO AREAS OUTSIDE THE TEMPLATE BY LEVELING.

W.S.L.S.
APPROVED PLANS
PERMIT # SP/WQ-201118
DATE 8-22-18 VE
(SEE PERMIT CONDITIONS)

RECEIVED
JUN 07 2018
BY:

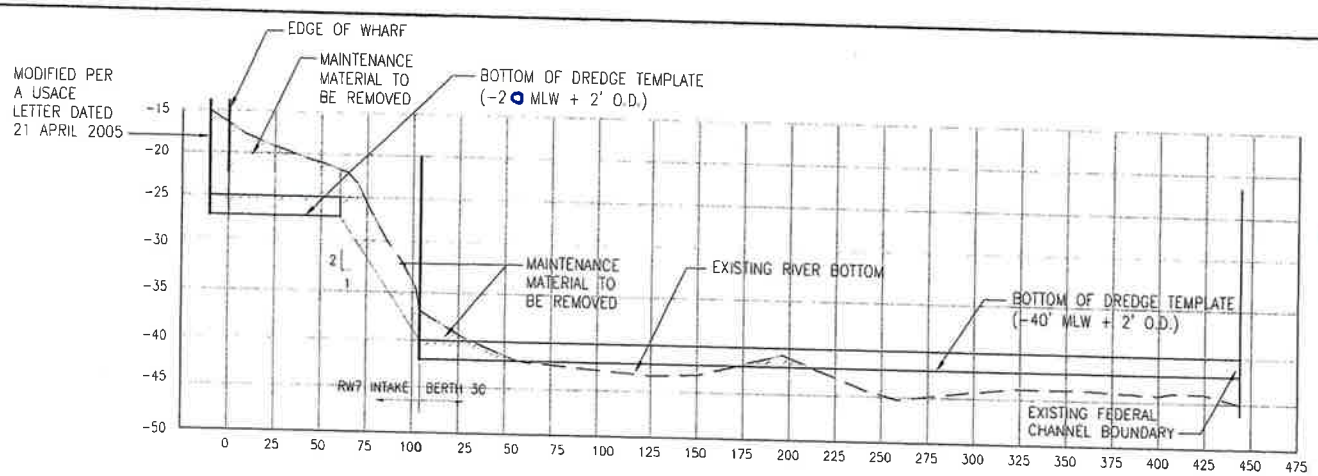
DREDGING AND OBSTRUCTION LEVELING PLAN (WEST SIDE) MARCUS HOOK REFINERY

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
R.C.	6/29/11	S.R.	7/13/11	03853.046.005
CHECKED	DATE	APPROVED	DATE	DWG. NO.
S.M.	7/13/11	S.R.	7/13/11	MH-1

FILE NO. G:\ACADPROJ\0385017001\HUDSON SUB\MARCUS HOOK\USACE\MH-1_2.DWG

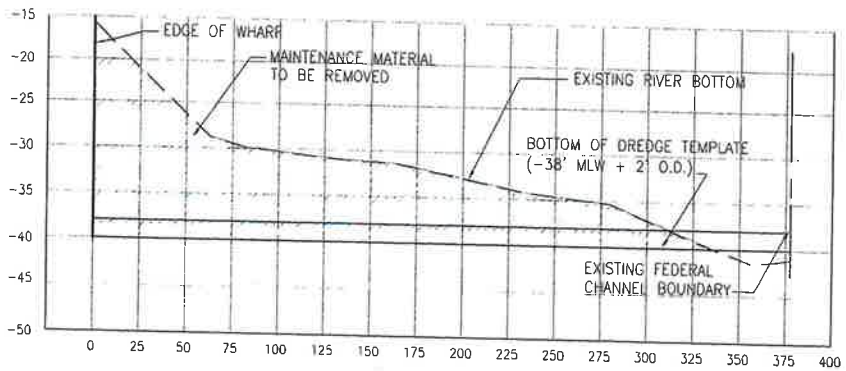


RW7 INTAKE AND BERTH 3C

TYPICAL DREDGING SECTION (A / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'



BERTH 1A

TYPICAL DREDGING SECTION (D / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

W.S.L.S.
APPROVED PLANS
PERMIT # SP/NQ-201/18
DATE 8-22-18 KE
(SEE PERMIT CONDITIONS)

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 - SPRING HIGH WATER - 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 19
100 YEAR FLOOD ELEVATION 9.00' (NAVI

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

RECEIVED
JUN 07 2018
BY:

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTIONS A AND D

MARCUS HOOK

WESTON SOLUTIONS

DRAWN	R.C.	DATE	6/29/11	DES. ENG.	S.R.	DATE	7/13/11	W. O. NO.	03853.046.005
CHECKED	S.M.	DATE	7/13/11	APPROVED	S.R.	DATE	7/13/11	DWG. NO.	MH-3

FILE NO. G:\ACADPROJ\0385017001\HUDSON SUB\MARCUS HOOK\USACE\MH-3_5.DWG

WETLANDS AND SUBAQUEOUS LANDS SECTION

PERMIT NO.: SP/WQ-201/18

CONSTRUCTION EXPIRATION DATE: 8-27-2021

TO CONDUCT THE FOLLOWING ACTIVITIES:

- **To conduct maintenance dredging at Berth C, the RW-7 intake and associated fish screen area, removing up to 100,000 cubic yards of sediment over a 5-year period to achieve the following depths below mean low water:**
  - **Berth C - 40 feet**
  - **RW-7 intake - 20 feet**
  - **RW-7 fish screen - 17 feet**

LOCATED:

In the Delaware River
South of the Pennsylvania/Delaware state line
At the Sunoco Marcus Hook Refinery
Claymont, New Castle County, Delaware

ISSUED TO: Sunoco Partners Marketing & Terminals L.P.

LOCATION OF WORK: Same as above

DISPLAY THIS CERTIFICATE IN A HIGHLY VISIBLE LOCATION ON THE JOB SITE.

Authorized by:

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

GENERAL CONDITIONS

1. The permittee and contractor shall at all times comply with all applicable laws and regulations of the Department of Natural Resources and Environmental Control.
2. The activities authorized herein shall be undertaken in accordance with the Permit conditions, the final stamped and approved plans, and with the information provided in the Permit application.
3. A copy of this Permit and the stamped approved plans shall be available on-site during all phases of construction activity.
4. The conditions contained herein shall be incorporated into any and all construction contracts associated with the construction authorized herein. The permittee and contractor are responsible to ensure that the workers executing the activities authorized by this Permit have full knowledge of, and abide by, the terms and conditions of this Permit.
5. No portion of the structure shall be constructed using creosote treated lumber.
6. No portion of the structure(s) authorized by this Permit shall exceed the dimensions for that structure identified on Page One of this Permit.
7. The activities authorized herein shall be conducted so as not to violate the State of Delaware's Surface Water Quality Standards in effect at the date of Permit authorization.
8. The issuance of this Permit does not constitute approval for any activities that may be required by any other local, state or federal government agency.
9. The issuance of this Permit does not imply approval of any other part, phase, or portion of any overall project the permittee may be contemplating.
10. This Permit authorizes only the activities described herein. Modifications to the project may require a supplemental approval from this office prior to the initiation of construction. A determination of the need for a supplemental approval will be made by this office pursuant to the permittee submitting written notification and revised plans indicating project changes. Failure to contact the Department prior to executing changes to the project shall constitute reason for this Permit being revoked.
11. The Contractors Completion Report shall be filled out and returned within 10 days of completion of the authorized work.
12. The permittee shall protect and hold the State of Delaware harmless from any loss, cost or damage resulting from the activities authorized herein.
13. Representatives of the Department of Natural Resources and Environmental Control shall be allowed to access the property to inspect all work during any phase of the construction and may conduct pre and post-construction inspections, collect any samples or conduct any tests that are deemed necessary.
14. The permittee shall maintain all authorized structures and activities in a good and safe condition.

15. All construction materials, waste or debris associated with this activity shall be properly disposed of and contained at all times to prevent its entry into waters or wetlands. Construction materials shall not be stockpiled in subaqueous lands or wetlands.
16. The permittee and contractor shall employ measures during construction to prevent spills of fuels, lubricants or other hazardous substances. In the event of a spill, the permittee and contractor shall make every effort to stop the leak and contain the spill, and shall immediately contact the Hazardous Spill Response Team (HAZMAT) at 1-800-662-8802 and this office at (302) 739-9943. The permittee and contractor are responsible to comply with all directives to contain and clean up the spilled material(s) as stipulated by the HAZMAT team, and to restore the site as may be required by this office.
17. No construction shall occur after the construction expiration date identified on Page One of this Permit. The permittee may file a construction expiration date extension request of up to one (1) year if necessary to complete the authorized work. Such requests must be received by the Department at least thirty (30) days prior to the construction expiration date.
18. Any actions, operations or installations which are found by the Department to be contrary to the public interest may constitute reason for the discontinuance and/or removal of said action, operation or installation. Removal and restoration shall be at the expense of the permittee and/or upland property owner within thirty (30) days of receipt of written notice of revocation and demand for removal.
19. Disturbance of subaqueous lands or wetlands adjacent to the authorized structures or activities is prohibited unless specifically addressed in the special conditions of this Permit. Disturbance of subaqueous lands or wetlands in the path of construction activities shall be minimized. Any temporarily impacted subaqueous lands or wetlands shall be returned to pre-disturbance elevations and conditions.
20. This Permit is personal and may not be transferred without the prior written consent of the Department. Prior to the transfer of the adjacent upland property, the permittee shall obtain the written consent of the Department to transfer the Permit to the new upland property owner. Failure to obtain such written consent may result in the revocation of this Permit and the removal of all structures authorized by this Permit at the expense of the permittee.
21. The permittee shall notify the Wetlands and Subaqueous Lands Section prior to the commencement of the work authorized by this Permit.
22. No portion of the structure shall be installed within ten (10) feet of the adjacent property lines.
23. No portion of the structure shall exceed 20% of the width of the water body as measured at mean low water.
24. The structures authorized by this Permit shall be constructed and maintained in a manner so as to assure water access to adjacent properties.
25. This Permit does not authorize any future repairs below the water line, or any additions or modifications to the structures authorized herein. Such activities require separate written authorization from the Department of Natural Resources and Environmental Control.
26. Failure to comply with any of the terms or conditions of this Permit may result in enforcement action which could include the revocation of this Permit and subsequent restoration of the site to preconstruction conditions.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

GENERAL CONDITIONS

1. The permittee and contractor shall at all times comply with all applicable laws and regulations of the Department of Natural Resources and Environmental Control.
2. The activities authorized herein shall be undertaken in accordance with the all conditions, the final stamped and approved plans, and with the information provided in the application.
3. A copy of this Certification and the stamped approved plans shall be available on-site during all phases of construction activity.
4. The conditions contained herein shall be incorporated into any and all construction contracts associated with the construction authorized herein. The permittee and contractor are responsible to ensure that the workers executing the activities authorized by this Certification have full knowledge of, and abide by, the terms and conditions of this Certification.
5. No portion of the structure shall be constructed using creosote treated lumber.
6. No portion of the structure(s) authorized by this Certification shall exceed the width dimension for that structure identified on Page One of this Certification.
7. The activities authorized herein shall be conducted so as not to violate the State of Delaware's Surface Water Quality Standards in effect at the date of Certification.
8. The issuance of this Certification does not constitute approval for any activities that may be required by any other local, state or federal government agency.
9. The issuance of this Certification does not imply approval of any other part, phase, or portion of any overall project the permittee may be contemplating.
10. This Certification authorizes only the activities described herein. Modifications to the project may require a supplemental approval from this office prior to the initiation of construction. A determination of the need for a supplemental approval will be made by this office pursuant to the permittee submitting written notification and revised plans indicating project changes. Failure to contact the Department prior to executing changes to the project shall constitute reason for this Certification being revoked.
11. The Contractors Completion Report shall be filled out and returned within 10 days of completion of the authorized work.
12. The permittee will protect and hold the State of Delaware harmless from any loss, cost or damage resulting from the construction or use of said structures.
13. Representatives of the Department of Natural Resources and Environmental Control shall be allowed to access the property to inspect all work during any phases of the construction and may conduct post-construction compliance inspections, collect any samples or conduct any tests that are deemed necessary.
14. The permittee shall maintain all authorized structures and activities in a good and safe condition.

15. All construction materials, waste or debris associated with this activity shall be properly disposed of and contained at all times to prevent its entry into waters or wetlands. Construction materials shall not be stockpiled in subaqueous lands or wetlands.

16. The permittee or their contractor shall employ measures during construction to prevent spills of fuels, lubricants or other hazardous substances. In the event of a spill, the permittee or their contractor shall make every effort to stop the leak and contain the spill, and shall immediately contact the Hazardous Spill Response Team (HAZMAT) at 1-800-662-8802 and this office at (302) 739-9943. The permittee and their contractor are responsible to comply with all directives to contain and clean up the spilled material(s) as stipulated by the HAZMAT team, and to restore the site as may be required by this office.

17. No construction shall occur after the construction expiration date identified on Page One of this Certification. The permittee may file an extension request of up to one (1) year if necessary to complete the authorized work. Such requests must be received by the Department at least thirty (30) days prior to the construction expiration date.

18. Any actions, operations or installations which are found by the Department to be contrary to the public interest may constitute reason for the discontinuance and/or removal of said action, operation or installation. Removal and restoration shall be at the expense of the permittee and/or upland property owner within thirty (30) days of receipt of written notice of revocation and demand for removal.

19. Disturbance of subaqueous lands or wetlands adjacent to the authorized structures or activities is prohibited unless specifically addressed in the special conditions of this Certification. Disturbance of subaqueous lands or wetlands in the path of construction activities shall be minimized. Any temporarily impacted subaqueous lands or wetlands shall be returned to pre-disturbance elevations and conditions.

20. This Certification is personal but may be transferred provided the permittee provides prior notice to the Department of the intent to transfer and the new property owner provides appropriate documentation to substantiate ownership of the adjacent upland property and/or the structures authorized herein. Failure to transfer this Certification to a new owner may result in the revocation of the Certification and the removal of all structures authorized by this Certification at the expense of the permittee.

21. The permittee shall notify the Wetlands and Subaqueous Lands Section prior to the commencement of the work authorized by this Certification.

22. This Certification is subject to the terms and conditions contained in any easement, license or lease that may have been granted by the State or any political subdivision, board, commission or agency of the State which may apply to the premises where the project authorized herein is located.

23. Erosion and sediment control measures shall be implemented in accordance with the specifications and criteria in the current Delaware Erosion and Sediment Control Handbook so as to minimize entry and dispersal of sediment and other contaminants in surface waters.

24. Failure to comply with any of the terms or conditions of this Certification may result in enforcement action, which could include the revocation of this Certification, and subsequent restoration of the site to preconstruction conditions.

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO
ATTENTION OF

Regulatory Branch
Application Section II

December 01, 2021

SUBJECT: CENAP-OP-R-2013-0760-46
SUNOCO LOGISTICS MARCUS HOOK REFINERY
NJDEP #: 0809-01-1001.14 (CDT 210001 Modification)

Mr. Michael Nesbitt
Marine Operations Manager
Energy Transfer Partners
4041 Market Street
Aston, PA 19014

Dear Mr. Nesbitt:

Reference is made to the above subject Department of the Army permit authorizing your company to perform maintenance dredging, by bucket method, at the Marcus Hook refinery (also known as the Marcus Hook Industrial Complex - MHIC). The site is located along the Delaware River, in both the Borough of Marcus Hook, Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware.

In accordance with your written request dated November 10, 2021, the following proposed removals of dredged materials totaling 65,399 cubic yards are hereby approved to proceed under the authority of the above referenced permit: approximately 22,519 cubic yards from Berth 1A, approximately 3,874 cubic yards from Berth 2A, approximately 18, 410 cubic yards from Berth 3A, approximately 5,036 cubic yards from Berth 3B, approximately 11,434 cubic yards from Berth 3C, approximately 2,521 cubic yards from Basin 2B including Raw Water Intake #5 (RW-5), and approximately 1,605 cubic yards from Raw Water Intake #7 (RW-7). The proposed work shall be performed in accordance with attached revised plans E-2 through E-6 which maintain the same dredging footprint and depths as originally approved but have been updated as to more current depth soundings. All authorized dredging includes a 2 foot over-dredging allowance. Dredged material will be placed at the Whites Basin rehandling facility in Logan Township, Gloucester County, New Jersey.

If you should have any questions regarding this matter, please contact me at (215) 656-6731 (office), (215) 605-7029 (mobile), or David.J.Caplan@usace.army.mil.

Sincerely,

David J. Caplan
Senior Staff Biologist

Enclosures

Copies Furnished:

USFWS, Galloway
NMFS, Highlands (Karen Greene)
NJDEP, Office of Dredging and Sediment Technology (Suzanne Biggins)
PADEP, Norristown (Randy Brown)
DDNREC, Subaqueous Lands (Katie Esposito)
DDNREC, Coastal Program (Bonnie Arvay)
Mr. Eric Dickerson, Weeks Marine, Incorporated, 901 Beach Street, Camden, New Jersey 08102
Mr. Ryan Brown, Weston Solutions, Incorporated, 1400 Weston Way, West Chester, Pennsylvania 19380

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO
ATTENTION OF

FEB 17 2015

SUBJECT: CENAP-OP-R-2011-0760-46 (formerly CENAP-OP-R-200002407-46)
SUNOCO LOGISTICS MARCUS HOOK REFINERY
PADEP #: E23-310 and E23-205
NJDEP #: 0809-01-1001.14
DDNREC#: SU-403/10, SP-253/08 and WQ-491/08

Mr. Mike Nesbitt
Manager of Marine Operations
Sunoco Logistics
10 Industrial Highway MS4
Lester, PA 19029

Dear Mr. Nesbitt:

Reference is made to Department of the Army permit dated January 27, 2014, authorizing Sunoco, Incorporated to perform mechanical maintenance dredging at the Marcus Hook refinery. The site is located along the Delaware River, in both the Borough of Marcus Hook, Delaware County, Pennsylvania and Claymont, Brandywine Hundred, New Castle County, Delaware.

In accordance with your consultant's letter dated September 12, 2014, this office has approved of your request to modify the Department of the Army permit to allow for the increased dredging depths of Berths 1A, 2A, and 3A to a maximum depth of 42 feet below mean low water (40' design depth and additional 2 foot over-dredge allowance) from the currently approved depths of 38 and 40 feet below mean low water (36' and 38' design depths and additional 2 foot over-dredge allowances). As such, the following subject permit Special Condition has been modified.

1. All work performed in association with the above noted project shall be conducted in accordance with the attached project plans E1 through E09 prepared by Weston Solutions,, Incorporated. The project plans provide for the mechanical maintenance dredging of the existing facility. The work shall be done within approximately 47 acres of mooring and water intake areas adjacent to Piers 1A, 1B, 2B, 2A, 3B, 3C, 3A ,Water Intakes RW-5 and -7, and a firewater intake area adjacent to RW-5. The dredging shall result in the removal of a maximum of 300,000 cubic yards of sediment (predominately silt and clay sized particles) but would be limited to between 35,000 and 120,000 cubic yards of materials from the above locations per dredging event. The dredging would return water depths surrounding the docks to design specifications (-40 feet below Mean Low Water –MLW- for Pier 3C; -38 feet below MLW for Piers 1A, 2A and 3A, and -20 feet below MLW for Docks 1B, 2B, 2C and 3B and intake structures). Authorization would include up to 2 feet of permissible over-dredging and a 10-year maintenance dredging provision.

Mechanically dredged sediment shall be transferred by barge to either the White's Basin re-handling facility in Gloucester County, New Jersey or to the Biles Island disposal facility in Bucks County, Pennsylvania. Disposal at White's Basin shall involve the bottom-dumping of the materials into the open water re-handling basin. Disposal at the Biles Island facility shall involve the hydraulic un-loading of the dredged materials into the upland disposal facility.

Additionally, the attached sheets E-2 through E-6 hereby supersede such originally approved plan sheets.

All other conditions to which the permit was made subject remain in full force and effect.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

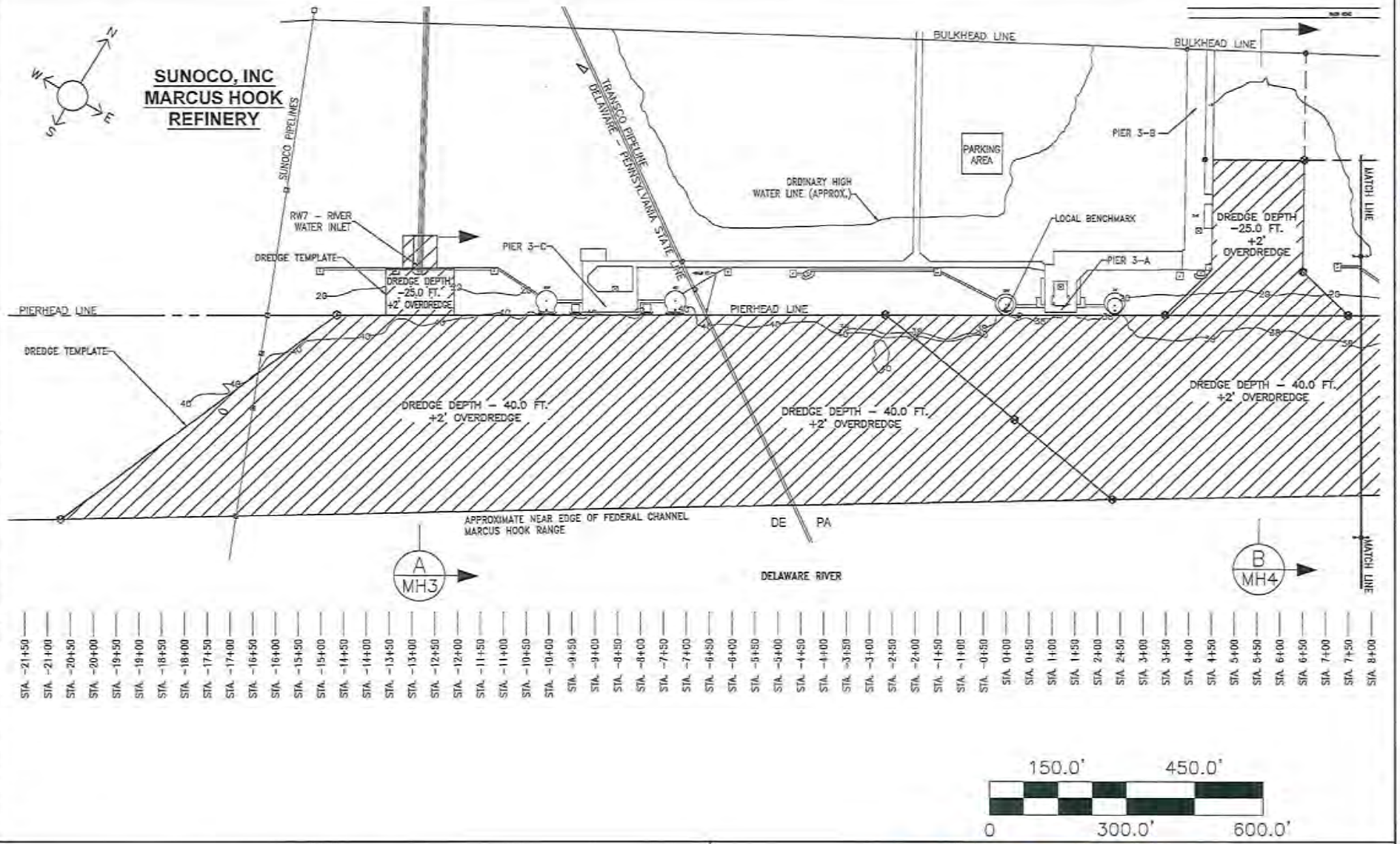
Frank J. Cianfrani
Chief, Regulatory Branch

for: Michael A. Bliss, P.E.
Lieutenant Colonel, Corps of Engineers
District Commander

Enclosures

Copies Furnished:

DDNREC, Wetlands and Subaqueous Lands (Dover, DE)
NJDEP, Dredging and Sediment Technology (Trenton)
PADEP, SE Regional Office (Norristown, PA)
USFWS, State College
NMFS, Sandy Hook
Mr. Ryan Brown, Weston Solutions, 1400 Weston Way, West Chester, Pennsylvania 19380
Surveillance and Enforcement Section
Single Copy File



E-2

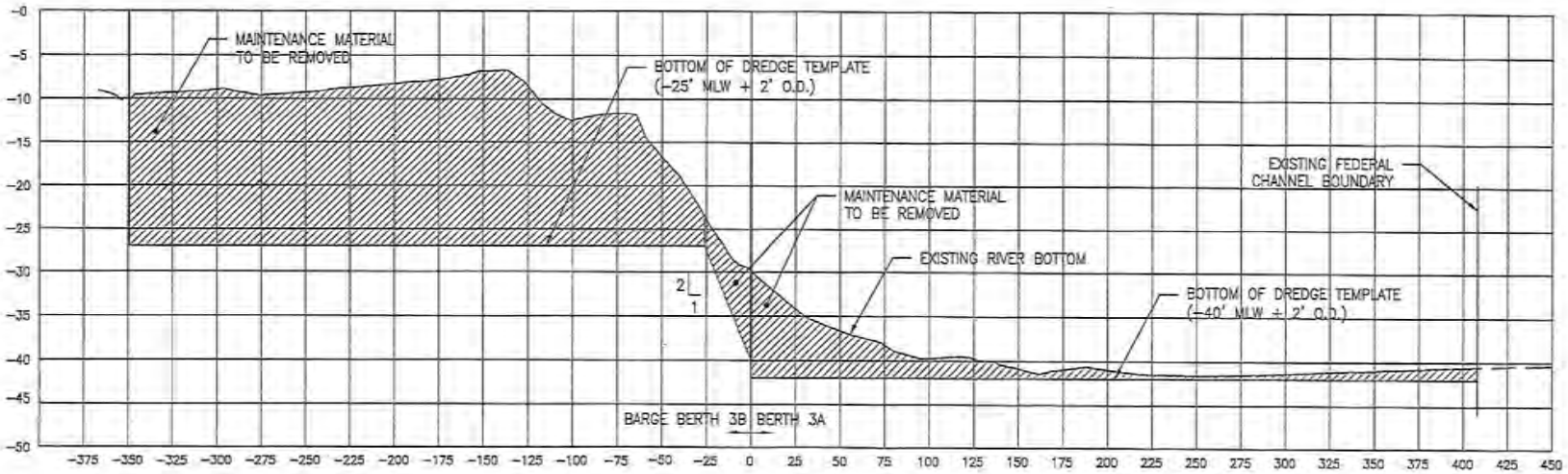
DREDGING PLAN
(WEST SIDE)
MARCUS HOOK REFINERY

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
E.S.	2/12/15	R.B.	2/12/15	15077.003.003
CHECKED	DATE	APPROVED	DATE	DWG. NO.
D.P.	2/12/15	R.B.	2/12/15	MH-1

FILE NO. G:\Acadproj\15077003003 Sunoco Dredge\MH-1_2 REV 2-2015.dwg



BERTH 3A AND BARGE BERTH 3B

TYPICAL DREDGING SECTION (B / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 - SPRING HIGH WATER - 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTION B

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
D.P.	2/12/15	R.B.	2/12/15	15077.003.003
CHECKED	DATE	APPROVED	DATE	DWG. NO.
E.S.	2/12/15	R.B.	2/12/15	MH-4

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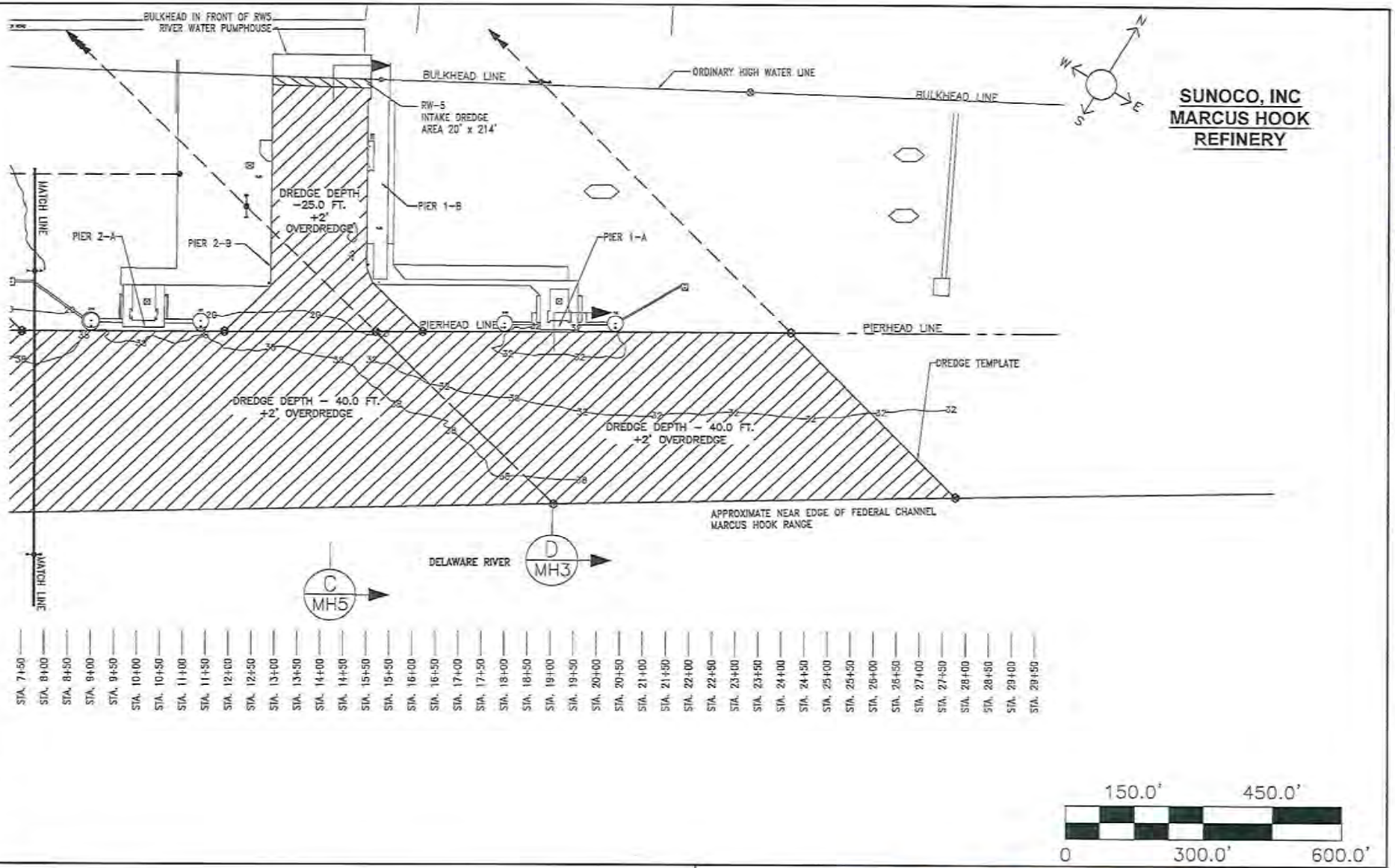
E-3



SUNOCO, INC
MARCUS HOOK
REFINERY

E-4

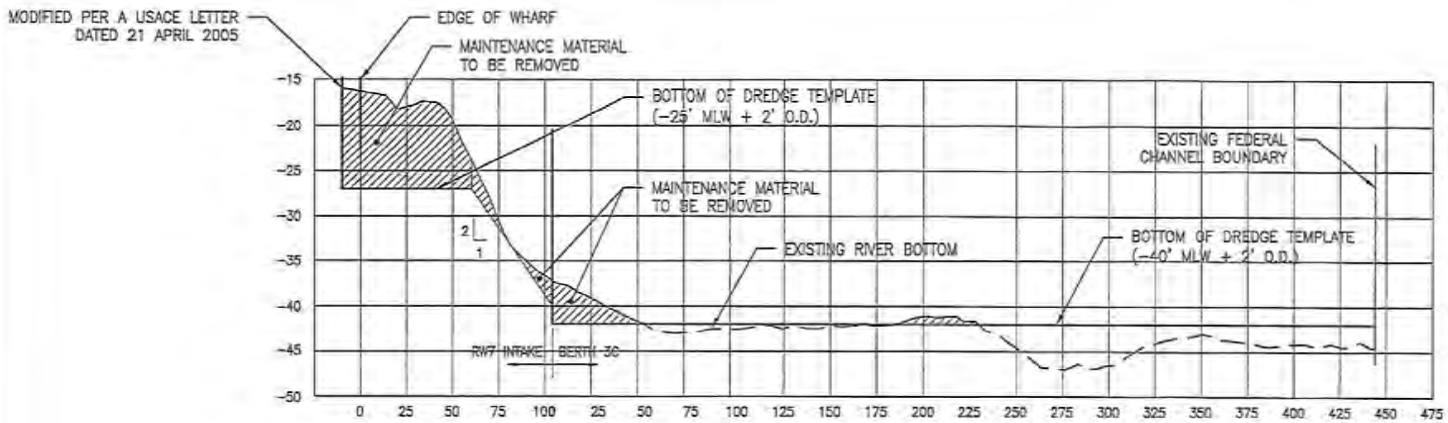
FILE NO. G:\Acadpro\15077003003 Sunoco Dredge\MH-1_2 REV 2-2015.dwg

DREDGING PLAN
(EAST SIDE)
MARCUS HOOK REFINERY

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
E.S.	2/12/15	R.B.	2/12/15	15077.003.003
CHECKED	**DATE**	**APPROVED**	**DATE**	**DWG. NO.**
D.P.	2/12/15	R.B.	2/12/15	MH-2

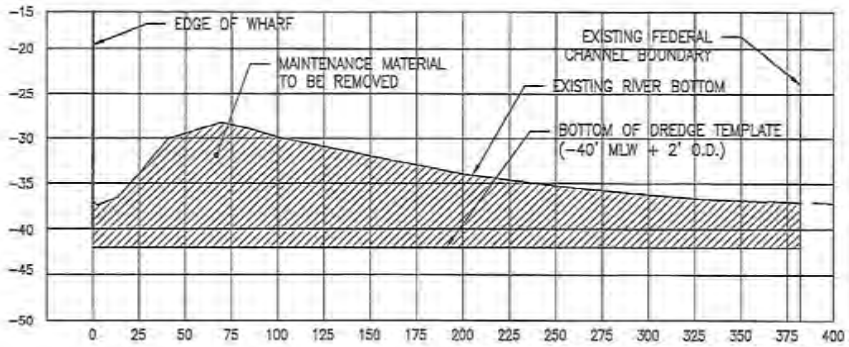


RW7 INTAKE AND BERTH 3C

TYPICAL DREDGING SECTION (A / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'



BERTH 1A

TYPICAL DREDGING SECTION (D / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 — MEAN HIGH WATER — 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

E-5

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTIONS A AND D

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
E.S.	2/12/15	R.B.	2/12/15	15077.003.003
CHECKED	DATE	APPROVED	DATE	DWG. NO.
D.P.	2/12/15	R.B.	2/12/15	MH-3

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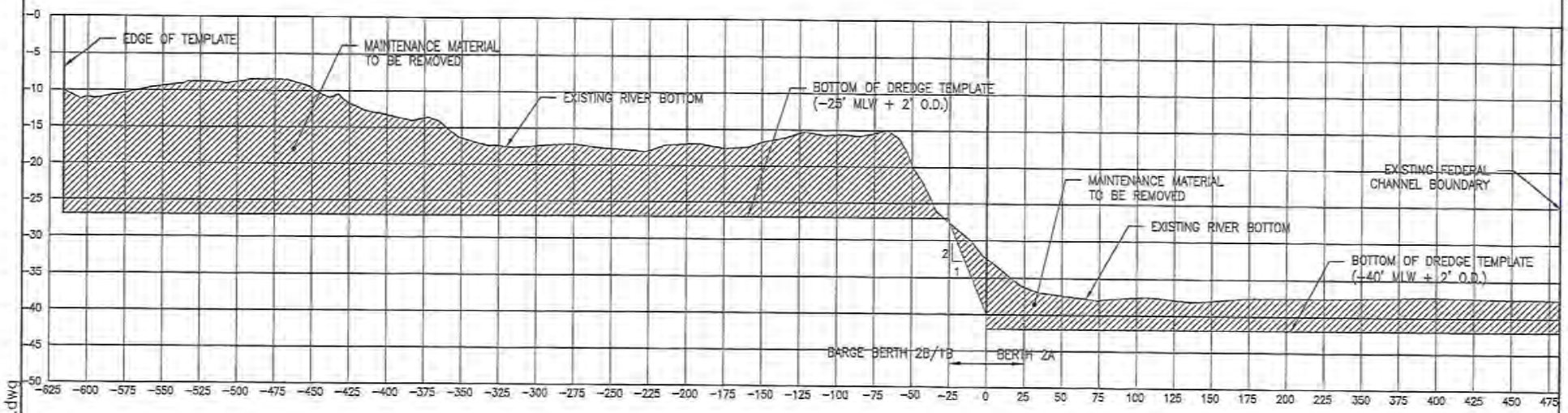


E-9

BERTH 2A AND BARGE BERTH 2B/1B

TYPICAL DREDGING SECTION (C / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE –2.96'
MEAN LOWER TIDE –3.15'
LOWEST RECORDED TIDE –9.95' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTION C

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
D.P.	2/12/15	R.B.	2/12/15	15077.003.003
CHECKED	DATE	APPROVED	DATE	DWG. NO.
E.S.	2/12/15	R.B.	2/12/15	MH-5

FILE NO. G:\Acadproj\15077003003 Sunoco Dredge\MH-3_5 REV 2-2015.dwg

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

DEPARTMENT OF THE ARMY

PHILADELPHIA DISTRICT CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO
ATTENTION OF

JAN 27 2014

SUBJECT: CENAP-OP-R-2011-0760-46 (formerly CENAP-OP-R-200002407-46)
SUNOCO LOGISTICS MARCUS HOOK REFINERY
PADEP #: E23-310 and E23-205
NJDEP #: 0809-01-1001.14
DDNREC#: SU-403/10, SP-253/08 and WQ-491/08

Mr. Mike Nesbitt
Manager of Marine Operations
Sunoco Logistics
10 Industrial Highway MS4
Lester, PA 19029

Dear Mr. Nesbitt:

Enclosed is a Department of the Army Permit (Enclosure 1) authorizing Sunoco, Incorporated to perform mechanical maintenance dredging at the Marcus Hook refinery. The site is located along the Delaware River, in both the Borough of Marcus Hook, Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware. Also enclosed is a notice of authorization (ENG Form 4336-Enclosure 2) to be conspicuously displayed at the site of work.

Carefully review all the terms and conditions of the Department of the Army permit and understand them fully. Performing any work not specifically authorized by the permit or failing to comply with its conditions may subject you and/or your contractor to the enforcement provisions of our regulations. If a contractor performs the work for you, both you and the contractor are responsible for assuring the work is done in conformance with the conditions and limitations of this permit. Please be sure the person who will do the work has read and understands the conditions of the permit.

This office shall be notified of the commencement and completion of the permitted work. To assist you in meeting this requirement, enclosed with the Department of the Army Permit is a Notification/Certification of Work Commencement Form and a Notification/Certification of Work Completion/ Compliance Form which must be signed and returned to this office. Additional information concerning this permit may be obtained by writing to David Caplan of my office at the above address or calling 215-656-6731.

If any material changes in the location or plans of the permitted work are found necessary on account of unforeseen or altered conditions or otherwise, revised plans should be submitted

promptly to this office in order that the revised plans, if found unobjectionable, may receive the approval required by law before operations on the permitted work are commenced.

Sincerely,

Frank J. Cianfrani
Chief, Regulatory Branch

Enclosures

DEPARTMENT OF THE ARMY PERMIT

PERMITTEE AND PERMIT NUMBER:

CENAP-OP-R-2011-0760
SUNOCO LOGISTICS MARCUS HOOK REFINERY

ISSUING OFFICE:

Department of the Army
U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

PROJECT DESCRIPTION: . To perform mechanical maintenance dredging within approximately 47 acres of mooring and water intake areas adjacent to Piers 1A, 1B, 2B, 2A, 3B, 3C, 3A ,Water Intakes RW-5 and -7, and a firewater intake area adjacent to RW-5. The work shall result in the removal of a maximum of 300,000 cubic yards of sediment but shall be limited to between 35,000 and 120,000 cubic yards of materials from the above locations per dredging event. The approved dredging template includes up to 2 feet of permissible over-dredging along with a 10-year maintenance dredging provision.

All work is to be completed in accordance with the attached plan(s) E1 through E09.

PROJECT LOCATION: at the Marcus Hook refinery in Tinicum Township , Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware.

PERMIT CONDITIONS:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2023. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in

conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with conditions specified in the certification as special conditions to this permit.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. All work performed in association with the above noted project shall be conducted in accordance with the attached project plans E1 through E09 prepared by Weston Solutions,, Incorporated. The project plans provide for the mechanical maintenance dredging of the existing facility. The work shall be done within approximately 47 acres of mooring and water intake areas adjacent to Piers 1A, 1B, 2B, 2A, 3B, 3C, 3A ,Water Intakes RW-5 and -7, and a firewater intake area adjacent to RW-5. The dredging shall result in the removal of a maximum of 300,000 cubic yards of sediment (predominately silt and clay sized particles) but would be limited to between 35,000 and 120,000 cubic yards of materials from the above locations per dredging event. The dredging would return water depths surrounding the docks to design specifications (-40 feet below Mean Low Water –MLW- for Pier 3C; -38 feet below MLW for Piers 1A, 2A and 3A, and -20 feet below MLW for Docks 1B, 2B, 2C and 3B and intake structures). Authorization would include up to 2 feet of permissible over-dredging and a 10-year maintenance dredging provision.

Mechanically dredged sediment shall be transferred by barge to either the White's Basin re-handling facility in Gloucester County, New Jersey or to the Biles Island disposal facility in Bucks County, Pennsylvania. Disposal at White's Basin shall involve the bottom-dumping of the materials into the open water re-handling basin. Disposal at the Biles Island facility shall involve the hydraulic un-loading of the dredged materials into the upland disposal facility.

2. Construction activities shall not result in the disturbance or alteration of greater than 47 acres of navigable waters of the United States for dredging.

3. Any deviation in construction methodology or project design from that shown on the above noted drawings must be approved by this office, in writing, prior to performance of the work. All modifications to the above noted project plans shall be approved, in writing, by this office. No work shall be performed prior to written approval of this office.

4. This office shall be notified at least 10 days prior to the commencement of authorized work by completing and signing the attached *Notification/ Certification of Work Commencement Form*. This office shall also be notified within 10 days of the completion of the authorized work by completing and signing the attached *Notification/Certification of Work Completion/Compliance Form*. All notifications required by this condition shall be in writing and shall be transmitted to this office by registered mail. Oral notifications are not acceptable. Similar notification is required each time maintenance work is to be done under the terms of this Corps of Engineers permit.

5. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration. (This special condition is applicable to Corps of Engineers permits that provide authorization under Section 10 of the Rivers and Harbors Act of 1899.)

6. That this permit is for maintenance dredging only. No new dredging is authorized. Furthermore, no placement of structures (e.g. docks, piers, piles, or bulkheads) in navigable waters of the United States or discharges of dredged or fill materials within waters of the United States are authorized for the project (including hydraulic un-loading at the Biles Island disposal facility).

7. All dredging shall be performed by bucket or dragline methods only. All dredged materials shall be placed directly onto water-tight barges or scows (with no overflow) and transported to either the Whites Basin rehandling basin located in Gloucester County, New Jersey or the Waste Management Incorporated Biles Island disposal facilities in Bucks County, Pennsylvania. Any deviation from this method of dredging and location of disposal must have the prior written approval of the Corps of Engineers.

8. Except as authorized herein, all dredged material shall be rehandled in an upland, non-wetland area.

9. That the dredged material disposal sites shall be appropriately contained to prevent erosion and subsequent sedimentation of the aquatic habitat of any water of the United States adjacent to or in proximity of that disposal site.

10. That the Corps shall be notified before any subsequent maintenance dredging takes place of the dates of commencement, the projected completion date of each dredging event, the projected volumes of dredged material to be generated, and of the location of the dredged material disposal site. See Special Condition 4 for the appropriate form.

11. Within 6 weeks of completion of each dredging event, the Corps shall be notified of the date of completion, the final amount of dredged material generated, and of the location of the dredged material disposal sites. See Special Condition 4 for the appropriate form.

12. That this permit does not include approval of beam obstruction leveling.

13. Any modification, suspension, or revocation of this Department of the Army permit shall not be the basis for any claim for damages against the United States.

14. That no dredging shall be performed to a depth greater than that of the connecting adjacent waterway.

15. Representatives of the U.S. Army Corps of Engineers shall be permitted to inspect the project during its phase of construction, and to collect any samples, or to conduct any tests deemed necessary.

16. That maintenance dredging is authorized until 31 December 2023 under this permit provided the dredging locations, depths, and the approved dredged material disposal site locations remain unchanged.

17. That the permittee (including the current and any future permittees) is responsible for ensuring that the contractor and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period the work is underway.

18. That this permit does not obviate the permittee from obtaining any State or local assent required by law for the activity authorized.

19. That no disposal at the Waste Management Incorporated Biles Island facility shall occur until this office has received copy of a site-specific approval from the Pennsylvania Department of Environmental Protection.

20. That the permittee shall comply with all terms and conditions of the current 401 Water Quality Certificates and Coastal Zone Management consistency concurrences issued by the New Jersey Department of Environmental Protection, the Pennsylvania Department of Environmental Protection, and the Delaware Department of Natural Resources and Environmental Control. After expiration of the state approvals, and prior to commencing each individual dredging/disposal event under the authority of this DA permit, the permittee shall obtain any necessary State approval, including Section 401 Water Quality Certification and Coastal Zone Management consistency concurrence required by law for the work. All conditions contained in the current Section 401 Water Quality Certificates and CZM consistency concurrences are incorporated as

special conditions of this permit .

21. Should the above WQCs and CZM concurrences be modified prior to their expirations or re-issuances, the permittee must notify this office of any state-approved changes.

22. That the permittee shall apply for, and receive, a site-specific 401 Water Quality Certificate and Coastal Zone Management consistency concurrences from the state of New Jersey prior to each disposal of dredged materials at the Weeks Marine/American Atlantic – White's Basin re-handling facility . Additionally, prior to such disposal, the permittee shall furnish a copy of each individual Section 401 Water Quality Certification (WQC) application or other state-required sediment sampling results via registered mail to the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency (Region II), U.S. Fish and Wildlife Service (Pleasantville, NJ) and National Marine Fisheries Service (Highlands, New Jersey) at the same time the application is submitted to the State.

23. Prior to disposal at Whites Basin, the permittee shall notify the Corps of Engineers in writing and provide copies of the prerequisite State approval(s) and Water Quality Certificate(s) for each proposed dredging event. No work (dredging) shall commence until such time as the Corps of Engineers provides written notification to the permittee that the work may proceed under the terms and conditions of this Department of the Army permit.

24 . The notification described in Special Condition Number Twenty Three (23) above shall include the following information:

a. name, mailing address and telephone number of the company for which the work is to be performed;

b. brief description of the proposed work and its purpose;

c. location map of the proposed work;

d. project plans (8.5 X 11 inch) indicating the size of the proposed work area, existing and proposed water depths and quantity of material to be removed;

e. proposed schedule for commencement and completion of the proposed work;

f. copy of required project specific State permit(s) and Section 401 Water Quality Certificate;

g. copy of registered mail receipts verifying the Federal resource agencies' receipt of Section 401 Water Quality Certificate application and sediment testing results (see Special Condition #12);

h. any other information the permittee believes appropriate.

25. That upon completion of the each dredging event, the permittee shall furnish the Philadelphia District Engineer with the certification that all dredging activities were performed in compliance with the approved plans. This certification shall include a survey, sealed by a licensed surveyor, of the post-dredging bottom depths to mean low water with cross-sections at 100-foot intervals within the authorized dredging area.

26. That all dredging shall occur between July 1 and March 14 of the following year to minimize impacts to fisheries.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above 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).

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act.

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) 1/23/2014 (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

1/27/14
(DATE)

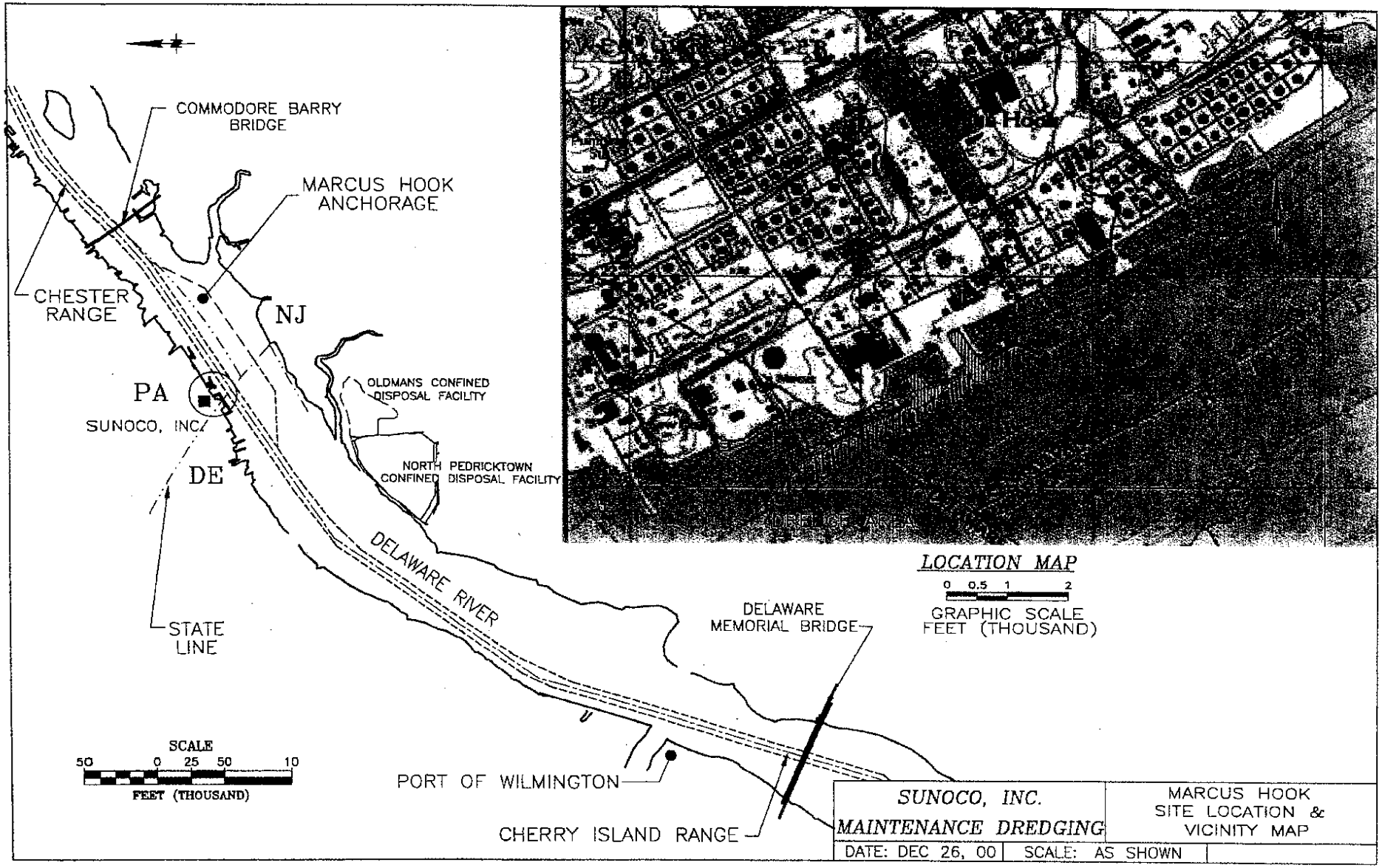
Frank J. Ciantrani
Chief, Regulatory Branch

for: John C. Becking, P.E.
Lieutenant Colonel, U.S. Army
District Commander

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

E-1


COMMODORE BARRY BRIDGE
MARCUS HOOK ANCHORAGE
CHESTER RANGE
NJ
PA
SUNOCO, INC.
DE
OLDMANS CONFINED DISPOSAL FACILITY
NORTH PEDRICKTOWN CONFINED DISPOSAL FACILITY
DELAWARE RIVER
STATE LINE
DELAWARE MEMORIAL BRIDGE
LOCATION MAP
0 0.5 1 2
GRAPHIC SCALE
FEET (THOUSAND)
SCALE
50 0 25 50 10
FEET (THOUSAND)
PORT OF WILMINGTON
CHERRY ISLAND RANGE
SUNOCO, INC.
MAINTENANCE DREDGING
MARCUS HOOK
SITE LOCATION &
VICINITY MAP
DATE: DEC 26, 00
SCALE: AS SHOWN

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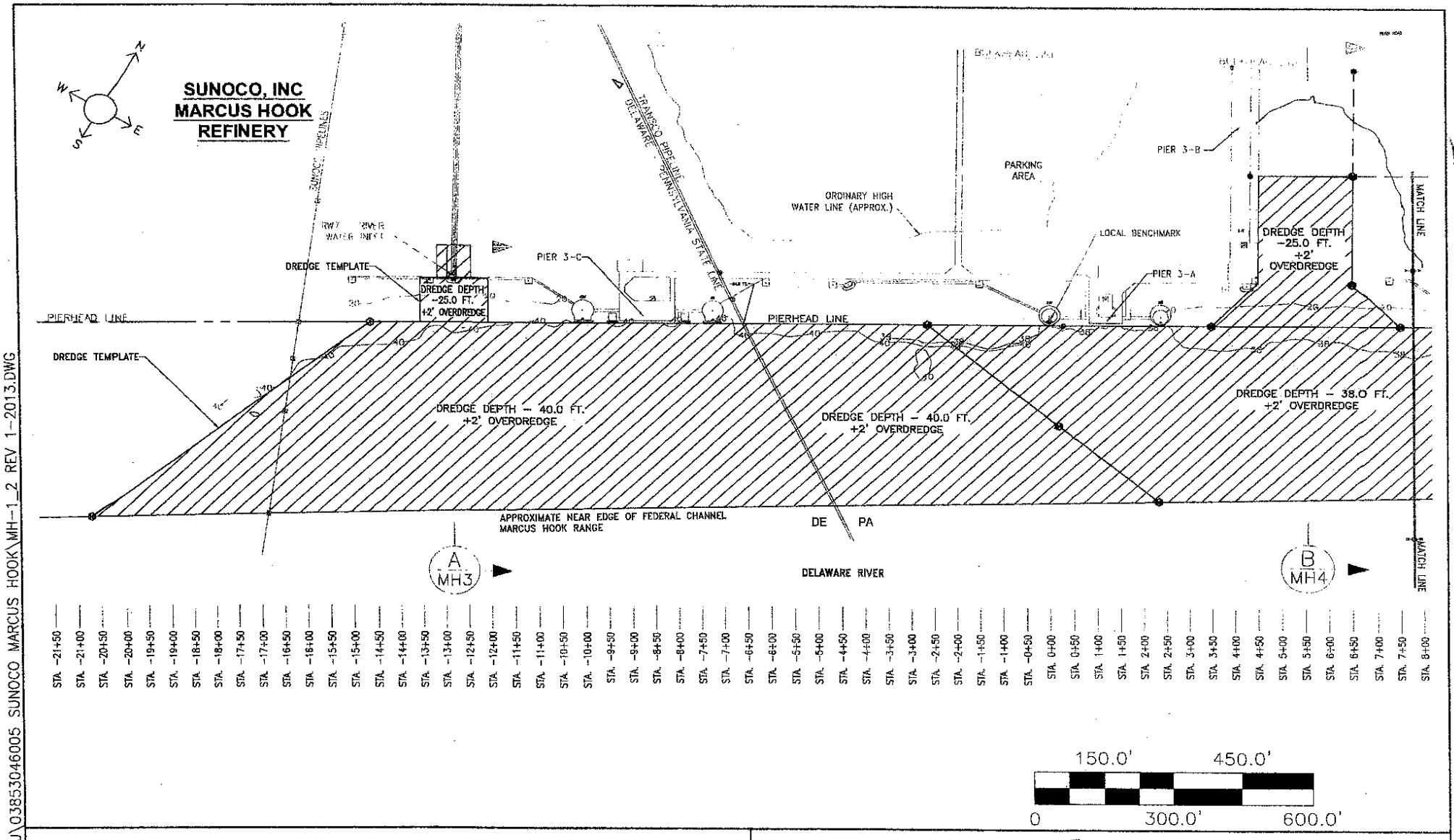

DREDGING PLAN
(WEST SIDE)
MARCUS HOOK REFINERY

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
R.C.	6/29/11	S.R.	7/13/11	03853.046.005
CHECKED	**DATE**	**APPROVED**	**DATE**	**DWG. NO.**
S.M.	7/13/11	S.R.	7/13/11	MH-1

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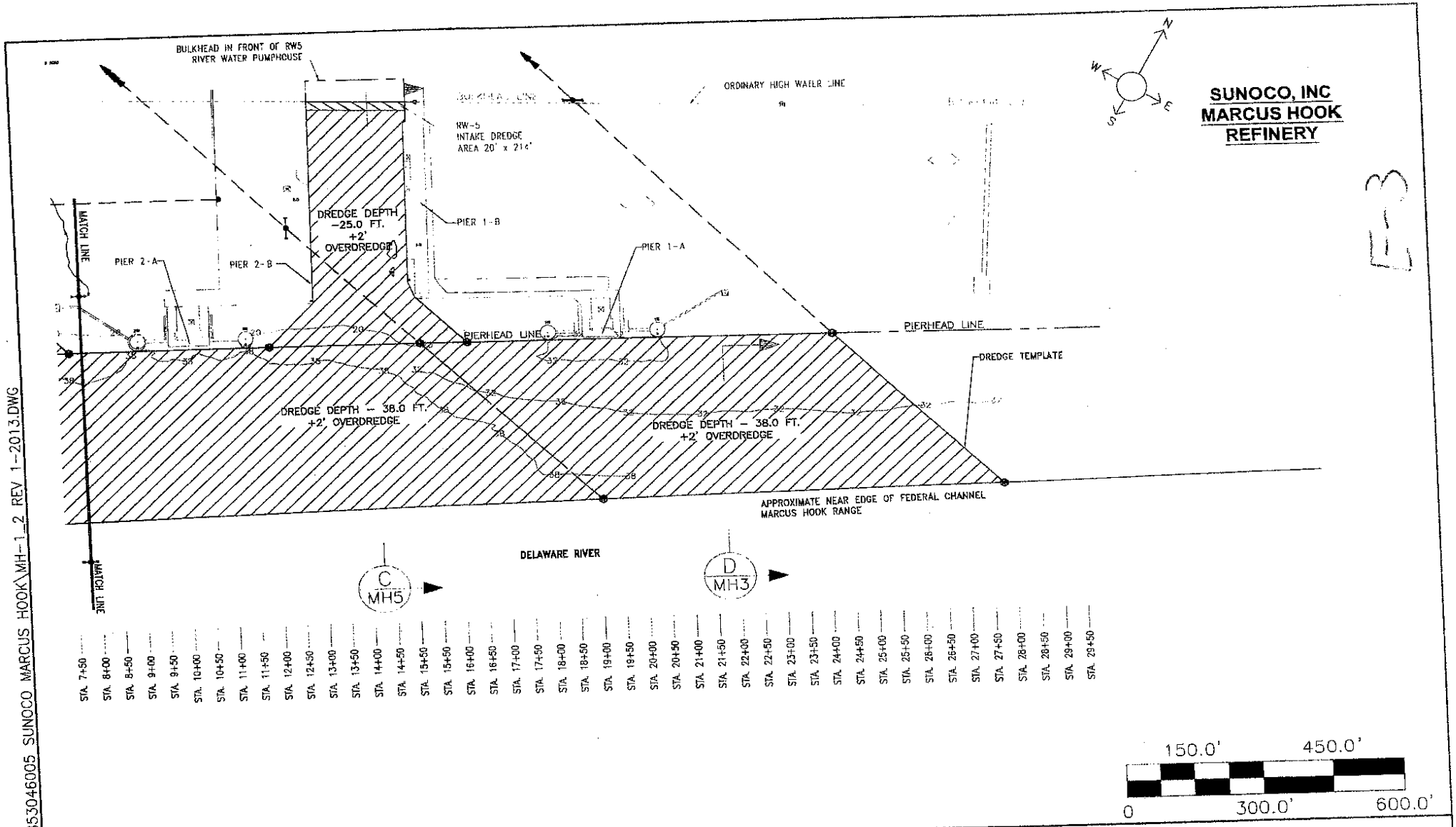

DREDGING PLAN
(EAST SIDE)
MARCUS HOOK REFINERY

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

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CHECKED 7/13/11	DATE S.M.	APPROVED S.R.	DATE 7/13/11	DWG. NO. MH-2

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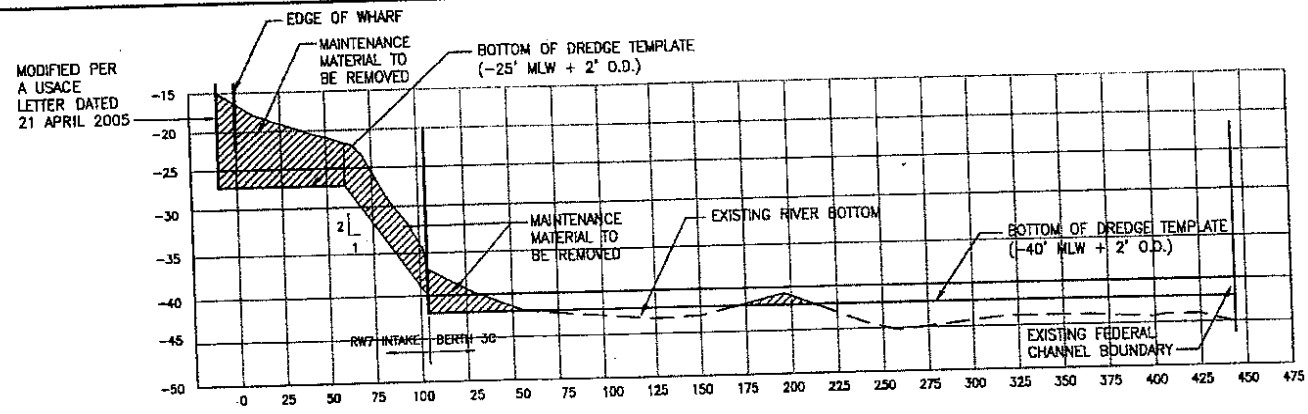
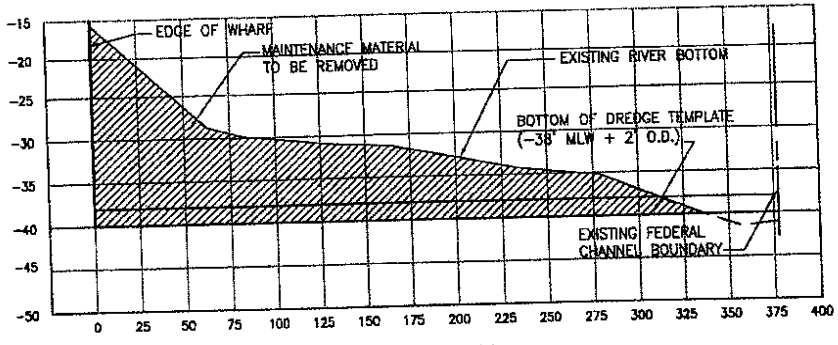


RW7 INTAKE AND BERTH 3C

TYPICAL DREDGING SECTION (A / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'



BERTH 1A

TYPICAL DREDGING SECTION (D / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIOAL JURISOICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 - SPRING HIGH WATER - 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATIDN TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIOE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOO ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTIONS A AND D

MARCUS HOOK

WESTON SOLUTIONS

DRAWN R.C.	DATE 6/29/11	DES. ENG. S.R.	DATE 7/13/11	W. O. NO. 03853.046.005
CHECKED S.M.	DATE 7/13/11	APPROVED S.R.	DATE 7/13/11	DWG. NO. MH-3

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E-4

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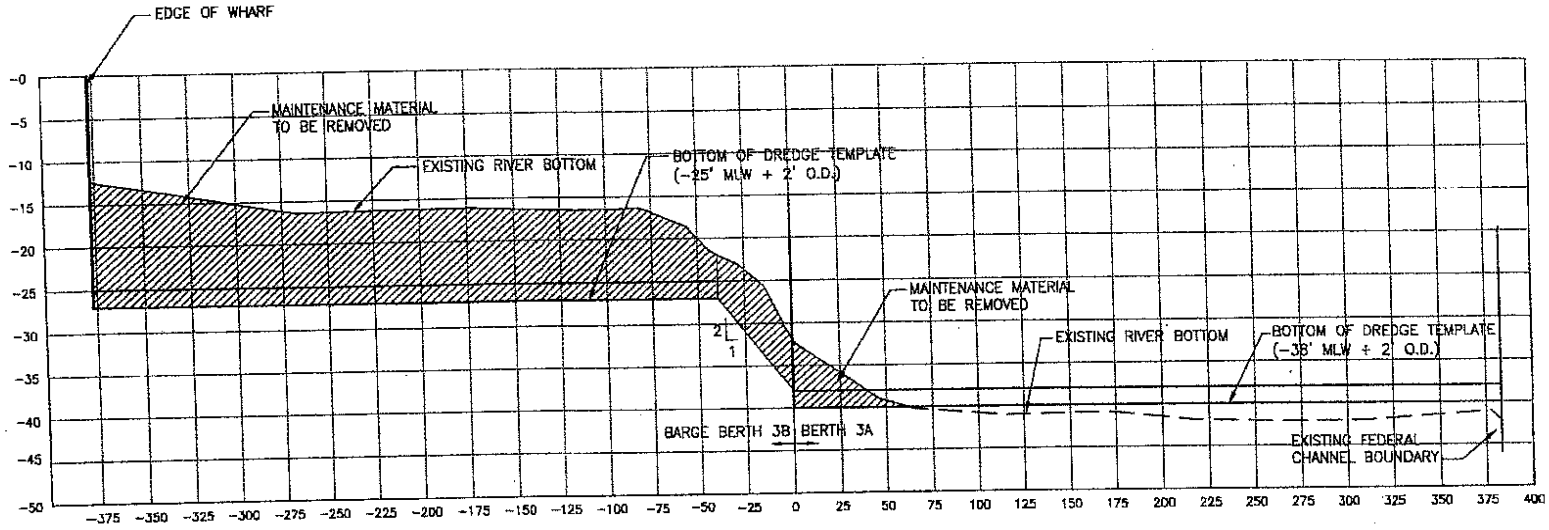
E-5



TYPICAL DREDGING SECTION (B / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK REFINERY
SECTION B

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
R.C.	6/29/11	S.R.	7/13/11	03853.046.005
CHECKED	DATE	APPROVED	DATE	DWG. NO.
S.M.	7/13/11	S.R.	7/13/11	MH-4

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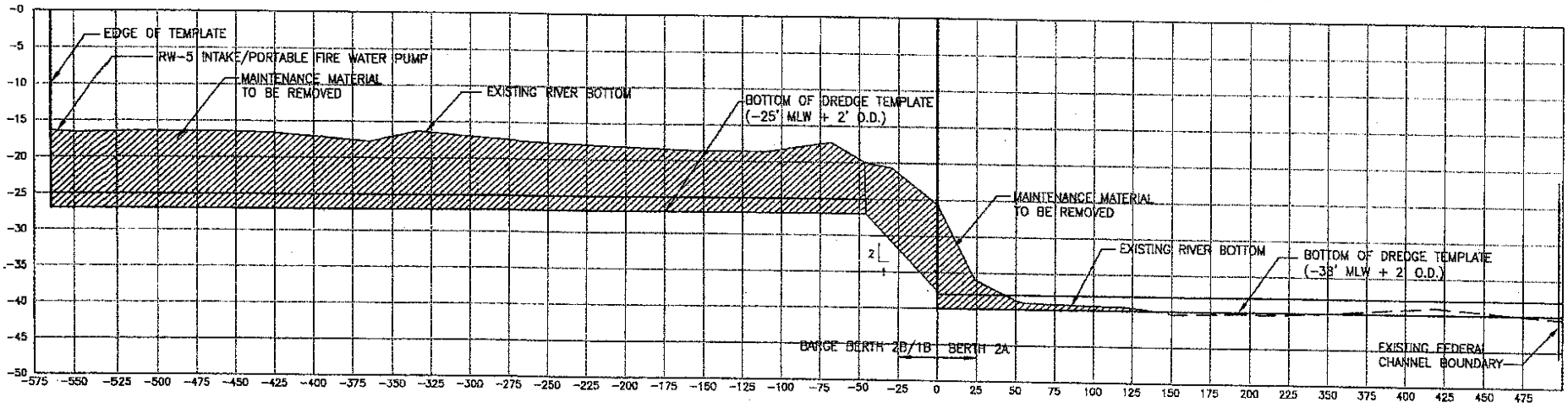

TYPICAL DREDGING SECTION

C
MH-2

HORIZONTAL SCALE = 1"= 100'
VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 -- SPRING HIGH WATER -- 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

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MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

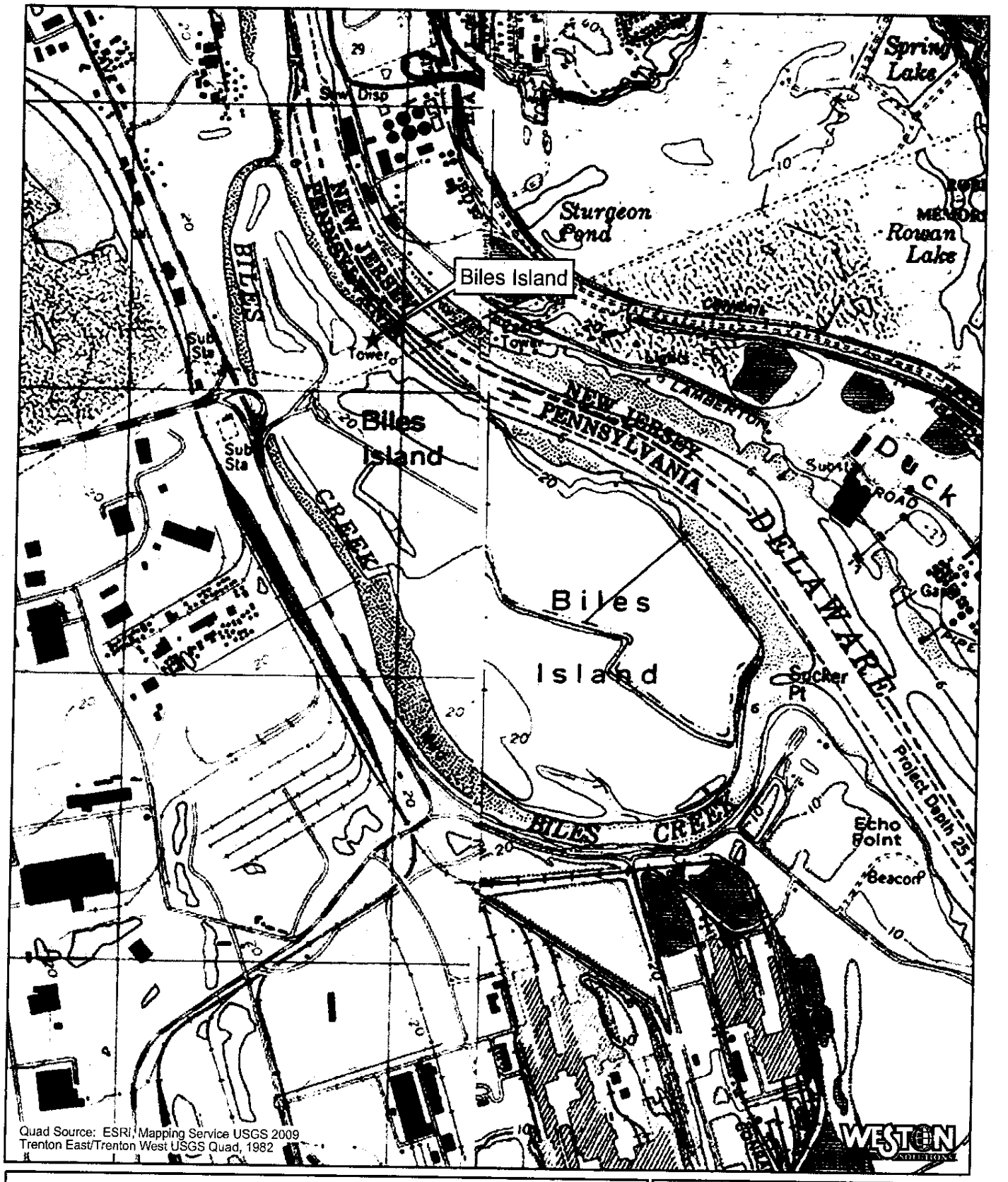
CROSS SECTIONS
MARCUS HOOK REFINERY
SECTION C

MARCUS HOOK

WESTON SOLUTIONS

DRAWN	R.C.	DATE	6/29/11	DES. ENG.	S.R.	DATE	7/13/11	W. O. NO.	03853.046.005
CHECKED	S.M.	DATE	7/13/11	APPROVED	S.R.	DATE	7/13/11	DWG. NO.	MH-5

E-6



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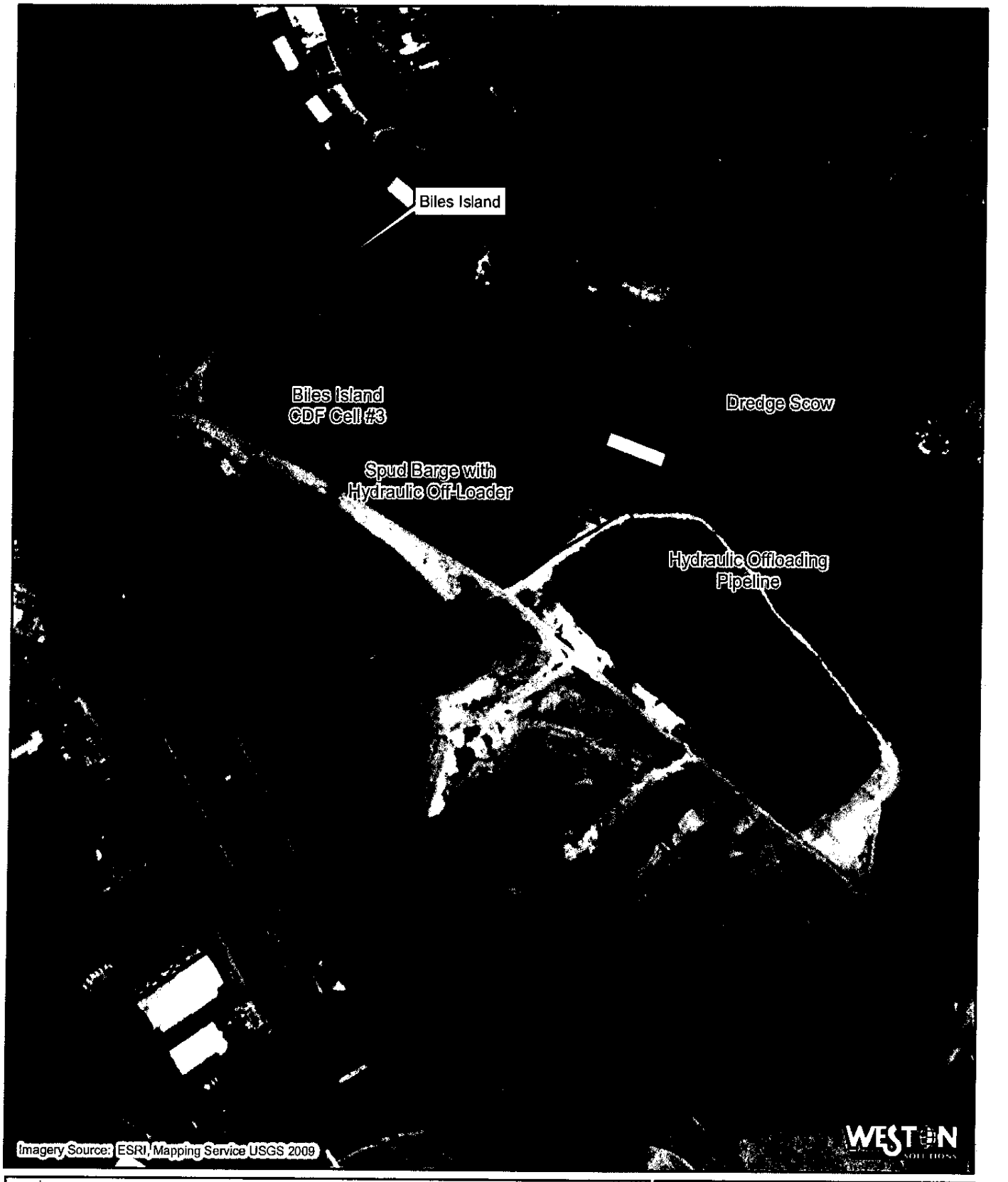
★ Site Location

N
W E
S

0 1,000 2,000 Feet

Biles Island
Bucks County
Falls Township, Pennsylvania

E-7



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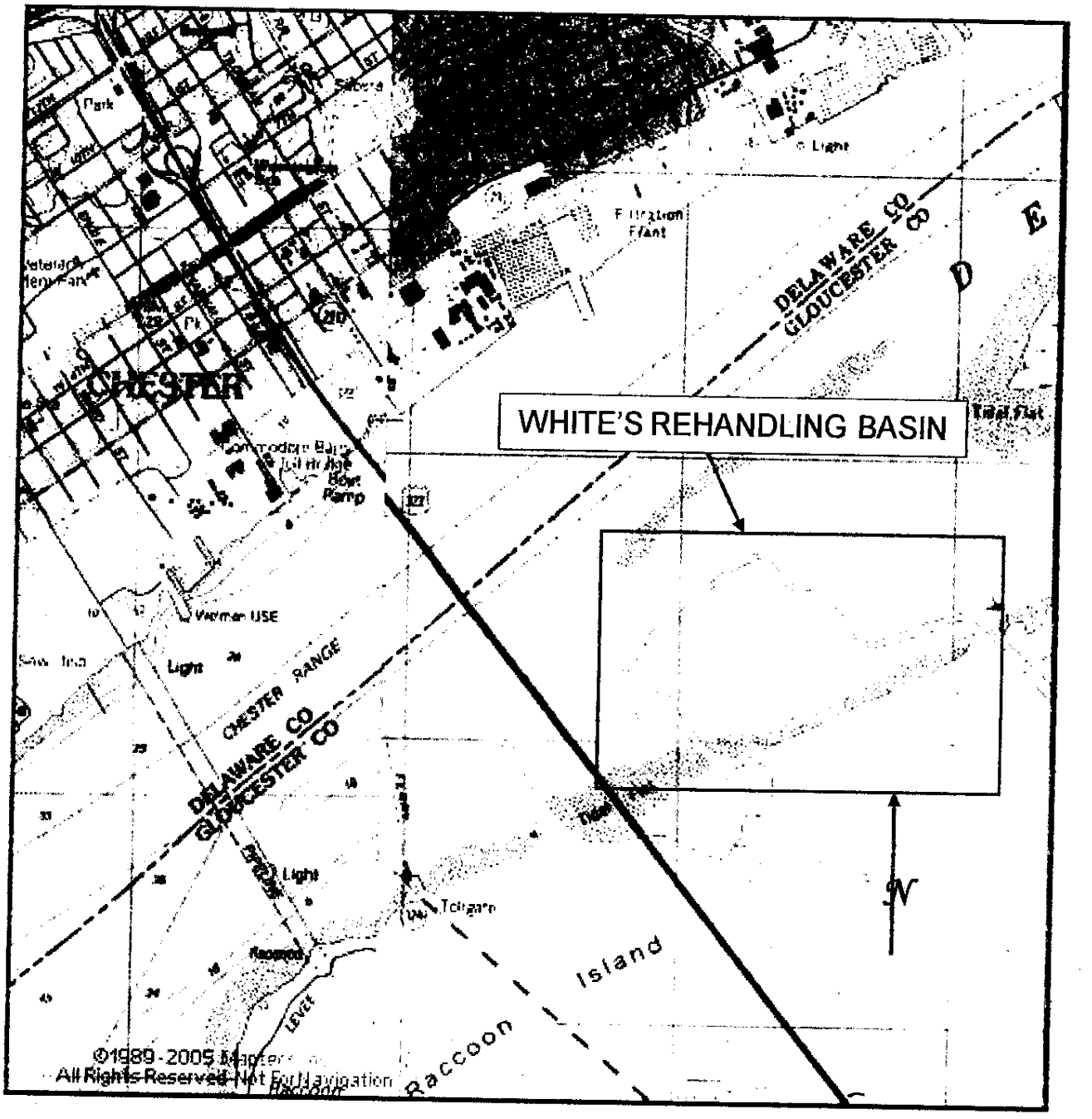
★ Site Location

N
W E
S

0 1,250
Feet

Biles Island
Off-Loading Sketch
Bucks County
Falls Township, Pennsylvania

E-8



WHITE'S REHANDLING BASIN
Scale: 1:24,000

Source: Bridgeport, NJ-PA, USGS Quadrangle 1987, Photorevealed 1994, DMA 5963 IV SW Series V822. Downloaded from www.Maptech.com.

E-9

NOTIFICATION/CERTIFICATION OF WORK COMMENCEMENT FORM

Permit Number: CENAP-OP-R-2011-0760
State Permit #: multiple
Name of Permittee: Sunoco Logistics
Project Name: MARCUS HOOK REFINERY
Waterway: Delaware River
County: Delaware and New Castle State: Pennsylvania and Delaware
Compensation/Mitigation Work Required: Yes ☐ No ☒

TO: U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
Attention: CENAP-OP-R

I have received authorization to: perform maintenance dredging at the Marcus Hook Refinery and dispose of dredged materials at either Whites Basin (Gloucester County, New Jersey) or Biles Island (Bucks County, Pennsylvania).

The work will be performed by:

Name of Person or Firm_____

Address: _____

_____

I hereby certify that I have reviewed the approved plans, have read the terms and conditions of the above referenced permit, and shall perform the authorized work in strict accordance with the permit document. The authorized work will begin on or about _____ and should be completed on or about _____.

Please note that the permitted activity is subject to compliance inspections by the Army Corps of Engineers. If you fail to return this notification form or fail to comply with the terms or conditions of the permit, you are subject to permit suspension, modification, revocation, and/or penalties.

_____ _____
Permittee (Signature and Date) Telephone Number

_____ _____
Contractor (Signature and Date) Telephone Number

NOTE: This form shall be completed/signed and returned to the Philadelphia District Office a minimum of 10 days prior to commencing work.

NOTIFICATION/CERTIFICATION OF WORK COMPLETION/COMPLIANCE FORM

Permit Number: CENAP-OP-R-2011-0760
State Permit #: multiple
Name of Permittee: Sunoco Logistics
Name of Contractor:
Project Name: MARCUS HOOK REFINERY
Waterway: Delaware River
County: Delaware and New Castle State: Pennsylvania and Delaware

Within 10 days of completion of the activity authorized by this permit, please sign this certification and return it to the following address:

U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
Attention: CENAP-OP-R

Please note that the permitted activity is subject to a compliance inspection by an Army Corps of Engineers representative. If you fail to return this notification form or fail to perform work in compliance with the permit, you are subject to administrative, civil and/or criminal penalties. Further, the subject permit may be suspended or revoked.

The authorized work was commenced on _____.

The authorized work was completed on _____.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the above noted permit.

_____	_____
Signature of Contractor	Signature of Permittee
Address:_____	Address: _____
_____	_____
Telephone Number:_____	Telephone Number:_____

SPECIAL NOTE FOR MAINTENANCE DREDGING:
If the above referenced permit authorizes maintenance dredging, the permittee/contractor shall notify this office of the completion of the work by submitting this form for each dredging occurrence. This form may be reproduced for this purpose

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF LAND RESOURCE PROTECTION
Mail Code 501-02A, P.O. Box 420, Trenton, New Jersey 08625-0420
Telephone: (609) 777-0454 or Fax: (609) 777-3656
www.nj.gov/dep/landuse

PERMIT

In accordance with the laws and regulations of the State of New Jersey, the Department of Environmental Protection hereby grants this permit to perform the activities described below. This permit is revocable with due cause and is subject to the terms, conditions, and limitations listed below and on the attached pages. For the purpose of this document, "permit" means "approval, certification, registration, authorization, waiver, etc." Violation of any term, condition, or limitation of this permit is a violation of the implementing rules and may subject the permittee to enforcement action.	Approval Date: **November 29, 2021** Expiration Date: **November 28, 2026**

Permit Number(s):	**Type of Approval(s):**	**Enabling Statute(s):**
0809-01-1001.14 CDT210001	Consistency Determination Water Quality Certificate Acceptable Use Determination	NJSA 12:5-3 NJSA 58:10A

Permittee:	**Site Location:**
Michael Nesbitt Energy Transfer Partners 4041 Market Street Aston, PA 19014	Block(s) & Lot(s): N/A Municipality: Marcus Hook (PA) and Brandywine Hundred (DE) County: Delaware (PA) and New Castle (DE) State: Pennsylvania and Delaware

Description of Authorized Activities:

This permit authorizes maintenance dredging of the Marcus Hook Industrial Complex located in Marcus Hook, Pennsylvania and Brandywine Hundred, Delaware. Approximately 65,399 cubic yards of material is authorized to be dredged from Berths 1A, 2A, 3A, 3B, 3C, 2B Basin/Intake RW5 and Intake RW7. Dredging shall occur by mechanical method using a closed-clamshell environmental bucket. Dredging shall be limited to a project depth of forty feet below mean low water (-40' MLW) for Berths 1A, 3A and 3C, thirty-six feet below mean low water (-36' MLW) for Berth 2A, fifteen feet below mean low water (-15' MLW) for 2B Basin/Intake RW5, thirteen feet below mean low water (-13' MLW) for Berth 3B, and twenty feet below mean low water (-20' MLW) for Intake RW7. Two feet (2') of allowable overdredge is authorized for all areas. Dredged material will be managed at the Weeks Marine Whites Basin dredged material management facility located in Logan Township, Gloucester County.

Subsequent dredging events may be authorized during the 5-year permit term subject to the conditions of the Acceptable Use Determination.

<u>All construction shall conform to the requirements, conditions and limitations of this permit and all approved drawings.</u>

By issuance of this permit, the State of New Jersey does not relinquish tidelands ownership or claim to any portion of the subject property or adjacent properties. This permit includes the State's Water Quality Certification pursuant to Section 401 of the federal Water Pollution Control Act (33 USC 1251 et seq.). This permit is authorized under and in compliance with the Rules on Coastal Zone Management, N.J.A.C. 7:7-1.1 et seq., as amended through October 05, 2021.

To minimize impacts to migrating and spawning of anadromous fish, in water work or sediment generating disturbance is prohibited from **March 15** to **May 31** of each year in accordance with the Delaware Basin Fish and Wildlife Management Cooperative.

Prepared by: **Katherine R. Todoroff**	**Received and/or Recorded by County Clerk:**
If the permittee undertakes any regulated activity, project, or development authorized under this permit, such action shall constitute the permittee's acceptance of the permit in its entirety as well as the permittee's agreement to abide by the requirements of the permit and all conditions therein.	

This permit is not valid unless authorizing signature appears on the last page.

STANDARD CONDITIONS:

1. **Extent of approval**:
   a. This document grants permission to perform certain activities that are regulated by the State of New Jersey. The approved work is described by the text of this permit and is further detailed by the approved drawings listed herein. All work must conform to the requirements, conditions and limitations of this permit and all approved drawings.
   b. If you alter the project without prior approval, or expand work beyond the description of this permit, you may be in violation of State law and may be subject to fines and penalties. Approved work may be altered only with the prior written approval of the Department.
   c. You must keep a copy of this permit and all approved drawings readily available for inspection at the work site.

2. **Acceptance of permit**: If you begin any activity approved by this permit, you thereby accept this document in its entirety, and the responsibility to comply with the terms and conditions. If you do not accept or agree with this document in its entirety, do not begin construction. You are entitled to request an appeal within a limited time as detailed on the attached Administrative Hearing Request Checklist and Tracking Form.

3. Notice of Construction: You must notify the Department in writing prior to beginning any work approved by this permit

4. Expiration date: All activities authorized by this permit must be completed by the expiration date shown on the first page unless otherwise extended by the Division. At that time, this permit will automatically become invalid and none of the approved work may begin or continue until a replacement permit is granted. (Some permits may qualify for an extension of the expiration date. Please contact the Department for further information.)

5. Rights of the State:
   a. This permit is revocable and subject to modification by the State with due cause.
   b. Representatives from the State have the statutory authority to enter and inspect this site to confirm compliance with this permit and may suspend construction or initiate enforcement action if work does not comply with this permit.
   c. This permit does not grant property rights. The issuance of this permit shall not affect any action by the State on future applications, nor affect the title or ownership of property, nor make the State a party in any suit or question of ownership.

6. **Other responsibilities:** You must obtain all necessary local, Federal and other State approvals before you begin work

CONSISTENCY DETERMINATION AND WATER QUALITY CERTIFICATE:

The Rules on Coastal Zone Management (N.J.A.C. 7:7) constitute New Jersey's enforceable policies under its federally approved Coastal Zone Management Program. This maintenance dredging project has been reviewed for consistency with the Rules on Coastal Zone Management, and for potential water quality impacts.

Based on the information provided in the application, the Office of Dredging and Sediment Technology hereby certifies that the subject project is consistent with the Rules on Coastal Zone Management and has determined that the project is not likely to cause a violation of New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B-1.1 et seq.), provided that the specific conditions noted below are met.

Therefore, this consistency determination includes the State's Water Quality Certification pursuant to Section 401 of the federal Water Pollution Control Act (33 USC 1251 et seq.) subject to specific conditions listed below.

This determination and certification is contingent upon compliance with the following conditions:

1. All necessary local, Federal, and other State approvals must be obtained by the applicant prior to the commencement of the authorized activities.

2. Prior to the initiation of dredging the permittee shall receive United States Army Corps of Engineering authorization for the project. A copy of said authorization shall be forwarded to this office upon receipt.

3. Dredging shall comply with the restricted time periods specified in the Delaware Basin Fish and Wildlife Management Cooperative's dredging schedule, as currently modified.

4. Dredging shall be limited to a project depth of forty feet below mean low water (-40' MLW) for Berths 1A, 3A and 3C, thirty-six feet below mean low water (-36' MLW) for Berth 2A, fifteen feet below mean low water (-15' MLW) for 2B Basin/Intake RW5, thirteen feet below mean low water (-13' MLW) for Berth 3B, and twenty feet below mean low water (-20' MLW) for Intake RW7. Two feet (2') of allowable overdredge is authorized for all areas.

5. Sediment sampling shall be required <u>prior</u> to each subsequent dredging event. See Acceptable Use Determination condition No. 3 below.

6. Dredging shall occur using a closed clamshell environmental bucket.

7. The dredge shall be operated so as to control the rate of descent of the bucket so as to maximize the vertical cut of the clamshell bucket while not penetrating the sediment beyond the vertical dimension of the open bucket (i.e. overfilling the bucket). This will reduce the amount of free water in the dredged material, will avoid overfilling the bucket, and minimize the number of dredge bucket cycles needed to complete the dredging contract.

8. Dredged material shall be deliberately placed within barges in order to prevent spillage of material overboard. The gunwales of the dredge scows shall not be rinsed during dredging.

9. Pre- and post-dredge surveys shall be performed for each dredging event. The results of these surveys and a calculation of the quantity of dredged material removed shall be submitted to the Office of Dredging and Sediment Technology within ninety (90) days of completion of each dredging event.

10. Violations of any of the conditions of this Water Quality Certificate will be considered violation of the New Jersey Water Pollution Control Act, NJSA 58:1-A-1 et seq., and subject to the penalties included therein.

ACCEPTABLE USE DETERMINATION:

1. The in-situ volume of sediment to be dredged for this maintenance dredging project is sixty-five thousand and three hundred ninety-nine cubic yards (65,399 yds^3) based on the hydrographic survey dated August 23, 2021.
2. This permit authorizes the placement of sixty-five thousand and three hundred ninety-nine cubic yards (65,399 yds^3) of dredged material at the Weeks Marine, Inc. Whites Rehandling Basin located in Logan Township, Gloucester County. Subsequently, the dredged material will be hydraulically pumped into one of the adjacent upland confined disposal facilities (Area 1 or Area II) for final

placement. This quantity is approximated based on existing hydrographic surveys and anticipated sedimentation rates. Actual volumes will be calculated by pre- and post-dredge surveys.

3. Subsequent maintenance dredging events may be authorized under this permit subject to the following conditions:
   a) Written authorization for each subsequent maintenance dredging event, in the form of a minor technical modification to this Acceptable Use Determination, must be obtained from the Office of Dredging and Sediment Technology prior to said event.
   b) Requests for authorization for subsequent maintenance dredging events shall include the following:
      i. Sediment sampling results obtained in accordance with a sampling plan approved by the Office of Dredging and Sediment Technology;
      ii. Current hydrographic survey including a calculation of the quantity of sediment to be dredged; and
      iii. Written consent from the proposed dredged material management site to accept the specified quantity of dredged material.
4. Any alternate disposal/use location must obtain all required state, local and federal permits.

APPROVED PLANS:

The drawings hereby approved are four (4) sheets prepared by S.T. Hudson Engineers, Inc., dated September 10, 2021, unrevised and entitled:

a. "**MARCUS HOOK INDUSTRIAL COMPLEX SURVEY TEMPLATE SHEET 1**", sheet 1 of 4,
b. "**MARCUS HOOK INDUSTRIAL COMPLEX SURVEY TEMPLATE SHEET 2**", sheet 2 of 4,
c. "**MARCUS HOOK INDUSTRIAL COMPLEX SURVEY TEMPLATE SHEET 3**", sheet 3 of 4, and,
d. "**MARCUS HOOK INDUSTRIAL COMPLEX SURVEY TEMPLATE SHEET 4**", sheet 4 of 4.

Please contact Katherine Todoroff with any questions regarding this permit action via email at Katherine.Todoroff@dep.nj.gov. Please reference the above file number.

Approved By:

Suzanne Biggins 2021.11.29 15:02:37 -05'00'

Suzanne U. Biggins, Supervisor
Office of Dredging & Sediment Technology
Division of Land Resource Protection

Original Sent to Agent to record

c: USACE, Philadelphia District-Regulatory Branch

Weston Solutions, Inc.
205 Campus Drive
Edison, New Jersey 08837
732-417-5800 Fax 732-417-5851
www.westonsolutions.com

March 28, 2022

David Caplan
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

Re: USACE Philadelphia District, Individual Permit Application
Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403)
Marcus Hook Terminal, Tinicum Township, Philadelphia, Pennsylvania

Dear Mr. Caplan,

On behalf of Energy Transfer, Weston Solutions, Inc. (Weston) is pleased to submit the enclosed individual permit application package for review. Energy Transfer seeks a new 10-year maintenance dredging permit under Section 10 of the Rivers and Harbors Act of 1899 (33USC 403) in order to continue work previously authorized under permit CENAP-OP-R-2013-0760-46 for periodic maintenance dredging activities at Energy Transfer's Marcus Hook Terminal within the Delaware River in Philadelphia, Pennsylvania. The only difference with this new Section 10 permit application is an increased depth of maintenance dredging at Berth 1A to 42'+2' (previously 40'+2"). All dredged material is proposed for disposal at White's Basin or Biles Island.

This individual permit application package includes the following attachments:

- ENG Form 4345
- Project Description
- Site Photographs
- Project Figures
- Permit Drawings
- Environmental Questionnaire
- Essential Fish Habitat
- Section 7 Consultation
- Coastal Zone Management Form
- Prior Permits
- Sediment Data

Weston is concurrently applying for applicable permits from the New Jersey Department of Environmental Protection (NJDEP) (Water Quality Certificate, Coastal Zone Consistency Determination), Pennsylvania Department of Environmental Protection (PADEP) and Delaware Natural Resources and Environmental Control (DNREC).

Energy Transfer and Weston are available at any time to clarify or address issues the USACE may have regarding this individual permit application. Please feel free to contact me at (908) 565-0888 or Ryan.Brown@WestonSolutions.com with any questions.

Sincerely,

cc: M. Nesbitt (Energy Transfer)
enc.

WESTON SOLUTIONS, INC.

Ryan Brown
Project Manager

Energy Transfer

Marcus Hook Terminal – Maintenance Dredging

USACE Philadelphia District, Individual Permit Application

March 2022

Prepared for:

Energy Transfer

Prepared by:

205 Campus Drive
Edison, New Jersey

Contents

1. ENG Form 4345

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   Figure 10: Marcus Hook Terminal Cross Section D

6. Environmental Questionnaire

7. Essential Fish Habitat

8. Section 7 Consultation

9. Coastal Zone Management Form

10. Prior Permits

11. Sediment Data

1. ENG Form 4345

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 01-08-2018

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME
First - Michael Middle - Last - Nesbitt
Company - Energy Transfer
E-mail Address - Michael.Nesbitt@energytransfer.com

8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Ryan Middle - H Last - Brown
Company - Weston Solutions, Inc.
E-mail Address - Ryan.Brown@WestonSolutions.com

6. APPLICANT'S ADDRESS:
Address- 100 Green St
City - Marcus Hook State - PA Zip - 19061 Country - USA

9. AGENT'S ADDRESS:
Address- 205 Campus Drive
City - Edison State - NJ Zip - 08837 Country - USA

7. APPLICANT'S PHONE NOs. w/AREA CODE
a. Residence 267-516-0367 b. Business 610-859-1912 c. Fax

10. AGENTS PHONE NOs. w/AREA CODE
a. Residence 908-565-0888 b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Ryan H Brown to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT 3/25/22 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Marcus Hook Terminal - Maintenance Dredging

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Delaware River

14. PROJECT STREET ADDRESS (if applicable)
Address 100 Green St
City - Marcus Hook State- PA Zip- 19601

15. LOCATION OF PROJECT
Latitude: °N 39 deg 48' 27" Longitude: °W 75 deg 25' 02"

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality Marcus Hook, PA and Brandywine Hundred, DE
Section - Township - Marcus Hook Borough Range - Delaware River Mile 79.0

17. DIRECTIONS TO THE SITE

Facility is along the Delaware River and is located at the intersection of Green and 2nd Street, approximately 2.5 miles downstream of the Commodore Barry Bridge in Marcus Hook, Delaware County, Pennsylvania.

From I-95 southbound, take Exit 2 (PA-452/Market St) south. After 1.2 miles turn right onto 10th Street and then immediately after, take a left onto Green Street. Proceed 0.5 miles to the Energy Transfer facility on the right.

18. Nature of Activity (Description of project, include all features)

The proposed project is the maintenance dredging of up to 50,000 cubic yards of material, per dredging event, depending on the seasonal sedimentation rates. Berthing areas at Marcus Hook Industrial Terminal (MHT) are to be mechanically dredged to a maximum of 44' below mean low water (42' dredge depth + 2' overdredge). Specifically, the dredging would return water depths surrounding the docks/berths to design specifications (-42' below Mean Low Water (MLW) for Berth 1A, -40' below MLW for Berths 2A, 3A and 3C, and -20' below MLW for Berths 2B, 3B and Raw Water Intakes RW-5 and RW-7.

Mechanical dredging would be conducted using an environmental clamshell dredge with material stored and transported in a watertight barge to the intended disposal facility of either White's Basin or Biles Island. See attached Dredge Plan and Cross Section (Figures 6 through 11). Crude oil products enter the MHIC primarily from marine vessels on the Delaware River. Berths 1A, 2A, 3A and 3C are designed to handle crude oil from crude oil carrier-class tankers and smaller crude oil vessels. The other berths can accommodate only smaller crude oil vessels.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of this permit application is to renew a prior permit for maintenance dredging activities. The prior permit, CENAP-OP-R-2013-0760-46, was issued to Energy Transfer (Sunoco) in January 2014 for maintenance mechanical dredging at Marcus Hook Terminal. The purpose of maintenance dredging at Energy Transfer's Marcus Hook Terminal is to maintain safe berthing areas. Sedimentation, which occurs naturally over time, causes a build up of material that causes a lack of sufficient dock access due to shallow water depths and can impair refinery operations and schedules.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

The proposed dredge disposal sites include White's Basin (operated by Weeks Marine) or Biles Island (operated by Waste Management). Weeks Marine and Waste Management are responsible for their respective discharge/placement permits.

Any alternate sites planned for dredged material placement will be appropriate for use as dredge material disposal sites, and applicable permits will be obtained before disposal operations commence.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
NA		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres NA

or

Linear Feet NA

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Energy Transfer limits maintenance dredging to the times and locations that are deemed absolutely necessary to provide safe berthing depths at the docks and other berthing areas required for business at Marcus Hook Terminal. Clamshell dredging will be utilized with an environmental clamshell bucket. All permit conditions with respect to dredging windows (in order to minimize impacts on anadromous fish migration and aquatic life during their spawning period) and best practices are followed during all dredging events.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Attached

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
NJDEP	WQC	0809-01 1001.14	September 30, 2021	November 29, 2021	--
PADEP	CZMA Fed Consisten		May 31, 2018	June 7, 2018	--
PADEP	Encroachment Permit	E23-205	January 4, 2014	January 7, 2014	--
DNREC	Subaqueous/Water Q	SP/WQ-201/18	May 16, 2018	August 27, 2018	--

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Michael Merlitt 3/25/22

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

GENERAL INFORMATION FOR THE
ENERGY TRANSFER MARCUS HOOK TERMINAL

Street Address for Facility:	100 Green Street Marcus Hook, PA 19601
Latitude and Longitude:	39°48' 27 N (39.809106 N) 75°25' 02"W (-75.415676 W)
River Mile from Mouth of Delaware Bay:	79.2
Local County Office:	Dr. Monica Taylor., Chairman Delaware County Council 201 W Front Street Media, PA 19063-2710
Local Township:	Andrew Weldon, Borough Manager Marcus Hook Borough 1111 Market Street Marcus Hook, PA 19061
Local Newspaper:	Delaware County Daily Times 390 Eagleview Blvd. Exton, PA 19341
Local Post Office	Marcus Hook Post Office 926 Market St Marcus Hook, PA 19061

Adjoining Property Owners

Trainer Refinery
Monroe Energy
4101 Post Road
Trainer, PA 19061

Hueber Launch Service
45 East Delaware Avenue
Marcus Hook, PA 19061

Department of the Army
AMSA #83-17
7 West Delaware Avenue
Marcus Hook, PA 19061

Honeywell International
6300 Philadelphia Pike
Claymont, DE 19703

2. Project Description

2 Project Description

The applicant, Energy Transfer, is seeking an Individual Permit to continue previously authorized maintenance dredging activities at the Marcus Hook Terminal (MHT) at 100 Green Street, Marcus Hook, PA, within the Delaware River at River Mile 79.2, in Tinicum Township, Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware. The MHT is located at 100 Green Street, Marcus Hook, PA at coordinates 39.809106° North and 75.415767° West. MHT was previously authorized for maintenance dredging in January 2014 under United States Army Corps of Engineers (USACE) Permit No. CENAP-OP-R-2011-0760-46.

Proposed maintenance dredge areas at MHT include Berths 1A, 1B, 2A, 2B, 3A, 3B, 3C, Water Intakes RW-5 and RW-7, and a firewater intake area adjacent to RW-5. Berthing areas at MHT are to be mechanically dredged to a maximum of depth of -42.0' MLLW with an additional 2 feet of allowable over-dredge for a total proposed depth range from -20.0' MLLW (-22.21 feet below mean low water) to -42.0' MLLW (-44.21 feet below mean low water. Specifically;

Berth	Design Depth	Over Dredge
Berth 3C	40.0'	2.0'
Berth 3A	40.0'	2.0'
Berth 2A	40.0'	2.0'
Berth 1A	42.0'	2.0'
Berth 3B	20.0'	2.0'
Berth 2B	20.0'	2.0'
Berth 1B	20.0'	2.0'
RW7	20.0'	2.0'
RW5	20.0'	2.0'

The location, area, and proposed depths for Berths 1A, 1B, 2A, 2B, 3A, 3B, 3C, Water Intakes RW-5 and RW-7, and a firewater intake area adjacent to RW-5 are identified in the enclosed permit drawings. See attached Dredge Plan and Cross Section (Figures 6 through 10).

Crude oil products enter the MHT primarily from marine vessels on the Delaware River.

Based on a March 2022 survey, the current maintenance dredging demand is approximately 50,000 cubic yards of material, per dredging event, depending on the seasonal sedimentation rates. Following an initial dredging event, Energy Transfer may request to conduct periodic maintenance dredging events throughout the duration of the permit. Based on the past 9 years of maintenance dredging at Marcus Hook Terminal, a reasonable approximation of the dredged sediment volume in any particular maintenance dredging event is 50,000 cubic yards. Based on an estimated 10 to 15 dredge events, we estimate a maximum of 750,000 cubic yards of material may be dredged over the proposed 10-year maintenance cycle.

Mechanical dredging will occur utilizing a closed-clamshell environmental bucket. The dredge will be used to control the rate of descent of the bucket to maximize the vertical cut of the clamshell bucket while not penetrating the sediment beyond the vertical dimension of the open bucket. This will reduce the amount of free water in the dredged material, will avoid overfilling the bucket, and minimize the number of dredge bucket cycles needed to complete the dredging contract. Dredged material will be stored and transported in a watertight barge to the intended disposal facility.

Dredged material generated with mechanical dredging would be disposed of at the facility of either White's Basin or Biles Island. If a disposal area other than at White's Basin or Biles Island is planned, a permit modification will be requested from USACE and a State Section 401 Water Quality Certificate will be obtained.

In advance of any maintenance dredging event, the dredged material will be sampled and characterized according to procedures of the approved Sampling and Analysis Plan (by NJDEP and/or PADEP depending on disposal facility). Testing results and letters of dredged material acceptance from disposal facilities will be provided to New Jersey Department of Environmental Protection and/or Pennsylvania Department of Environmental Protection with copy to USACE prior to commencement of dredging activities. The most recent sediment characterization data from Marcus Hook Terminal is provided in Section 11.

3. Site Photographs

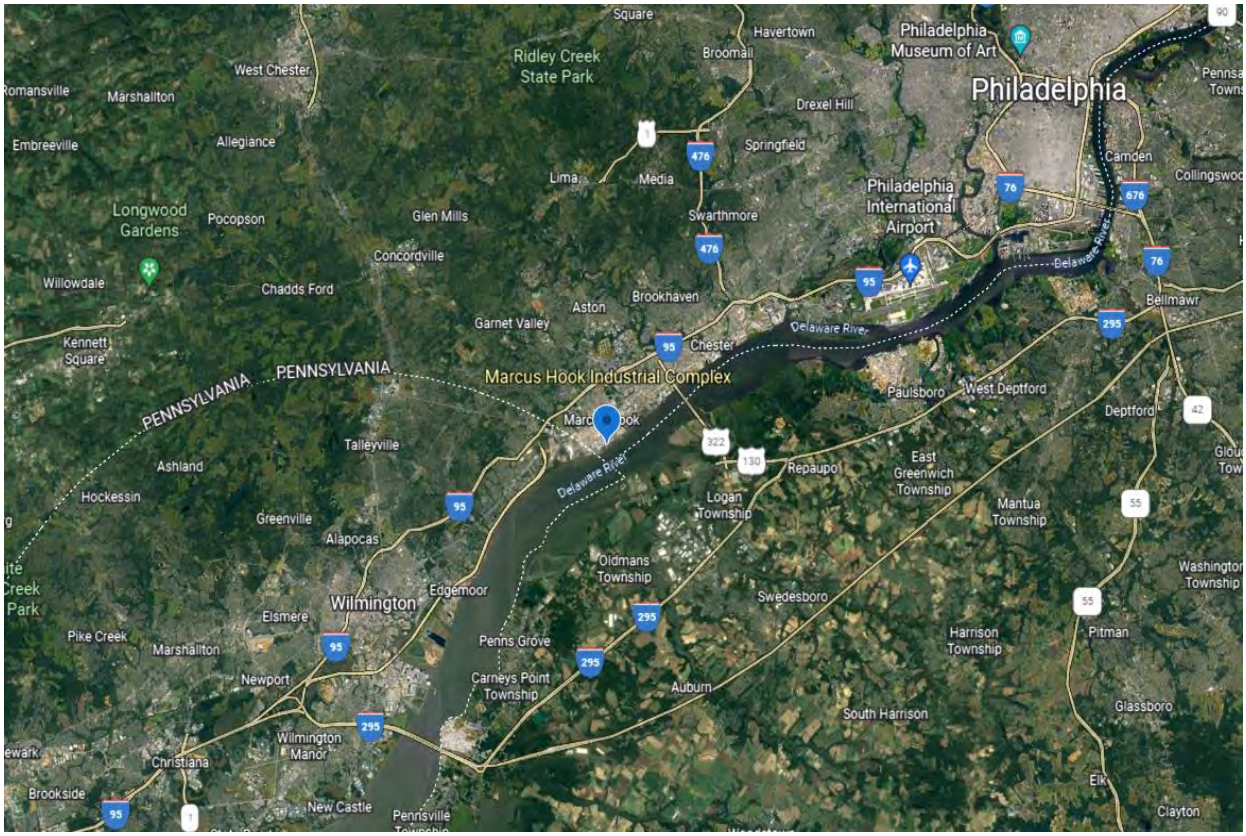


Figure 1: Aerial Photo of Marcus Hook Terminal (formerly Marcus Hook Industrial Complex) (Photo Courtesy Google Earth).

Figure 2: Aerial Photo of Marcus Hook Terminal (formerly Marcus Hook Industrial Complex) (Photo Courtesy Google Earth).

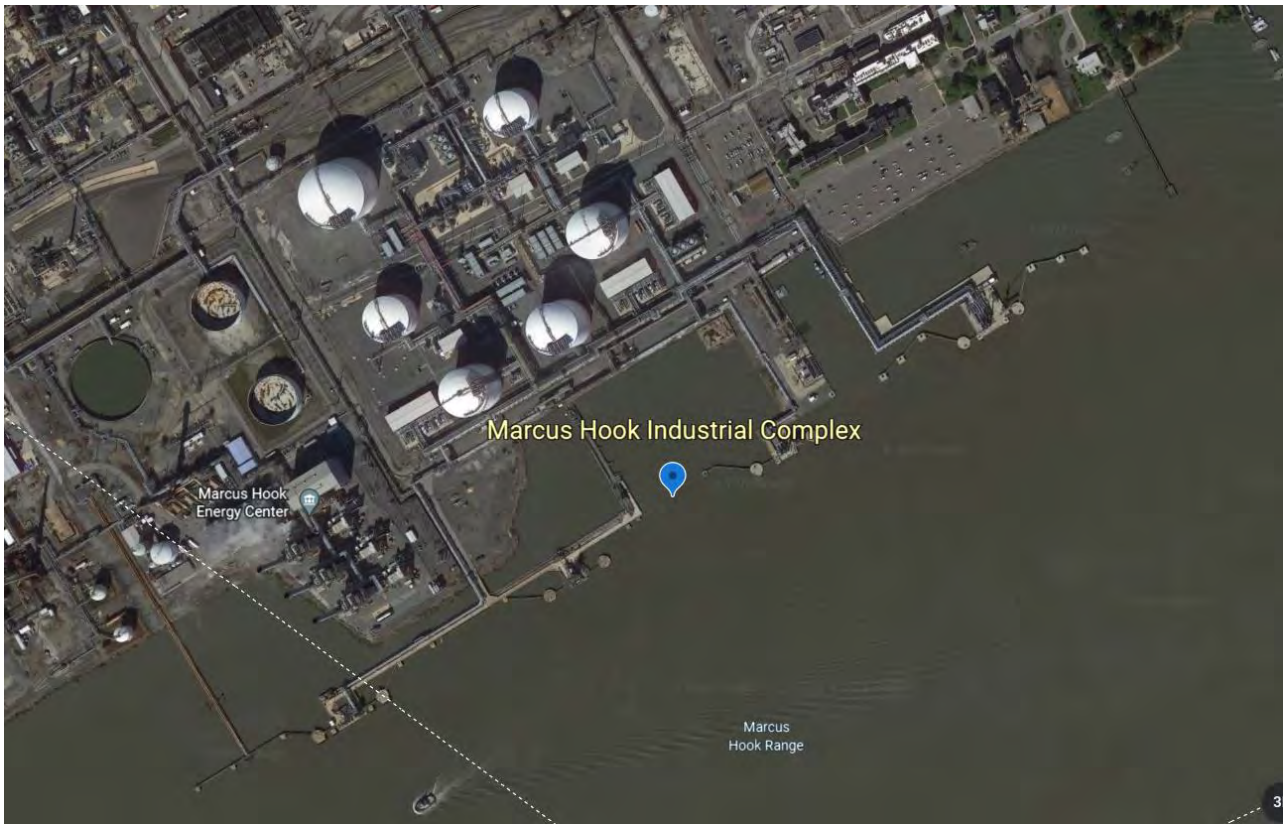


Figure 3: Aerial Photo of Marcus Hook Terminal (formerly Marcus Hook Industrial Complex) (Photo Courtesy Google Earth).

Figure 4: View of Marcus Hook Terminal Berths 2B, RW5, and 1B (looking west from in front of Berth 2A).

Figure 5: View of Marcus Hook Terminal Berths 3A (left), 3B (center) and 2A (right) (looking west).

Figure 6: View of Marcus Hook Terminal Inner Barge Dock Berth 1B (looking west).

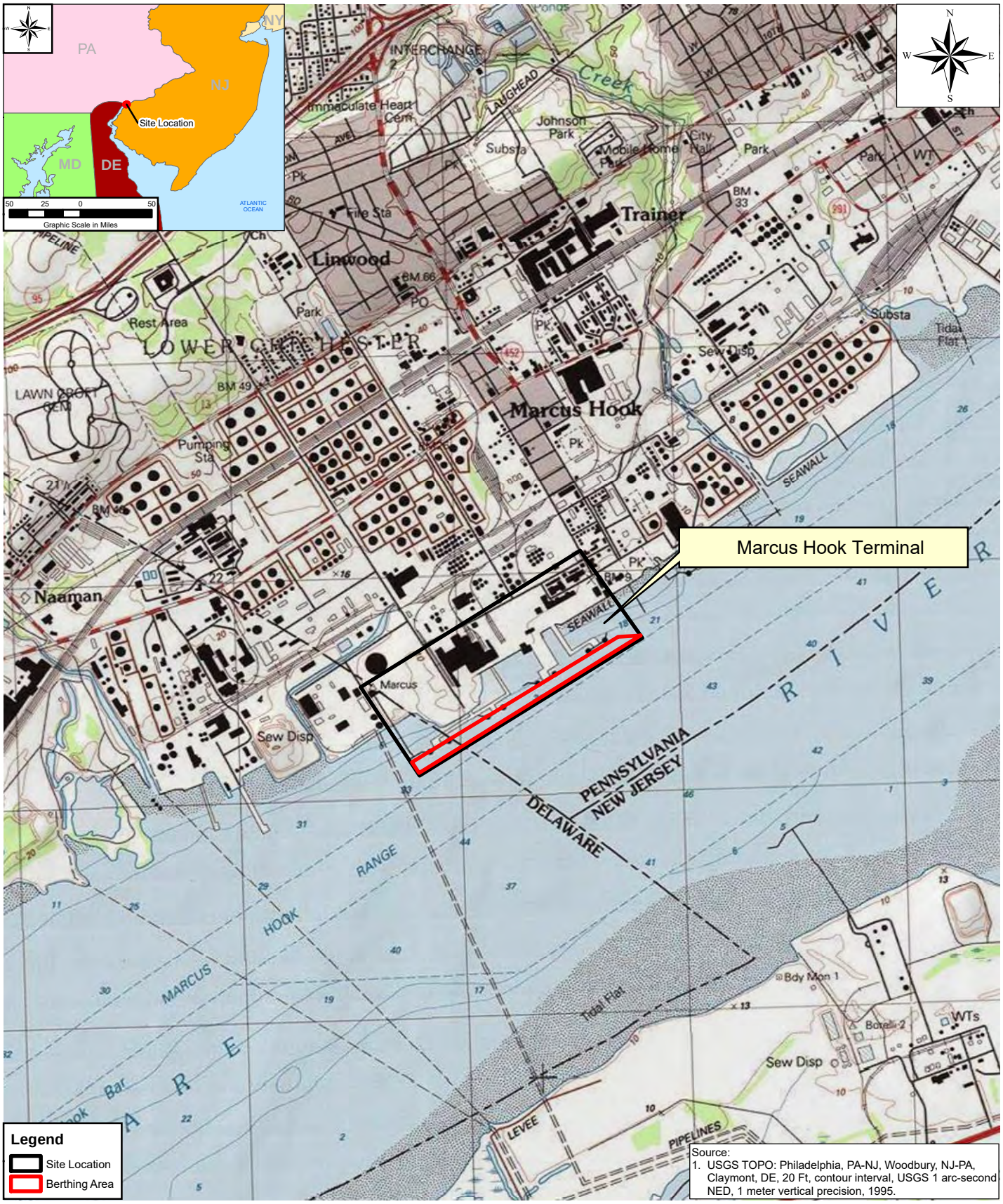
Figure 7: View of Marcus Hook Terminal Outer Berth 2A (looking downriver from Berth 1A).

Figure 8: View of Marcus Hook Terminal Outer Berth 3A (looking downriver).

4. Project Figures

Project Figures

Figure 1: Site Location Map
Figure 2: Marcus Hook Terminal and Sediment Disposal Sites
Figure 3: White's Rehandling Basin
Figure 4: Biles Island
Figure 5: Biles Island Off-Loading Sketch



Source:
1. USGS TOPO: Philadelphia, PA-NJ, Woodbury, NJ-PA, Claymont, DE, 20 Ft, contour interval, USGS 1 arc-second NED, 1 meter vertical precision, 1995.

SCALE:
2,000 1,000 0 2,000
Graphic Scale in Feet

TITLE:
MARCUS HOOK TERMINAL
DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

PROJECT:
Marcus Hook Terminal

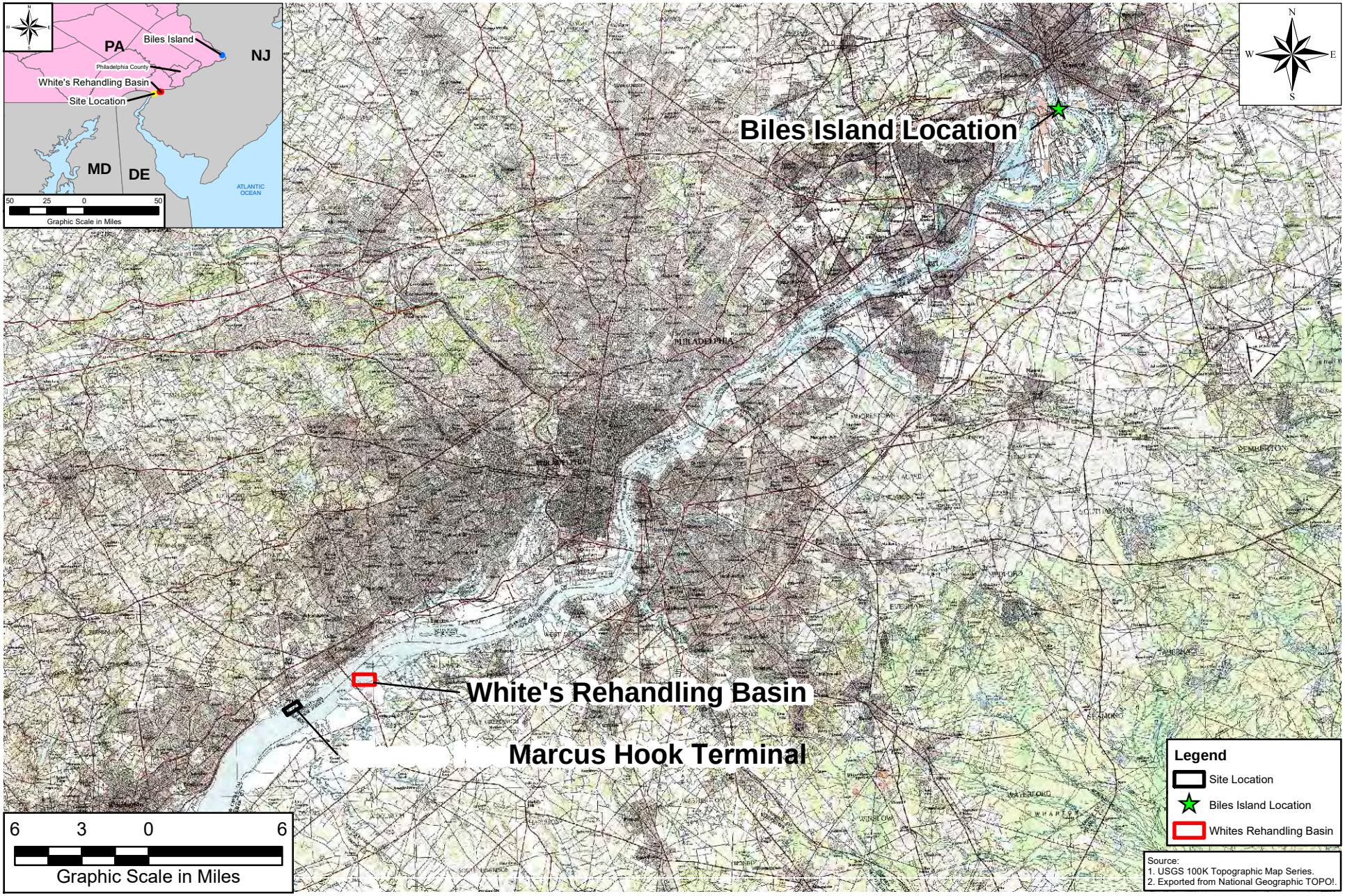
CLIENT NAME:
Energy Transfer

WESTON SOLUTIONS

DATE:
March 2022

FIGURE #:
1

P:\Sunoco\GIS\MXD\2022_03_MarcusHook\28030_Sunoco_Log_Marcus_Hook_Site_Loc.mxd



WESTON SOLUTIONS

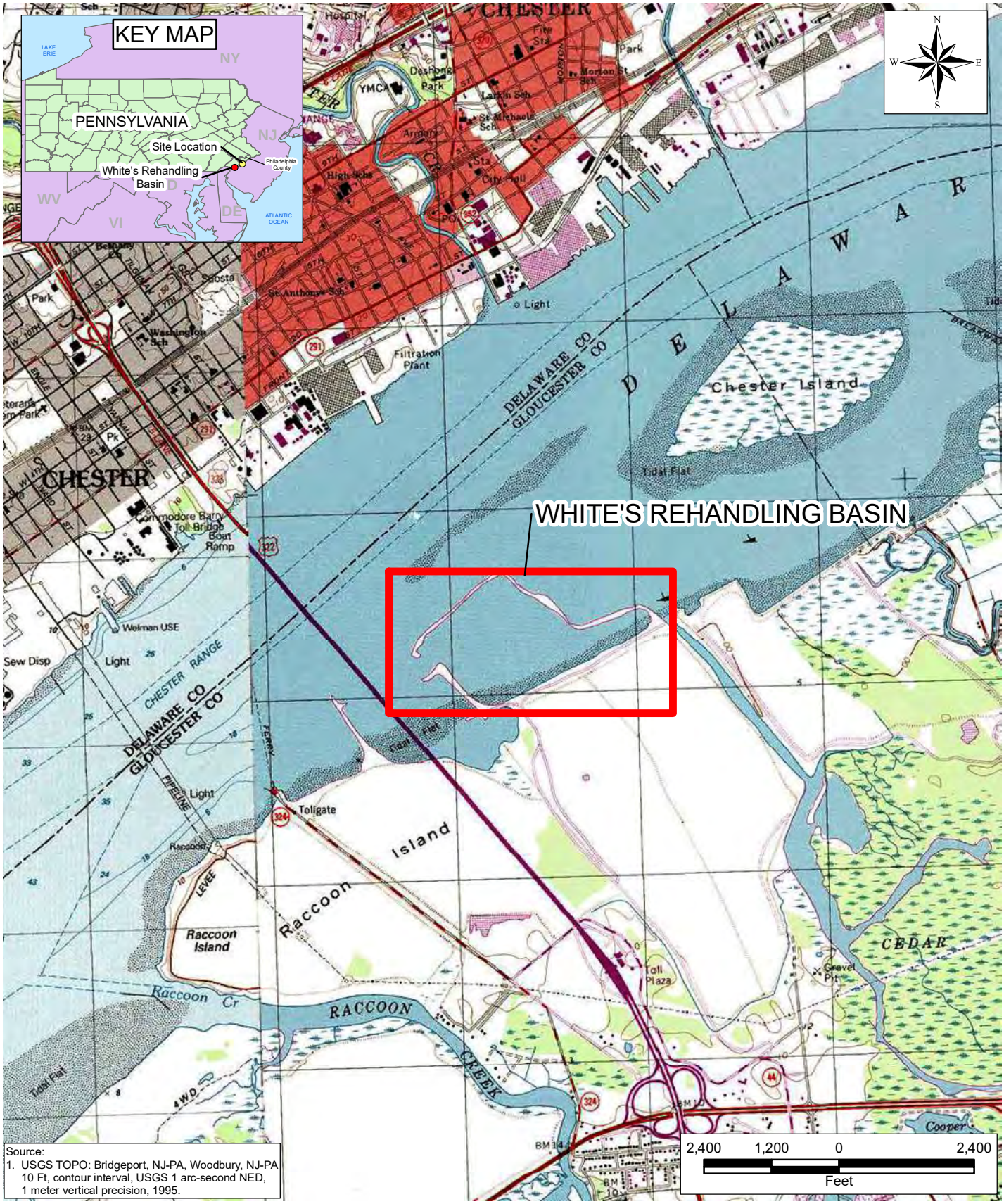
DATE: March 2022

FIGURE #: 1

PROJECT: Marcus Hook Terminal

CLIENT NAME: Energy Transfer

TITLE: MARCUS HOOK TERMINAL AND SEDIMENT DISPOSAL SITES
MARCUS HOOK TERMINAL
DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA



LEGEND:

White's Rehandling Basin

TITLE:

WHITE'S REHANDLING BASIN
MARCUS HOOK TERMINAL
DELAWARE RIVER PHILADELPHIA,
PENNSYLVANIA

PROJECT:

Marcus Hook Terminal

CLIENT NAME:

Energy Transfer

WESTON SOLUTIONS

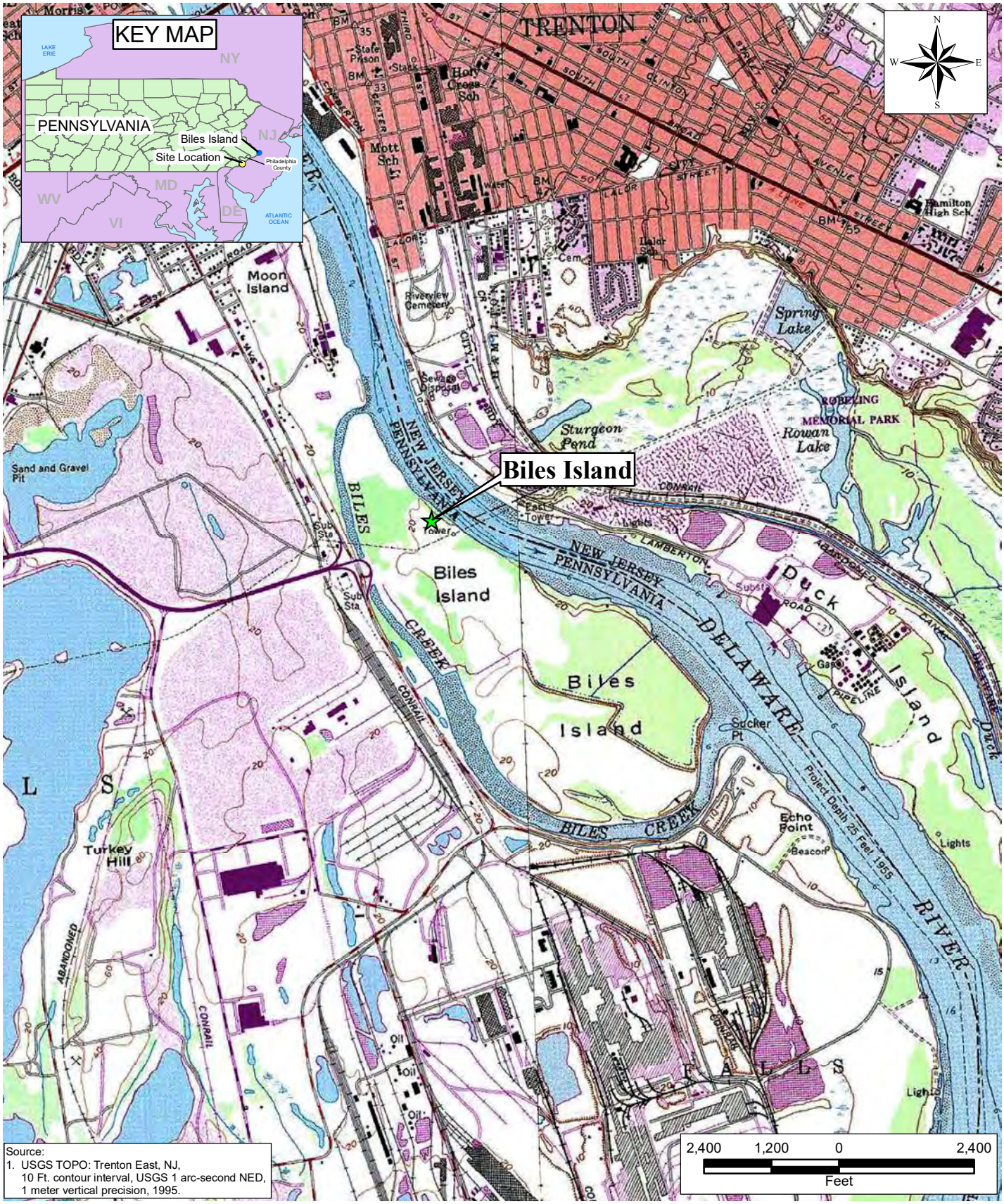
DATE:

March 2022

FIGURE #:

3

P:\Sunoco\GIS\MXD\2016_08_Sunoco_Logistics_Inc\20069_Sunoco_Logistics_Whites_Rehandling_Location.mxd



LEGEND:

★ Biles Island Location

TITLE:

BILES ISLAND
BUCKS COUNTY
FALLS TOWNSHIP, PENNSYLVANIA

PROJECT:

Marcus Hook Terminal

CLIENT NAME:

Energy Transfer

WESTON SOLUTIONS

DATE:

March 2022

FIGURE #:

4

P:\Sunoco\GIS\MXD\2016_08_Sunoco_Logistics_Inc\20070_Sunoco_Logistics_Biles_Island_Location.mxd

Source:
NJ Office of Information Technology, Office of Geographic Information Systems. New Jersey 2015 High Resolution Orthophotography. https://njgin.state.nj.us/NJ_NJGINExplorer/IW.jsp. February 2016.

LEGEND:

Biles Island Location

TITLE:

BILES ISLAND
OFF-LOADING SKETCH
BUCKS COUNTY
FALLS TOWNSHIP, PENNSYLVANIA

PROJECT:

Marcus Hook Terminal

CLIENT NAME:

Energy Transfer

WESTON SOLUTIONS

DATE:

March 2022

FIGURE #:

5

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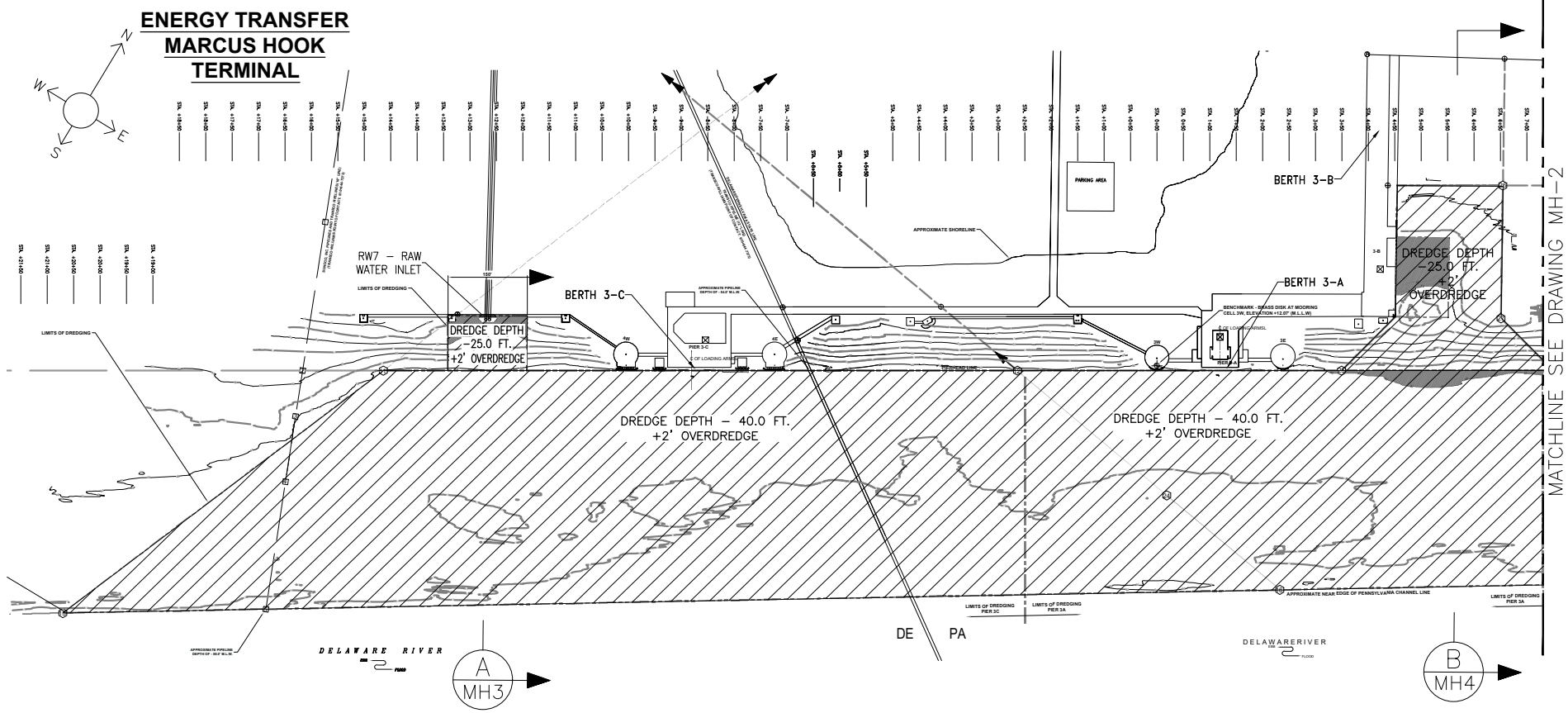
5. Permit Drawings

Permit Drawings

Figure 6: Marcus Hook Terminal – Dredging Plan (West Side)
Figure 7: Marcus Hook Terminal – Dredging Plan (West Side)
Figure 8: Marcus Hook Terminal Cross Sections A and D
Figure 9: Marcus Hook Terminal Cross Section C
Figure 10: Marcus Hook Terminal Cross Section D



150.0' 450.0'

0 300.0' 600.0'

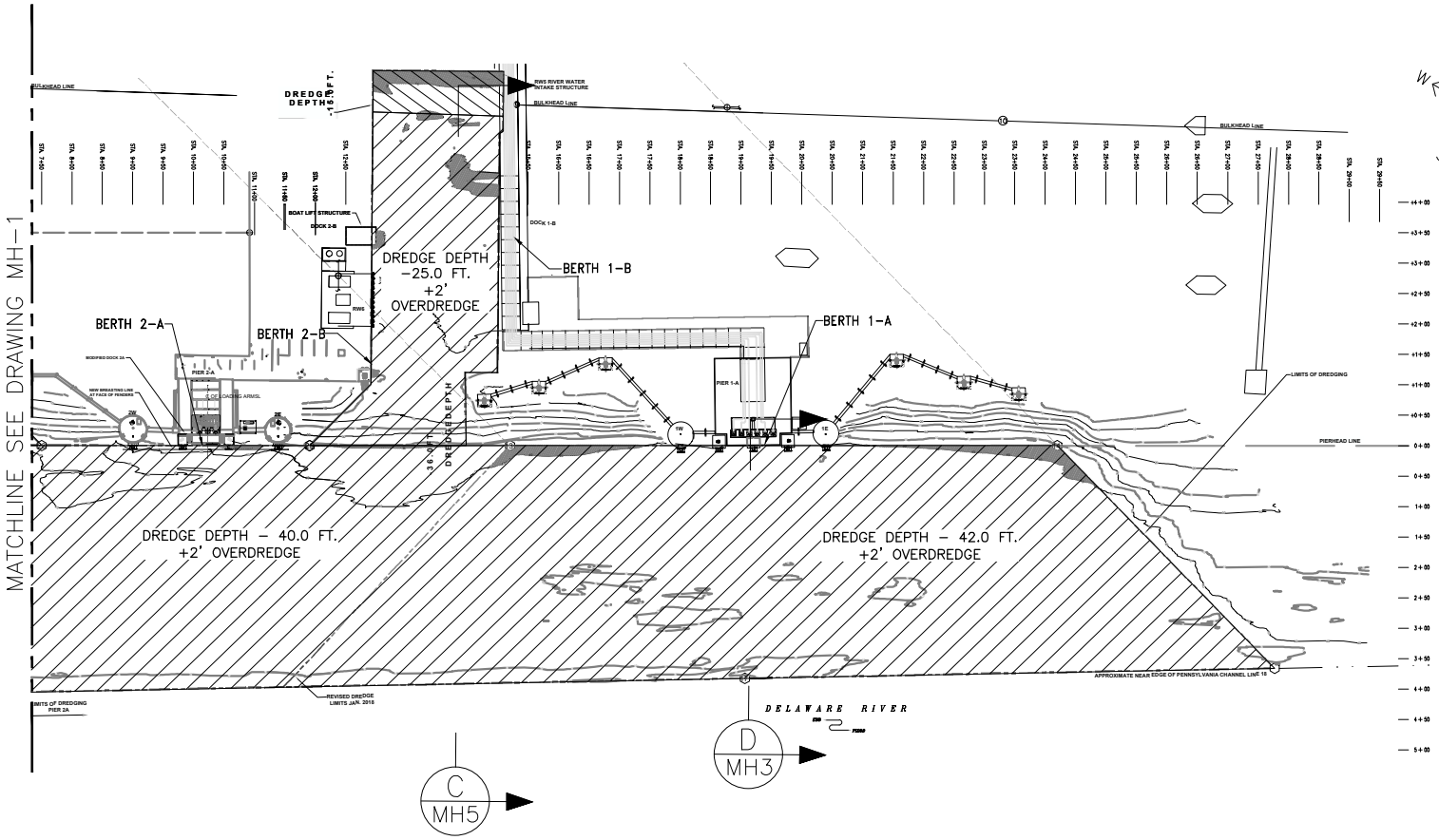
DREDGING PLAN
(WEST SIDE)
MARCUS HOOK TERMINAL

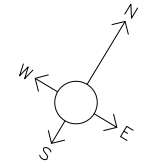
MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

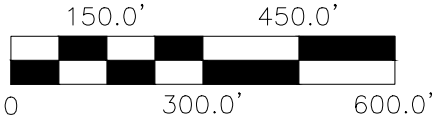
DRAWN E.S.	DATE 3/9/22	DES. ENG. R.B.	DATE 3/9/22	W. O. NO. 15077.003.011
CHECKED D.P.	DATE 3/9/22	APPROVED R.B.	DATE 3/9/22	DWG. NO. MH-1

FILE NO. C:\DP-Projects\15077003011 EnergyTransfer MarcusHook\MH-1_2-2022.dwg





ENERGY TRANSFER
MARCUS HOOK
TERMINAL



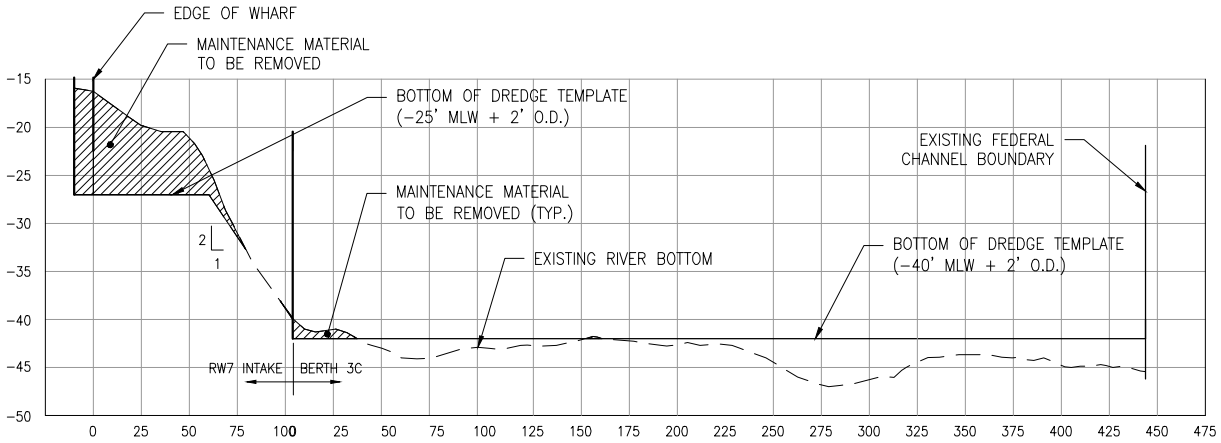
DREDGING PLAN
(EAST SIDE)
MARCUS HOOK TERMINAL

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
E.S.	3/9/22	R.B.	3/9/22	15077.003.011
CHECKED	**DATE**	**APPROVED**	**DATE**	**DWG. NO.**
D.P.	3/9/22	R.B.	3/9/22	MH-2

FILE NO. C:\DP-Projects\15077003011 EnergyTransfer MarcusHook\MH-1_2-2022.dwg

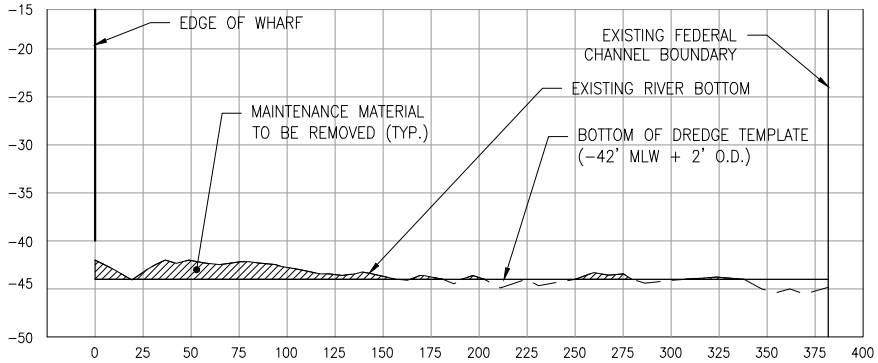


RW7 INTAKE AND BERTH 3C

TYPICAL DREDGING SECTION (A / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'



BERTH 1A

TYPICAL DREDGING SECTION (D / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

HIGHEST RECORDED TIDE 7.34' (NOV 1950)
MEAN HIGHER HIGH TIDE 3.46'
MEAN HIGH TIDE 3.04'
MEAN TIDE LEVEL 0.04'
MEAN LOW TIDE -2.96'
MEAN LOWER TIDE -3.15'
LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

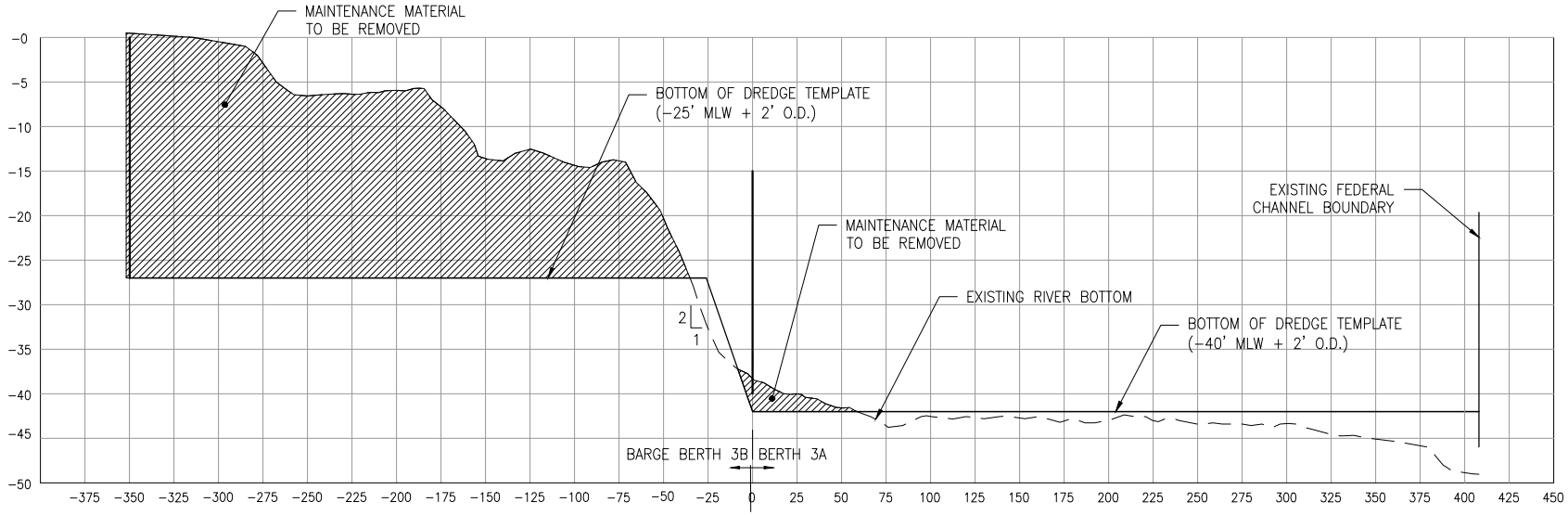
CROSS SECTIONS
MARCUS HOOK TERMINAL
SECTIONS A AND D

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
E.S.	3/9/22	R.B.	3/9/22	15077.003.011
CHECKED	DATE	APPROVED	DATE	DWG. NO.
D.P.	3/9/22	R.B.	3/9/22	MH-3

FILE NO. C:\DP-Projects\15077003011 EnergyTransfer MarcusHook\MH-3_5-2022.dwg



BERTH 3A AND BARGE BERTH 3B

TYPICAL DREDGING SECTION (B / MH-1)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

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100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK TERMINAL
SECTION B

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN	DATE	DES. ENG.	DATE	W. O. NO.
D.P.	3/9/22	R.B.	3/9/22	15077.003.011
CHECKED	DATE	APPROVED	DATE	DWG. NO.
E.S.	3/9/22	R.B.	3/9/22	MH-4

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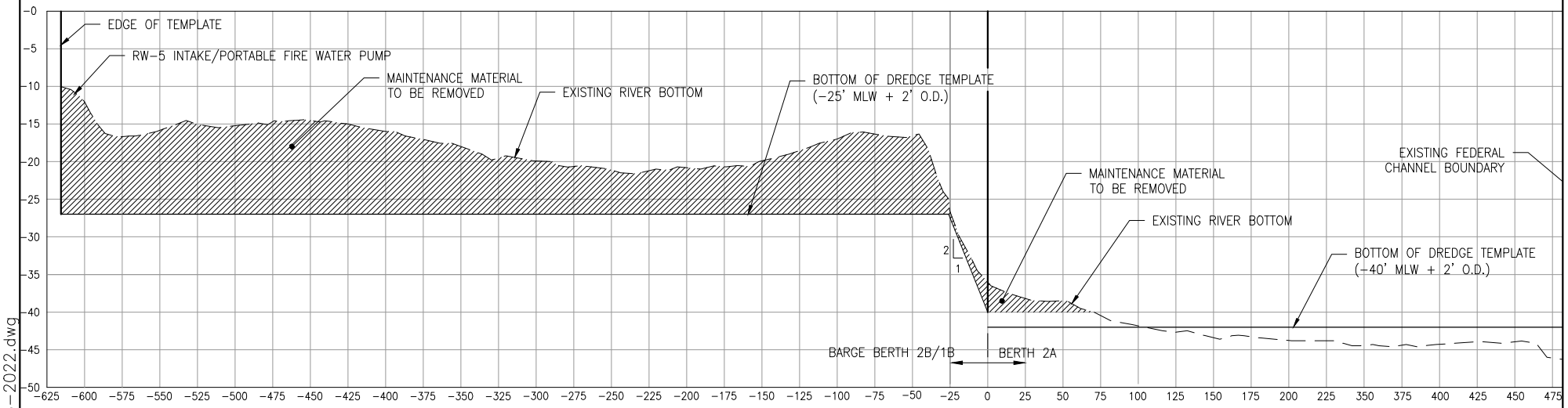

BERTH 2A AND BARGE BERTH 2B/1B/RW-5

TYPICAL DREDGING SECTION (C / MH-2)

HORIZONTAL SCALE = 1"= 100'

VERTICAL SCALE = 1"=20'

WATER LEVEL DATA

THE EXTENT OF TIDAL JURISDICTION IS BASED UPON TIDAL DATA AS FOLLOWS:

SECTION 10 -- MEAN HIGH WATER -- 3.04' NAVD 1988
SECTION 404 – SPRING HIGH WATER – 4.48' NAVD 1988

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION TIDE DATA FOR THE REPORTING STATION CLOSEST TO THE SITE, STATION 8545240, PHILADELPHIA (USCG STATION), DELAWARE RIVER, PA, BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 IS AS FOLLOWS:

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LOWEST RECORDED TIDE -9.96' (DEC 1962)
100 YEAR FLOOD ELEVATION 9.00' (NAVD 88)

CONVERSION OF THE NAVD 1988 GROUND ELEVATIONS TO NGVD 1929 IS +0.98'

CONVERSION OF THE NAVD 1988 TIDAL DATA TO NGVD 1929 IS +1.32'

CROSS SECTIONS
MARCUS HOOK TERMINAL
SECTION C

MARCUS HOOK PENNSYLVANIA

WESTON SOLUTIONS

DRAWN D.P.	DATE 3/9/22	DES. ENG. R.B.	DATE 3/9/22	W. O. NO. 15077.003.011
CHECKED E.S.	DATE 3/9/22	APPROVED R.B.	DATE 3/9/22	DWG. NO. MH-5

FILE NO. C:\DP-Projects\15077003011 EnergyTransfer MarcusHook\MH-3_5-2022.dwg

6. Environmental Questionnaire

MARCUS HOOK TERMINAL
ENVIRONMENTAL QUESTIONNAIRE
PART I

I. Project Description.

The applicant, Energy Transfer, is seeking an Individual Permit to continue previously authorized maintenance dredging activities at the Marcus Hook Terminal (MHT) in Tinicum Township, Philadelphia, Pennsylvania and Brandywine Hundred, New Castle County, Delaware. The MHT is located at 100 Green Street at coordinates 39.809106° North: 75.415767° West. MHT was previously authorized for maintenance dredging in January 2013 under United States Army Corps of Engineers (USACE) Permit No. CENAP-OP-R-2011-0760-46).

A. General Site Location: Accurately locate the project site with respect to State, county or other subdivision and in relation to streams and rivers.

The proposed dredging project will occur at Energy Transfer's MHT located on the western shore of the Delaware River (River Mile 79.2). The MHT is situated along the Delaware River and is located 100 Green Street, Marcus Hook, PA, within the Delaware River at River Mile 79.2, in Tinicum Township, Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware.

B. Specific Site Location: Completely locate the project site with respect to cove, creek, property owner, plot number, etc.

New Jersey State Plane Coordinates of Dredging Site: 356677.542 N and 234871.680 E
Latitude and Longitude: 39°48' 32.796"N and 75°24' 56.88"W
Decimal Latitude and Longitude – 39.809106° North; 75.415767° West.

C. Description of proposed action: Carefully describe the action proposed, including the method of construction and equipment and materials to be used. Detail in your description is important.

The proposed project is the maintenance dredging of approximately 50,000 cubic yards (cy) of material per event approximately every 6 to 12 months, from the berthing areas at the MHT on the Delaware River. This may result in up to total of fifteen (15) events, with a maximum volume of 750,000 cy. The seven berthing areas and two raw water intakes will be dredged to their respective design depths of 20' + 2' to 42'+2' overdredge. Specifically, the berths and intake areas will be dredged to the following specifications:

Table 1. Dredged Areas at Marcus Hook Terminal

Berth	Design Depth	Over Dredge
Berth 3C	40.0'	2.0'
Berth 3A	40.0'	2.0'
Berth 2A	40.0'	2.0'
Berth 1A	42.0'	2.0'
Berth 3B	20.0'	2.0'
Berth 2B	20.0'	2.0'
Berth 1B	20.0'	2.0'
RW7	20.0'	2.0'
RW5	20.0'	2.0'

The water quality and sediment material at the site are anticipated to be consistent with those of previous maintenance dredging efforts based on the high level of consistency in the physical and chemical characteristics of dredged material from this location that has been characterized previously.

Dredging will be conducted by mechanical dredge, with disposal pending on which certified disposal facility is available at the time of the dredging event. No hydraulic dredging is proposed. Proposed dredging methods and disposal locations are as follows:

Clamshell Dredging: Two disposal facilities are proposed for disposal of sediment material dredged via mechanical (clamshell) dredge. Both facilities are permitted and authorized for the disposal of dredged sediment material. The preferred disposal location is White's Basin and associated upland disposal facility located in Logan Township, New Jersey. At White's Rehandling Basin, sediment material would be removed via mechanical dredge, transported via watertight barge to White's Rehandling Basin, bottom-dumped into White's Basin subaqueous disposal pit. When the basin is pumped out, sediments will ultimately be hydraulically pumped into an upland CDF. The alternate dredged material disposal location is Bile's Island, located in Falls Township, Bucks County, PA, at approximately River Mile 128 on the Delaware River. At the Biles Island site, sediment material would be dredged via mechanical dredge, barged approximately 52 miles upriver to Biles Island, then pumped upland via a hydraulic unloader directly into the upland CDF. Figures of each of these confined disposal facilities are attached to this permit renewal application.

D. Purpose of Proposed Action: Define the purpose of the proposed structure or work.

The purpose of the proposed action is to maintain safe berthing areas at MHT.

E. Submit color photographs of the site, with explanations of the views shown (prints only).

See enclosed site photographs.

PART II - ENVIRONMENTAL IMPACT CHECKLIST			
ENVIRONMENTAL IMPACT	YES	NO	QUALIFYING REMARKS
A. PHYSICAL			
1. TOPOGRAPHY	X		The proposed project is maintenance dredging of existing berths. All dock areas but Berth 1A have previously been dredged to their maximum permitted depth plus two foot overdredge. Berth 1A is proposed for deepening the dredge depth by 2 feet from 40' to 42' plus two foot overdredge.
2. GEOLOGICAL ELEMENTS AND LEACHING		X	Sediments are characterized through cores collected and analyzed prior to dredging. Results are evaluated through the state's 401 water quality certificate application process.
3. AIR		X	
4. TRANSPORTATION		X	Sediments are transported via barge for clamshell dredging events.
5. HANDLING OF HAZARDOUS MATERIALS		X	Historical and recent sampling at Energy Transfer's MHT indicates material is non-hazardous. Chemical and physical sampling is required as part of all 401 WQC applications.
6. SPOIL DISPOSAL	X		All disposal of dredged material spoils will occur in Confined Disposal Facilities (CDF) specifically designed to dewater and store sediments. Disposal location for each event is permitted via appropriate Water Quality Certificates. Each CDF has additional permits for operation, protection of water quality, and protection of groundwater.
7. SEWAGE AND SOLID WASTES		X	
8. WATER RESOURCES			
a. WATER QUALITY	X		Turbidity and suspended sediment levels do temporarily increase in the immediate vicinity of the dredging template during dredging event. However, dredging events will only occur during the allowable dredging windows to minimize the effects to spawning and migrating fish in the Delaware River.
b. HYDROGRAPHY, CIRCULATION, LITTORAL DRIFT		X	The proposed dredging projects will not impact the hydrography, circulation, and littoral drift for several reasons. The same dredging area and depths (template) will be maintained as the previous 50+ years with the exception of the deepening of Berth 1A from 40' to 42'. These dredging projects are short-term, on the order of weeks, and no equipment is permanently placed in the river. The zone of dredging is narrow relative to the wide width of the Delaware River at RM 79.
c. GROUND WATER		X	Groundwater monitoring wells have been installed and are monitored at the upland CDF associated with White's Basin and Biles Island.
B. BIOLOGICAL			
1. VEGETATION			
a. TERRESTRIAL		X	N/A
b. AQUATIC		X	No aquatic vegetation exists in the area to be dredged. The dredged areas are all below the photic zone.
2. FISH AND WILDLIFE			
a. MAMMALS		X	No significant impacts are expected. Areas to be dredged are not known to be utilized by mammals.

b. BIRDS		X	No significant impacts are expected. The areas to be dredged are not foraging areas for birds.
c. AMPHIBIANS		X	N/A
d. REPTILES		X	N/A
e. FISH		X	Dredging restrictions during the spawning and migrating period of anadromous fish will be followed. Previously, different environmental windows were used for clamshell dredging. These windows are currently under review by regulatory agencies. Energy Transfer and its dredging contractors will adhere to the latest promulgated dredging windows in its dredging permit.
f. SHELLFISH		X	No significant impacts expected. There are no shellfish beds in the areas to be dredged.
g. INVERTEBRATES		X	No significant impacts expected.
3. RARE OR ENDANGERED SPECIES		X	Two species of special concern are potentially located in the project area: 1) Shortnose sturgeon (*Acipenser brevirostrum)* and 2) Atlantic sturgeon *(Acipenser oxyrinchus)*. Energy Transfer will adhere to the specified environmental dredging windows to minimize impacts to these species during spawning and migration. These species utilize shallow mud flats with aquatic vegetation and lower flow rates for spawning further upriver (Philadelphia to Trenton). The proposed project area does not contain suitable spawning habitat for sturgeon. Other NOAA species of special concern in the Delaware River are also known to utilize shallow waters for spawning. This type of habitat does not occur within the dredging template.

ENVIRONMENTAL IMPACT	YES	NO	QUALIFYING REMARKS
C. CULTURAL			
1. LAND USE		X	Both proposed sediment disposal locations (Biles Island, and White's Basin) are currently used as dredged sediment disposal facilities. White's Basin Subaqueous Disposal Facility is also currently used for dredged sediment disposal. Additionally, all areas to be dredged have been historically dredged and permitted for such activity. No changes in land use will occur.
2. POPULATION DENSITY AND TRENDS		X	N/A
3. REGIONAL DEVELOPMENT		X	N/A
4. HISTORIC PLACES		X	N/A
5. ARCHAEOLOGICAL SITES		X	No archaeological sites are located within the dredging or disposal areas. Further, all sites have been used for industrial use for over 50 years.
6. AESTHETICS		X	No residential areas are located in close proximity to either the dredging or disposal sites.
7. UTILITIES		X	N/A
8. TRANSPORTATION SYSTEMS		X	N/A
9. RECREATION		X	N/A
10. PUBLIC HEALTH		X	Dredged material is non-hazardous material. Sediments are characterized prior to each removal to verify composition. Sediments are disposed in designated CDFs and do not pose any threat to public health.
D. OTHER FACTORS			
1. SECONDARY EFFECTS		X	
2. CONTROVERSIALITY		X	This application is for an activity that has been previously authorized.
3. IS SIGNIFICANT DREDGING INVOLVED?	X		Maintenance dredging is performed as needed, approximately every 6 to 12 months. Dredging volumes have historically varied per event, depending on sedimentation rates in the Delaware River. The previous maximum dredging event volume was approximately 170,000 cy. Dredge volumes in the past five years have been lower. This project involves no new dredging areas or new depths. Total amount of material to be dredged over the next 10 years is not expected to exceed 750,000 cy.
4. IS SIGNIFICANT FILLING INVOLVED?		X	No filling is involved.

PART III

CONSIDERATIONS OF A DREDGING PROPOSAL

A. Describe characteristics and locations of the proposed dredged material disposal site.

The proposed dredge disposal sites are the White's Basin and upland CDF, Bile's Island. Both proposed locations have been historically used as and are used currently as dredged materials management areas. Weeks Marine operates White's Basin. Waste Management owns and operates Bile's Island. Upland sites are large open areas enclosed by earthen berms. Dredged material placed into the sites dewaters by decanting and evaporation. In addition, sediments placed in the upland CDF associated with White's Basin is dewatered by decanting, the discharge of which is regulated through a New Jersey 401 WQC issued to the USACE which contains limits for TSS and certain metals.

B. Is there a comprehensive plan for disposal sites which take into account the accumulative effect over time and the decreasing amount of suitable sites for disposal?

At this time, a comprehensive regional plan evaluating anticipated dredging frequency and volumes relative to available confined disposal capacity has not been created for the Delaware River Basin. However, regional long-term dredging needs and available CDF capacity were evaluated throughout the permitting and review process associated with the Delaware River Channel Deepening Project. Energy Transfer also regularly attends the Maritime Exchange Private Berth Dredging Committee meetings in order to stay informed on regional dredging issues. These meetings are attended by all dredging-related stakeholders, including representatives from state regulatory agencies, private and public entities that need to perform dredging, USACE, and others.

Energy Transfer engages in long-term planning for dredged material management and participates in the Regional Sediment Management Workshops. Energy Transfer completed a Dredged Material Management Plan (DMMP) in 2011 for its own five Delaware River Basin facilities, which evaluates its own dredging needs over time and various disposal locations and potential beneficial use opportunities. This evaluation emphasized the need to facilitate beneficial use of dredged material from existing CDFs in order to maintain adequate capacity at disposal sites. Furthermore, Energy Transfer also preliminarily evaluated the possibility of purchasing/leasing a former dredged material disposal site and creating its own disposal area for dredged material. The DMMP concluded that a Feasibility Study of this alternative should be conducted and continues to pursue this option even though operation of such a facility is outside Energy Transfer' core refining mission.

Also, due to economic and operational considerations, Energy Transfer limits maintenance dredging to where and when it is necessary in order to provide safe berthing depths at the refinery and to those berthing areas that are required for the needs of the business.

C. Describe the present land use of the disposal site.

The proposed disposal locations are currently confined disposal facilities, specifically designed to store and dewater dredged material.

D. Describe characteristics of the material to be disposed including:

1. Physical nature of material (i.e. sand, silt, clay, etc.). Give percentages of the various fractions if available.

Based on historical and recent sampling results at Energy Transfer MHT, the material is expected to be primarily fine-grained material (silt and clay with some fine sands and trace gravels).

2. Chemical Composition of Material: Many areas, especially marinas, highly industrialized areas, etc., have sediments with high concentrations of pollutants (chemicals, organic material, etc.). These materials may be re-suspended or reintroduced into the water and result in serious environmental damage. If your proposed dredging is in an area such as described above, a chemical analysis of the material to be dredged should be provided.

Approximately 12 sediment cores are proposed for collection within the dredging template at MHT as part of sediment characterization efforts planned for May 2022. These sediments will be collected as part of Sediment Characterization Reports and submitted to NJDEP and/or PADEP as part of 401 Water Quality Certificate (WQC) applications for dredging.

Sediments will be tested for grain size distribution, metals, semivolatiles, PCBs, pesticides, and cyanide. The sediment sample results will be compared with New Jersey Non-residential Soil Cleanup Ingestion/Dermal and Inhalation Standards as part of NJDEP 401 WQC applications.

3. Dewatering properties of material to be disposed.

The dewatering properties of the material will be similar to the material currently being placed into the proposed disposal locations by USACE from shipping channel maintenance dredging, as well as the prior maintenance dredging operations at the MHT site over the past 10+ years in the Delaware River.

4 Compatibility of material settling rates of material to be disposed.

All characteristics, including settling rates, of dredged sediments from MHT are compatible with dredged material currently being placed at the site by USACE during the shipping channel maintenance dredging, as well as the prior maintenance dredging operations at the MHT site over the past 10+ years in the Delaware River. MHT berthing areas are adjacent to the federal navigation channel.

5. Dredging and disposal schedule to insure that operations do not degrade water quality during times of anadromous fish migration.

Energy Transfer will comply with the dredging restrictions imposed by USACE in order to protect aquatic life.

E. When the project involves land disposal discuss the following:

1. Method of disposal to be utilized, i.e., pipeline discharge, barge, hopper (underway or stationary)

Please see description provided in Question 1.C.

2. Describe method of dredged material containment (i.e., embankment, behind bulkhead, etc.).

The upland CDF adjacent to White's Basin uses a stone and earthen dike revetment as the method of containment. Bile's Island uses earthen embankments as the method of containment.

3. What type of leachates will be produced from the spoil material and what is planned for protection of the groundwater?

The leachates would be expected to be very similar to those at White's Basin from current maintenance dredging materials removed from USACE shipping channel dredging, as well as the prior maintenance dredging operations at the MHT site over the

past 10+ years on the Delaware River. Bulk sediment characterization efforts described above have verified that the dredged sediments are not hazardous.

4. Methods to insure that spoil water does not adversely affect water quality both during construction and after completion of the project.

Normal dredging restrictions and precautions would apply. No clamshell dredging will occur during the most recently promulgated dredging windows to minimize impacts aquatic life during their spawning period.

5. Provisions for monitoring during discharge – water quality, sediment transport, precautions to prevent "short" circuiting dumping.

Normal maintenance dredging precautions and disposal site inflow procedures would apply. The CDF operators are required to monitor discharge and report results to USACE and NJDEP (White's Basin) or PADEP (Biles Island) as part of the 401 WQC for each facility. Discharge Water Quality has historically been well within the limits established by the WQC.

F. Consider and discuss the following for water disposal:

1. Describe methods to be used for water disposal, including volumes and site selection.

No permanent aqueous disposal is proposed as part of this application.

Temporary aqueous disposal occurs in one of the two proposed scenarios, environmental clamshell dredging with disposal at White's Basin. In this case only, dredged material will be transported to White's Basin via watertight barge and bottom-dumped into the subaqueous disposal pit in the Delaware River. The material will then be re-handled and moved to an upland CDF. NJDEP requires the operator of White's Basin to monitor surface water and groundwater at the CDF. The surface water discharge is monitored via a 401 WQC; groundwater is monitored via monitoring wells. The volume of material and associated water varies by event.

2. Describe the existing water characteristics at the site, including chemical analysis for water quality

Water quality at the docks (dredging sites) is consistent with water quality in the Delaware River since the docks are hydraulically connected to the river. Water quality at White's Basin (disposal site) is conducted by the operator of White's Basin as a condition of their WQC.

G. Discuss the frequency and amount of maintenance dredging which will be required; discuss the resulting impacts.

The frequency of the maintenance dredging is anticipated to be once every 6 to 12 months with volumes of up to 50,000 cubic yards per event. Maintenance dredging is strictly performed on an "as-needed" basis. Energy Transfer completed a Dredge Material Management Plan (DMMP) in summer 2011. The long-term plan is examining beneficial reuse scenarios in which it evaluated the advantages, disadvantages, and costs associated various sediment removal methods and disposal areas.

H. Alternatives

1. Discuss all alternatives to the project including the no action alternative.

"No Action" is not a feasible alternative. Maintenance dredging is critical to providing safe berthing depths and continued operations. Alternate site locations for the berthing areas are also not feasible since the proposed project is maintenance dredging of existing berthing areas. If dredging does not occur, the berthing areas would eventually fill with sediment material.

2. Discuss alternative types and methods of dredging and disposal, such as pipeline discharge, barging, or hopper method.

Two types of dredging have been proposed in this application, 1) clamshell dredging with barge transport (White's Basin disposal); and 2) clamshell dredging with sealed scow transport (Bile's Island).

3. Discuss alternatives to dredging.

   There are no alternatives to dredging since sediments must be removed from the berthing areas.

4. Discuss alternative areas of sites for spoil disposal.

   Two alternative sites have been proposed for soil disposal in this application: White's Basin and Biles Island. In addition to these locations, opportunities for beneficial use of sediments will continue to be pursued. Several beneficial use options were evaluated in Energy Transfer' Dredged Material Management Plan.

5. Discuss impact of port docking patterns upon the demand for dredging. Can alternative patterns reduce the amount of dredging required to support port operations?

   Energy Transfer has examined its dock patterns in conjunction with the needs of the business for the MHT and at this time needs access to all berthing areas. As part of the long-term dredging plan, Energy Transfer will continue to periodically review alternative docking patterns in order to further minimize the amount of dredging required.

6. Suggest alternative means of construction which would prevent or minimize water quality degradation using EPA standards for guidance.

   Not applicable to maintenance dredging activities since there is no construction as part of the proposed project. Regarding the dredging, Energy Transfer' contractors will use environmental buckets when clamshell dredges are used, if feasible. Energy Transfer evaluated the possibility of using silt curtains to minimize suspended sediments during dredging. Unfortunately, the high flow rates in the Delaware River preclude the use of this technique. Silt curtains are better suited for lower energy waterways.

7. State in detail impacts resulting in alternative locations for the proposed project.

   Alternative locations are not practical to these maintenance dredging activities.

PART IV

CONSIDERATIONS OF A FILLING PROPOSAL:

THIS SECTION IS NOT APPLICABLE. NO FILLING ACTIVITIES ARE PROPOSED.

A. Describe in detail the existing characteristics of the area proposed for filling (i.e., aquatic area, marsh, mudflat, swamp, etc.). In your description be sure to include the types of vegetation present and the types of animals that use the area. (Provide photographs.)

Not applicable – no filling to occur.

B. Give the following information in regard to the project size: **Not applicable – no filling to occur.**

1. Total area to be filled.
2. Size of underwater area to be filled.
3. Area of intertidal zone to be filled.
4. Area of wetlands to be filled.
5. Proposed height of fill.
6. Volume of material that will be used in filling.

C. Describe in detail the material to be used as fill including as follows: **Not applicable – no filling to occur.**

1. Type of fill to be used (sand, stone, rubble, etc.). If the material is a composite (i.e., rubble), list the types of materials it will contain.
2. Give the specific location of the source of this material.
3. What types of leachates will be produced from the fill material and what is planned for protection of surface and groundwater

D. Carefully describe the method of fill, including the following: **Not applicable – no filling to occur.**

1. Method of fill placement including equipment used in deposition and grading.
2. Method of stabilization of banks from erosion, sloughing, wave action, boat wakes, etc.
3. Method of stabilization of the surface of the fill.
4. Length of time needed for completion of the project. State if filling will be continuous, intermittent, etc.
5. Method of controlling turbidity when filling an underwater area.

E. Purpose of the Project **Not applicable – no filling to occur.**

1. What is the intended use of the filled area?
2. What structures, if any, will be constructed on the fill?
3. What benefits would you gain from the proposed fill?

F. Alternatives **Not applicable – no filling to occur.**

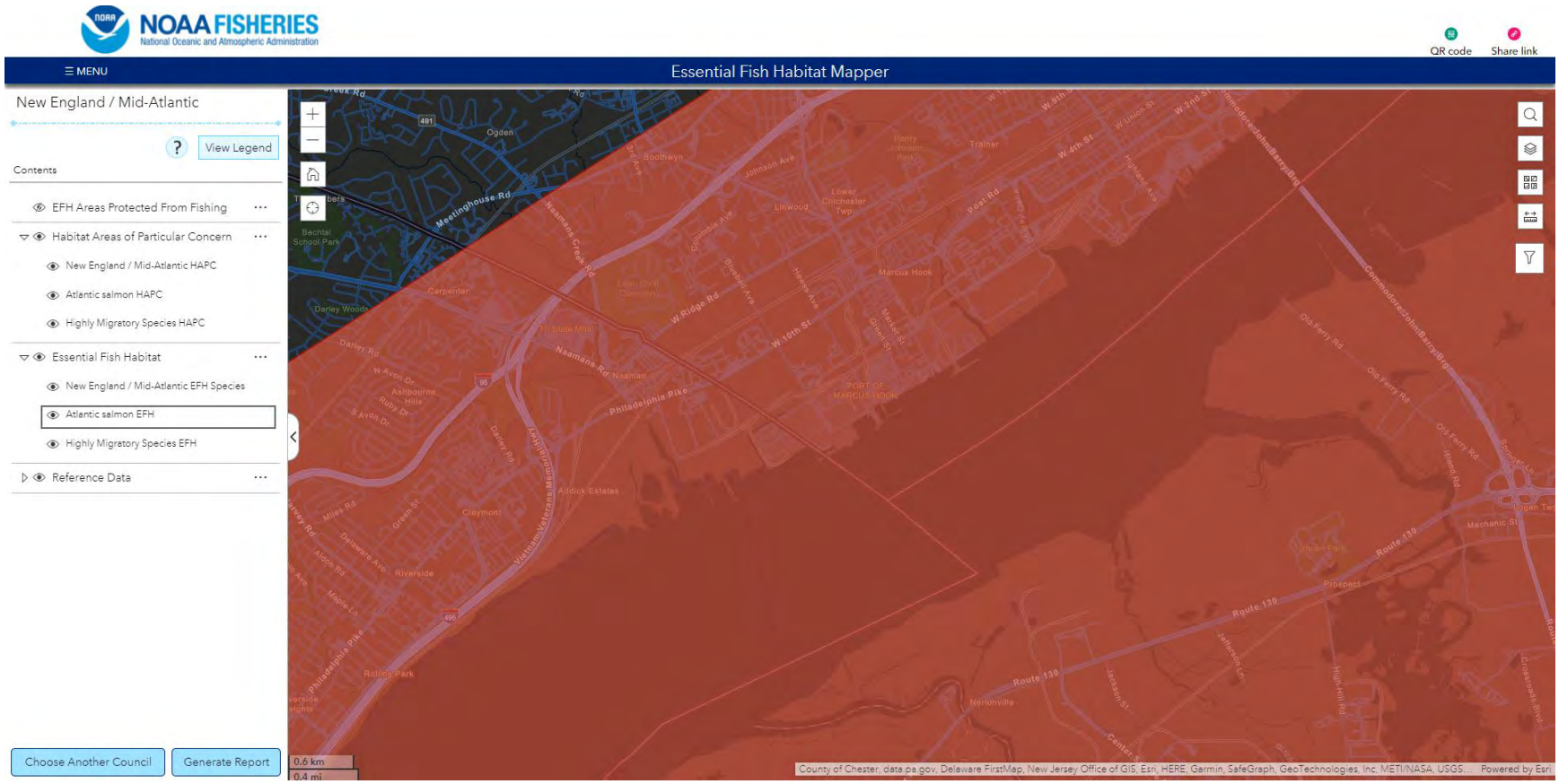
1. Discuss the “no action” alternative and how this would affect your present and future plans for the development of the area.

2. Discuss alternative locations for the proposed fill.

3. Discuss the use of elevated structures (i.e., causeways, elevated platforms, etc.) in place of the proposed fill.

4. Discuss any other alternatives you have considered prior to formulating the presently submitted proposal.

7. Essential Fish Habitat



NOAA Fisheries Mid-Atlantic Habitat Areas of Particular Concern and Essential Fish Habitat both exist at the Energy Transfer Marcus Hook Terminal based on the seasonal presence of Atlantic and Shortnose Sturgeon.

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 39º 48' 26" N, Longitude = 76º 35' 0" W
Decimal Degrees: Latitude = 39.807, Longitude = -75.417

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

***** W A R N I N G *****

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH

Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
		Little Skate	Juvenile Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
		Atlantic Herring	Juvenile Adult	New England	Amendment 3 to the Atlantic Herring FMP
		Red Hake	Adult	New England	Amendment 14 to the Northeast Multispecies FMP
		Windowpane Flounder	Adult Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
		Winter Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
		Clearnose Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
		Longfin Inshore Squid	Eggs	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
		Bluefish	Adult Juvenile	Mid-Atlantic	Bluefish
		Atlantic Butterfish	Larvae Adult	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
		Scup	Juvenile Adult	Mid-Atlantic	Summer Flounder, Scup, Black Sea Bass
		Summer Flounder	Juvenile Adult	Mid-Atlantic	Summer Flounder, Scup, Black Sea Bass
		Black Sea Bass	Juvenile Adult	Mid-Atlantic	Summer Flounder, Scup, Black Sea Bass

Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. ****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**
All spatial data is currently available for the Mid-Atlantic and New England councils, **Secretarial EFH**, Bigeye Sand Tiger Shark, Bigeye Sixgill Shark, Caribbean Sharpnose Shark, Galapagos Shark, Narrowtooth Shark, Sevengill Shark, Sixgill Shark, Smooth Hammerhead Shark, Smalltail Shark

8. Section 7 Consultation

SUBJECT: CENAP-OP-R-2011-0760-46
ENERGY TRANSFER MARCUS HOOK INDUSTRIAL COMPLEX
NLAA Concurrence Request for Mechanical Maintenance Dredging

This District 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). This document contains the Corps' determination with respect to Section 7 of the Endangered Species Act (ESA), including a request for concurrence from the National Marine Fisheries Service (NMFS). We have made the determination that the proposed activity may affect, but is not likely to adversely affect, any species listed as threatened or endangered by the NMFS or their critical habitat under the ESA of 1973, as amended. Our supporting analysis is provided below.

WATERWAY: Delaware River

LOCATION: The proposed dredging is located at the Marcus Hook Industrial Complex at 100 Green Street, Marcus Hook, PA, within the Delaware River at River Mile 79.0, in Tinicum Township, Delaware County, Pennsylvania and Brandywine Hundred, New Castle County, Delaware. [Latitude: 39.809106° North; Longitude: 75.415767° West]

The proposed dredged material disposal site is located at either Whites Basin (preferred), within and adjacent to the Delaware River at River Mile 82.4, and immediately upstream of the Commodore Barry Bridge (U.S. Route 322) in Logan Township, Gloucester County, New Jersey; [Latitude: 39.82568° North; Longitude: 75.35844° West] or at Biles Island (alternate), adjacent to the Delaware River at River Mile 130.9, and approximately 2.5 miles downstream of the U.S. 1 Bridge in Falls Township, Bucks County, Pennsylvania. [Latitude: 40.17856° North; Longitude: 74.74708° West]

Location maps for the proposed dredging and disposal sites are included.

ACTIVITY: The applicant proposes to perform maintenance dredging of Berths 1A, 1B, 2A, 2B, 3A, 3B, 3C, Water Intakes RW-5 and RW-7, and a firewater intake area adjacent to RW-5, including 10 years of maintenance dredging. Dredging would be by mechanical or bucket method, within an area encompassing a maximum of 47 acres (total for all berth and water intake areas). The proposed initial dredging volume would be 50,000 cubic yards, to a depth of -35.0' MLLW with an additional 2 feet of allowable over-dredge for a total proposed depth range from -20.0' MLLW (-22.21 feet below mean low water) to -42.0' MLLW (-44.21 feet below mean low water. The applicant anticipates a maximum of fifteen additional dredging events within 10 years (following the initial event), with an average of 50,000 cubic yards for each such event.

All dredged material would be transported by water-tight scows to one of the indicated disposal sites. At the Whites Basin disposal facility in Logan Township, material would be bottom-dumped within the existing rehandling basin for subsequent hydraulic pumping to the adjacent upland confined disposal facility. At Biles Island, material would be hydraulically unloaded into the disposal facility. The applicant has stated, and numerous sediment sampling events have documented that the sediments to be dredged are primarily comprised of silt/clay material with some sand.

This office previously issued a 10-year maintenance dredging permit to the owner of this facility on January 27, 2014 (Corps permit CENAP-OP-R-2011-0760-46). Operation of the Whites Basin disposal facility is currently authorized under Corps permit CENAP-OP-R-2013-00696-46.

All dredging would be subject to a seasonal restriction, which would prohibit dredging from March 15 through June 30, inclusive, of any year in order to protect anadromous fish spawning and migration activities. It is included as a proposed conservation recommendation as part of our Essential Fish Habitat consultation with NMFS (Habitat Conservation Division).

PURPOSE: The applicant's stated project purpose is to ensure the continued successful operation of these three docks.

Additional Project Information:

- Anticipated starting date: Initial anticipated summer 2022.
- Duration of project: Approximately 20 days (per event), assuming up to 5,000 CY per day.
- Applicable time of year restriction: Bucket dredging prohibited March 15 to June 30.

Describe all activities to be carried out:

- Include any mitigation/minimization measures proposed as part of the action (special permit conditions, restrictions on equipment, time of year)
- If silt curtains or cofferdams, describe: no silt curtain or cofferdam proposed.
- If dredging, include the following information:
    - Dredge type: environmental clamshell bucket.
    - Volume of material to be removed: 50,000 CY initial; up to 700,000 CY more.
    - Authorized dimensions of channel and/or depths to be restored: -17.21' MLLW to -44.21 MLLW.
    - Disposal location and estimate of number of trips: approximately 3 miles up-river (Whites Basin) or 52 miles upstream (Biles Island); would require approximately 25 scow trips.
    - If maintenance is included, indicate the frequency and location of disposal: up to fifteen additional events in 10 years; same disposal location.
    - Time of year proposed and future time of year restrictions: same restriction.
- Duration of work: approximately 14 days (per dredging event).
- If pile driving, include the following information: N/A.
- Estimate of sediment plume size, duration and characteristics for any sediment disturbing activity: elevated suspended sediment levels of up to 445 mg/L may be present in the immediate vicinity of the clamshell bucket, and suspended sediment levels of up to 191 mg/L could be present within a 2,000 foot radius from the location of the clamshell dredge.
- If NPDES, include: N/A.

- If there will be project vessels: vessels will include two (2) hopper barges (scows), the clamshell dredge on a work barge, and two (2) tug vessels. The hopper barges will be 4,000 CY split-hull barges, 240' L x 54' W x 22' H in size. Their light (unloaded) draft is 3-5' and the loaded draft is 11-12'. The dredge barge is 158' (L) x 60' W x 12' H in size, with a draft of 7'. The tow tug boat is 71.5 x 26' in size with a draft of 7.4'. The tender tug barge is 69' x 26' in size with a maximum draft of 9.6'. The vessel speed is 6 knots in transit to the disposal site.
    - Approximate size and type of vessel: see above.
    - Available information on speed: up to 6 knots.
    - Travel routes: in designated federal navigation channel for transit, approximately 3 miles up-river (Whites Basin) or 52 miles up-river (Biles Island); otherwise, vessel operation within and immediately adjacent to dredge area while working.
    - Number of trips: approximately 24.
    - Presence of lookout: no.
- If in-water or over-water structures:
    - Describe the size of the structure and how it will be constructed/installed: no new structures.
- If aquaculture: N/A.
- If rip-rap or other material being placed on shoreline or bottom, provide description of type of material and how it will be placed (e.g., small rocks by hand): N/A.

Description of the Action Area and Its Habitat:

The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR § 402.02). For this project, the action area includes the proposed dredging area and the underwater area where effects of dredging will occur due to habitat alteration and an increase in suspended sediment; the transportation route of the dredged material within the Delaware River; and the existing rehandling basin at Whites Basin (Biles Island is an upland, confined disposal facility).

Project activities used to define the action area include dredging, transport of sediment, and disposal of sediment. The proposed dredge areas are situated along seven docks and 2 water intake areas and are used by vessels to access the seven docks. The areas will be modified to allow for safe berthing. Analyses of conventional mechanical clamshell bucket dredging operations have shown elevated suspended sediment levels may be present in the immediate vicinity of the clamshell bucket, and within a 2,000 foot radius from the location of the clamshell dredge (USACE 2001, Burton, 1993). As such, the action area includes the waters of the Delaware River, within the proposed dredging area and up to 2,000 feet away (subject to the ebb and flow of the tide), where turbidity impacts are expected to occur.

The dredged material will be transported by barges to the Weeks Marine Whites Basin for rehandling and upland disposal or to Biles Island for upland disposal. Transport and docking of the scows/barges could result in vessel strikes of sturgeon fish. Thus, in addition to the dredging area and additional potential turbidity area, the action area includes the navigation or ship channel from the dredge site up-river 3 miles to, and including, the Weeks Marine Whites Basin,

or from the dredge site up-river 52 miles to, and including, Biles Island. These areas together are expected to encompass all of the direct and indirect effects of the proposed action.

The discharge of dredged material into Whites Basin, and the subsequent pumping of the material to the upland disposal site, has been separately reviewed and approved previously (see Department of the Army individual permit CENAP-OP-R-2011-0760-46). That permit authorizes rehandling and disposal operations for any and all dredged material generated within the Delaware and Schuylkill Rivers. It is not exclusively authorized only for the Weeks Marine "blanket" dredging permit sites (see CENAP-OP-R-2013-00695-46). Since sediment disposal enters into determination of action area, and the vessels need to enter the Whites Basin as part of the transport, that area was included in the action area in order to account for potential vessel impacts. While the actual disposal operations have been specifically reviewed and approved separately, further review and consideration of that activity is included herein. We note that this permit application is for dredging only, pursuant to Section 10 of the Rivers and Harbors Act. There is no review or authority under Section 404 of the Clean Water Act (CWA) for this application, as the applicant has no control over those operations, which are separately approved and carried out by Weeks Marine in combination with their handling of dredged material from other sites, and it is not possible to separate out this material for this analysis. All material re-handled in the basin is subject to testing requirements by the State of New Jersey, and must receive an individual Section 401 (CWA) Water Quality Certificate prior to such rehandling.

The proposed dredging project and action area are located within the tidal portion of the Delaware River, in an area of active port facilities and an adjacent maintained major federal navigation channel, which is currently being deepened to 45 feet. Habitat in the dredging area can be described as estuarine freshwater subtidal with water depths ranging from -20 MLW to -42 MLW. The mean tidal range at this location is approximately 6.25 feet (MHW to MLW). The site has dredged at least annually over the past 10 years. The dredge area has been the access area to the docks since at least the 1960s. The applicant has determined that the sediment can be characterized as mostly silt and clay material with some sand.

Vessel use would be limited to the barges (including scows) and tugs identified above, both working in and around the dredging area as well as transiting the federal navigation channel of the Delaware River to and from the disposal site. For the transportation of the dredged material to the disposal site, the portion of river being traversed is heavily and constantly used by large commercial vessels (e.g. tug boats, freight barges, container ships, and oil tankers) as well as recreation vessels of varying sizes. The river is surrounded by large port facilities of Philadelphia and Camden as well as large petroleum refineries in Camden and Gloucester Counties (New Jersey) and Delaware County (Pennsylvania).

The Delaware River is approximately ¾ of a mile to 1 mile wide from the dredging site down-river to the disposal site. In all, the action area includes approximately 3 river miles (Whites Basin) or 52 river miles (Biles Island) of the Delaware River channel within the federal navigation channel (or ship channel, 800 feet wide in this reach, not counting various designated anchorages) for a navigable impact area within the ship channel of approximately 0.54 square miles (roughly 350 acres for Whites Basin) or 7.9 square miles (roughly 5,000 acres for Biles Island) for transport, plus 47 acres of open waters at the dredge site for actual dredging and

equipment movement, the 80-acre Whites Basin (Biles Island is an upland, confined disposal facility), and approximately 200 acres of open water for potential turbidity plume (based on a 2000' radius as described in "Water Quality Effects").

As noted above, the Delaware River at the project area is primarily used for heavy commercial ship navigation to facilities upstream and downstream. No floodplain access, important to supporting forage for young of the year sturgeon, is available to the sturgeon due to large riprap and elevation change between the river and the adjacent uplands along the river between dredging and disposal sites. There are no known shellfish beds or submerged aquatic vegetation areas.

NMFS Listed Species and Critical Habitat in the Action Area:

Shortnose Sturgeon

The Federally endangered shortnose sturgeon (*Acipenser brevirostrum*) occurs in the Delaware River from the lower Bay upstream to at least Lambertville, New Jersey (RM 148). In the Delaware River, movement to the spawning grounds occurs in early spring, typically in late March, with spawning occurring through early May. The concentrated use of the Scudders Falls region (RM 133) in the spring by large numbers of mature male and female shortnose sturgeon indicates that the area between Scudders Falls and the Trenton rapids (RM 133-139) is where spawning occurs.

Limited studies have been conducted on juveniles in the Delaware River. As shortnose sturgeon demonstrate nearly identical migration patterns in all rivers, it is likely that juveniles in the Delaware River exhibit similar migration patterns to sturgeon in other river systems. In these systems, juveniles moved back and forth in the low salinity portion of the salt wedge during summer. In the Delaware River, the oligohaline/freshwater interface can range from as far south as Wilmington, Delaware, north to Philadelphia, Pennsylvania, depending upon meteorological conditions such as excessive rainfall or drought. As a result, it is possible that in the Delaware River, juveniles could range from Artificial Island (RM 54) to the Schuylkill River (RM 92) (O'Herron 2000, pers. comm.). Research in other river systems indicates that juveniles are typically found over silt and sand/mud substrates in deep water of 10-20 meters (33-66 feet).

After spawning, adult shortnose sturgeon migrate rapidly downstream to the Philadelphia area (RM 100). Within a few weeks of migrating to this area, many adult sturgeon return upriver between RM 127 and 134, while others gradually move to the same area over the course of the summer (O'Herron et al. 1993). By the time water temperatures have reached 10°C, typically by mid-November, most adult sturgeon have returned to the overwintering grounds in the Roebling (RM 124), Bordentown (RM 129), or Trenton reaches (RM 133). However, unlike sturgeon in other river systems, shortnose sturgeon in the Delaware do not appear to remain as stationary during overwintering periods. Overwintering fish have been found to be generally active, appearing at the surface and even breaching through the skim ice (O'Herron et al., 1993). Due to the relatively active nature of these fish, the use of the river during the winter is difficult to predict. There is also evidence that, unlike adults, juveniles do not form dense aggregations and instead are more dispersed in overwintering areas (ERC, 2007). Studies tracking the movements

of juvenile sturgeon in the Delaware River indicate that individual behavior is diverse, with some individuals establishing a relatively small "home range" (Fisher, 2011) during the winter months and others exhibiting extensive movements. No information on what factors contribute to different behaviors is available; these differences are seen in fish of the same year class making it difficult to determine if there are environmental or developmental factors at play or if it is merely natural variability.

Additionally, preliminary tracking studies of juveniles indicate that the entire lower Delaware River from Philadelphia (approximately RM 100) to below Artificial Island (RM 49) may be used as an overwintering area by juvenile shortnose sturgeon (ERC, 2007).

Based on the best available scientific information, adult and juvenile shortnose sturgeon are likely to be using the action area as a migratory pathway to and from overwintering, spawning, and foraging grounds. The action area (i.e., RM 79-82 for Whites Basin and RM 79-131 for Biles Island) is also within the area believed to be used by overwintering juvenile shortnose sturgeon (i.e., RM 49-100). While the project site is a maintained port facility, and is surrounded by such facilities, the area may support benthic invertebrates for opportunistic foraging. Due to the distance from the spawning grounds, which are up-river from the action area, shortnose sturgeon eggs or larvae, whose occurrence is limited to the waters near the spawning grounds, will not occur in the action area. Therefore, based on the best available scientific information, adult and juvenile (including overwintering juveniles and young of the year (YOY)[1]) shortnose sturgeon may occur in the action area year-round in the action area, including movement to and from overwintering, spawning, and foraging grounds.

<u>Atlantic Sturgeon</u>

Atlantic sturgeon (*Acipenser oxyrinchus*) originating from the New York Bight, Chesapeake Bay, South Atlantic, and Carolina Distinct Population Segments (DPS) are listed as endangered, while the Gulf of Maine DPS is listed as threatened. The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida; therefore, Atlantic sturgeon originating from any of the five DPSs may be present in the Delaware Bay.

Atlantic sturgeon are omnivorous benthic feeders that draw food into a ventrally located protrusible mouth (Bigelow and Schroeder, 1953). The diet of adult and subadult Atlantic sturgeon includes benthic invertebrates such as mollusks, crustaceans (incl. amphipods, decapods and isopods), worms (Oligo- and Polychaeta), gastropods and occasionally fish (ASSRT, 2007; Guilbard et al., 2007; Savoy, 2007). Juveniles also feed on aquatic insects. (ASSRT, 2007). Soft substrates, such as sand and mud, constitute ideal forage conditions for Atlantic sturgeon. Atlantic sturgeon presence is strongly associated with the availability, of prey, and as a result sturgeon may occur in any marine, estuarine or riverine location where suitable forage and habitat are available.

Atlantic spawning migration and spawning is believed to occur from April through June (Fox and Breece, 2010). In the Delaware River, likely spawning locations have been identified to exist at RM 75-93 and RM 106-118 (Breece et al., 2011, Fox and Breece, 2010). Tracking of

[1] YOY fish are less than one year old, but are no longer larvae.

adults showed that they spent relatively little time in the river each year, generally about 4 weeks (Fox and Breece, 2010).

Sturgeon eggs are deposited on hard bottom substrate such as coarse sand, cobble, gravel, bedrock, etc. (ASMFC, 2009), and the negative buoyant and adhesive eggs attach to the bottom substrate at the spawning site. After hatching, larvae move downstream to rearing grounds above the tidal saltwater edge in the upper estuary (Kynard and Horgan, 2002). In the Delaware River, YOY use several areas from Deepwater (RM 65) to Roebling (RM 123) during late fall to early spring with some remaining in the Marcus Hook area while others move upstream (Calvo et al., 2010; Fisher, 2009). Larvae do not tolerate saline water, age-0 (i.e., YOY) have low survival at salinities greater than 8 ppt, and juveniles may occupy freshwater for more than two years (age-1 and -2) though some may move down in brackish water when temperature drops (Lazzari et al., 1986, Haley 1999; Hatin et al., 2007; McCord et al., 2007; Munro et al., 2007).

Older fish are more salt tolerant and occur in higher salinity waters as well as low salinity waters but remain in the natal estuary for months to years before emigrating to open ocean (ASSRT 2007; Dadswell, 2006; Collins et al., 2000). In the Delaware River, juvenile Atlantic sturgeon are believed to overwinter in the deeper waters of the lower estuary. At age two years or older, juveniles may leave the estuary and enter the bay and coastal areas as subadults.

Subadults (as well as adults) from multiple DPSs are found migrating along the coast and may enter the Delaware Bay. Generally, subadults, including non-natal sturgeon, immigrate into the bay and estuary as early as mid-March but more typically from mid-April through May. They then move upstream and establish home range in the summer months in the river (Fisher, 2011, Simpson, 2008). In late fall (about November), subadults depart the river to overwintering areas in the lower estuary, Delaware Bay, or nearshore ocean (Brundage and Meadows, 1982; Lazzari et al., 1986; Shirey et al., 1997; 1999; Brundage and O'Herron, 2009; Brundage and O'Herron in Calvo et al., 2010).

Based on the best available scientific information, adult, subadult, juvenile and YOY Atlantic sturgeon are likely to be present in the action area (RM 79-82 for Whites Basin or 79-131 for Biles Island), including movement to and from overwintering, spawning, and foraging grounds. The action area may be suitable for sturgeon foraging. The proposed dredging area is located within the upper reaches of what is considered suitable for spawning Atlantic sturgeon. However, the habitat characteristics of the portions of the action area located within, and near, the proposed dredging area (maintained port facility, muddy substrate and frequent vessel disturbances) make actual spawning within the dredging area unlikely. In addition, due to the timeframe of work (i.e., July through mid-March due to seasonal restriction), eggs or larvae are not expected to be present in the vicinity of the action area and thus, will not be exposed to the direct and indirect effects of the proposed action.

Further information concerning the location and distribution for each DPS of Atlantic sturgeon can be found on NOAA's webpage at http://www.nmfs.noaa.gov/pr/species/fish/atlantic-sturgeon.html and is incorporated here by reference.

Atlantic Sturgeon Critical Habitat

The final rule (82 FR 39160) designates critical habitat for the New York Bight DPS in the Delaware River between the Trenton-Morrisville Route 1 Toll Bridge and the Delaware Bay (RM 48 – 133). For this project, the action area includes the proposed dredging area and the underwater area where effects of dredging will occur due to habitat alteration and an increase in suspended sediment (RM 79); the transportation route of the dredged material within the Delaware River (RM 79-82 for Whites Basin and RM 79-131 for Biles Island); and the existing rehandling basin at Whites Basin (RM 82 – Biles Island is an upland, confined disposal facility). As such, the entire action area overlaps with critical habitat for the New York Bight DPS.

The final rule identifies four physical and biological features (PBFs) essential for the conservation of Atlantic sturgeon belonging to the New York Bight DPS. The four PBFs are:

- PBF 1 – Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range) for settlement of fertilized eggs, refuge, growth, and development of early life stages;
- PBF 2 – Aquatic habitat with a gradual downstream salinity gradient of 0.5 up to as high as 30 parts per thousand and soft substrate (e.g., sand, mud) between the river mouth and spawning sites for juvenile foraging and physiological development;
- PBF 3 – Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support: (1) unimpeded movements of adults to and from spawning sites; (2) seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary; and (3) staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (e.g., at least 1.2 m) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river, and;
- PBF 4 – Water, between the river mouth and spawning sites, especially in the bottom meter of the water column, with the temperature, salinity, and oxygen values that, combined, support: (1) spawning; (2) annual and interannual adult, subadult, larval, and juvenile survival; and (3) larval, juvenile, and subadult growth, development, and recruitment (e.g., 13 to 26 °C for spawning habitat and no more than 30 °C for juvenile rearing habitat, and 6 mg/L or greater dissolved oxygen for juvenile rearing habitat).

The proposed dredging area is mostly silt and clay material with some sand. Clayey silt, sandy silt and sandy mud occurs in the federal navigation channel within 1,000 feet of the proposed dredging area (Sommerfield and Madsen, 2003). As such, PBF 1 is not present in the proposed dredging area and within 1,000 feet of the underwater area where effects of dredging will occur due to habitat alteration and an increase in suspended sediment (RM 79). In addition, due to the frequent discharge of dredged material and subsequent pumping of the material into the upland disposal site, PBF 1 is not present within the existing rehandling basin at Whites Basin (RM 82 – Biles Island is an upland, confined disposal facility).

Hard bottom habitat believed to be appropriate for sturgeon spawning (mainly sand with some gravel and mud) occurs between 1,000-2,000 feet of the proposed dredging area on the opposite

side of the federal navigation channel (RM 79). In addition, hard bottom habitat believed to be appropriate for sturgeon spawning occurs at several distinct locations within the Delaware River in the action area (Sommerfield and Madsen, 2003). As such, PBF 1 is present between 1,000-2,000 feet of the underwater area where effects of dredging will occur due to habitat alteration and an increase in suspended sediment (RM 79), as well as at several distinct locations along the transportation route of the dredged material within the Delaware River (RM 79-82 for Whites Basin and RM 79-131 for Biles Island).

PBF 2 may be present in the lower portion of the action area during extreme low-flow or drought events, such as the drought of the 1960's, where the salt front reached RM 102, and more recently in 2010, where the salt front reached RM 86 (Moberg and DeLucia, 2016). However, the median salt front occurred between RM 67-76 from 1998 to 2013 (Moberg and DeLucia, 2016), and the action area occurs between RM 79-131. Therefore, PBF 2 is not present within the action area under normal conditions.

PBFs 3 and 4 are present in the proposed dredging area and the underwater area where effects of dredging will occur due to habitat alteration and an increase in suspended sediment (RM 79); the transportation route of the dredged material within the Delaware River (RM 79-82 for Whites Basin and RM 79-131 for Biles Island); and the existing rehandling basin at Whites Basin (RM 82 – Biles Island is an upland, confined disposal facility).

Effects of the Action:

Habitat Modification

Effects to listed species can be caused by disturbance to the river bottom that reduces the availability of prey species or alters the composition of forage. Activities that may alter the river bottom, reduce availability of prey species, or alter the composition of forage include the dredging of the Delaware River (47 acres). The action area has been shown to support habitat for small benthic organisms. Sturgeon could utilize the area opportunistically for foraging based on current conditions.

The navigation channel (below the mean low water line to a depth of 45'), as part of the action area, is approximately 800 feet wide from the subject site up-river 3 miles to the disposal site at Whites Basin or up-river 52 miles to the disposal site at Biles Island. With the inclusion of the entire ship channel width from the dredge site to the disposal sites, the action area includes approximately 3 or 52 river miles of the Delaware River channel for Whites Basin or Biles Island, respectively, or a navigable impact area of approximately 350 or 5,000 acres (0.5 or 7.9 square miles) for Whites Basin or Biles Island, respectively, for transport (plus the 80-acre Whites Basin) and approximately 47 acres of open waters at the dredge site for actual dredging and equipment movement. The 47-acre dredging area has been dredged at least annually for the past 10 years, and dredging has occurred from the 1960s. Aside from any maintenance work on the docks, we do not expect any other impacts or removal of bottom substrate within the action area that will not require consultation with NMFS. Minimal, recurring temporary impacts (47 acres) will result from the dredging at the project site. The rest of the action area is taken up by shallow barge movement in 20' to 42' deep waters. Sediment plumes from the work zone would

have only a minimal effect on the surrounding habitat. Further, studies done by Wilbur and Clarke (2007) demonstrate that benthic communities in temperate regions occupying shallow waters with substrate of sand, silt, or clay reported recovery times between 1 and 11 months after dredging. It can be expected that benthic communities within the action area will recover within a year of dredging.

The area of proposed dredging is relatively small compared to the overall foraging habitat available in this reach of the river. For instance, there are less developed shoreline areas directly across the river in New Jersey. In addition, except for modified depths, the dredging area is expected to recover to pre-project conditions following completion of the proposed project in terms of benthic communities. As such, the recurring temporary loss of available foraging habitat within the action area is not expected to reduce availability of forage to sturgeon to a point where any reduction in growth, survival, or reproduction could be meaningfully measured of detected. Thus, the Corps has determined that habitat modification is expected to have insignificant effects on federally listed shortnose and Atlantic sturgeon.

Vessel Traffic

Collision with vessels is a source of anthropogenic mortality for sturgeon. However, beyond the vessel traffic associated with the dredging, no greater traffic is anticipated to result in demonstrable changes in normal vessel usage of the river. A limited number of vessels will be required to complete the work: two tugs, a dredge barge and two scows. The proposed work should require approximately 25 round-trips to the disposal site over 20 days, with the remaining vessel operation limited to the proposed dredge area and the immediately adjacent area. Therefore, we have considered the likelihood that an increase in vessel traffic related to proposed construction activities would generally increase the risk of interactions between sturgeon and vessels in the action area, in addition to baseline conditions. The use of barges will result in a localized, temporary increase in vessel traffic during a 20-day period every year for the next ten years (i.e., up to fifteen events). For the most part, barges will be relatively immobile during dredging operations, which will minimize the risk of vessel strike in the shallower project area. The time of year restrictions indicated above will ensure that vessel strikes with adult sturgeon migrating to and from spawning sites are avoided. While sturgeon may over-winter in the action area, the shallower depth of the project area is not considered habitat used for winter aggregation, which will minimize the risk of vessel strike at that time. Given the background level of vessel use in the channel, and the extremely small increase in vessel traffic above these existing levels in the area, there will be no measurable or detectable increase in the risk of vessel strike, and effects to sturgeon are insignificant.

Fish Removal in Bucket Dredges

Larvae could be present in the system if late spawning (i.e., spawning in late July) occurs. Sturgeon larvae drift passively with (i.e., are entrained by) the current, mainly drift in the bottom one meter of the deepest areas or thalweg of the river and may seek cover in coarse bottom substrate (e.g., cobble) during day and drift during night (Bath et al., 1981; Kynard and Horgan, 2002). In rivers, the deepest portion (i.e., the thalweg) with the strongest currents is normally found in outside bends. The navigation channel traverses close to the project site (see attached

map) and constitutes the deepest portion of the 800-foot wide river channel. As such, the navigation channel conduits the majority of flow, and the strongest currents and deepest portion of the channel would be located adjacent to the site. Thus, as larvae are weak swimmers, we expect the current in the navigation channel to entrain larvae and larvae to follow the flow of the federally maintained navigation channel. In contrast, the area of proposed dredging is located near to the shore (see attached map). Within the dredge area, the substrate is comprised of approximately 50% sand and 50% silt/clay. As such, the substrate is unsuitable for larvae as resting or cover habitat. The dredging operations will take up to 20 days to complete. However, actual active dredging will occur during fewer days and will only occur during day. Given the behavior of Atlantic sturgeon larvae, the channel geomorphology at the project site, the location of the project site relative to the navigation channel, the short duration of dredging, the time of day dredging will occur, the time of year dredging will occur, and the lack of any cover for larvae in the bottom substrate at the project site, we have determined that it is extremely unlikely that larvae will be exposed to dredging operations. Effects of dredging on larvae are discountable.

Bucket (clamshell) dredging may kill or injure sturgeon. Such dredges operate via the penetration of the bucket's two "jaws" beneath the sediment and the simultaneous lift and closure of the jaws to remove the sediment from the benthos; therefore, in order to contact the dredge bucket, a sturgeon would have to be on the bottom. Sturgeon do occur on the bottom, especially when engaging in foraging behaviors. However, the bucket will move at a speed of two feet per second or less. The highly mobile juvenile, sub-adult, and adult sturgeon would therefore be able to detect and avoid the bucket with minor movements. Based on this information, it is extremely unlikely that a sturgeon would be removed in a bucket dredge operating within the project site. As such, effects to sturgeon from the proposed project are discountable.

Water Quality Effects

The proposed project involves the mechanical or bucket dredging of sediments from the river bottom. The primary water quality effect that such dredging may have on fishery species would largely be associated with turbidity and resulting elevation of total suspended solids (TSS). Suspended sediment levels from conventional mechanical clamshell bucket dredging operations have been shown to range from 105 mg/L in the middle of the water column to 445 mg/L near the bottom (210 mg/L, depth-averaged) (ACOE, 2001). Furthermore, a study by Burton (1993) measured turbidity levels 500, 1,000, 2,000 and 3,300 feet from dredge sites in the Delaware River, and turbidity levels were detected between 15 mg/L and 191 mg/L up to 2,000 feet from the dredge site. Based on these analyses, elevated suspended sediment levels of up to 445 mg/L may be present in the immediate vicinity of the clamshell or bucket, and suspended sediment levels of up to 191 mg/L could be present within a 2,000 foot radius from the location of the clamshell or bucket dredge.

A literature review by Burton (1993) demonstrated that lethal effects on fish due to turbid waters can occur at levels between 580 mg/L to 700,000 mg/L, depending on the species. Studies on striped bass (an anadromous species) showed that pre-spawners did not avoid concentrations of 954 to 1920 mg/L to reach spawning sites (Summerfelt and Moiser, 1976 and Combs, 1979 in Burton, 1993). Both shortnose and Atlantic sturgeon are thought to be at least as tolerant of

elevated turbidity as other anadromous fish. The TSS levels expected for mechanical dredging (i.e., up to 445 mg/L) are below those shown to have an adverse effect on fish (580.0 mg/L for the most sensitive species, with approximately 1,000-2,000 mg/L more typical for anadromous fish; see summary of scientific literature in Burton, 1993). Further, TSS levels at or above 390 mg/L may negatively impact benthic communities (EPA, 1986). Loss or reduction of benthic organisms may indirectly adversely affect sturgeon because they forage on such organisms. Since TSS levels during mechanical dredging have been shown to range from 105 mg/L to 445 mg/L, benthic communities could be adversely impacted if the higher TSS levels occur. However, any turbidity over 390 mg/L will be quickly diluted as the suspended sediment is transported and spread by water currents and therefore limited to the immediate areas surrounding the dredge and of short term. Consequently, any sediment plume with TSS levels over 390 mg/L will occur over a small area and mostly be limited to the dredged area. As such, any turbidity impacts on the benthic community would not be expected to limit forage available for sturgeon as discussed above for effects from dredging (Habitat Modification).

Elevated TSS levels could affect sturgeon if a plume causes a barrier to normal behaviors, but effects to sturgeon from exposure to the sediment plume are expected to be limited to behavioral responses. Sturgeon are highly mobile, and they could avoid the sediment plume with minor movements to alter course out of the sediment plume. Such movement could result in increased energy expenditure and reduced energy intake due to reduced foraging time. Given the species' tolerance to elevated turbidity (see above), any such movements are expected to be minimal. The river in the vicinity of the project area is approximately 1 mile wide, and any minor movements due to sediment plumes in the immediate vicinity of the dredging would be within normal activity patterns. Given the river width, foraging in adjacent areas (outside the sediment plume) are unlikely to be affected. Based on this information, any effects of suspended sediment resulting from proposed dredging activities on the sturgeon, including behavioral responses/ movements, would be too small to be meaningfully measured or detected, and are insignificant.

Disposal of Dredge Material

As described above, dredge material will be deposited in a semi-enclosed basin in the Delaware River (Whites Basin) or an upland, confined disposal facility at Biles Island. As disposal operations at Whites Basin will involve the placement of material within the Delaware River, disposal may affect benthic habitat and water quality.

Whites Basin: Material Disposal and Effects to Benthic Habitat

To date, no sturgeon have been documented within Whites Basin. This may be due to the semi-enclosure of the disposal site and unsuitable habitat within the basin. As the basin is used frequently to deposit dredged material and this material is being dredged for disposal at upland sites, the benthos of this area is continually disturbed, resulting in limited benthic resources. With limited benthic resources, and thus, a lack of suitable forage, combined with frequent disturbances within the basin, shortnose and Atlantic sturgeon are extremely unlikely to occur within the basin. Instead, shortnose or Atlantic sturgeon are likely to bypass the opening of the semi-enclosed basin while migrating to other areas of the Delaware River that are more suitable for foraging, spawning, or other essential behaviors. Based on this and the best available

information, effects of disposal activities on Atlantic and shortnose sturgeon are discountable.

Whites Basin: Water Quality Effects of Material Disposal

The proposed disposal of material at Whites Basin will cause a recurring temporary increase in the amount of turbidity in the semi-enclosed basin to slightly above background levels (average range of 10.0 to 120.0 mg/l); however, suspended sediment is expected to settle out of the water column within a few hours and any increase in turbidity will be short term. Turbidity levels associated with the placement of material within the basin are likely to remain primarily within the basin, though a small plume may extend into the Delaware River if sediment is placed near the confluence of the basin mouth and the Delaware River.

As described above, studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993). TSS levels expected for material disposal (10.0 to 120.0 mg/l) are below those shown to have an adverse effect on fish (580.0 mg/L for the most sensitive species, with 1,000.0 mg/L more typical; see summary of scientific literature in Burton 1993). While the increase in suspended sediments in Delaware River may cause Atlantic or shortnose sturgeon to alter their movements, any change in behavior will only involve movements to alter course out of the sediment plume, and would not amount to a measurable or detectable change in normal activity patterns. Any course modifications would not affect the migration ability or energy use of sturgeon. Based on the above information, the effect of suspended sediment resulting from disposal activities at Whites Basin on Atlantic or shortnose sturgeon will be insignificant.

<u>Critical Habitat Effects</u>

Direct and indirect effects to critical habitat associated with the project include effects to PBFs 1, 3 and 4 related to turbidity, water quality, impingement, and vessel traffic.

PBF 1: Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand range) for settlement of fertilized eggs, refuge, growth, and development of early life stages

Mechanical dredging will result in a temporary and localized increase in suspended sediment concentrations in the water column in the dredged area. The highest concentrations of dredging induced suspended sediment and deposition occur in the water column and on the riverbed in and adjacent to the dredged area. Suspended sediment will predominantly flow along the near shoreline upstream and downstream with the incoming and outgoing tides. Deposition of the suspended sediment will also occur as sediment particles settle to the riverbed. Again, deposition will mainly settle along the near shoreline upstream and downstream with the incoming and outgoing tides.

PBF 1 is present between 1,000-2,000 feet of the proposed dredged area in the center of the river on the opposite side of the federal navigation channel. A limited amount of suspended sediment and deposition is expected to reach the hard substrate on the opposite side of the federal navigation channel. Sediment deposition may temporarily bury existing hard substrate with a

thin layer of soft substrate; however, the riverbed will return to pre-construction conditions after a few tidal cycles. Thus, these localized impacts from sediment deposition will be short-term and transient in nature. As such, sediment deposition during construction is expected to have an insignificant effect on the ability of the habitat to provide for settlement of fertilized eggs, refuge, growth, and development of early life stages.

Based on the factors described above, we have determined that effects to PBF 1 and its conservation function from stressors associated with the proposed action are so small that they cannot be meaningfully measured, detected, or evaluated. Therefore, effects are insignificant.

PBF 3: Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support: (1) unimpeded movements of adults to and from spawning sites; (2) seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary; and (3) staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (e.g., at least 1.2 m) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river

Atlantic sturgeon may have to swim around dredge equipment, but we do not expect any entrapment, impingement, and entrainment to occur, so the equipment will not create barriers that would limit sturgeon's ability to migrate to or from areas within critical habitat rivers necessary for foraging, staging, spawning, rearing, etc. In sum, any sturgeon movement to avoid a dredge would be too minor to be meaningfully measured or detected, and is therefore, insignificant.

Atlantic sturgeon may also have to swim around turbidity plumes in critical habitat rivers. The Delaware River is about ¾ of a mile wide at the dredging site (i.e., approximately 3,960 feet), and suspended sediment levels of up to 191 mg/L could be present within a 2,000 foot radius from the dredged area. Therefore, the projected turbidity plume will not create a barrier that would limit sturgeon's ability to migrate to or from areas within critical habitat rivers necessary for foraging, staging, spawning, rearing, etc. In sum, any sturgeon movement to avoid a turbidity plume would be too minor to be meaningfully measured or detected, and is therefore, insignificant.

It is possible that vessel traffic could affect PBF 3. However, vessel traffic associated with this project will be minor and temporary, and there will be no increase in permanent vessel traffic. As described above, we expect the increase in temporary vessel traffic to be extremely low, and therefore vessels will not create a barrier that would limit sturgeon's ability to migrate to or from areas within critical habitat rivers necessary for foraging, staging, spawning, rearing, etc. In sum, effects of vessel traffic on Atlantic sturgeon critical habitat are insignificant.

PBF 4 – Water, between the river mouth and spawning sites, especially in the bottom meter of the water column, with the temperature, salinity, and oxygen values that, combined, support: (1) spawning; (2) annual and interannual adult, subadult, larval, and juvenile survival; and (3) larval, juvenile, and subadult growth, development, and recruitment (e.g., 13 to 26 °C for

spawning habitat and no more than 30 °C for juvenile rearing habitat, and 6 mg/L or greater dissolved oxygen for juvenile rearing habitat)

The risk of entrapment, impingement, and entrainment will not affect water quality as described in PBF 4. In sum, any sturgeon movement to avoid a dredge would be too minor to be meaningfully measured or detected, and is therefore, insignificant.

While deepening may change the hydraulics at the three docks the Corps has determined that the project will not change the flow or hydraulics of the river channel within the action area. Therefore, maintenance dredging will not measurably change normal tidal or salinity conditions. Any effect to salinity gradient is therefore insignificant. Suspension of sediment during dredging may temporarily affect water quality including dissolved oxygen, but flow and settling of sediment will return conditions to pre-project value within a few days after the dredging is completed. Bottom water temperatures at the dredging site may decrease slightly because of increased depth, but changes in average water temperature within the action area will not be meaningfully measured, detected or evaluated within the temporal and spatial natural variation in water temperatures of the river channel. Effects to water are therefore insignificant. Given the project's location along the river's shoreline, at an active port facility adjacent to a major shipping channel, as well as the river's width at the site (approximately 3/4 of a mile), any effects to water flow would be too minor to be meaningfully measured or detected, and is therefore, insignificant.

It is possible that vessel traffic could affect PBF 4. However, vessel traffic associated with this project will be minor and temporary, and there will be no increase in permanent vessel traffic. Therefore, we expect effects of water quality to be too small to be meaningfully measured or detected, and therefore, effects are insignificant.

Conclusions:

Based on the analysis that any effects to listed species of sturgeon and critical habitat will be insignificant and/or discountable, we have determined that the proposed project is not likely to adversely affect any listed species or critical habitat under NMFS jurisdiction, provided that any permit issued by this office includes a seasonal restriction prohibiting mechanical dredging from March 15 through June 30, inclusive, of any year. This determination is based on the best scientific and commercial data available to complete this analysis. Pursuant to Section 7 of the ESA, we request NMFS concurrence with this determination.

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Quad Source: ESRI, Mapping Service
USGS 2013. Marcus Hook PA, NJ, Del
USGS Quad, 1967. Revised 1970

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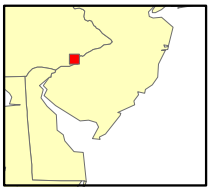

Quadrangle Location

Figure 1
Site Location Map - Energy Transfer Marcus Hook Terminal
Delaware River
Marcus Hook, Pennsylvania

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9. Coastal Zone Management Form

Coastal Zone Management Form will be submitted upon receipt from New Jersey Department of Environmental Protection and Pennsylvania Department of Environmental Protection.

10. Prior Permits

Permit Summary - March 2022
Marcus Hook Terminal

	File Name	Permit #	Agency	Issue Date	Expiry Date	Notifications Req'd	Description	Allows
	MH-Hisorical_O&E_Permits							
1	MH-USACE-Misc-121764	NAPOP-N	USACE	12/17/1964	12/31/1967	on commencement / on completion	Sections 10/404 Department of the Army Permit to construct a solid fill	Construction of retaining dikes and solid fill in the Delaware River
2	MH-DNREC-SLP-082975	01645	DNREC	8/29/1975	N/A	N/A	Subaqueous lands permit	Ownership of subaqueous land
3	MH-NJDEP-WQC-081987	WQC #87-6-6	NJDEP	8/19/1987	N/A	N/A	Section 401 Water Quality Certification	Disposal of 600,000 cubic yards of dredged material at Weeks Marine
4	MH-PADER-Misc-053089	E23-205	PADER	5/30/1989	6/29/1989	on commencement / on completion	Emergency repair permit	Removal and replacement of existing mooring dolphin
5	MH-PADER-Misc-122289	E23-205	PADER	12/22/1989	N/A	N/A	Commercial license agreement	Maintenance of a mooring dolphin
6	MH-PADER-O&E-010390	E23-3205	PADER	1/3/1990	12/31/1992	On commencement, 20 days before completion, 30 days after completion	Chapter 105 Water Obstruction and Encroachment Permit	Reconstruction and maintenance of a mooring dolphin
7	MH-NJDEP-WQC-030493	0809-91-0028.15	NJDEP	3/4/1993	3/4/1994	N/A	Section 401 Water Quality Certification	Disposal of 120,000 cubic yards of dredged material into Weeks Marine
8	MH-NJDEP-WCQMod-113093	0809-91-0028.15	NJDEP	11/30/1993	3/2/1998	N/A	Section 401 Water Quality Certification with a volume modification and an expiration date extension	Disposal of 600,000 cubic yards of dredged material at Weeks Marine
9	MH-PADER-Misc-070894	E23-310	PADER	7/8/1994	9/5/1994	N/A	Emergency repair permit	Repairs on existing marine terminal
10	MH-USACE-Misc-011095	CENAP-OP-R-199401097-42	USACE	1/10/1995	12/31/1997	on commencement / on completion	Sections 10/404 Department of the Army Permit	Installation of new mooring dolphin and walkway near Pier 3 B
12	MH-USACE-Dredge-073098	CENAP-OP-R-199702725-23	USACE	7/30/1998	12/31/2003	10 days prior / 10 days post	Sections 10/404 Department of the Army Dredging Permit	Maintenance dredging at Sunoco berths 1, 2, and 3
13	MH-USACE-BeamMod-030900	CENAP-OP-R-199902028-24	USACE	3/9/2000	3/14/2000	10 days prior / 10 days post	Temporary obstruction leveling permit	Obstruction leveling in front of docks 2A, 2C, 3A for a one-time event
14	MH-DRBC-Docket-092800	Docket D-2000-44	DRBC	9/28/2000	9/28/2025	on commencement / on completion	Approval pursuant to section 3.8 of the Delaware River Basin Compact	Utilization of up to 11mgd of surface water from the Delaware River for the proposed 750 MW electric generating station
15	MH-USACE-Misc-021501	DACW-31-3-01-093	USACE	2/15/2001	8/15/2002	5 days prior	Department of the Army license for the use of disposal areas	Temporary placement of 100,000 cubic yards of dredged material in a USACE confined disposal facility
16	MH-NJDEP-WQC&CZM-021601	0809-90-0001.4	NJDEP	2/16/2001	2/16/2002	14 days prior and on completion	Combined Section 401 Water Quality Certification and Coastal Zone Consistency Determination permit	One-time disposal of 100,000 cubic yards of dredged material into a US Army Corps of Engineers Confined Disposal Facility
17	MH-DNREC-WQC&SLP-030601	WQ-030/01 MD-030/01	DNREC	3/6/2001	4/15/2001	10 days prior	Section 401 Water Quality Certification and Subaqueous Lands Permit	Maintenance dredging and disposal of 3,200 cubic yards of dredged material at the USACE Confined Disposal Facility
18	MH-DNREC-CZM-030701	Unknown	DNREC	3/7/2001	N/A	N/A	Coastal Zone Consistency Determination	Maintenance dredging and temporary placement of hydraulic dredging pipeline in the Delaware River
19	MH-USACE-Dredge-030801	CENAP-OP-R-200002407-46	USACE	3/8/2001	12/31/2011	10 days prior / 10 days post	Sections 10/404 Department of the Army maintenance dredging permit	Hydraulic maintenance dredging including a steel pipeline laid under the federal navigation channel with a one-time disposal at Oldman's or Pedricktown confined disposal facilities
20	MH-PADEP-O&E-070301	E23-406	PADEP	7/3/2001	N/A	15 days prior / on completion	Chapter 105 Water Obstruction and Encroachment Permit	Maintenance of fill in and around the Delaware River
21	MH-DRBC-Misc-110602	Docket D-2000-44	DRBC	11/6/2002	N/A	N/A	Document regarding approval of condition "m"	Non-submission of design plans
22	MH-DNREC-WQC&SLP-030403	WQC-019/03 MD-018/03	DNREC	3/4/2003	3/4/2008	10 days prior / 10 days post	Water quality certification and subaqueous lands permit	Maintenance dredging at the RW-7 intake with disposal of dredged material onsite
23	MH-USACE-VolMod-071703	CENAP-OP-R-200002407-46	USACE	7/17/2003	12/31/2011	10 days prior / 10 days post	Sections 10/404 Department of the Army maintenance dredging permit modification - supersedes document dated 6/24/03	Expanded mechanical dredging of 150,000 cubic yards of material
24	MH-DNREC-WQC&SLP-072803	WQC-019/03S MD-018/03S	DNREC	7/28/2003	7/28/2008	10 days prior/ 10 days post	Section 401 Water Quality Certification and Subaqueous Lands Permit	Maintenance dredging of 75,000 cubic yards of material with disposal onsite of at a USACE confined disposal facility or at Weeks Marine
25	MH-DNREC-CZM-073003	FC 03.082	DNREC	7/30/2003	N/A	N/A	Coastal Zone Consistency Determination	Maintenance dredging and temporary placement of hydraulic dredging pipeline in the Delaware River

Permit Summary - March 2022
Marcus Hook Terminal

	File Name	Permit #	Agency	Issue Date	Expiry Date	Notifications Req'd	Description	Allows
26	MH-PADEP-Misc-081903	E23-205	PADEP	8/19/2003	N/A	N/A	A document describing the permits and licenses which authorize the operation and maintenance of Marcus Hook Terminal	
27	MH-PADEP-CZMMod-082003	E23-205	PADEP	8/20/2003	N/A	N/A	Coastal Zone Consistency Determination	Expanded mechanical dredging with disposal at Weeks Marine
28	MH-NJDEP-WQC-082603	0809-03-0004.1	NJDEP	8/26/2003	8/26/2004	14 days prior and on completion	Section 401 Water Quality Certification	One-time disposal of 104,000 cubic yards of dredged material into Weeks Marine
29	MH-USACE-MiscMod-101703	CENAP-OP-R-200002407-46	USACE	10/17/2003	12/31/2011	10 days prior / 10 days post	Sections 10/404 Department of the Army maintenance dredging permit modification	Expanded to include dredging of 250 cubic yards near the RW-5 intake
30	MH-USACE-BeamMod-050404	CENAP-OP-R-200002407-46	USACE	5/4/2004	12/31/2011	10 days prior / 10 days post	Sections 10/404 Department of the Army maintenance dredging permit modification	Modification to use beam obstruction leveling
31	MH-PADEP-WQCMod-072704	E23-205	PADEP	7/27/2004	N/A	N/A	Section 401 Water Quality Certification	Obstruction leveling with disposal at Weeks Marine
32	MH-PADEP-CZMMod-090204	E23-205	PADEP	9/2/2004	N/A	N/A	Coastal Zone Consistency Determination	Obstruction leveling
33	MH-DNREC-CZMMod-021405	FC 03.082	DNREC	2/14/2005	N/A	N/A	Coastal Zone Consistency Determination modification	Maintenance dredging of an additional 1000 cubic yards of material
34	MH-DNREC-WQC&SLPMod-040505	WQC-019/03S2 SP-018/03S2	DNREC	4/5/2005	7/28/2008	10 days prior / on completion	Section 401 Water Quality Certification and Subaqueous Lands Permit modification	A dredging expansion to accommodate the installation of fish screens around the RW-7 intake structure
35	MH-NJDEP-WQC-122807	0809-01-1001.11	NJDEP	12/28/2007	12/27/2010	7 days prior / on completion	Section 401 Water Quality Certification and acceptable use determination	Disposal of dredged material @ Weeks Marine
36	MH-DNREC-Misc-070308	SP-253/08	DNREC	7/3/2008	N/A	N/A	A document requesting additional information for permit application processing	
37	MH-DNREC-WQC-022709	SP-253/08	DNREC	2/27/2009	2/27/2014	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 401 Water Quality Certification and Subaqueous Lands Permit modification	Maintenance dredging in Delaware waters
38	MH-Marcus2011NPPermit	CENAP-OP-R-200002407-46 (IP)	USACE	2/18/2011	One Time		permit to perform maintenance dredging	
39	MH-DNREC-SLL-021111	SP-253/08	DNREC	2/10/2011	2/27/2014			
40	MH-PADEP_Approval_020411	E23-205	PADEP	2/4/2011	N/A			
41	MH-NJ WQC 02252011	00809-01-1001.14 (CDT110001)	NJDEP	2/25/2011	2/24/2016	Prior to start	Acceptable Use Modification	
42	MH-DNREC-CZM 010614	Maintenance dredging of Berth 3C & RW7	DNREC	1/6/2014	N/A	N/A	Coastal Zone Consistency Determination	Dredge with clamshell bucket and hydraulic handpipe
43	MH-PADEP-CRM-010714	Encroachment Permit E-23-205	PADEP	1/7/2014	N/A	N/A	Coastal Zone Consistency Determination	Maintenance dredging of Berths 1,2,& 3 and intakes RW-5 & RW-7
44	MH-NJDEP-AUD-011714	AUD - File # 0809-01-1001.14 (CDT110001)	NJDEP	1/17/2014	2/24/2016			Dredge and place at Weeks Marine
45	MH-DNREC- SLL Extension-012414	SP-253/08, WQ-491/08, SU-403/10	DNREC	1/24/2014	2/27/2015	90 days before completion	Extend expiration date of permits	Changed to 2/27/15
46	MH-USACE-Section 10-012714	CENAP-OP-R-2011-0760-46	USACE	1/27/2014	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	permit to perform maintenance dredging	Maintenance dredging for 47 acres
47	MH-NJDEP AUD MOD 02032015	AUD - File # 0809-01-1001.14 (CDT110001)	NJDEP	2/3/2015	2/24/2016	Prior to start	Acceptable Use Modification for 271,487 CY material	Dredge and place at Weeks Marine
48	MH-USACE Amendment 02052015	CENAP-OP-R-2011-0760-46	USACE	2/5/2015	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	permit to perform maintenance dredging	Maintenance dredging at Berth 3A

Permit Summary - March 2022
Marcus Hook Terminal

	File Name	Permit #	Agency	Issue Date	Expiry Date	Notifications Req'd	Description	Allows
49	MH-NJDEP AUD MOD 06262015	AUD - File # 0809-01-1001.14 (CDT110001)	NJDEP	6/26/2015	2/24/2016	Prior to start	Acceptable Use Modification for 138,209 CY material from Berths 1A inshore, 1B, 2A, 3A, 3C and RW5	Dredge and place at Weeks Marine
50	MH-USACE Amendment 07012015	CENAP-OP-R-2011-0760-46	USACE	7/1/2015	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	permit to perform maintenance dredging at 1A, 1B, 2A, 3A/3C, and RW5	Dredge and place at Weeks Marine
51	MH-NJDEP AUD MOD 07162016	AUD - File # 0809-01-1001.14 (CDT110001)	NJDEP	7/16/2015	2/24/2016	Prior to start	Acceptable Use Modification for Berths 3D and RW7	Dredge and place at Weeks Marine
52	MH-NJDEP AUD MOD (3B) 07162016	AUD - File # 0809-01-1001.14 (CDT110001)	NJDEP	7/16/2015	2/24/2016	Prior to start	Acceptable Use Modification for Berth 3B	Dredge and place at Weeks Marine
53	MH-USACE Amendment 3B 07162015	CENAP-OP-R-2011-0760-46	USACE	7/16/2015	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	permit to perform maintenance dredging at Berth 3B	Dredge and place at Weeks Marine
54	MH-USACE Amendment 3C 07162015	CENAP-OP-R-2011-0760-46	USACE	7/16/2015	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at Berths 3C and RW7	Dredge and place at Weeks Marine
55	MH-DNREC SLL SP257-15 07242015	SP257-15	DNREC	7/24/2015	7/23/2018	Pre notification / Surveys due 6 weeks following completion	Subaqueous Lands Permit to dredge 30,000 cy from 3C and RW7	Dredge and place at Weeks Marine
56	MH-DNREC Corrected CC 2014.0021 07302015	Maintenance dredging of Berth 3C & RW7	DNREC	7/30/2015	N/A	N/A	Coastal Zone Consistency Determination Revision	Dredge and place at Weeks Marine
57	MH-USACE-Dredge Authorization 09022016	CENAP-OP-R-2011-0760-46	USACE	9/2/2016	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
58	MH-PADEP - MHIC Sept 2016 Approval 092016	Encroachment Permit E-23-205	PADEP	9/2/2016	NA	N/A		Dredge and place at Weeks Marine
59	MH-DNREC - SP257-15a2. sunoco 021517	SP257-15	DNREC	2/15/2017	3/15/2017	Pre notification / Completion 10 days / Surveys due 6 weeks following completion	Subaqueous Lands Permit to dredge 3C and RW7	Dredge and place at Weeks Marine
60	MH-NJDEP WQC - 09012016 #0809-01-1001.14	AUD - File # 0809-01-1001.14 (CDT160001)	NJDEP	9/1/2016	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
61	MH-USACE - 2011-0760-46 Scanned Letter Dated 10-12-2017	CENAP-OP-R-2011-0760-46	USACE	10/12/2017	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
62	MH-NJDEP - 0809-01-1001.14 170004 Permit Mod 101117	AUD - File # 0809-01-1001.14 (CDT170001)	NJDEP	10/11/2017	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
63	MH-USACE2011-0760-46 MHIC Extension 03132018	CENAP-OP-R-2011-0760-46	USACE	3/13/2018	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
64	MH-PADEP - 2018-06-07_MarcusHook_FC_Confirm	Encroachment Permit E-23-205	PADEP	6/7/2018	12/31/2023	N/A		Dredge and place at Weeks Marine
65	MH-DNREC - 2018.0080 CON Interstate Sunoco Marcus Hook	DE FC 2018.0080	DNREC	8/22/2018	12/31/2023	N/A	Coastal Zone Management Approv	Dredge and place at Weeks Marine
66	MH-DNREC SP-201-18 WQ-201-18	SP/WC201/18	DNREC	8/27/2018	8/27/2021	Pre notification / Completion 10 days / Surveys due 6 weeks following completion	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
67	MH-USACE - 2011-0760-46 Scanned Letter Dated 09-06-2018	CENAP-OP-R-2011-0760-46	USACE	9/6/2018	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine

Permit Summary - March 2022
Marcus Hook Terminal

	File Name	Permit #	Agency	Issue Date	Expiry Date	Notifications Req'd	Description	Allows
68	MH-NJDEP - 0809-01-1001.14 CDT180001 09042018	AUD - File # 0809-01-1001.14 (CDT180001)	NJDEP	9/4/2018	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
69	MH-NJDEP - 0809-01-1001.14 CDT190001 07242019	AUD - File # 0809-01-1001.14 (CDT190001)	NJDEP	7/24/2019	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
70	MH-USACE - 2011-0760-46 Scanned Letter Dated 07-26-2019	CENAP-OP-R-2011-0760-46	USACE	7/26/2019	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
71	MH-DNREC SP,WQ-201-18 - revised	SP/WC201/18	DNREC	8/27/2018	8/27/2023	Pre notification / Completion 10 days / Surveys due 6 weeks following completion	Subaqueous Lands Permit to dredge 3C and RW7	Dredge and place at Weeks Marine
72	MH-NJDEP - 0809-01-1001.14 CDT190002 - 013120	AUD - File # 0809-01-1001.14 (CDT190002)	NJDEP	1/31/2020	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
73	MH-USACE - 2011-0760-46 Scanned Letter Dated 02-03-2020	CENAP-OP-R-2011-0760-46	USACE	2/3/2020	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
74	MH-NJDEP - 0809-01-1001.14 CDT200001 111220	AUD - File # 0809-01-1001.14 (CDT200001)	NJDEP	11/12/2020	8/31/2021	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
75	MH-USACE - 2011-0760-46 Scanned Letter & Plans Dated 11-13-2020	CENAP-OP-R-2011-0760-46	USACE	11/13/2020	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine
76	MH-NJDEP - 0809-01-1001.14 CDT210001 113021	AUD - File # 0809-01-1001.14 (CDT210001)	NJDEP	11/30/2021	11/28/2026	Prior to start, completion. Volume removed within 6 weeks	Section 401 Water Quality Certification	Dredge and place at Weeks Marine
77	MH-USACE - 2011-0760-46 Letter and Plans 12012021	CENAP-OP-R-2011-0760-46	USACE	12/1/2021	12/31/2023	noptification within 10 days prior to start and 10 days atter completion. Volume removed within 6 weeks	Section 10 permit to perform maintenance dredging at MHIC	Dredge and place at Weeks Marine

11. Sediment Data

Weston Solutions, Inc.
205 Campus Drive
Edison, NJ 08837
732-417-5800 Fax 732-417-5801
www.westonsolutions.com

November 3, 2021

Ms. Katherine Todoroff
Office of Dredging and Sediment Technology
New Jersey Department of Environmental Protection
Mail Code #501-02A, P.O. Box 420
Trenton, New Jersey 08625-0425
Trenton, NJ 08625-0028

Re: Marcus Hook Industrial Complex Water Quality Certificate
Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7
October 2021 Sediment Sampling Results

Dear Ms. Todoroff,

As you are aware, Sunoco Partners Marketing and Terminals (Sunoco) is proposing to dredge the berthing areas at their Marcus Hook Industrial Complex (MHIC) (Figure 1) starting as early as late November 2021. Specifically, Sunoco plans on maintenance dredging berths 1A, 2A, 3A, 3B, 3C, 2B Basin/Intake RW5 and Intake RW7. Sunoco would like to dredge the MHIC site according to the following permitted depths, plus 2 feet of overdredge:

- Berth 1A to 40' Mean Low Water (MLW);
- Berth 2A to 36' MLW;
- Berth 3A to 40' MLW;
- Berth 3B to 13' MLW;
- Berth 3C to 40' MLW;
- Basin 2B/Intake RW5 to 15' MLW, and
- Intake RW7 to 20' MLW.

Sunoco and Weston Solutions, Inc. (Weston®), Sunoco's environmental consultant, are requesting that the upcoming dredging be performed under New Jersey Department of Environmental Protection (NJDEP) 401 Water Quality Certificate (WQC) and Acceptable Use Determination (AUD) (Permit No. 0809-01 1001.14, CDT200001).

Weston chose the core locations using recent hydrographic surveys of the dock areas performed by S.T. Hudson Engineers, Inc. (Camden, NJ) on August 23, 2021.

These surveys show that approximately 65,399 cubic yards (cy) (22,519 cy from Berth 1A, 3,874 cy from Berth 2A, 18,410 cy from Berth 3A, 5,036 cy from Berth 3B, 11,434 cy from Berth 3C, 2,521 cy from Basin 2B/Intake RW5 and 1,605 cy from Intake RW7) needs to be removed from the MHIC berthing areas in order to achieve the proposed dredge depths (see Attachment 1 for volume calculations). The Sediment Sampling and Analysis Plan (SSAP) submitted on September 21, 2021, presented the number of cores to be collected and the appropriate analyses to be conducted, and was approved by the NJDEP on October 12, 2021. A description of this

sampling event and a summary of the sediment sample results are presented in this correspondence.

Material dredged from MHIC will be disposed of at White's Rehandling Basin, which is owned and operated by Weeks Marine, Inc./American Atlantic. Open clamshell dredging will be conducted to remove the sediment from the berthing areas. Sediment will be transported by scow, bottom-dumped into a subaqueous disposal pit, and then hydraulically moved to an upland disposal basin. White's Rehandling Basin, located in Logan Township, Gloucester County, NJ is an approved disposal basin that has the capacity for the estimated maximum 65,399 cy to be dredged.

October 2021 Sediment Sampling Event

Thirteen (13) sediment cores were collected to characterize the approximately 65,399 cy of sediments currently within the dredge templates. The thirteen cores collected from MHIC on October 18 and 19, 2021 were collected by WESTON from a motorized sampling platform operated by Aqua Survey Inc. using a modified sediment coring device (Vibracore).

All 13 initial cores collected were processed into 6 discrete samples and 4 composite samples according to the approved SSAP. One of the samples (Sample J) was added to the program outlined in the SSAP when the bottom of Core 13 (Berth 1A) was found to have a distinct strata (larger grain size within the matrix). This sampling strategy resulted in a total of 10 analytical samples plus a duplicate, matrix spike (MS), and matrix spike duplicate (MSD) samples. Refer to Figures 2-4 for the core locations. Each core was collected to the design depth of the area to be dredged plus 2 feet of allowable over dredge depth (see Table 1).

Core logs were prepared by Weston of each sediment core collected, and they are provided as Attachment 2. The core logs list the precise collection coordinates as recorded by global positioning system (GPS), the depth of each core, and a physical description of the core. The physical description of each core is provided in Table 2. The only distinct strata observed was at the bottom 1.8 feet of Core 13, and hence only Core 13 was sub-sampled. Photographs of the individual cores can be found in Attachment 3.

After core collection, logging, and screening for volatiles using a MiniRae, each core was homogenized and composited, as applicable, into samples per the sampling plan (see Table 1) and stored in sealed glass jars by Weston field personnel. Samples were stored at 4°C and transported to American Analytical Laboratories (AAL) for analysis. Samples were analyzed for the NJDEP required physical and chemical parameters. A field duplicate, matrix spike and matrix spike duplicate were also prepared and analyzed.

Table 1. Sediment Sampling Summary at MHIC

Core #	Core Location	Sample Type	Sample to Depth*	Existing Depth	Target Core Length	Collected Core Length	Analytes**
1	Intake RW7	Sample A	20' + 2'	18.4'	3.6'	3.6'	Full Suite List
2	Berth 3C	Sample B	40' + 2'	38.7'	3.3'	3.3'	Full Suite List
3	Berth 3C	Composite C	40' + 2'	38.9'	3.1'	3.1'	Full Suite List
4	Berth 3B	Sample D	13' + 2'	7.8'	7.2'	7.2'	Full Suite List
5	Berth 3A	Composite C	40' + 2'	37.4'	4.6'	4.6'	Full Suite List
6	Berth 3A	Composite E	40' + 2'	38.7'	3.3'	3.3'	Full Suite List
7	Berth 3A	Composite E	40' + 2'	35.8'	6.2'	6.2'	Full Suite List
8	Berth 2A	Sample F	36' + 2'	32.1'	5.9'	5.9'	Full Suite List
9	Berth 2B	Sample G	15' + 2'	14.9'	2.1'	2.1'	Full Suite List
10	Berth 1A	Composite H	40' + 2'	39.1'	2.9'	2.9'	Full Suite List
11	Berth 1A	Composite H	40' + 2'	38.9'	3.1'	3.1'	Full Suite List
12	Berth 1A	Composite I	40' + 2'	36.5'	5.5'	5.5'	Full Suite List
13	Berth 1A	Composite I	40' + 2'	39.4'	2.6'	2.6'	Full Suite List
13***	Berth 1A	Sample J	40' + 2'	39.4'	2.6'	2.6'	Full Suite List

*Includes 2' overdredge, as requested by NJDEP.
** Samples analyzed for SVOCs, PCB aroclors, pesticides, metals, hexavalent chromium, cyanide, percent moisture, sulfide, grain size, TOC and % moisture
*** Sample J was a discrete sample collected from a distinct strata in the bottom 1.8 feet of Core 13. This was added during the field program and NJDEP was notified prior to analysis.

The sediment sampling procedures were conducted in accordance with *The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters* (NJDEP, 1997), the *Field Sampling Procedures Manual* (NJDEP, 2005), and the approved *Sediment Sampling and Analysis Plan (SSAP) Template (Version 4.0)* as updated by the NJDEP Office of Dredging and Sediment Technology in September 2020.

Analytical Results and Screening of Sediment Samples

AAL analyzed the samples submitted for the applicable NJDEP chemical and physical parameters. All 10 samples plus the duplicate sample were analyzed for the approved list of parameters (semi volatile organic compounds [SVOCs], pesticides, PCB arolcors, TAL metals, trivalent and hexavalent chromium, cyanide, and percent solids and grain size). All 10 samples were also analyzed for grain size, total organic compounds (TOC) and percent moisture. The method for each parameter is outlined in Table 3.

Table 2. Physical Descriptions of Sediment Cores

Core ID	Physical Description
1	Gray silt, fine sand
2	Gray silty fine sand
3	Gray silt, fine sand
4	Brown/gray silty fine sand
5	Gray silt, fine sand
6	Brown/gray silty fine sand
7	Brown/gray silty fine sand
8	Brown/gray silty sand
9	Brown/gray silty sand
10	Brown/gray silty fine sand
11	Brown/gray silty sand
12	Dark gray silt and sand
13	Gray silt and sand

Table 3. Analytical Parameters and Methods

Test Parameter	Analytical Method
Grain Size	ASTM D422
TCL SVOCs	SW-846 8270E
PCBs (Aroclors)	SW-846 8082A
TCL Pesticides	SW-846 8081B
TAL Metals	SW-846 6010C/7471B
Hexavalent/Trivalent Chromium	6010D/7196A
Cyanide, total	SW-846 9012B
TOC	Lloyd Kahn
Percent Moisture	ASTM D2216
Sulfide	SW 9034

TCL = Target Compound List
TAL = Target Analyte List
TOC = Total Organic Compound
ASTM = American Society for Testing and Materials
EPA = U.S. Environmental Protection Agency

PHYSICAL CHARACTERIZATION OF SEDIMENTS

Grain Size: Grain size was classified using the ASTM Method. MHIC sediments were primarily comprised of rock, sand and silt/clay. The grain size analysis indicated that the samples only had rock in samples MHIC-3C-Comp B (30.5%) and at location MHIC-1A-Sample J (26%). Samples ranged from 47.5% sand at location MHIC-1A-Comp H to 67.8% at location MHIC-1A-Sample J. Samples ranged from 14.1% silt/clay at location MHIC-3C-Sample B to 52.5% silt/clay at location MHIC-1A-Comp H. The results for the grain size analysis in sediments collected from MHIC are provided in Table 4.

Total Organic Carbon (TOC): Sediments at MHIC contained TOC concentrations ranging from 1,520 milligrams/kilogram (mg/kg) at location MHIC-1A-Sample J to 35,500 mg/kg at location MHIC-RW7-Sample A. The results for the TOC analysis in sediments are summarized in Table 4.

CHEMICAL CHARACTERIZATION OF BULK SEDIMENTS

Results from the bulk sediment analysis were compared to the most current New Jersey Soil Remediation Standards (SRS) for both residential and non-residential soils. Table 5 provides a summary of detected concentrations for the bulk sediments collected from MHIC. The analytical lab report is provided in Attachment 4 (electronically on the attached thumb drive).

Semivolatile Organic Compounds (SVOCs): Eighteen SVOCs were detected in one or more of the sediment samples collected at MHIC, as summarized in Table 5. No detected SVOCs concentrations exceeded NJ Residential and Non-Residential SRSs.

Pesticides: Three pesticides were detected in one or more of the sediment samples collected at MHIC, as summarized in Table 5. No detected pesticide concentrations exceeded NJ Residential and Non-Residential SRSs.

PCBs: Only Aroclor-1260 was detected in one or more of the sediment samples collected at MHIC as summarized in Table 5. No concentrations of any PCB exceeded NJ Residential or Non-Residential SRS.

Inorganic Chemicals (Metals and Cyanide): Twenty-three metals plus cyanide were detected in one or more of the sediment samples collected at MHIC, as summarized in Table 5. No detected inorganic chemical concentrations exceeded NJ Residential or Non-Residential SRSs.

Note that no NJ SRSs have been developed for calcium, total chromium, iron, magnesium, potassium, sodium or thallium, so detected concentrations of these substances could not be compared to screening criteria. Calcium concentrations ranged 848 mg/kg to 4,210 mg/kg. Total chromium concentrations ranged from 28.8 mg/kg to 47.2 mg/kg. Iron concentrations ranged from 15,700 mg/kg to 29,600 mg/kg. Magnesium concentrations ranged from 2,020 mg/kg to 4,540 mg/kg. Potassium concentrations ranged from 1,660 mg/kg to 3,400 mg/kg. Sodium concentrations ranged from 139 mg/kg to 473 mg/kg. Thallium was not detected in any sample.

QUALITY ASSURANCE & QUALITY CONTROL

This section documents the data validation for the ten sediment samples including one field duplicate collected for the project.

The data validation was conducted in general accordance with the USEPA National Functional Guidelines for Organic and Inorganic Superfund Data Methods Review (November, 2020) and the applicable methods listed in Table 3 above.

General

1. **Samples**

The following table summarizes the samples for which the data validation was conducted.

Samples	Lab ID	Analysis	Date Collected
MHIC-3B-Sample D	2110088-001A-001B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-3AC-Sample C	2110088-002A-002B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-3C-Sample B	2110088-003A-003B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-RW7-Sample A	2110088-004A-004B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-RW7-Sample A Dup	2110088-005A-005B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium	10/18/2021
MHIC-1A-Comp I	2110088-006A-006B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-1A-Comp J	2110088-007A-007B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-1A-Comp H	2110088-008A-008B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/19/2021
MHIC-2A-Sample F	2110088-009A-009B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021
MHIC-3A-Comp E	2110088-010A-010B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/19/2021
MHIC-2B Basin-Sample G	2110088-011A-011B	SVOC, Pest/PCBs, Metals/Hg, Cyanide, Trivalent Chromium, Hexavalent Chromium, TOC, Grain Size	10/18/2021

2. **Holding Times / Sample Receipt**

All samples were received by the laboratory on 10/20/2021 (cooler temps 1.8 and 2.1 degrees C). Samples were received intact and under custody. All samples were analyzed within method required holding times.

All soil samples had a percent solid greater than 30%, therefore, no organic data was qualified. Professional judgment was used in estimating the positive (J) and non-detected (UJ) inorganic results in the following samples due to percent solids less than 50%:

MHIC-3B-Sample D (42.8%), MHIC-3AC-Sample C (45.4%), MHIC-RW7-Sample A (41.0%) , MHIC-RW7-Sample A Dup (48.3%), MHIC-1A-Comp I (40.1%), MHIC-1A-Comp H (40.5%), MHIC-2A-Sample F (44.1%), MHIC-3A-Comp E (40.8%) and MHIC-2B Basin-Sample G (39.5%).

The laboratory was contacted on November 2, 2021 and asked to submit the CLP-Like Form Xs, to identify the pesticide/PCB sample results between columns and the calculated relative percent differences (%RPDs). Also, to confirm if the total organic carbon samples were analyzed in quadruple per the Lloyd Kahn method and asked whether the hexavalent chromium matrix spike results reported were the insoluble or soluble matrix spike results. The laboratory provided the Form Xs and raw TOC data on November 2, 2021 and provided responses to all inquiries as detailed below.

Organics (SVOC, Pest/PCBs)

1. **Method Blank**

All method blanks were free of contamination.

2. **Surrogates**

All surrogate recoveries were within QC limits.

3. **Laboratory Control Samples**

All LCS recoveries of reported compounds were within QC limits with the following exceptions:

PCB LCS-30112 (associated samples ALL), was spiked with Aroclor 1232, Aroclor 1260, and Arochlor 1260 and recoveries were within laboratory established control limits.

Pesticide LCS 30112 (associated samples-ALL except 11/1/21 analyses of MHIC-RW7-Sample A and MHIC-RW7-Sample A Dup) was not spiked with Mirex and Toxaphene

and recoveries/RPDs were within QC limits except for hexachlorobenzene (9.95%). Pesticide LCS 30216 (associated samples MHIC-RW7-Sample A and MHIC-RW7-Sample A Dup) had hexachlorobenzene (19.5/16.7%) and gamma-BHC (RPD 20.3%) outside QC limits. Professional judgment was used in estimating the non-detected results for hexachlorobenzene (UJ) in all samples.

SVOC LCS-30116 (associated samples ALL) had 1,4-dioxane (14.1%) recoveries below QC limits. Professional judgment was used in estimating (UJ) the non-detected 1,4-dioxane results in all samples due to potential low bias.

4. **Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Recoveries**

The SVOC, PCB, and pesticide MS and MSDs were performed on sample MHIC-3AC-Sample C and recoveries/RPDs were within QC limits with the following exceptions:

- 4,4'-DDT (1.12/-0.421%) and hexachlorobenzene (5.65/16.5%) recovered below QC limits. The positive result for 4,4'-DDT and the non-detected result for hexachlorobenzene were estimated (J and UJ respectively) in pesticide parent sample MHIC-3AC-Sample C due to potential low bias.
- 1,4-dioxane (17.4/19.3%) recovered below QC limits. Since all 1,4-dioxane results are being estimated due to poor LCS recoveries, no further action is necessary.

5. **Field Duplicate**

Samples MHIC-RW7-Sample A and MHIC-RW7-Sample A Dup are field duplicate samples and when sample concentrations were greater than five times the LOQ, the %RPD was less than 50; and, when sample concentrations were less than five times the LOQ, the absolute difference was less than two times the LOQ.

6. **Quantitation/Dilution/Calibration**

No organic samples required dilutions. If the case narrative did not note calibration issues, it is assumed criteria were met.

The following pesticide/PCB samples had concentrations of compounds with a percent RPD greater than 25 between column results: the action taken is presented in the table below. In all cases, the laboratory reported the lower of the two results.

Sample	Compound	Concentrations Column 1/2 (ug/kg)	%RPD	Action
MHIC-3B-Sample D	4,4'-DDD 4,4'-DDE	16/11 12/8.7	39.1 30.9	11 J 8.7 J

	4,4'-DDT	5.8/3.8 J	41.4	3.8 J*
MHIC-3AC-Sample C	4,4'-DDT	5.7/4.0	33.6	5.7 J
MHIC-3C-Sample B	4,4'-DDD 4,4'-DDT	11/7.1 6.1/4.6	43.1 27.7	7.1 J 4.6 J
MHIC-RW7-Sample A Dup	4,4'-DDT	8.7/2.8 J	103.5	2.8 J*
MHIC-1A-Comp I	4,4'-DDT	5.3/4.0 J	28.4	2.8 J*
MHIC-2B Basin-Sample G	4,4'-DDD	12/9.1	31.7	9.1 J

*Note – concentration was below the LOQ and already estimated (J).

Inorganic (Metals/Hg, Cyanide (Total and Amenable), Trivalent and Hex Chromium)

1. **Method Blank**

All method blanks were free of contamination.

2. **Laboratory Control Samples**

All LCS recoveries of reported compounds had recoveries within laboratory QC limits.

3. **Laboratory Duplicate/Serial dilution**

No laboratory duplicates were presented with this data set since MSDs were performed.

4. **Matrix Spike and Matrix Spike Recoveries**

The inorganic MS and MSD were performed on sample MHIC-3AC-Sample C and recoveries/RPDs were within QC limits with the following exceptions:

- Lead (68.1/63.9%), nickel (73.8/67.8%), selenium (133%/-), silver (137%/-), sodium (49.3/60.2%), and zinc (64.6/66.3%).

No action was necessary for metals aluminum, calcium, iron, magnesium, manganese, and potassium due to parent sample concentrations greater than four times the spiked levels. No action was necessary for silver and selenium since the compounds were not detected in the parent sample. The positive results for lead, nickel, sodium and zinc were estimated (J) in parent sample MHIC-3AC-Sample C due to potential low bias.

The laboratory confirmed on November 2, 2021, that the hexavalent chromium MS and MSD results were the soluble recoveries and they were within QC limits, therefore, no action was necessary.

5. **Field Duplicate**

Samples MT-1020-Comp A and MT-1020-Comp A-DUP are field duplicate samples and when sample concentrations were greater than five times the LOQ, the %RPD was less than 50; and, when sample concentrations were less than five times the LOQ, the absolute difference was less than two times the LOQ.

6. **Quantitation/Dilution**

All metal samples required a tenfold dilution for two or more analytes resulting in elevated LOQs.

General Chemistry (TOC and Grain Size: grain size results were not evaluated by the validator)

1. **Method Blank**

All method blanks were free of contamination.

2. **Laboratory Control Samples**

All LCS recoveries were within laboratory QC limits.

3. **Matrix Spike/Laboratory Duplicate/Triplicate TOC Results**

An MS, MSD and laboratory duplicate was performed on TOC sample MHIC-3AC-Sample C and QC criteria were met.

The laboratory submitted the raw data for TOC on November 2, 2021, and it confirmed that TOC samples were analyzed in triplicate and all RPDs were less than 20%.

4. **Field Duplicate**

A field duplicate was not provided for the TOC and grain size analyses.

Overall Assessment

Based on the quality control data presented, this validation review, and the required qualifiers, all of the results are acceptable for use.

SUMMARY

Based on the sampling results described above, these sediments do not present a disposal concern. Concentrations of SVOCs, pesticides, PCBs, metals, hexavalent and trivalent chromium, and cyanide in bulk sediments from all locations collected at the MHIC on October 18 and 19, 2021 were below the lower of NJ Residential and Non-Residential SRS and can be disposed of at White's Rehandling Basin.

The major findings of this sediment characterization are as follows:

- Sediment can be dredged from Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 and can be disposed of at White's Rehandling Basin based on analytical data from sediment sampling in October 2021 as described herein.
- The maintenance dredged sediments to be removed from the Delaware River at MHIC are mainly comprised of sand and silt/clay.
- Low levels of SVOCs, pesticides, Aroclor 1260, inorganics, trivalent chromium and cyanide were detected in bulk sediments collected at Marcus Hook Industrial Complex. However, no compounds were detected in bulk sediments in concentrations that exceeded NJ SRS for Residential or Non-residential Settings.
- All samples were processed within holding times and according to method specifications.

Sunoco and Weston are available at any time to clarify or address issues the Department may have regarding this request. Please call me at (908) 565-0888 with any questions. We appreciate the Departments' review and look forward to approval of the enclosed sediment data and the related Water Quality Certificate approval.

Sincerely,

WESTON SOLUTIONS, INC.

Ryan Brown
Project Manager

cc: M. Nesbitt (Sunoco)
D. Caplan (USACE)
R. Montgomerie (USEPA)
USFWS
NMFS

TABLES

Table 4 - Sediment Physical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:		MHIC-RW7-Sample A	MHIC-3C-Sample B	MHIC-3AC-Comp C	MHIC-3B-Sample D	MHIC-3A-Comp E	MHIC-2A-Sample F	MHIC-2B -Sample G	MHIC-1A-Comp H	MHIC-1A-Comp I	MHIC-1A-Sample J
Laboratory ID:		**2110088-004**	**2110088-003**	**2110088-002**	**2110088-001**	**2110088-010**	**2110088-009**	**2110088-011**	**2110088-008**	**2110088-006**	**2110088-007**
Sampling Date:		**10/18/2021**	**10/18/2021**	**10/18/2021**	**10/18/2021**	**10/19/2021**	**10/18/2021**	**10/18/2021**	**10/19/2021**	**10/18/2021**	**10/18/2021**
GRAIN SIZE AND TOTAL ORGANIC CARBON											
Percent Rock	%	0	30.5	0	0	0	0	0	0	0	26
Percent Sand	%	53.7	55.4	55	59.7	53.4	49.5	50	47.5	67.8	56.8
Percent Silt/Clay	%	46.3	14.1	45	40.3	46.6	50.6	50	52.5	32.2	17.2
Total Organic Carbon	PPM	35500	17700	28800	24000	33800	25700	31200	27800	31900	1520

Table 5 - Sediment Analytical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:	NJ Residential SRS Limits	NJ Non-Residential SRS Limits	MHIC-RW7-Sample A		MHIC-RW7-Sample A		MHIC-3C-Sample B		MHIC-3AC-Comp C		MHIC-3B-Sample D		MHIC-3A-Comp E	
Laboratory ID:			2110088-004		2110088-005		2110088-003		2110088-002		2110088-001		2110088-010	
Sampling Date:			10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/19/2021	
SEMIVOLATILE ORGANIC COMPOUNDS (ug/kg)					DUPLICATE									
1,2,4-Trichlorobenzene	73	820	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
1,2-Dichlorobenzene	5300	59000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
1,3-Dichlorobenzene	5300	59000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
1,4-Dichlorobenzene	5	13	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
1,4-Dioxane	NA	NA	0.06	UJ	0.064	UJ	0.041	UJ	0.054	UJ	0.058	UJ	0.06	UJ
2,4,5-Trichlorophenol	6100	68000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2,4,6-Trichlorophenol	19	74	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2,4-Dichlorophenol	180	2100	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2,4-Dimethylphenol	1200	14000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2,4-Dinitrophenol	120	1400	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
2,4-Dinitrotoluene	0.7	3	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2,6-Dinitrotoluene	0.7	3	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
2-Chloronaphthalene	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2-Chlorophenol	310	2200	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2-Methylnaphthalene	230	2400	0.15	J	0.17	J	0.041	U	0.054	U	0.058	U	0.06	U
2-Methylphenol	310	3400	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2-Nitroaniline	39	23000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
2-Nitrophenol	NA	NA	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
3,3´-Dichlorobenzidine	1	4	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
3+4-Methylphenol	31	340	0.087	J	0.11	J	0.041	U	0.063	J	0.062	J	0.099	J
3-Nitroaniline	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4,6-Dinitro-2-methylphenol	6	68	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
4-Bromophenyl phenyl ether	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4-Chloro-3-methylphenol	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4-Chloroaniline	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4-Chlorophenyl phenyl ether	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4-Nitroaniline	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
4-Nitrophenol	NA	NA	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Acenaphthene	3400	37000	0.25	J	0.29	J	0.041	U	0.054	U	0.058	U	0.06	U
Acenaphthylene	NA	300000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Acetophenone	2	5	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Aniline	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Anthracene	17000	30000	0.1	J	0.11	J	0.041	U	0.084	J	0.058	U	0.06	U
Atrazine	210	2400	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Azobenzene	0.7	2	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Benzaldehyde	6100	68000	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Benzidine	0.7	0.7	0.24	U	0.26	U	0.16	U	0.22	U	0.23	U	0.24	U
Benzo(a)anthracene	5	17	0.21	J	0.21	J	0.064	J	0.13	J	0.12	J	0.14	J
Benzo(a)pyrene	0.5	2	0.18	J	0.19	J	0.065	J	0.13	J	0.13	J	0.15	J
Benzo(b)fluoranthene	5	17	0.23	J	0.22	J	0.077	J	0.15	J	0.17	J	0.2	J
Benzo(g,h,i)perylene	380000	30000	0.14	J	0.15	J	0.054	J	0.12	J	0.13	J	0.15	J
Benzo(k)fluoranthene	45	170	0.18	J	0.18	J	0.065	J	0.14	J	0.14	J	0.16	J
Benzyl alcohol	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Biphenyl	61	240	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Bis(2-chloroethoxy)methane	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Bis(2-chloroethyl)ether	0.4	2	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Bis(2-chloroisopropyl)ether	23	67	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Bis(2-ethylhexyl)phthalate	35	140	0.2	J	0.22	J	0.081	U	0.15	J	0.19	J	0.19	J
Butyl benzyl phthalate	1200	14000	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Caprolactam	31000	340000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Carbazole	24	96	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Chrysene	450	1700	0.26	J	0.25	J	0.084	J	0.17	J	0.17	J	0.21	J
Dibenzo(a,h)anthracene	0.5	2	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Dibenzofuran	NA	NA	0.14	J	0.16	J	0.041	U	0.054	U	0.058	U	0.06	U
Diethyl phthalate	49000	550000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U

Table 5 - Sediment Analytical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:	NJ Residential SRS Limits	NJ Non-Residential SRS Limits	MHIC-RW7-Sample A		MHIC-RW7-Sample A		MHIC-3C-Sample B		MHIC-3AC-Comp C		MHIC-3B-Sample D		MHIC-3A-Comp E	
Laboratory ID:			2110088-004		2110088-005		2110088-003		2110088-002		2110088-001		2110088-010	
Sampling Date:			10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/19/2021	
Dimethyl phthalate	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Di-n-butyl phthalate	6100	68000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Di-n-octyl phthalate	2400	27000	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Fluoranthene	2300	24000	0.71		0.66		0.12	J	0.25	J	0.24	J	0.28	J
Fluorene	2300	24000	0.21	J	0.21	J	0.041	U	0.054	U	0.058	U	0.06	U
Hexachlorobenzene	0.3	1	0.06	UJ	0.064	UJ	0.041	UJ	0.054	UJ	0.058	UJ	0.06	UJ
Hexachlorobutadiene	6	25	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Hexachlorocyclopentadiene	45	110	0.3	U	0.32	U	0.2	U	0.27	U	0.29	U	0.3	U
Hexachloroethane	12	48	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Indeno(1,2,3-c,d)pyrene	5	17	0.16	J	0.15	J	0.056	J	0.12	J	0.12	J	0.15	J
Isophorone	510	2000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Naphthalene	6	17	0.098	J	0.12	J	0.041	U	0.054	J	0.058	U	0.065	J
Nitrobenzene	5	14	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
N-Nitrosodimethylamine	0.7	0.7	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
N-Nitrosodi-n-propylamine	0.2	0.3	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
N-Nitrosodiphenylamine	99	390	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Parathion	NA	NA	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Pentachlorophenol	0.9	3	0.12	U	0.13	U	0.081	U	0.11	U	0.12	U	0.12	U
Phenanthrene	NA	300000	0.85		0.83		0.076	J	0.12	J	0.12	J	0.15	J
Phenol	18000	210000	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
Pyrene	1700	18000	0.54	J	0.51	J	0.11	J	0.23	J	0.24	J	0.27	J
Pyridine	NA	NA	0.06	U	0.064	U	0.041	U	0.054	U	0.058	U	0.06	U
PESTICIDES (ug/kg)														
4,4´-DDD	3	13	0.018		0.016	J	0.0071	J	0.064	J	0.011	J	0.015	
4,4´-DDE	2	9	0.012		0.011		0.0057		0.012		0.0087	J	0.013	
4,4´-DDT	2	8	0.014		0.0028	J	0.0046	J	0.0057	J	0.0038	J	0.0054	J
Aldrin	0.04	0.2	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
alpha-BHC	0.1	0.5	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
alpha-Chlordane	0.2	1	0.015	U	0.016	U	0.0096	U	0.013	U	0.014	U	0.014	U
beta-BHC	0.4	2	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Chlorobenzilate	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
DBCP	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
delta-BHC	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Dieldrin	0.04	0.2	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endosulfan I	470	6800	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endosulfan II	470	6800	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endosulfan sulfate	470	6800	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endrin	23	340	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endrin aldehyde	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Endrin ketone	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
gamma-BHC	0.4	2	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
gamma-Chlordane	0.2	1	0.015	U	0.016	U	0.0096	U	0.013	U	0.014	U	0.014	U
Heptachlor	0.1	0.7	0.0049	U	0.0052	U	0.0032	U	0.0043	U	0.0046	U	0.0048	U
Heptachlor epoxide	0.07	0.3	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Hexachlorobenzene	0.3	1	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Hexachlorocyclopentadiene	45	110	0.0073	U	0.0078	U	0.0048	U	0.0065	U	0.0069	U	0.0072	U
Methoxychlor	390	5700	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Mirex	NA	NA	0.0024	U	0.0026	U	0.0016	U	0.0022	U	0.0023	U	0.0024	U
Toxaphene	0.6	3	0.032	U	0.034	U	0.021	U	0.028	U	0.03	U	0.031	U
PCBS (ug/kg)														
Aroclor 1016	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1221	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1232	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1242	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1248	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1254	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U

Table 5 - Sediment Analytical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:	NJ Residential SRS Limits	NJ Non-Residential SRS Limits	MHIC-RW7-Sample A		MHIC-RW7-Sample A		MHIC-3C-Sample B		MHIC-3AC-Comp C		MHIC-3B-Sample D		MHIC-3A-Comp E	
Laboratory ID:			2110088-004		2110088-005		2110088-003		2110088-002		2110088-001		2110088-010	
Sampling Date:			10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/18/2021		10/19/2021	
Aroclor 1260	0.2	1	0.029	J	0.026	U	0.016	U	0.029	J	0.027	J	0.028	J
Aroclor 1262	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
Aroclor 1268	0.2	1	0.024	U	0.026	U	0.016	U	0.022	U	0.023	U	0.024	U
METALS (ug/kg)														
Aluminum	78000	NA	19900	J	21300	J	12300		25300	J	21500	J	19600	J
Antimony	31	450	0.44	UJ	0.489	UJ	0.287	U	0.43	UJ	0.42	UJ	0.466	UJ
Arsenic	19*	19*	8.39	J	9.94	J	3.25		7.57	J	7.83	J	8.22	J
Barium	16000	59000	143	J	154	J	78.7		138	J	142	J	157	J
Beryllium	16	140	0.22	UJ	0.244	UJ	0.143	U	0.215	UJ	0.21	UJ	0.233	UJ
Cadmium	78	78	0.387	J	0.435	J	0.143	U	0.383	J	0.374	J	0.461	J
Calcium	NA	NA	3740	J	4210	J	1740		3390	J	3750	J	3870	J
Chromium	NA	NA	42.7	J	46.7	J	28.8		44.8	J	44.1	J	45.5	J
Cobalt	1600	590	3.58	J	4.19	J	2.15		3.7	J	3.62	J	3.57	J
Copper	3100	45000	30.3	J	33.6	J	17.4		32.1	J	31.5	J	32.5	J
Iron	NA	NA	24300	J	27000	J	15700		29600	J	25800	J	24300	J
Lead	400	800	30.5	J	35.2	J	15.6		32.6	J	31.9	J	35.7	J
Magnesium	NA	NA	3910	J	4540	J	2510		4140	J	4280	J	4230	J
Manganese	11000	5900	1270	J	1400	J	591		1570	J	1210	J	1300	J
Mercury	23	65	0.155	J	0.202	J	0.0651		0.189	J	0.169	J	0.165	J
Nickel	1600	23000	25.2	J	28.5	J	17.1		26.4	J	26.1	J	27.6	J
Potassium	NA	NA	3300	J	3390	J	2000		3280	J	3400	J	3190	J
Selenium	390	5700	0.44	UJ	0.596	J	0.287	U	0.43	UJ	0.42	UJ	0.466	UJ
Silver	390	5700	0.22	UJ	0.244	UJ	0.143	U	0.215	UJ	0.21	UJ	0.233	UJ
Sodium	NA	NA	401	J	473	J	225		385	J	419	J	362	J
Thallium	NA	NA	0.66	UJ	0.733	UJ	0.43	U	0.645	UJ	0.63	UJ	0.699	UJ
Vanadium	78	1100	36.5	J	39.8	J	25.9		37.8	J	37.8	J	37.1	J
Zinc	23000	110000	158	J	183	J	81.9		163	J	167	J	178	J
WET CHEMISTRY (ug/kg)														
Chromium, Hexavalent	NA	NA	0.593	UJ	0.635	UJ	0.395	U	0.55	UJ	0.563	UJ	0.601	UJ
Chromium, Trivalent	NA	NA	42.7	J	46.7	J	28.8		44.8	J	44.1	J	45.5	J
Cyanide Total & Amenable	47	680	1.33	J	1.27	J	0.261		0.682	J	0.404	J	0.924	J
Percent Moisture (%)	NA	NA	59		61.7		38.6		54.6		57.2		59.2	
Total Organic Carbon	NA	NA	35500				17700		28800		24000		33800	

Notes:

* - The direct contact standard for arsenic is based on natural background

% - Percent

-- - Sample not run for this analyte

Comp - Composite Sample

ug/kg - micrograms/kilogram

NA - No Criteria specified in current

SRS - Soil Remediation Standards

Qualifier Definition:

J - The analyte was detected below the limit of quantitation but greater than the established Limit of Detection (LOD). These results should be considered estimated.

U - The compound was analyzed for but not detected.

Shading indicates the detected concentration exceeds Current NJDEP Residential SRS.

Shading indicates the detected concentration exceeds Current NJDEP Non-Residential SRS.

Criteria Source:

N.J.A.C. 7:26D Remediation Standards, N.J.S.A. 13:1D-1 et seq., 58:10-23.11a et seq., 58:10A-1 et seq. and 58:10B-1 et seq., amended May 7, 2012.

Table 5 - Sediment Analytical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:	NJ Residential SRS Limits	NJ Non-Residential SRS Limits	MHIC-2A-Sample F		MHIC-2B-Sample G		MHIC-1A-Comp H		MHIC-1A-Comp I		MHIC-1A-Sample J	
Laboratory ID:			2110088-009		2110088-011		2110088-008		2110088-006		2110088-007	
Sampling Date:			10/18/2021		10/18/2021		10/19/2021		10/18/2021		10/18/2021	
SEMIVOLATILE ORGANIC COMPOUNDS (ug/kg)												
1,2,4-Trichlorobenzene	73	820	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
1,2-Dichlorobenzene	5300	59000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
1,3-Dichlorobenzene	5300	59000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
1,4-Dichlorobenzene	5	13	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
1,4-Dioxane	NA	NA	0.056	UJ	0.063	UJ	0.062	UJ	0.06	UJ	0.035	UJ
2,4,5-Trichlorophenol	6100	68000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2,4,6-Trichlorophenol	19	74	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2,4-Dichlorophenol	180	2100	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2,4-Dimethylphenol	1200	14000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2,4-Dinitrophenol	120	1400	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
2,4-Dinitrotoluene	0.7	3	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2,6-Dinitrotoluene	0.7	3	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
2-Chloronaphthalene	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2-Chlorophenol	310	2200	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2-Methylnaphthalene	230	2400	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2-Methylphenol	310	3400	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2-Nitroaniline	39	23000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
2-Nitrophenol	NA	NA	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
3,3´-Dichlorobenzidine	1	4	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
3+4-Methylphenol	31	340	0.084	J	0.063	U	0.094	J	0.091	J	0.035	U
3-Nitroaniline	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4,6-Dinitro-2-methylphenol	6	68	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
4-Bromophenyl phenyl ether	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4-Chloro-3-methylphenol	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4-Chloroaniline	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4-Chlorophenyl phenyl ether	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4-Nitroaniline	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
4-Nitrophenol	NA	NA	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Acenaphthene	3400	37000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Acenaphthylene	NA	300000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Acetophenone	2	5	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Aniline	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Anthracene	17000	30000	0.056	U	0.063	U	0.081	J	0.06	J	0.035	U
Atrazine	210	2400	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Azobenzene	0.7	2	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Benzaldehyde	6100	68000	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Benzidine	0.7	0.7	0.23	U	0.25	U	0.25	U	0.24	U	0.14	U
Benzo(a)anthracene	5	17	0.12	J	0.13	J	0.17	J	0.15	J	0.035	U
Benzo(a)pyrene	0.5	2	0.13	J	0.15	J	0.19	J	0.16	J	0.035	U
Benzo(b)fluoranthene	5	17	0.17	J	0.19	J	0.23	J	0.2	J	0.035	U
Benzo(g,h,i)perylene	380000	30000	0.12	J	0.13	J	0.15	J	0.14	J	0.035	U
Benzo(k)fluoranthene	45	170	0.13	J	0.15	J	0.18	J	0.16	J	0.035	U
Benzyl alcohol	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Biphenyl	61	240	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Bis(2-chloroethoxy)methane	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Bis(2-chloroethyl)ether	0.4	2	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Bis(2-chloroisopropyl)ether	23	67	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Bis(2-ethylhexyl)phthalate	35	140	0.17	J	0.22	J	0.24	J	0.21	J	0.069	U
Butyl benzyl phthalate	1200	14000	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Caprolactam	31000	340000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Carbazole	24	96	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Chrysene	450	1700	0.16	J	0.18	J	0.24	J	0.2	J	0.035	U
Dibenzo(a,h)anthracene	0.5	2	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Dibenzofuran	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Diethyl phthalate	49000	550000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U

Table 5 - Sediment Analytical Data - Berths 1A, 2A, 3A, 3B, 3C, Basin 2B/Intake RW5 and Intake RW7 - All Results
Sunoco Partners Marketing Terminals - Marcus Hook Industrial Complex
October 2021

Client SampleID:	NJ Residential SRS Limits	NJ Non-Residential SRS Limits	MHIC-2A-Sample F		MHIC-2B-Sample G		MHIC-1A-Comp H		MHIC-1A-Comp I		MHIC-1A-Sample J	
Laboratory ID:			2110088-009		2110088-011		2110088-008		2110088-006		2110088-007	
Sampling Date:			10/18/2021		10/18/2021		10/19/2021		10/18/2021		10/18/2021	
Dimethyl phthalate	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Di-n-butyl phthalate	6100	68000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Di-n-octyl phthalate	2400	27000	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Fluoranthene	2300	24000	0.25	J	0.29	J	0.36	J	0.31	J	0.041	J
Fluorene	2300	24000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Hexachlorobenzene	0.3	1	0.056	UJ	0.063	UJ	0.062	UJ	0.06	UJ	0.035	UJ
Hexachlorobutadiene	6	25	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Hexachlorocyclopentadiene	45	110	0.28	U	0.31	U	0.31	U	0.3	U	0.17	U
Hexachloroethane	12	48	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Indeno(1,2,3-c,d)pyrene	5	17	0.12	J	0.13	J	0.17	J	0.14	J	0.035	U
Isophorone	510	2000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Naphthalene	6	17	0.056	U	0.063	U	0.062	U	0.061	J	0.035	U
Nitrobenzene	5	14	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
N-Nitrosodimethylamine	0.7	0.7	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
N-Nitrosodi-n-propylamine	0.2	0.3	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
N-Nitrosodiphenylamine	99	390	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Parathion	NA	NA	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Pentachlorophenol	0.9	3	0.11	U	0.13	U	0.12	U	0.12	U	0.069	U
Phenanthrene	NA	300000	0.11	J	0.13	J	0.19	J	0.16	J	0.035	U
Phenol	18000	210000	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
Pyrene	1700	18000	0.23	J	0.27	J	0.33	J	0.28	J	0.038	J
Pyridine	NA	NA	0.056	U	0.063	U	0.062	U	0.06	U	0.035	U
PESTICIDES (ug/kg)												
4,4´-DDD	3	13	0.032		0.0091		0.015		0.015		0.0014	U
4,4´-DDE	2	9	0.012		0.012		0.013		0.012		0.0025	J
4,4´-DDT	2	8	0.0065		0.0042	J	0.018		0.004	J	0.032	
Aldrin	0.04	0.2	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
alpha-BHC	0.1	0.5	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
alpha-Chlordane	0.2	1	0.013	U	0.015	U	0.014	U	0.014	U	0.0083	U
beta-BHC	0.4	2	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Chlorobenzilate	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
DBCP	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
delta-BHC	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Dieldrin	0.04	0.2	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endosulfan I	470	6800	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endosulfan II	470	6800	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endosulfan sulfate	470	6800	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endrin	23	340	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endrin aldehyde	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Endrin ketone	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
gamma-BHC	0.4	2	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
gamma-Chlordane	0.2	1	0.013	U	0.015	U	0.014	U	0.014	U	0.0083	U
Heptachlor	0.1	0.7	0.0045	U	0.005	U	0.0048	U	0.0048	U	0.0028	U
Heptachlor epoxide	0.07	0.3	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Hexachlorobenzene	0.3	1	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Hexachlorocyclopentadiene	45	110	0.0067	U	0.0074	U	0.0072	U	0.0072	U	0.0041	U
Methoxychlor	390	5700	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Mirex	NA	NA	0.0022	U	0.0025	U	0.0024	U	0.0024	U	0.0014	U
Toxaphene	0.6	3	0.029	U	0.032	U	0.031	U	0.031	U	0.018	U
PCBS (ug/kg)												
Aroclor 1016	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1221	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1232	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1242	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1248	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1254	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U

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October 2021

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Laboratory ID:			2110088-009		2110088-011		2110088-008		2110088-006		2110088-007	
Sampling Date:			10/18/2021		10/18/2021		10/19/2021		10/18/2021		10/18/2021	
Aroclor 1260	0.2	1	0.025	J	0.029	J	0.031	J	0.027	J	0.014	U
Aroclor 1262	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
Aroclor 1268	0.2	1	0.022	U	0.025	U	0.024	U	0.024	U	0.014	U
METALS (ug/kg)												
Aluminum	78000	NA	20700	J	21300	J	19200	J	21200	J	12800	
Antimony	31	450	0.408	UJ	0.445	UJ	0.452	UJ	0.424	UJ	0.252	U
Arsenic	19*	19*	5.8	J	7.88	J	5.52	J	7.15	J	0.632	
Barium	16000	59000	141	J	148	J	142	J	154	J	73.1	
Beryllium	16	140	0.204	UJ	0.223	UJ	0.226	UJ	0.212	UJ	0.126	U
Cadmium	78	78	0.391	J	0.628	J	0.452	J	0.45	J	0.126	U
Calcium	NA	NA	3640	J	3730	J	3590	J	3930	J	848	
Chromium	NA	NA	44.1	J	47.2	J	41.6	J	43.4	J	39.2	
Cobalt	1600	590	3.38	J	4.24	J	4.14	J	3.97	J	2.32	
Copper	3100	45000	31.6	J	40.3	J	33.1	J	32.5	J	17.8	
Iron	NA	NA	25100	J	25900	J	24200	J	25500	J	21400	
Lead	400	800	31.9	J	39.5	J	34.6	J	34.7	J	9.28	
Magnesium	NA	NA	3950	J	4060	J	3780	J	4090	J	2020	
Manganese	11000	5900	1320	J	1010	J	1290	J	1390	J	336	
Mercury	23	65	0.212	J	0.209	J	0.173	J	0.168	J	0.0263	
Nickel	1600	23000	25.8	J	28.8	J	25.7	J	26.6	J	21.8	
Potassium	NA	NA	3240	J	3340	J	2950	J	3240	J	1660	
Selenium	390	5700	0.408	UJ	0.886	J	0.452	UJ	1.18	J	0.252	U
Silver	390	5700	0.204	UJ	0.223	UJ	0.226	UJ	0.212	UJ	0.126	U
Sodium	NA	NA	400	J	331	J	322	J	352	J	139	
Thallium	NA	NA	0.611	UJ	0.668	UJ	0.678	UJ	0.636	UJ	0.378	U
Vanadium	78	1100	37	J	39.4	J	34.3	J	36.9	J	42.3	
Zinc	23000	110000	166	J	203	J	170	J	176	J	48.5	
WET CHEMISTRY (ug/kg)												
Chromium, Hexavalent	NA	NA	0.545	UJ	0.61	UJ	0.593	UJ	0.597	UJ	0.339	U
Chromium, Trivalent	NA	NA	44.1	J	47.2	J	41.6	J	43.4	J	39.2	
Cyanide Total & Amenable	47	680	0.521	J	1.1	J	1.66	J	1.32	J	0.132	J
Percent Moisture (%)	NA	NA	55.9		60.5		59.5		58.9		28.9	
Total Organic Carbon	NA	NA	25700		31200		27800		31900		1520	

Notes:

* - The direct contact standard for arsenic is based on natural background

% - Percent

-- - Sample not run for this analyte

Comp - Composite Sample

ug/kg - micrograms/kilogram

NA - No Criteria specified in current

SRS - Soil Remediation Standards

Qualifier Definition:

J - These results should be considered estimated.

U - The compound was analyzed for but not detected.

Shading indicates the detected concentration exceeds Current NJDEP Residential SRS.

Shading indicates the detected concentration exceeds Current NJDEP Non-Residential SRS.

Criteria Source:

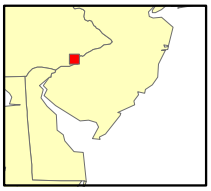
N.J.A.C. 7:26D Remediation Standards, N.J.S.A. 13:1D-1 et seq., 58:10-23.11a et seq., 58:10A-1 et seq. and 58:10B-1 et seq., amended May 7, 2012.

FIGURES

Quad Source: ESRI, Mapping Service
USGS 2013. Marcus Hook PA, NJ, Del
USGS Quad, 1967. Revised 1970

N
W E
S

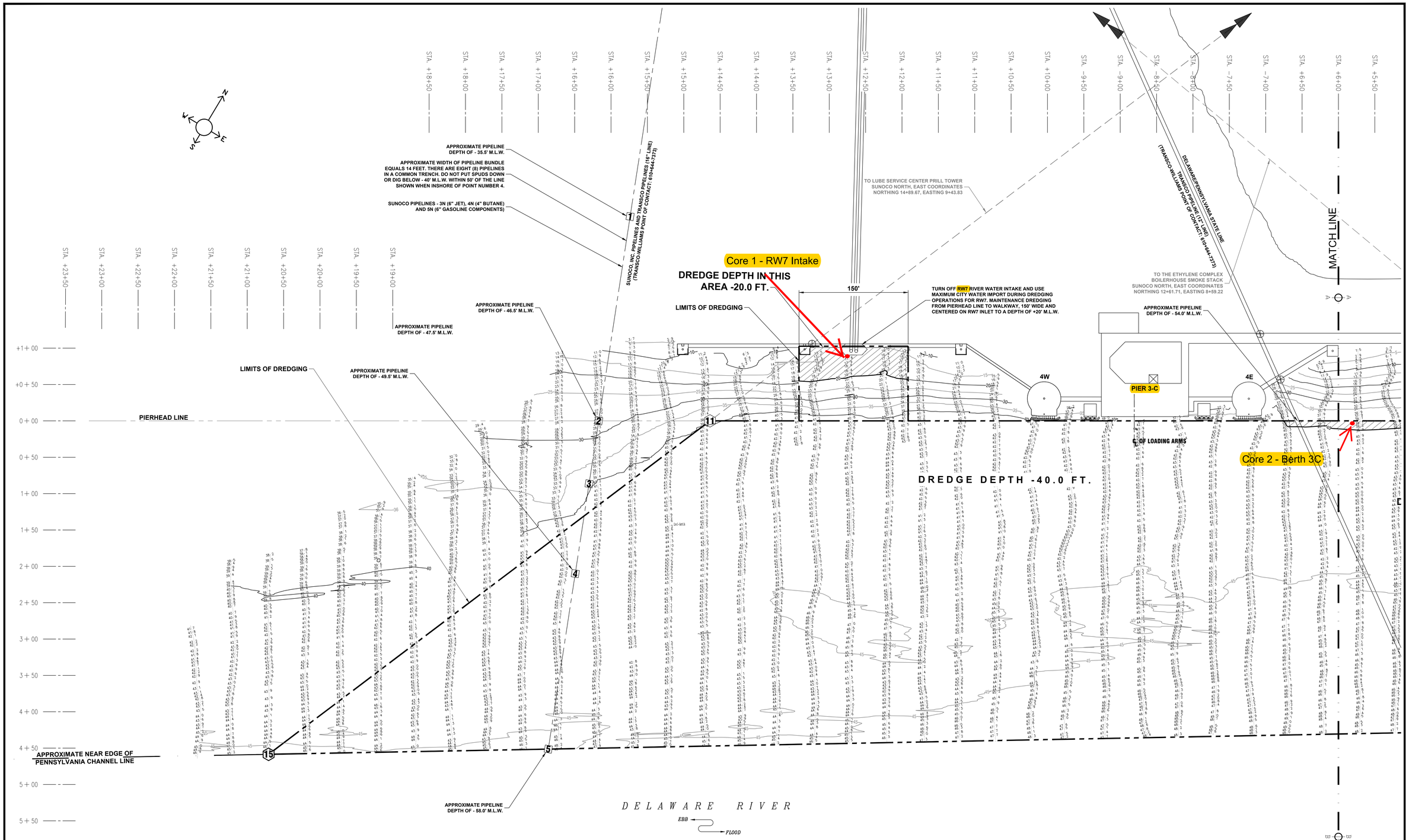
0 2,500 5,000
Feet



Quadrangle Location

Figure 1
Site Location Map - Sunoco
Marcus Hook Industrial Complex
Delaware River
Marcus Hook, Pennsylvania

File: \\fsfed01\tig\sunoco\mxd\site_loc.mxd, 16-Dec-10 11:17, ricksc



SITE PLAN

SCALE: 1" = 50.0'

0 50 100 150

NOTES

1. HORIZONTAL CONTROL IS BASED ON NEW JERSEY 2900 STATE PLANE COORDINATES, NAD83, AS ESTABLISHED IN THE FIELD AND SOLELY FOR THE USE OF THIS HYDROGRAPHIC SURVEY.
2. ALL SOUNDINGS WERE TAKEN USING A TRIMBLE SPS 855 WITH RTK, HYPACK 16A SOFTWARE, A TELEDYNE ODOM HYDROTRAC CONTINUOUS RECORDING SURVEY FATHOMETER.
3. VERTICAL CONTROL WAS OBTAINED FROM KEYNET GPS (TRIMBLE VIRTUAL REFERENCE STATION [VRS] NETWORK) REAL-TIME KINEMATIC (RTK) CORRECTIONS TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), AND CONVERTED TO MEAN LOWER LOW WATER (M.L.L.W.) WHICH IS 3.00' BELOW NAVD88. NAVD88 CONVERSION OF 3.00' OBTAINED FROM THE ARMY CORP OF ENGINEERS.
4. SOUNDINGS WERE TAKEN ON MONDAY, AUGUST 23, 2021.
5. THE INFORMATION DEPICED ON THIS MAP REPRESENTS THE RESULTS OD SURVEYS CONDUCTED ON THE DATES INDICATED, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
6. THE DECIMAL POINT (.) DENOTES THE SOUNDING LOCATION.
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8. CONTOURS WERE INTERPOLATED WITH TRIMBLE NAVIGATION LIMITED SOFTWARE, TERRAMODEL VERSION 10.11.
9. CROSS HATCHING INDICATES AREAS THAT ARE ABOVE THE SPECIFIED MINIMUM DREDGE DEPTH.
10. DREDGE LIMITS WERE PROVIDED BY SUNOCO LOGISTICS' DRAWING "E_MHRF_C580001R00".
11. CHANNEL LOCATIONS WERE PROVIDED BY THE UNITED STATES ARMY CORPS OF ENGINEERS' DRAWINGS, "AAOA11PS.dwg" & "AAOA12PS.dwg".

LEGEND

LIMITS OF DREDGING

DATUM CHART

LOCAL BENCHMARK – BRASS DISK AT MOORING CELL 3W +12.07 (M.L.L.W.)

NAVD 88 +3.0 (M.L.L.W.)

12.07'

MEAN LOWER LOW WATER 0.0

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S. T. HUDSON ENGINEERS, INC.
PROFESSIONAL ENGINEERS & CONSULTANTS
900 Dudley Avenue
Cherry Hill, N.J. 08002
856-342-6600
Fax No. 856-342-8323

drawn DJD	date 9/10/2021	contract	
checked SD	FILE E-1162	21-211	
drftg. approval AS			
MARCUS HOOK INDUSTRIAL COMPLEX		dwg. no.	rev.
CONDITION HYDROGRAPHIC SURVEY		2of4	0

ENGINEERING RECORD

DRAWN BY	GMN
CHECKED BY	
APPROVED BY	
DATE	9/12/01
SCALE	1" = 50'+0"

OLD DRAWING NO.

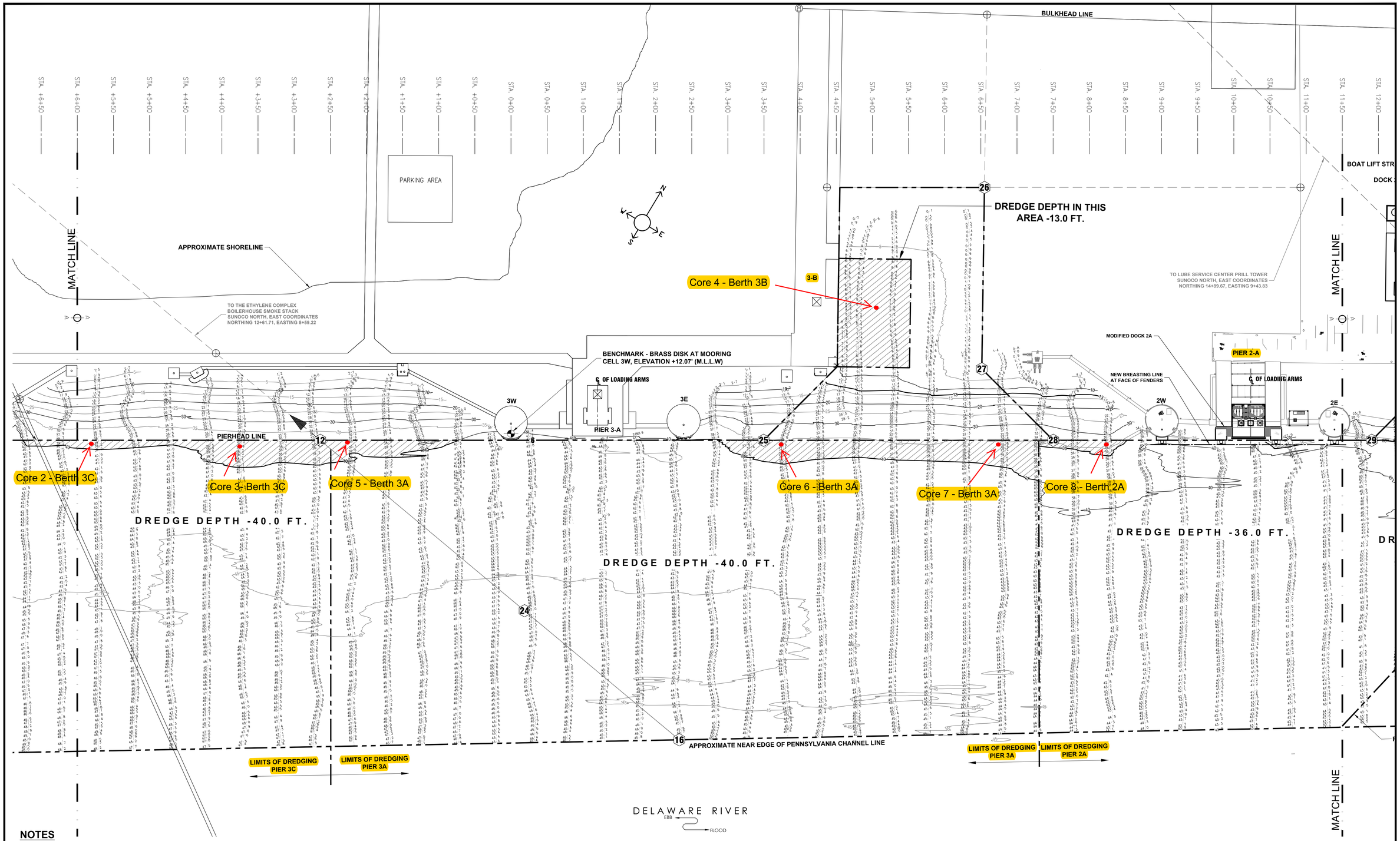
REV.	DATE	APP#	DESCRIPTION	APPROVAL

ENERGY TRANSFER PARTNERS

MARCUS HOOK INDUSTRIAL COMPLEX
SURVEY TEMPLATE
SHEET 2

TOWNSHIP OF MARCUS HOOK

DWG. NO. Figure 2



SITE PLAN

SCALE: 1" = 50.0'

0 50 100 150

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LEGEND

LIMITS OF DREDGING

DATUM CHART

LOCAL BENCHMARK – BRASS DISK AT MOORING CELL 3W +12.07 (M.L.L.W.)

NAVD 88	+3.0	(M.L.L.W.)
MEAN LOWER LOW WATER	0.0	

12.07'

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ENGINEERING RECORD

DRAWN BY	GMN
CHECKED BY	
APPROVED BY	
DATE	9/12/01
SCALE	1" = 50'-0"

OLD DRAWING NO.

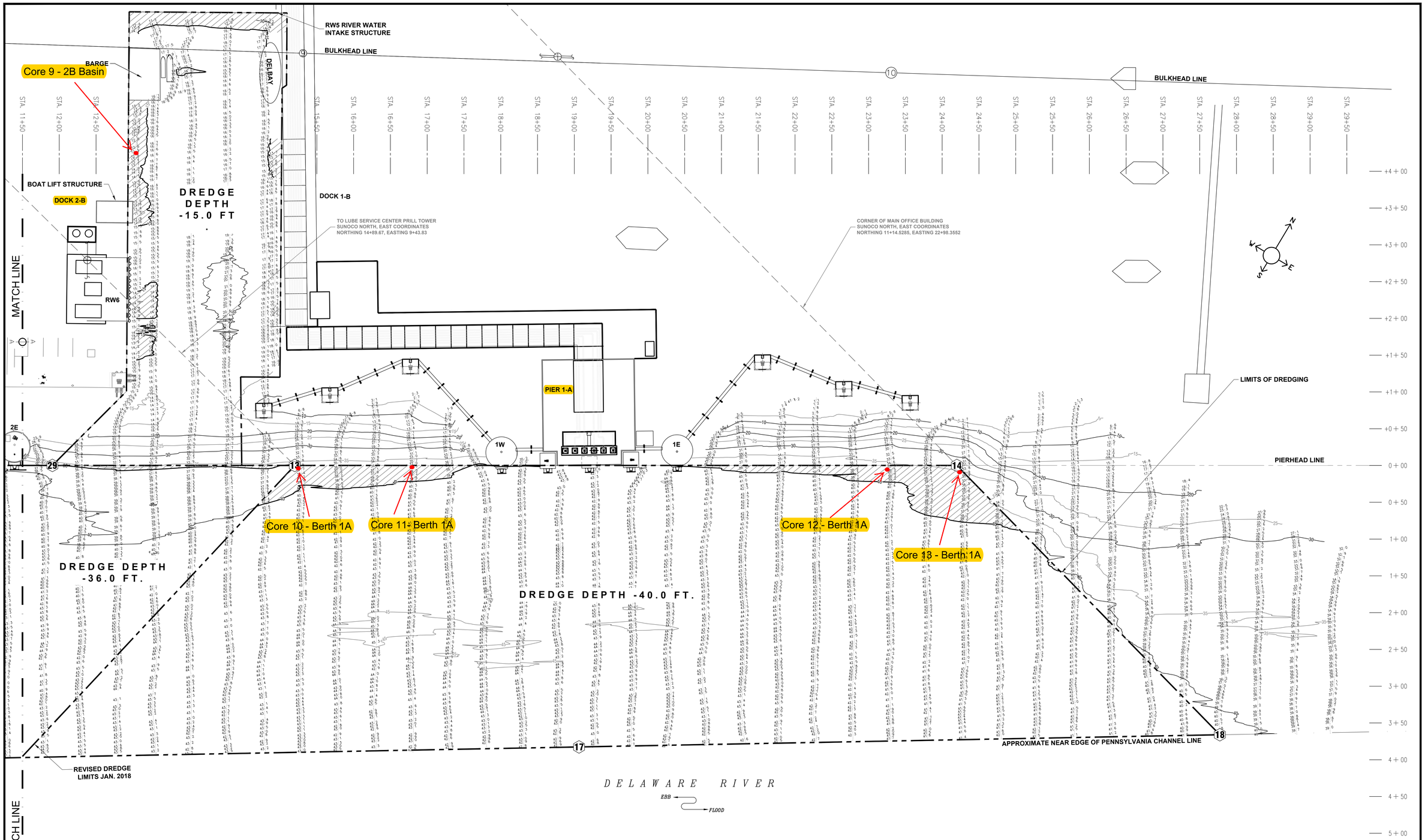
REV.	DATE	APP#	DESCRIPTION	APPROVAL

ENERGY TRANSFER PARTNERS

MARCUS HOOK INDUSTRIAL COMPLEX
SURVEY TEMPLATE
SHEET 3

TOWNSHIP OF MARCUS HOOK

DWG. NO. Figure 3



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9. CROSS HATCHING INDICATES AREAS THAT ARE ABOVE THE SPECIFIED MINIMUM DREDGE DEPTH.
10. DREDGE LIMITS WERE PROVIDED BY SUNOCO LOGISTICS' DRAWING "E_MHRF_C580001R00".
11. CHANNEL LOCATIONS WERE PROVIDED BY THE UNITED STATES ARMY CORPS OF ENGINEERS' DRAWINGS, "AAOA11PS.dwg" & "AAOA12PS.dwg".

LEGEND

LIMITS OF DREDGING — — — — — —

SITE PLAN

SCALE: 1" = 50.0'

0 50 100 150

DATUM CHART

LOCAL BENCHMARK – BRASS DISK AT MOORING CELL 3W +12.07 (M.L.L.W.)

NAVD 88	+3.0 (M.L.L.W.)	12.07'
MEAN LOWER LOW WATER	0.0	

"Drawings issued in electronic form are provided for the convenience of the recipient and are used at the sole risk of the user. Reliance may be placed only on hard copies of drawings issued by S.T. Hudson Engineers. In the event of any discrepancy, the hard copy will govern."

S. T. HUDSON ENGINEERS, INC.
PROFESSIONAL ENGINEERS & CONSULTANTS
900 Dudley Avenue
Cherry Hill, N.J. 08002
Fax No. 856-342-8323 856-342-6600

drawn	DJD	date 9/10/2021	contract
checked	SD	FILE E-1162	21-211
drftg. approval	AS		

MARCUS HOOK INDUSTRIAL COMPLEX

CONDITION HYDROGRAPHIC SURVEY

dwg. no. 4of4 rev. 0

ENGINEERING RECORD

DRAWN BY	GMN
CHECKED BY	
APPROVED BY	
DATE	9/12/01
SCALE	1" = 50'+0"

OLD DRAWING NO.

REV.	DATE	APP#	DESCRIPTION	APPROVAL

ENERGY TRANSFER PARTNERS

MARCUS HOOK INDUSTRIAL COMPLEX
SURVEY TEMPLATE
SHEET 4

TOWNSHIP OF MARCUS HOOK

DWG. NO. Figure 4

ATTACHMENT 1
Volume Calculations

TABLE No. 1
ENERGY TRANSFER MARCUS HOOK
DREDGE VOLUME SUMMARY
AUGUST 2021

SITE: ENERGY TRANSFER PARTNERS

Marcus Hook Terminal
Marcus Hook, PA
August 24, 2021
Job # 21-211

	DESCRIPTION	DESIGN DEPTH	"BEFORE DREDGE" VOLUME SUMMARY Materials within pay prism						"AFTER DREDGE" VOLUME SUMMARY Materials remaining within pay prism						TOTAL PAY QUANTITY (C.Y.)
			SURVEY DATE	REQUIRED (C.Y.)	OVERDEPTH (C.Y.)	3:1 Side Slopes	3:1 Side Slopes 2' O.D.	TOTAL (C.Y.)	SURVEY DATE	REQUIRED (C.Y.)	OVERDEPTH (C.Y.)	3:1 Side Slopes	3:1 Side Slopes 2' O.D.	TOTAL REMAINING (C.Y.)	
A	Berth 3C	40.0'	8/23/2021	305	2,078	5,005	4,046	11,434		0	0	0	0	0	0
B	Berth 3A	40.0'	8/23/2021	1,077	2,413	10,300	4,620	18,410		0	0	0	0	0	0
C	Berth 2A	36.0'	8/23/2021	136	482	1,408	1,848	3,874		0	0	0	0	0	0
D	Berth 1A	40.0'	8/23/2021	935	3,141	13,370	5,073	22,519		0	0	0	0	0	0
E	Berth 3B	13.0'	8/23/2021	3,122	1,381	236	297	5,036		0	0	0	0	0	0
F	RW7 Intake	20.0'	8/23/2021	962	643	0	0	1,605		0	0	0	0	0	0
G	2B Basin	15.0'	8/23/2021	318	2,203	0	0	2,521		0	0	0	0	0	0
		TOTALS		6,855	12,341	30,319	15,884	65,399		0	0	0	0	0	0

1. All volumes calculated via in-place measurements.
2. Volume quantities calculated using HYPACK ver. 2018 ALL Format.
3. Limits of dredging shown on STHE Dredge Survey Drawing **E-1162**.

ATTACHMENT 2
Core Logs

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1038	Crew:	JP	
Coordinates:	N	355169.2	E	232783.4	Vessel:	Schuylkill	
Core # : 1 - RW7	Zone: NJ	Datum NAD 83			Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	22.0	Core Penetration Length (ft.):	8.0		
Measured Water Depth [MWD] [ft.]:	23.6	Recovered Core Length (ft.):	6.3		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	5.4	Sample Length Retained (ft.):	3.6		
Corrected Depth @ MLLW [ft.]:	18.2	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y	N	
Corrected Depth @ MLW [ft.]:	18.4				
Required Sample Core Length [SCL] [ft.]:	3.6				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Gray silt, fine sand
Bottom 6.3		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1109	Crew:	JP	
Coordinates:	N	355437.2	E	233437.3	Vessel:	Schuylkill	
Core # :	2-Berth 3C	Zone: NJ	Datum NAD 83		Deploy:	1	2	3
Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::			42.0	Core Penetration Length (ft.):		8.0	6.0	6.0
Measured Water Depth [MWD] [ft.]:			44.4	Recovered Core Length (ft.):		5.5	2.4	3.4
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:			5.9	Sample Length Retained (ft.):				3.3
Corrected Depth @ MLLW [ft.]:			38.5	Core Volume Retained (gal.):				
+ MLW Adjustment [ft.}			0.2	Collected to Project Depth:		Y	N	
Corrected Depth @ MLW [ft.]:			38.7					
Required Sample Core Length [SCL] [ft.]:			3.3					

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		First two deployments in were in water deeper than 40' corrected depth. Deploy 3: MWD: 44.4, T/A: 5.9, Required Core Length: 3.3
		Gray silty sand, fine sand
Bottom 3.4		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes		
Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft
Liner Type:	Soft	Hard
Vibracorer:	P3	P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer	Slambar
Eckman	Ponar: Standard / Petite
Box Core	

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1135	Crew:	JP	
Coordinates:	N	355563.5	E	233606.0	Vessel:	Schuylkill	
Core # :	3-Berth 3C	Zone: NJ	Datum NAD 83		Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	7.0		
Measured Water Depth [MWD] [ft.]:	44.7	Recovered Core Length (ft.):	3.8		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	6.0	Sample Length Retained (ft.):	3.1		
Corrected Depth @ MLLW [ft.]:	38.7	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y	N	
Corrected Depth @ MLW [ft.]:	38.9				
Required Sample Core Length [SCL] [ft.]:	3.1				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Gray silt with fine sand
Bottom 3.8		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1309	Crew:	JP	
Coordinates:	N	356226.7	E	234251.1	Vessel:	Schuylkill	
Core # : 4-Berth 3B	Zone: NJ	Datum NAD 83			Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	15.0	Core Penetration Length (ft.):	10.0		
Measured Water Depth [MWD] [ft.]:	12.9	Recovered Core Length (ft.):	7.3		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	5.3	Sample Length Retained (ft.):	7.2		
Corrected Depth @ MLLW [ft.]:	7.6	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	7.8				
Required Sample Core Length [SCL] [ft.]:	7.2				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty fine sand
Bottom 7.3		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1239	Crew:	JP	
Coordinates:	N	355625.6	E	233710.5	Vessel:	Schuylkill	
Core # : 5-Berth 3A	Zone: NJ	Datum NAD 83			Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	8.0		
Measured Water Depth [MWD] [ft.]:	42.7	Recovered Core Length (ft.):	5.5		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	5.5	Sample Length Retained (ft.):	4.6		
Corrected Depth @ MLLW [ft.]:	37.2	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	37.4				
Required Sample Core Length [SCL] [ft.]:	4.6				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Gray silt, fine sand
Bottom 5.5		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/19/21	Time: 0917	Crew:	JP	
Coordinates:	N	355943.4	E	234225.5	Vessel:	Schuylkill	
Core # :	6-Berth 3A	Zone: NJ	Datum NAD 83		Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	8.0		
Measured Water Depth [MWD] [ft.]:	41.5	Recovered Core Length (ft.):	4.4		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	3.0	Sample Length Retained (ft.):	3.3		
Corrected Depth @ MLLW [ft.]:	38.5	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	38.7				
Required Sample Core Length [SCL] [ft.]:	3.3				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty fine sand
Bottom 4.4		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/19/21	Time: 0931	Crew:	JP	
Coordinates:	N	356101.2	E	234484.9	Vessel:	Schuylkill	
Core # : 7-Berth 3A	Zone: NJ	Datum NAD 83			Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	9.0		
Measured Water Depth [MWD] [ft.]:	38.8	Recovered Core Length (ft.):	7.3		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	3.2	Sample Length Retained (ft.):	6.2		
Corrected Depth @ MLLW [ft.]:	35.6	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	35.8				
Required Sample Core Length [SCL] [ft.]:	6.2				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty fine sand
Bottom 7.3		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1335	Crew:	JP	
Coordinates:	N	356177.6	E	234627.7	Vessel:	Schuylkill	
Core # : 8-Berth 2A	Zone: NJ	Datum NAD 83			Deploy:	1	2	3
Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::		38.0		Core Penetration Length (ft.):		8.0		
Measured Water Depth [MWD] [ft.]:		36.8		Recovered Core Length (ft.):		6.6		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:		4.9		Sample Length Retained (ft.):		5.9		
Corrected Depth @ MLLW [ft.]:		31.9		Core Volume Retained (gal.):				
+ MLW Adjustment [ft.}		0.2		Collected to Project Depth:		Y / N		
Corrected Depth @ MLW [ft.]:		32.1						
Required Sample Core Length [SCL] [ft.]:		5.9						

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown grey silt/sand
Bottom 6.6		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1357	Crew:	JP	
Coordinates:	N	356836.7	E	234807.2	Vessel:	Schuylkill	
Core # :	9-Basin 2B	Zone: NJ	Datum NAD 83		Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	17.0	Core Penetration Length (ft.):	6.0		
Measured Water Depth [MWD] [ft.]:	19.2	Recovered Core Length (ft.):	5.1		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	4.5	Sample Length Retained (ft.):	2.1		
Corrected Depth @ MLLW [ft.]:	14.7	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	14.9				
Required Sample Core Length [SCL] [ft.]:	2.1				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty sand
Bottom 5.1		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft / Hard

Vibracorer: P3 / P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD		
Job#:	41-140	Date:	10/19/21	Time:	0838	Crew:	JP	
Coordinates:	N	356519.9	E	235229.0		Vessel:	Schuylkill	
Core # :	10-Berth 1A	Zone: NJ	Datum NAD 83			Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	7.0		
Measured Water Depth [MWD] [ft.]:	40.7	Recovered Core Length (ft.):	3.9		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	1.8	Sample Length Retained (ft.):	2.9		
Corrected Depth @ MLLW [ft.]:	38.9	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	39.1				
Required Sample Core Length [SCL] [ft.]:	2.9				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty fine sand
Bottom 3.9		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/19/21	Time: 0853	Crew:	JP	
Coordinates:	N	356600.1	E	235354.0	Vessel:	Schuylkill	
Core # :	11-Berth 1A	Zone: NJ	Datum NAD 83		Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	6.0		
Measured Water Depth [MWD] [ft.]:	41.1	Recovered Core Length (ft.):	4.0		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	2.4	Sample Length Retained (ft.):	3.1		
Corrected Depth @ MLLW [ft.]:	38.7	Core Volume Retained (gal.):			
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N		
Corrected Depth @ MLW [ft.]:	38.9				
Required Sample Core Length [SCL] [ft.]:	3.1				

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Brown gray silty sand
Bottom 4.0		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD		
Job#:	41-140	Date:	10/18/21	Time:	1453	Crew:	JP	
Coordinates:	N	356955.0	E	235933.0		Vessel:	Schuylkill	
Core # :	12-Berth 1A	Zone: NJ	Datum NAD 83			Deploy:	1	2	3
Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::			42.0	Core Penetration Length (ft.):			8.0		
Measured Water Depth [MWD] [ft.]:			40.0	Recovered Core Length (ft.):			5.5		
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:			3.7	Sample Length Retained (ft.):			5.5		
Corrected Depth @ MLLW [ft.]:			36.3	Core Volume Retained (gal.):					
+ MLW Adjustment [ft.}			0.2	Collected to Project Depth:			Y N		
Corrected Depth @ MLW [ft.]:			36.5						
Required Sample Core Length [SCL] [ft.]:			5.5						

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
		Dark gray silt and sand
Bottom 5.5		

# of containers:				
Type of container:	bucket	hardliner	cup	other

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615

AQUA SURVEY, INC.

SEDIMENT CORE LOG

Client :	Weston Solutions, Inc.		Project :	Delaware River - Marcus Hook		Logger: MD	
Job#:	41-140	Date:	10/18/21	Time: 1422	Crew:	JP	
Coordinates:	N	356991.8	E	236027.3	Vessel:	Schuylkill	
Core # :	13-Berth 1A	Zone: NJ	Datum NAD 83		Deploy:	1	2	3

Project Depth (incl. 2.0ft. Overdredge) [PD] [ft] MLW::	42.0	Core Penetration Length (ft.):	8.0
Measured Water Depth [MWD] [ft.]:	40.6	Recovered Core Length (ft.):	5.7
Tide Adjust [TA] (+/- ft. from MLLW) [ft.]:	4.3	Sample Length Retained (ft.):	5.5*
Corrected Depth @ MLLW [ft.]:	36.3	Core Volume Retained (gal.):	
+ MLW Adjustment [ft.}	0.2	Collected to Project Depth:	Y / N
Corrected Depth @ MLW [ft.]:	36.5	* Top 3.6' composited with Core 12 per SSAP	
Required Sample Core Length [SCL] [ft.]:	5.5	3.7-5.5' collected as a discrete sample (Sample J)	

All Length Measurements are in Decimal Feet

Sample Interval (ft.)	Sample Id #	Description
Top 0.0		
3.6		Gray silt and sand
Bottom 5.7		Large gravel mixed with gray silt and sand (this distinct interval was separated into a separate Sample J for analysis)

	bucket	hardliner	cup	other
# of containers:				
Type of container:				

Conditions:

Comments: Core to client

Core Volumes

Nominal core-barrel diameter		EST. Volume
3.0"		.25 gal/ft
3.5"	8.0"	.33 gal/ft
4.0"		.50 gal/ft

Liner Type: Soft Hard

Vibracorer: P3 P5 VT6 Other

Live Organisms Present	Y	N
Oil Present	Y	N
Odor Present	Y	N
Debris Present	Y	N
Within 10% of Req'd Core Length	Y	N
Photo	Y	N

Pushcorer Slambar

Eckman Ponar: Standard / Petite

Box Core

MLW #td ver 030615