PUBLIC NOTICE

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

In replying refer to:
Public Notice Number: NAN-2016-00908-EHA
Issue Date: March 27, 2018
Expiration Date: May 7, 2018

To Whom It May Concern:

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

APPLICANT: Transcontinental Gas Pipe Line Company, LLC
Atttn: Timothy Powell
2800 Post Oak Boulevard, L-17
Houston, Texas 77056

ACTIVITY: Install a 26-inch diameter natural gas pipeline

WATERWAY: Raritan Bay, Lower New York Bay, Atlantic Ocean

LOCATION: Middlesex County and Monmouth County, New Jersey; Richmond County and Queens County, New York

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

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in preparation of an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

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

Comments submitted in response to this notice will be fully considered during the public interest review for this permit application. Comments provided will become part of the public record for this permit application. All written comments, including contact information, will be made a part of the administrative record, available to the public under the Freedom of Information Act. The Administrative Record, or portions thereof, may also be posted on a Corps of Engineers internet web site. Due to resource limitations, this office will normally not acknowledge the receipt of comments or respond to individual letters of comment.

The New York District of the U.S. Army Corps of Engineers is serving as one of the cooperating agencies involved in the preparation of an Environmental Impact Statement by the Federal Energy Regulatory Commission (FERC). A Notice of Availability for the Draft Environmental Impact Statement (DEIS) was posted on the FERC website (www.ferc.gov) on March 23, 2018, and the DEIS can be viewed on the FERC website by clicking on the eLibrary link. A limited number of copies are available for distribution and public inspection at: Federal Energy Regulatory Commission, Public Reference Room, 888 First Street, NE, Room 2A, Washington, DC 20426, phone (202) 502-8371. Copies of the DEIS have been mailed to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; local newspapers and libraries in the project area; and potentially affected landowners and other interested individuals and groups. Information to submit comments on the DEIS can be found on the FERC website or by calling (866) 208-3676. FERC will conduct four public meetings in the project area to receive comments on the DEIS. The New York District Corps of Engineers will participate in two of the public meetings as listed below to gather information on this proposal to assist in the review of the permit application for the proposed activity and will consider public comments on the material matters at issue with respect to activities regulated by the Corps.

The date, time and location of the public meetings are as follows:

Date and Time:	Wednesday, April 25 from 5:00 to 9:00 pm
Location:	George Bush Senior Center 1 Old Bridge Plaza Old Bridge, NJ 08857 (732) 721-5600
Date and Time:	Thursday, April 26 from 5:00 to 9:00 pm
Location:	Best Western Gregory Hotel 8315 4th Avenue Brooklyn, NY 11209 (718) 238-3737

Information on project impacts to Endangered and Threatened Species, Essential Fish Habitat, and sites included in or eligible for inclusion in the National Register of Historic Places can be found in the DEIS.

Reviews of activities pursuant to Section 404 of the Clean Water Act will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404 (b) of the Clean Water Act and the applicant will obtain water quality certificates or waivers from the appropriate state agencies in acordance with Section 401 of the Clean Water Act prior to a permit decision.

Pursuant to Section 307 (c) of the Coastal Zone Management Act of 1972 as amended [16 U.S.C.

1456 (c)], for activities under consideration that are located within the coastal zone of a state which has a federally approved coastal zone management program, the applicant has certified in the permit application that the activity complies with, and will be conducted in a manner that is consistent with, the approved state coastal zone management program. By this public notice, we are requesting the state's concurrence with, objection to, or waiver of the applicant's certification. No permit decision will be made until one of these actions occur. For activities within the coastal zone of New York State, the applicant's certification and accompanying information is available from the Consistency Coordinator, New York State Department of State, Division of Coastal Resources and Waterfront Revitalization, Coastal Zone Management Program, One Commerce Plaza, 99 Washington Avenue, Albany, New York 12231, Telephone (518) 474-6000. Comments regarding the applicant's certification, and copies of any letters to this office commenting upon this proposal, should be so addressed. For activities within the coastal zone of New Jersey State, the applicant's certification and accompanying information is available from the New Jersey Department of Environmental Protection, Coastal Management Program, P.O. Box 418, 401 E. State Street, Trenton, NJ, 08625, Telephone (609) 633-2201. Comments regarding the applicant's certification, and copies of any letters to this office commenting upon this proposal, should be so addressed.

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

- Federal Energy Regulatory Commission
- National Park Service
- New York State Department of Environmental Conservation
- New Jersey Department of Environmental Protection

It is requested that you communicate the foregoing information concerning the activity to any persons known by you to be interested and who did not receive a copy of this notice. If you have any questions concerning this application, you may contact this office at (917) 790-8523 and ask for Naomi Handell.

In order for us to better serve you, please complete our Customer Service Survey located at http://www.nan.usace.army.mil/Missions/Regulatory/CustomerSurvey.aspx.

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

Stephan A. Ryba
Chief, Regulatory Branch

Enclosures

WORK DESCRIPTION

The applicant, Transcontinental Gas Pipe Line, LLC (Transco), has requested Department of the Army authorization to install a new natural gas transmission pipeline loop and associated subsea manifold tie-in and cathodic protection in Old Bridge Township and the Borough of Sayreville, Middlesex County, New Jersey and in Raritan Bay, Lower New York Bay and the Atlantic Ocean, Middlesex County and Monmouth County, New Jersey and Richmond County and Queens County, New York.

The proposed work is part of the Northeast Supply Enhancement Protect. The Federal Energy Regulatory Commission (FERC) has jurisdiction over the entire proposed project pursuant to Sections 7(b) and 7(c) of the Natural Gas Act and Part 157 of the FERC Commission's regulations. The applicant is seeking a Certificate of Public Convenience and Necessity from the Commission to construct, install, own, operate, and maintain an expansion of their existing interstate natural gas pipeline system in New York.

The work would involve:

Onshore Construction and Impacts

Madison Loop: The proposed Madison Loop work involves a 26-inch diameter natural gas pipeline that would begin at Mile Post (MP) 8.57 of the existing Lower Bay Loop C and would extend approximately 3.43 miles to connect with the proposed Raritan Bay Loop at MP 12.00. The proposed work from MP 10.41 to MP 10.98 and MP 11.25 to MP 12.00 would temporarily impact 2.82 acres of wetlands. All temporarily disturbed areas would be restored to pre-existing conditions. The pipeline would be installed via open cut and horizontal directional drilling (HDD). A total of approximately 1,780 cubic yards of material would be temporarily placed into the wetland areas during construction, to be used as backfill for the trench. See Sheets 4-29 of 62.

Offshore Construction and Impacts

Raritan Bay Loop: The proposed Raritan Bay Loop work involves a 26-inch diameter natural gas pipeline beginning in Sayreville, Middlesex County, New Jersey at MP 12.00. The proposed pipeline would extend offshore approximately 23.33 miles (MP 12.16 to MP 35.49) across Raritan Bay and Lower New York Bay, to the Atlantic Ocean, and would connect to the existing Rockaway Delivery Lateral at the proposed Rockaway Transfer Point. The cathodic protection system for the Raritan Bay Loop would consist of an offshore anode sled connected to the Raritan Bay Loop by an approximately 1,800 linear foot cable from the anode sled to the Morgan Meter and Regulating (M&R) Station at MP 12.1 and an approximately 550 linear-foot cable from the Morgan M&R Station to the Raritan Bay Loop at MP 12.0. See Sheet 30 of 62.

Two segments of the proposed offshore pipeline would be installed with HDD. The first proposed HDD crossing begins at an upland entry site at MP 12.00 and would exit offshore at MP 12.50. In order to create the HDD exit pit, the applicant proposes to dredge approximately 9,930 cubic yards of material, consisting of silt, clay and sand. The material would be placed at a state approved upland location or at the Historic Area Remediation Site (HARS). The HDD exit pit would contain cuttings and drilling fluid generated during the HDD process, which are proposed to be left in place. The applicant also proposes to cover the exit pit with native or compatible material upon construction completion. Approximately 1,155 cubic yards of drilling fluid and cuttings would be placed in the Morgan Shore Approach HDD exit pit during reaming, swabbing and pullback operations. See Sheet 35 of 62.

The second HDD crossing, located at Ambrose Channel, would be a water to water connection. The east pit would be at MP 30.40 and the west pit would be at MP 29.52. In order to create the HDD east pit, the applicant proposes to dredge approximately 32,450 cubic yards of sand and the material would either be side-cast for use as subsequent backfill, placed at a state approved upland location, or placed at the HARS. In order to create the HDD west pit, the applicant proposes to dredge approximately 14,050 cubic yards of sand with some silt/clay and the material would be placed at a state approved upland location or at the HARS. Approximately 17,725 cubic yards of drilling fluid and cuttings would be placed in the east and west pits during pilot hole drilling reaming, swabbing and pullback operations. See Sheet 39 of 62.

Cathodic protection HDD: The cables would be installed via HDD. Additionally, an environmental bucket dredge would be used to remove approximately 500 cubic yards of material to create a pit approximately 1,200 feet north of MP12.35 to install the cable and anode sled. This dredged material would be placed at a state-approved upland location. See Sheet 48 of 62.

The applicant proposes to cover the HDD entry and exit pits with native or compatible material upon construction completion. The HDD entry and exit pits would be backfilled (capped) with a minimum of one to two feet of clean, suitable material, to restore waterbody bottom contours to match existing seafloor elevations. The volume of backfill at the HDD pit for the Morgan Shore pipeline crossing would be approximately 8,775 cubic yards. The volume of backfill at the two HDD pits for the Ambrose Channel pipeline crossing would be a total of approximately 28,775 cubic yards. The volume of backfill at the offshore HDD pit for the cathodic protection cable would be approximately 250 cubic yards.

Offshore areas would be crossed using HDD between MP 12.16 and 12.50 (Morgan Shore crossing) and between MP 29.52 and MP 30.40 (Ambrose Channel crossing). A jet trencher would be used to install the proposed pipeline from MP 16.60 to 17.31, MP 17.89 to MP 24.00, MP 25.22 to MP 29.52, and from MP 30.40 to 35.19. A hand-jet or small-scale suction pump equipment would be used for two cable crossings (MP 13.88 and MP 35.19) and at the Rockaway Transfer Point (MP 35.49). An environmental bucket dredge or jet trencher would be used to install the remaining segments of pipe, including the Raritan Bay Channel crossing, the Chapel Hill Channel crossing, and the Anchorage Area 28 crossing (i.e., MP 12.50 to MP 16.60, MP 17.31 to MP 17.89, MP 24.00 to MP 25.22, and MP 35.19 to MP 35.49). Barge overflow is proposed.

The proposed workspace during construction would occupy approximately 15,600 acres. The total area of temporary disturbance during construction would be approximately 117 acres.

Sidecasting is proposed for materials excavated with an environmental bucket dredge in areas more than 15 feet deep. Material dredged from areas less than 15 feet deep would be placed at the Historic Area Remediation Site or a state approved upland location.

Proposed dredging/trenching area and volume (See Sheets 53-55 of 62):

From MP 12.50 to MP 16.60-approximately 31 acres
From MP 16.60 to MP 17.31-approximately 0.78 acres
From MP 17.31 to MP 17.89-approximately 7.82 acres
From MP 17.89 to MP 24.00-approximately 6.69 acres
From MP 24.00 to MP 24.84-approximately 9.47 acres
From MP 24.87 to MP 25.20-approximately 1.07 acres
From MP 25.20 to MP 29.52-approximately 4.73 acres
From MP 30.40 to MP 35.19-approximately 5.23 acres

From MP 35.23 to MP 35.49-approixmately 0.54 acres

Jet Trencher-approximately 277,000 cubic yards
Environmental Bucket Dredge-approximately 492,000 cubic yards
Hand Jet-approximately 10,000 cubic yards

Area disturbed: During proposed pipeline installation, suspension and re-deposition of sediment would occur over an approximately 300 acre area of seafloor. During proposed backfill activities, excavation and placement of the backfill material would occur over an approximately 830 acre area of seafloor.

Proposed backfill:

The applicant proposes to backfill the proposed pipeline using the jet trencher or clamshell dredge as necessary. The applicant proposes to backfill the proposed pipeline in the following manner:

For navigable waters located outside of designated federal navigation channels and anchorage areas: a minimum four feet of cover (ie: sand) in soft sediment is proposed and a minimum two feet of cover in consolidated rock is proposed.

For designated federal navigation channels: a minimum burial of eight feet below authorized depth (including side-slopes) is proposed and a minimum four feet of cover in soft sediment is proposed.

For designated (charted) anchorage grounds: a minimum seven feet of cover in soft sediment for un-maintained anchorage is proposed and a minimum 11 feet of cover in soft sediment for maintained (dredged) anchorage is proposed.

The proposed cover material sources include: Ambrose Channel, Sandy Hook Channel and Naval Station Earle. Corps authorization for proposed backfill sources would be obtained under separate permit applications.

Cable Crossings

The proposed pipeline route would cross the Neptune Regional Transmission System power cable at MP 13.9 and MP 35.2. The cable crossings would maintain a minimum of 18 inches of separation between the top of the cable and the proposed bottom of the pipeline. The pipeline would also be installed with four feet of cover. See Sheets 44-47 of 62.

Other work outside New York District/Outside Corps Jurisdiction

Other aspects of the proposed work include: In Baltimore District, 10.2 miles of 42-inch-diameter pipeline loop in Lancaster County, Pennsylvania (the Quarryville Loop); In Philadelphia District and outside Corps jurisdiction, modification of existing Compressor Station 200 in Chester County, Pennsylvania; in New York District, but in Assumed Waters, construction of new Compressor Station 206 in Somerset County, New Jersey; and appurtenant facilities. See FERC DEIS for additional details.

HARS

INTRODUCTION TO THE HISTORIC AREA REMEDIATION SITE (HARS):

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

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

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

As of the end of December 2017, dredged materials from one hundred twenty (120) different completed and ongoing Department of the Army (DA) permitted and federal dredging projects in the Port of New York and New Jersey have been dredged and placed as Remediation Material in the ocean at the Historic Area Remediation Site (HARS) since the closure of the Mud Dump Site and designation of the HARS in September 1997. This represents approximately 75 million cubic yards of Remediation Material.

The HARS, which includes the 2.2 square nautical mile area of the MDS, is an approximately 15.7 square nautical mile area located approximately 3.5 nautical miles east of Highlands, New Jersey and 7.7 nautical miles south of Rockaway, New York. The MDS is located approximately 5.3 nautical miles east of Highlands, New Jersey and 9.6 nautical miles south of Rockaway, New York. When determined by bathymetry (a map depicting the relative depths of water in a particular area) that capping is complete, the USEPA will take any necessary rulemaking to de-designate the HARS.

The HARS includes the following three areas:

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

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

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

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

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

ALTERNATIVES TO HARS PLACEMENT:

Regarding ocean placement of dredged material, the Ocean Dumping Regulations [Title 40 CFR Sections 227.16(b)] state that ". . . alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures which need not be competitive with the costs of ocean dumping, taking into account the environmental impacts associated with the use of alternatives to ocean dumping . . ." USACE, New York District has evaluated the regional practicability of potential disposal alternatives in the September, 1999 Draft "Implementation Report for the Dredged Material Management Plan for the Port of New York and New Jersey." The Recommended Plan within the report addresses both the long and short term dredged material placement options in two specific timeframes, heretofore referred to as the 2010 Plan and the 2040 Plan, respectively.

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

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

Many of the dredged material management options presented in the 2010 Plan, however, are not presently permitted and/or are presently under construction at this time and therefore considered unavailable for the purposes of this application. Other options are not available at reasonable incremental costs, thus leaving HARS placement as the preferred alternative. For more information

on the New York District Corps of Engineers programs, visit our website at http://www.nan.usace.army.mil

After all dredged material sampling and testing has been concluded, and a final evaluation of suitability of dredged materials generated by this project to be used for remediation of the HARS has been conducted, a Supplemental Public Notice will be issued.

Mitigation Statement

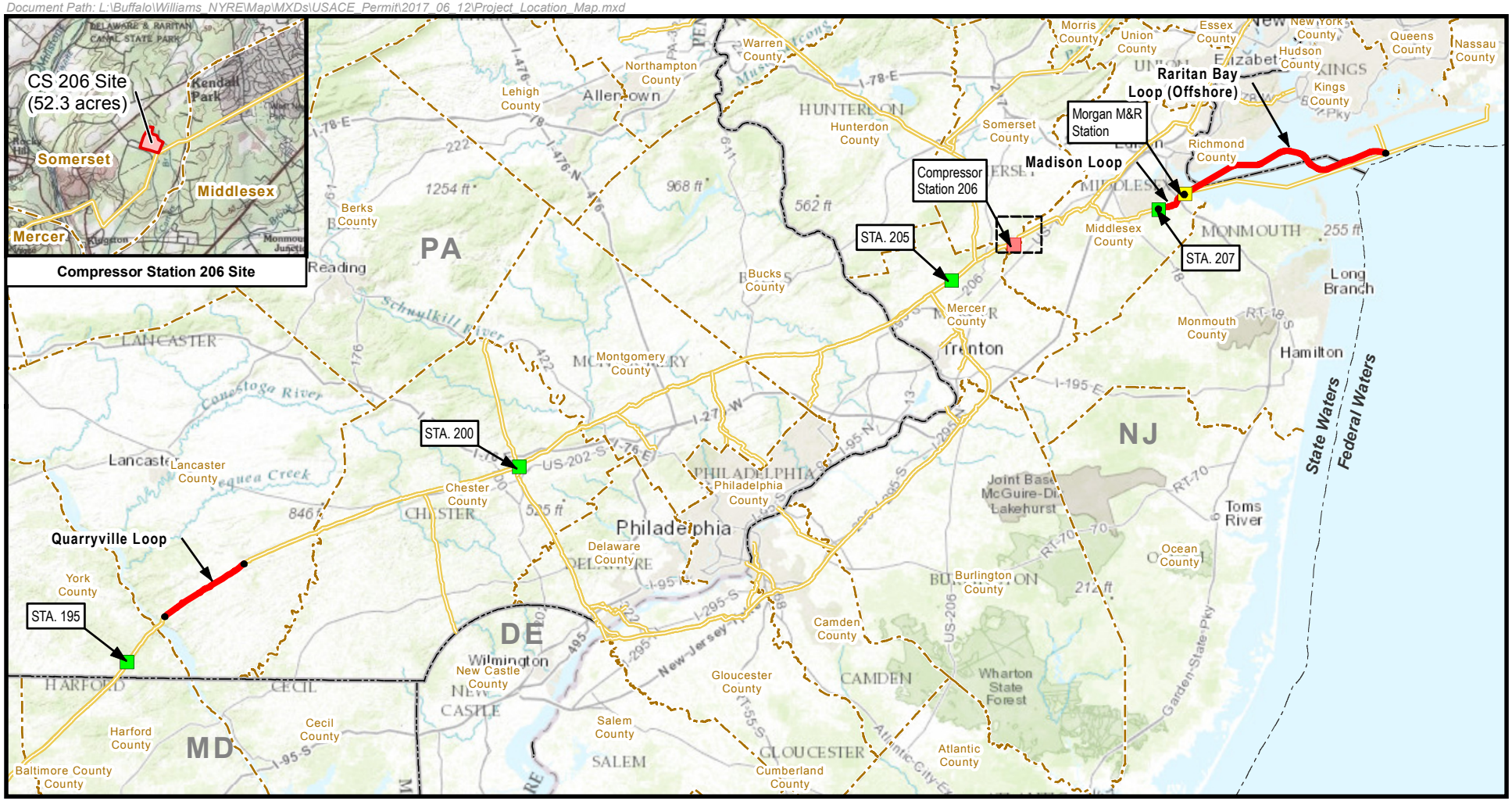
The applicant has stated that they have avoided, minimized, and mitigated for proposed impacts to the maximum extent practicable by: Onshore – Co-locating the route with existing pipeline right of way, using HDD for wetland and inshore waterbody crossings; using construction mats in saturated wetlands with unstable soils to minimize disturbance of wetland hydrology; segregating excavated topsoil in unsaturated wetlands to preserve the seed bank; developing an HDD Contingency Plan that includes daily monitoring along the drill path and clean-up procedures to be used in the event of an inadvertent release; revegetating wetlands with an approved seed mix or annual ryegrass to stabilize disturbed soils.

Offshore – Routing to avoid designated anchorage areas to the maximum extent practicable; using an environmental bucket for all clamshell dredging, prohibiting scow overflow in areas with elevated contaminants (e.g., Class C sediments); using HDD for two segments of the offshore route; coordinating with New York and New Jersey to develop plans for compensatory mitigation for shellfish impacts; avoiding construction in important habitat areas during sensitive periods for Atlantic sturgeon, winter flounder, and river herring to the maximum extent practicable; developing a vessel traffic plan to minimize interference with commercial and recreational boating and shipping activities during construction.

Stated Purpose

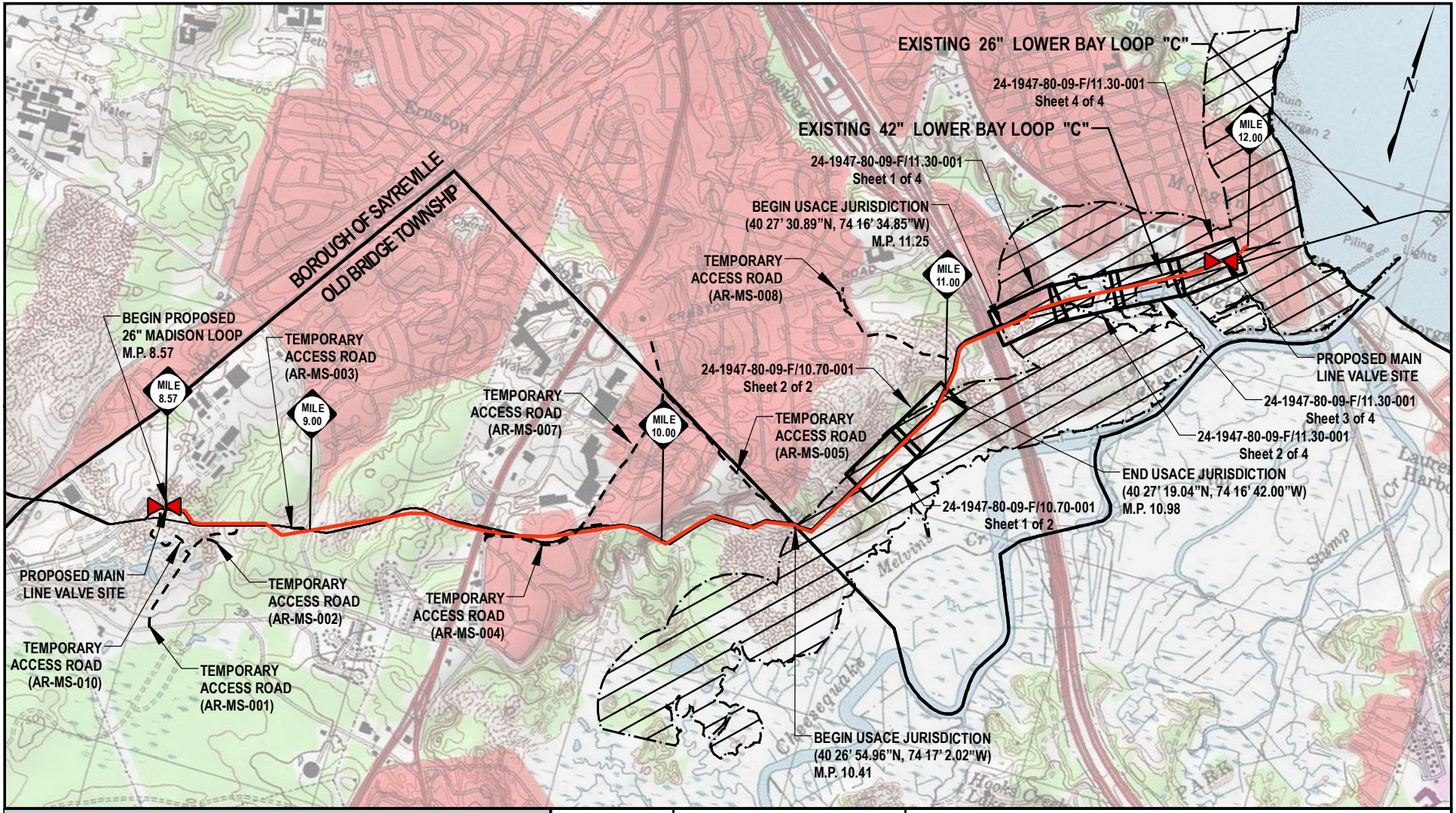
The applicant's stated purpose of this project is to provide 400,000 dekatherms per day (Dth/d) of incremental firm transportation capacity to Brooklyn Union Gas Company and KeySpan Gas East Corporation (collectively referred to as National Grid) in order to serve National Grid's residential and commercial customers in the New York City area and to ensure diverse sources of natural gas flowing into the New York City metropolitan area, and improve system reliability by providing a second supply path to the Rockaway Transfer Point, which is currently served only by Transco's Lower New York Bay Lateral (LNYBL).

Table of Contents



Data Sources: Williams 2017; E&E 2017; ESRI 2012; NOAA ENC 2013 (Chart # 12327 and # 12326) Seamless Web Service; USCG 2016

A-1: Project Vicinity Map
Northeast Supply Enhancement Project
Pennsylvania, New Jersey and New York



LEGEND

- PROPOSED 26' MADISON LOOP
- EXISTING PIPELINE
- ACCESS ROADS
- COUNTY/TOWNSHIP BOUNDARY
- USACE/NJDEP DUAL JURISDICTION LINE

0 2,000 4,000 6,000

SCALE IN FEET

DRG 7.5 MIN. QUAD MAP:
40074-D3 (SOUTH AMBOY, NJ)

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	05/19/2017	CNC	ISSUED FOR INFORMATION	1185727	LR	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
USACE WETLAND/WATERBODY LOCATION MAP
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
M.P. 8.57 TO M.P. 12.00
MIDDLESEX COUNTY, NEW JERSEY

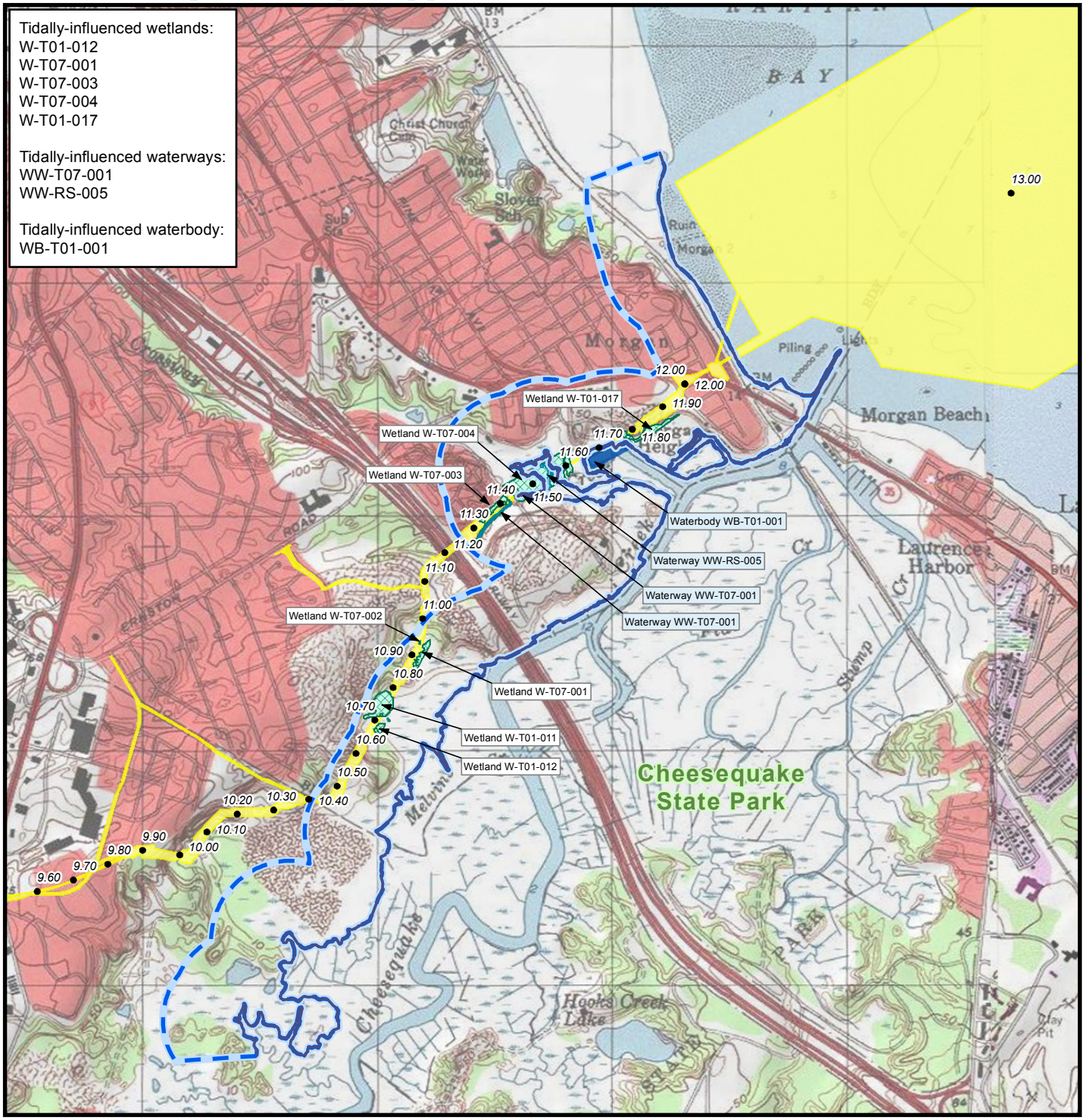
MUSTANG OF NEW JERSEY, INC.

Williams

DRAWN BY: CNC	DATE: 05/12/2017	ISSUE FOR BID:	SCALE: 1"= 2000'
CHECKED BY: LR	DATE: 05/12/2017	ISSUE FOR CONSTRUCTION:	0
APPROVED BY: MJH	DATE: 05/12/2017	DRAWING NUMBER: A-2	SHEET 1 OF 1
WO: 1185727		1:47 PM 5/25/2017	

\\wp-fs-arcgis-1.woodgroup.com\GIS_Projects\01_Projects\106259\03_Exhibits\20_USACE\2017_05_11\USACE_Madison-Oveview.mxd

Drawing A-2 Onshore Pipeline Location Map



- Milepost
- Derived MHWL
- 1,000-ft Buffer of MHWL
- Proposed Limit of Disturbance
- Waterways Crossed by the Project
- Wetlands Crossed by the Project
- Waterbodies Crossed by the Project

A-3: Waters and Wetlands Delineated along the Madison Loop within USACE Jurisdiction
Northeast Supply Enhancement Project
New Jersey and New York

0 0.25 0.5 Miles
0 0.25 0.5 0.75 Kilometers
N

Notes:
1. *Tidal designation includes wetlands and waterways that may be influenced by spring tides and storm surge (based on field observations).*

Drawing A-3 Waters and Wetlands Delineated Along the Madison Loop within USACE Jurisdiction

Feature ID	Impacted Area Acres (sq.ft.)	Cross Section Typical Reference Drawing
W-T01-012D-1	<0.01 (213)	-
W-T01-011A-1	0.59 (25,552)	Type I or Type II
W-T07-001D-1	<0.01 (61)	-
W-T07-002A-1	0.01 (540)	Type I or Type II
W-T07-003A-1	0.39 (16,884)	Type I or Type II
W-T07-003B-1	0.26 (11,295)	Type I or Type II
WW-T07-001	<0.01 (4)	-
W-T07-004D-1	1.43 (62,356)	Type I or Type II and Lockwood Marina HDD Profile
WW-RS-005	0.02 (893)	Lockwood Marina HDD Profile
W-T01-017D-1	0.24 (10,328)	Lockwood Marina HDD Profile
WB-T01-001	0.09 (3,955)	Lockwood Marina HDD Profile
W-T01-017A-1	0.08 (3,289)	Lockwood Marina HDD Profile

Revision as of 12/22/17: Impacted Area for W-T07-004D-1 has been reduced to 1.26 acres (54,755 square feet)

1. Wetland W-T07-004D-1 will be crossed via open cut and HDD.
2. Stream feature WW-RS-005 runs for 24 linear feet within the Project limits of disturbance.
3. Stream feature WW-T07-001 runs for 3.7 linear feet within the Project limits of disturbance.
4. The use of Type I or Type II installation method will depend on wetland conditions at the time of construction.
5. Cross Section Typical Reference Drawing not provided for features that will not be trenched during pipeline installation.
6. NAVD88 Conversion Factors for the Mean High Water (MHW) Line and Spring High Water Line (SHW) are as follows:
   a. 0.0 ft SHW = +5.2 ft NAVD88*
   b. 0.00 ft MHHW = +2.70 ft NAVD88**
   c. 0.00 ft MHW = +2.36 ft NAVD88**
   d. 0.00 ft MLW = -2.67 ft NAVD88**

   *(Source: Field derived)

   **(Source: NOAA VDatum for Lat 40.466862, Long -74.263345)

NOTES

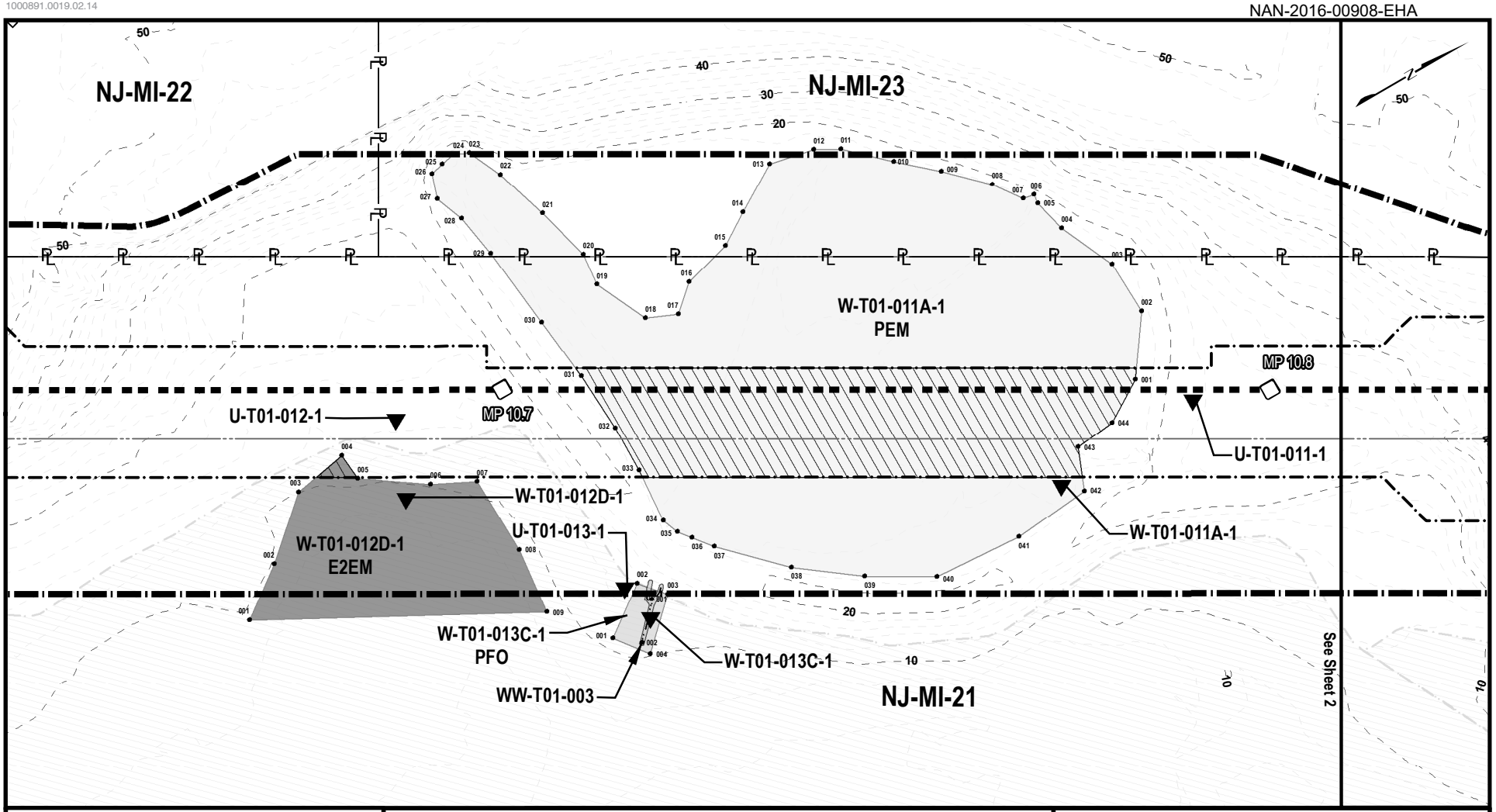
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
NOTES SHEET
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
M.P. 8.57 TO M.P. 12.00
MIDDLESEX COUNTY, NEW JERSEY

Drawing: Sheet 1 of 1

No.	Date	By	Revision Description	Chk.
0	05/19/2017	CNC	ISSUED FOR INFORMATION	LR

MUSTANG OF NEW JERSEY, INC.

Williams



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T01-011A-1	PEM	0.59 (25,552)
W-T01-012D-1	E2EM	<0.01 (213)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

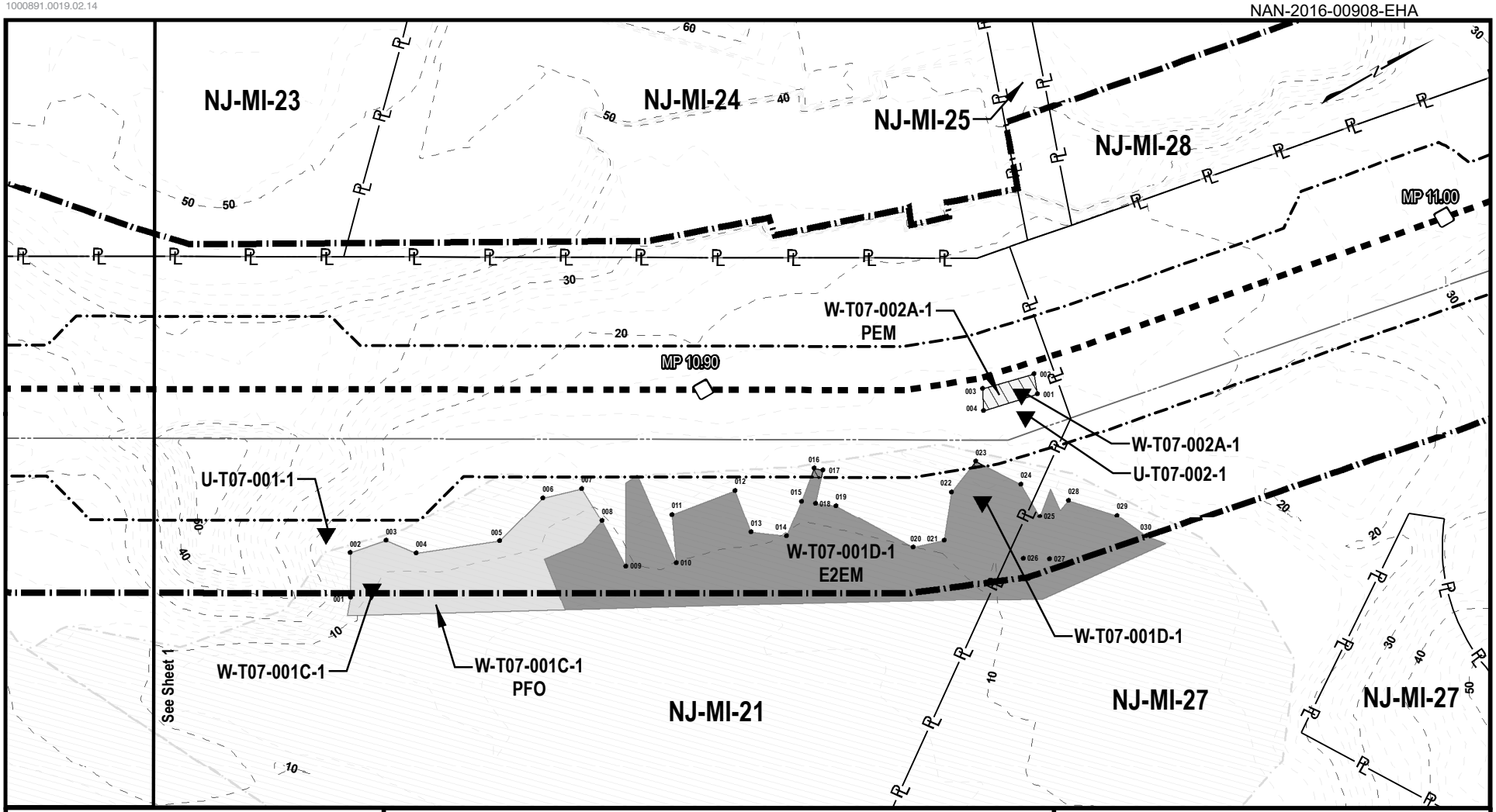
1 inch = 100 feet

0 50 100 Feet

Drawing No.: A-5

Sheet 1 of 2

No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T07-001D-1	E2EM	<0.01 (61)
W-T07-002A-1	PEM	0.01 (540)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

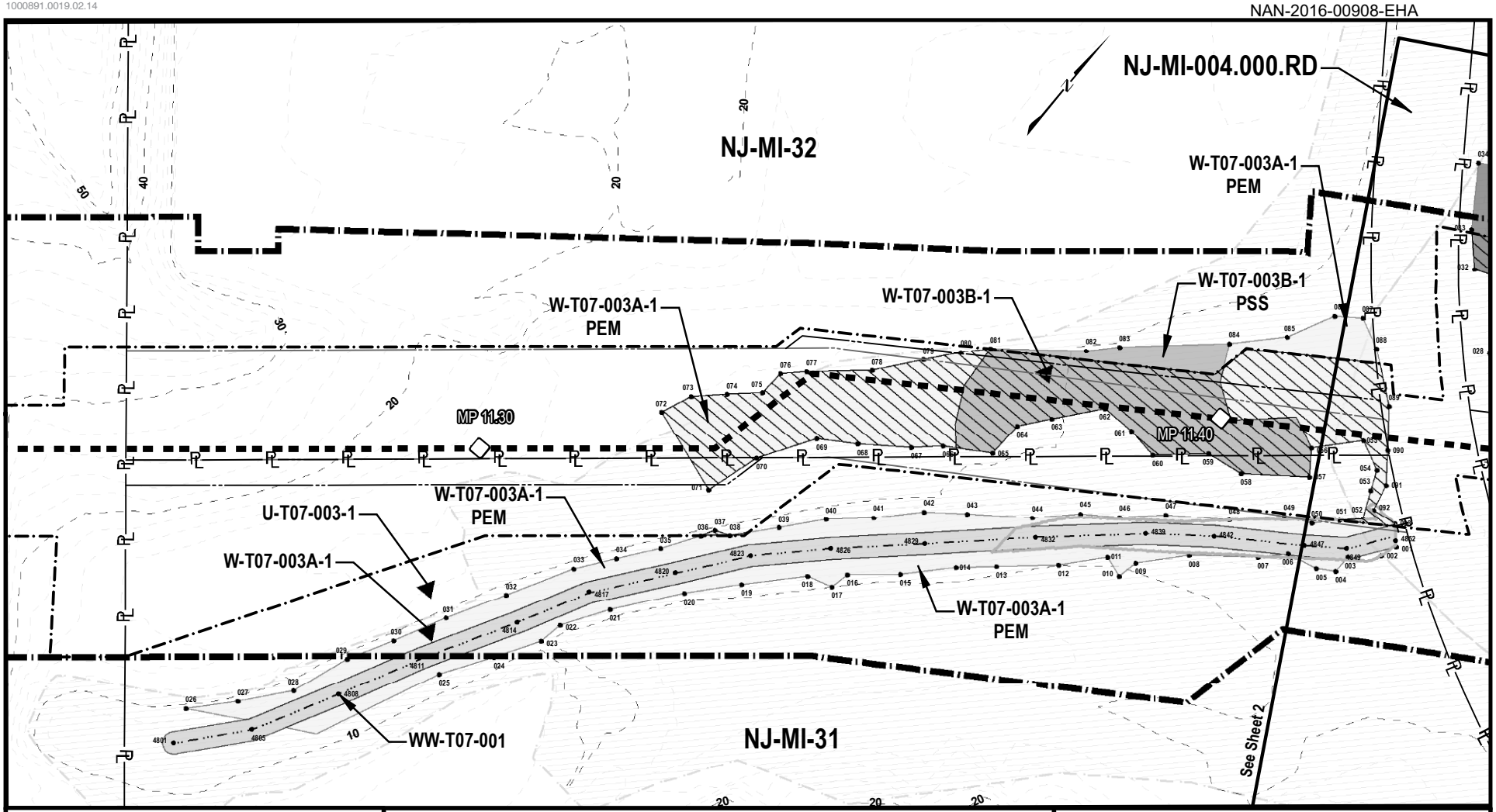
1 inch = 100 feet

0 50 100 Feet

Drawing No.: A-5

Sheet 2 of 2

No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T07-003A-1	PEM	0.39 (16,884)
W-T07-003B-1	PSS	0.26 (11,295)
W-T07-004D-1	E2EM	1.43 (62,356)

Revision as of 12/22/17: Impacted Area for W-T07-004D-1 has been reduced to 1.26 acres (54,755 square feet)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

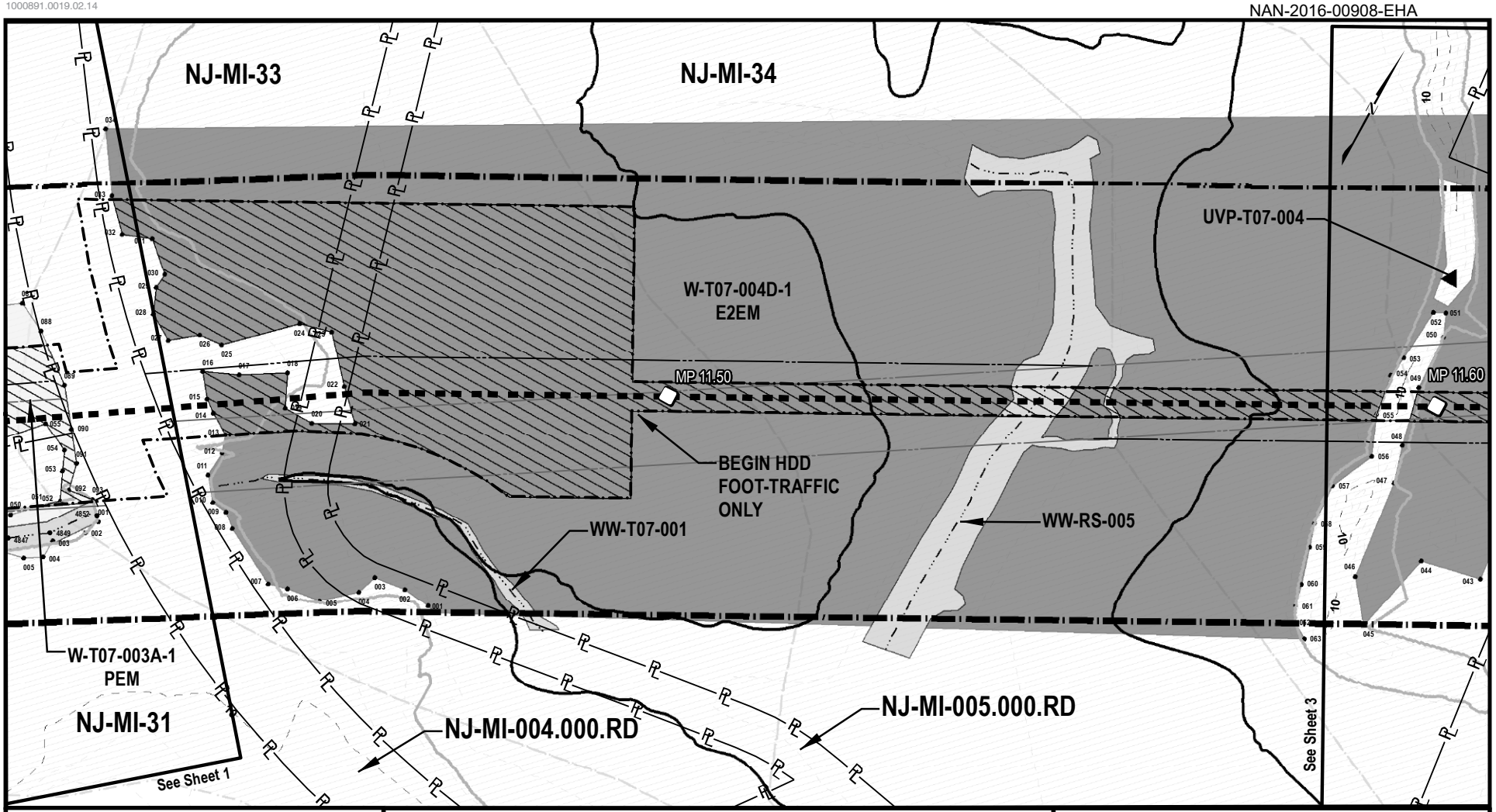
1 inch = 100 feet

0 50 100 Feet

Sheet 1 of 4

Drawing No.: **24-1947-80-09-F/11.30-001**

No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T07-003A-1	PEM	0.39 (16,884)
W-T07-004D-1	E2EM	1.43 (62,356)
WW-T07-001		<0.01 (4)
WW-RS-005		0.02 (893)

Revision as of 12/22/17: Impacted Area for W-T07-004D-1 has been reduced to 1.26 acres (54,755 square feet)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

1 inch = 100 feet

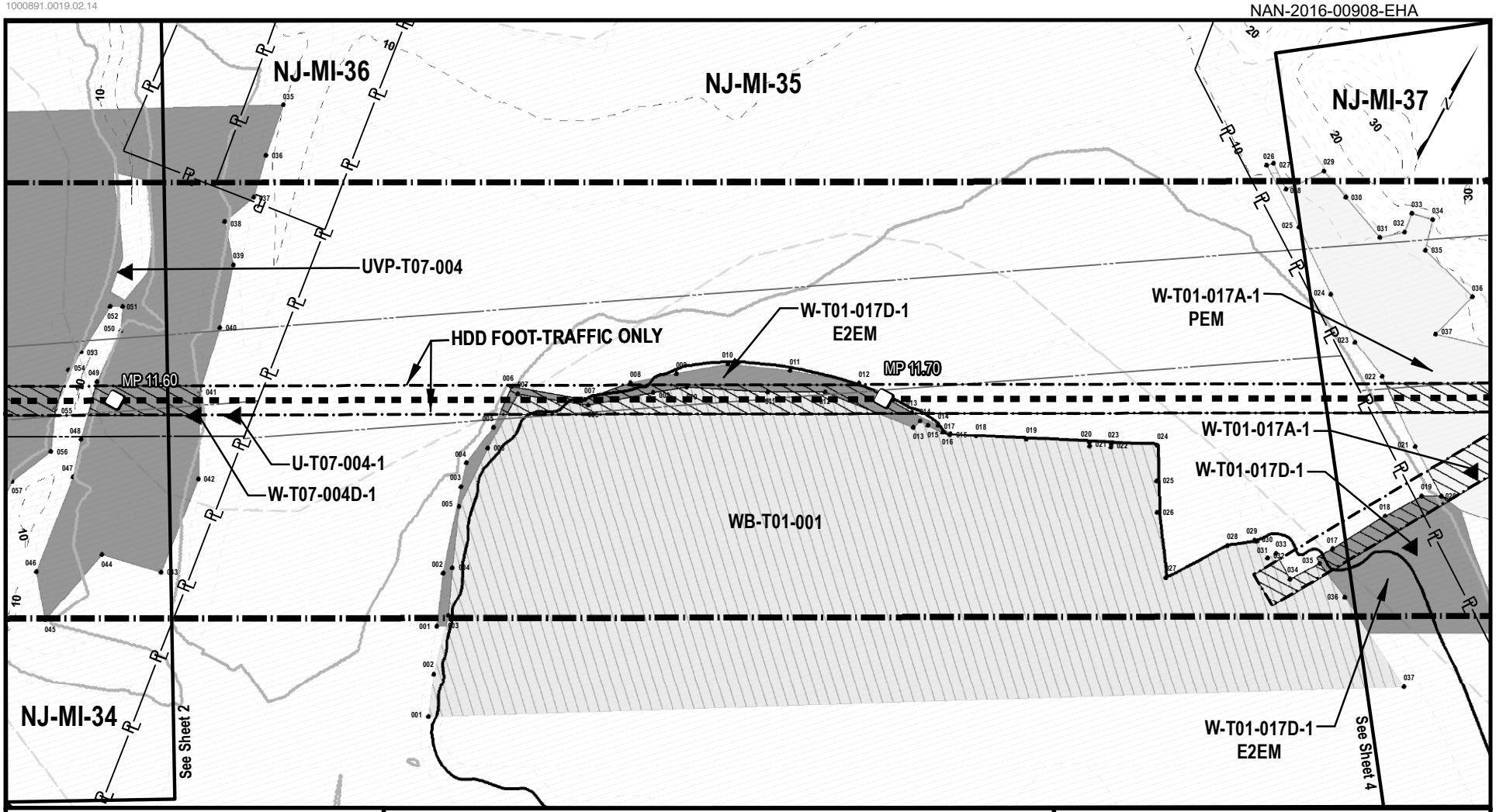
0 50 100 Feet

Drawing No.: **A-5**

Sheet 2 of 4

No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR

Drawing A-5 Onshore Pipeline Alignment Sheets



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T07-004D-1	E2EM	1.43 (62,356)
WB-T01-001		0.09 (3,955)
W-T01-017D-1	E2EM	0.24 (10,328)
W-T01-017A-1	PEM	0.08 (3,289)

Revision as of 12/22/17: Impacted Area for W-T07-004D-1 has been reduced to 1.26 acres (54,755 square feet)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

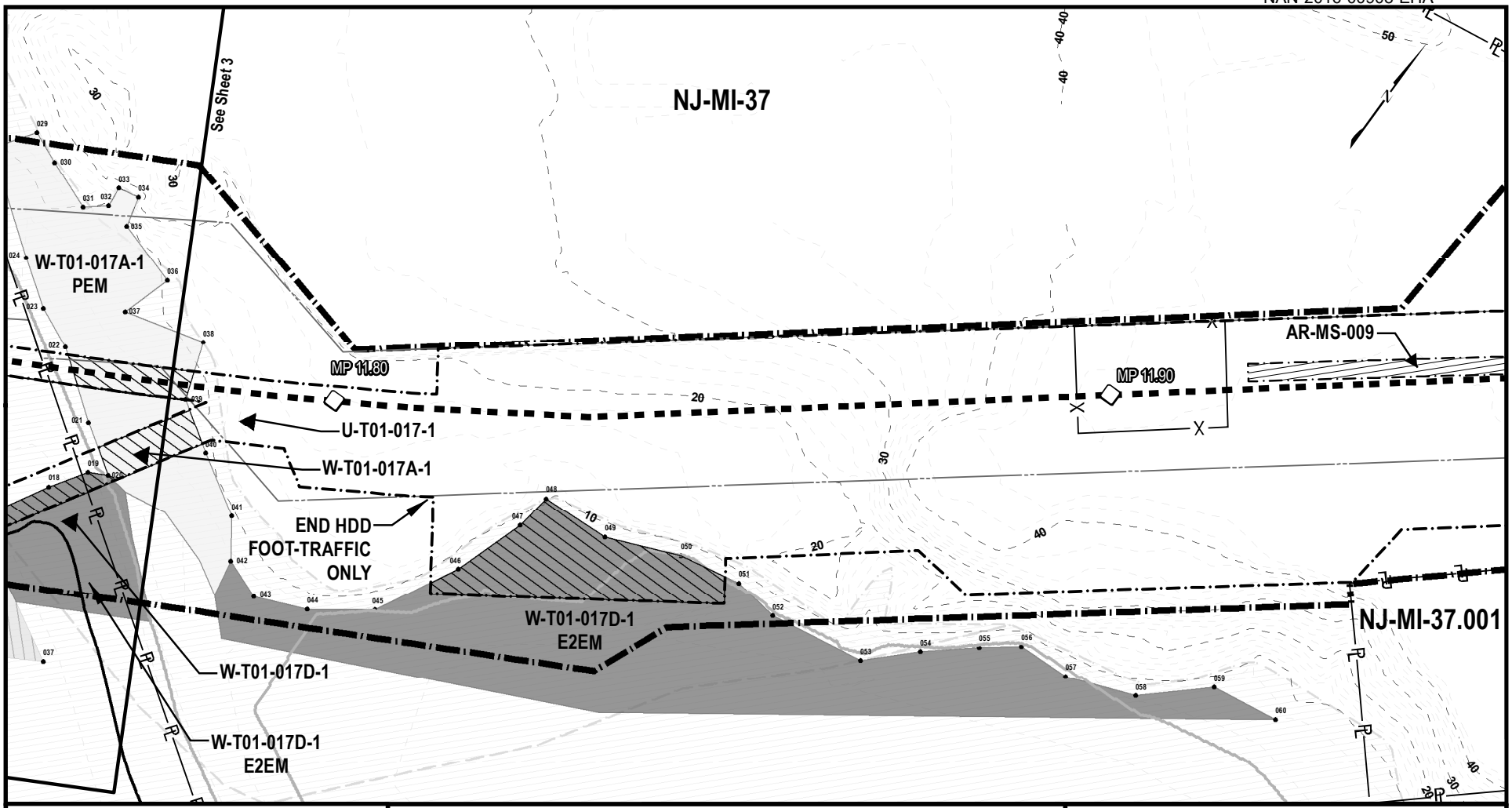
1 inch = 100 feet

0 50 100 Feet

Sheet 3 of 4

Drawing No.: **24-1947-80-09-F/11.30-001**

No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR



Legend

Palustrine Wetland Type (Cowardin)
- Emergent
- Forest
- Scrub-shrub
- E2EM

Stream <= 5' wide
Waterbody
Impact Area
Waterway based on ordinary high water mark
Wetland/Waterbody Flag Point
Wetland/Upland Waterbody Data
Survey Area Boundary
Proposed TGPL R/W
Limits of Disturbance
Minor Contour Interval
10' Major Contour

Parcels
Milepost
ROW Centerline
Access Road
Floodplain Area
Existing TGPL R/W
Mean High Waterline
Spring High Waterline
Township Boundary

Wetland and Waterbody ID and Cowardin Class

Feature ID	Wetland Class	Impacted Area Acres (square feet)
W-T01-017D-1	E2EM	0.24 (10,328)
W-T01-017A-1	PEM	0.08 (3,289)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
UNITED STATES ARMY CORPS OF ENGINEERS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
BOROUGH OF SAYREVILLE
MIDDLESEX, NEW JERSEY

MUSTANG OF NEW JERSEY, INC.

Williams

1 inch = 100 feet

0 50 100 Feet

Drawing No.: **A-5**

Sheet 4 of 4

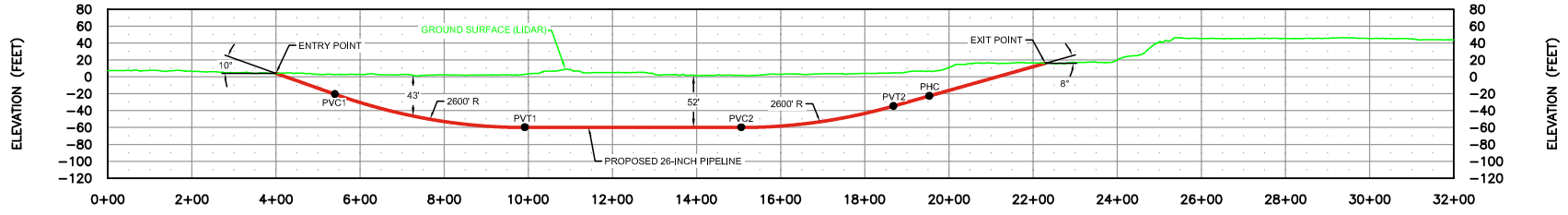
No.	Date	By	Revision Description	Chk.
0	5/10/2017	CNC	ISSUED FOR INFORMATION	LR

MIDDLESEX COUNTY, NEW JERSEY

PLAN VIEW

0 200 400

GRAPHIC SCALE IN FEET



PROFILE VIEW

0 200 400

GRAPHIC HORIZONTAL SCALE IN FEET

0 50 100

GRAPHIC VERTICAL SCALE IN FEET

HORIZONTAL DIRECTIONAL DRILL DATA LOCKWOOD MARINA HDD		
DESCRIPTION	STATION (ft)	ELEVATION (ft)
ENTRY @ 10°	4+00.00	4.13
PVC1 = 2600' RADIUS	5+39.68	−20.50
PVT1 =	9+91.17	−60.00
PVC2 = 2600' RADIUS	15+05.59	−60.00
PVT2 =	18+67.44	−34.62
PHC = −6.13° 2600' RADIUS	19+52.62	−22.73
PHT =	22+30.79	16.12
EXIT @ 8°	22+30.79	16.12
HORIZONTAL DISTANCE (ft) = 1829.02		
DIRECTIONAL DRILL PIPE LENGTH (ft) = 1838.21		

NOT FOR CONSTRUCTION

DRAWING COORDINATE SYSTEM

HORIZONTAL DATUM: SPCS – NEW JERSEY NAD83 AND GEOGRAPHIC NAD83

VERTICAL DATUM: NAVD 88

REV.	DATE	REVISION	APPVD.
B	05/19/17	UPDATED AERIAL IMAGERY	JET
A	05/15/17	PLAN AND PROFILE	JET

WILLIAMS
NORTHEAST SUPPLY ENHANCEMENT

MIDDLESEX COUNTY — NEW JERSEY

TITLE

LOCKWOOD MARINA
HORIZONTAL DIRECTIONAL DRILL

DESIGNED	DRAWN	CK'D.	PROJECT NO.	REV.
JET	GEJ	JET	10150	B

SCALE AS NOTED | DATE 05/03/16 | DWG. NO. 1 SHT. 1 OF 1

THINK SAFETY FIRST

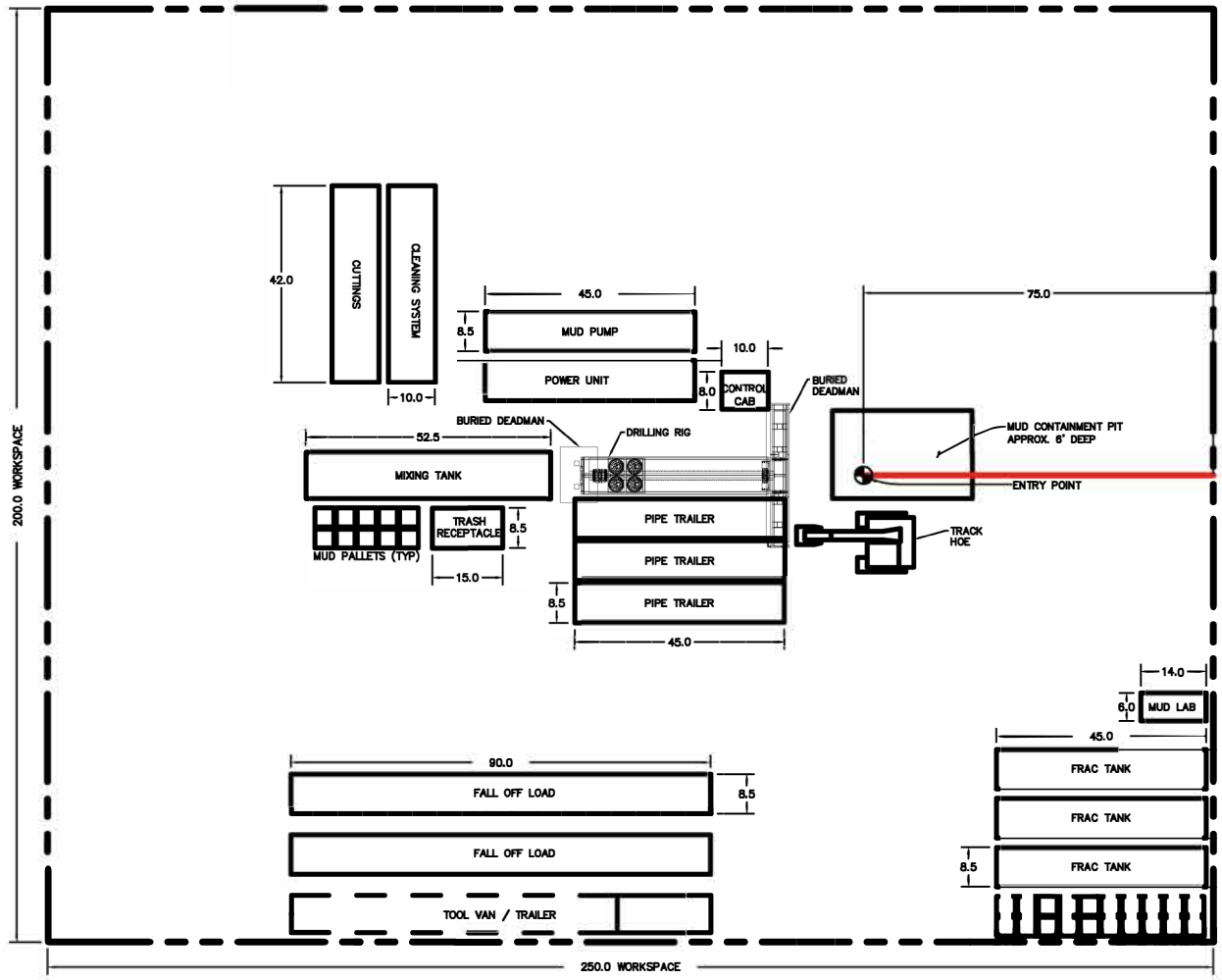
ISSUED FOR PERMIT

laney

"There is no substitute for experience"

831 Crossbridge Drive • Spring, Texas 77373
Tel: (281) 540-6615 • Fax: (281) 540-6727
www.laneydrilling.com

Drawing A-6 Lockwood Marina Horizontal Directional Drill



THINK SAFETY FIRST

PLAN VIEW

40 0 40

GRAPHIC SCALE IN FEET

REV.	DATE	REVISION	APPVD.
A	01/18/17	TYPICAL ENTRY LAYOUT	JET

WILLIAMS
NORTHEAST SUPPLY ENHANCEMENT PROJECT

TITLE: TYPICAL ENTRY EQUIPMENT LAYOUT

DESIGNED	DRAWN	CK'D.	PROJECT NO.	REV.
JET	JM	JET	10150	A

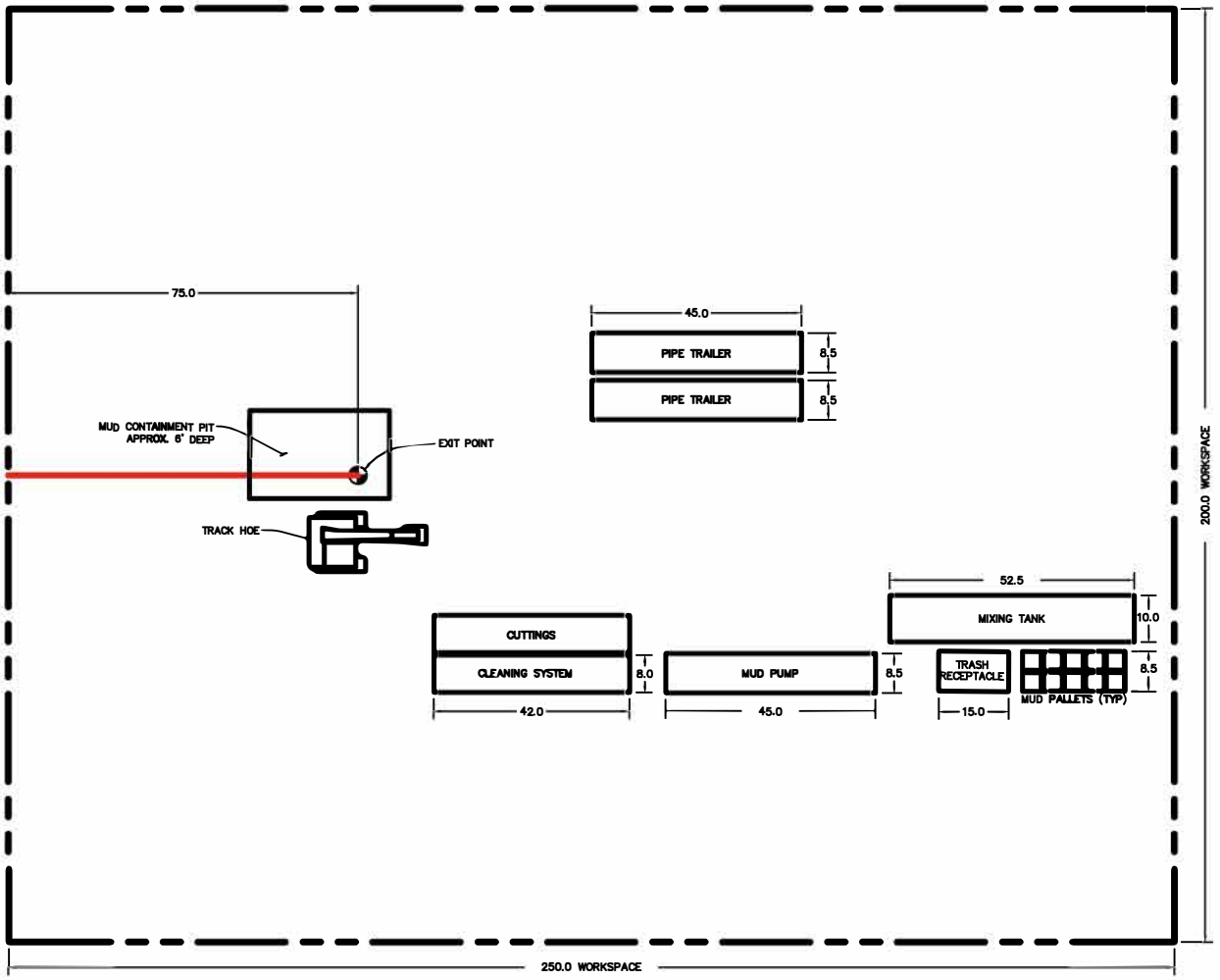
SCALE: AS NOTED | DATE: 01/17/17 | DWG. NO. SHT. 1 OF 1

Laney

"There is no substitute for experience"

831 Crossbridge Drive • Spring, Texas 77373
Tel: (281) 540-6615 • Fax: (281) 540-6727
www.laneydrilling.com

Drawing A-7 Onshore Typical Entry Equipment Layout



THINK SAFETY FIRST

PLAN VIEW

40 0 40

GRAPHIC SCALE IN FEET

REV.	DATE	REVISION	APPVD.
A	01/18/17	TYPICAL EXIT LAYOUT	JET

WILLIAMS
NORTHEAST SUPPLY ENHANCEMENT PROJECT

TITLE: TYPICAL EXIT EQUIPMENT LAYOUT

DESIGNED	DRAWN	CK'D.	PROJECT NO.	REV.
JET	JM	JET	10150	A

SCALE: AS NOTED | DATE: 01/18/17 | DWG. NO. SHT. 1 OF 1

Laney

"There is no substitute for experience"

831 Crossbridge Drive • Spring, Texas 77373
Tel: (281) 540-6615 • Fax: (281) 540-6727
www.laneydrilling.com

Drawing A-8 Onshore Typical Exit Equipment Layout

Transcontinental Gas Pipe Line Company LLC

TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
M.P. 8.57 TO M.P. 12.00
MIDDLESEX COUNTY, NEW JERSEY

DATE: 03/20/2017 REV. 0

Rev. 0
03-20-17

DOCUMENT NAME	SHEET NUMBER	ROW WIDTH (FT)	DESCRIPTION	REVISION	DATE
F-XS-MADI-D-01	01		COVERSHEET	0	03/20/2017
F-XS-MADI-D-01	02		TABLE OF CONTENTS	0	03/20/2017
F-XS-MADI-D-01	03	90	TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	0	03/20/2017
F-XS-MADI-D-01	04	120-140	TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SOUTH SIDE	0	03/20/2017
F-XS-MADI-D-01	05	90	TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	0	03/20/2017
F-XS-MADI-D-01	06	110-130	TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	0	03/20/2017
F-XS-MADI-D-01	07	90	TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	0	03/20/2017
F-XS-MADI-D-01	08	115-130	NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	0	03/20/2017
F-XS-MADI-D-01	09	145-165	ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES	0	03/20/2017
F-XS-MADI-D-01	10	140	ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES	0	03/20/2017
F-XS-MADI-D-01	11	75	WITHIN STREAM AND SATURATED WETLAND AREAS OVER EXISTING TRANSCONTINENTAL PIPELINE	0	03/20/2017
F-XS-MADI-D-01	12	75	WITHIN SATURATED WETLAND AREAS ADJACENT TO TRANSCONTINENTAL PIPELINE	0	03/20/2017
F-XS-MADI-D-01	13		CROSS-SECTION TYPICAL MILEPOST LISTING	0	03/20/2017

DRAWING NO. | REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

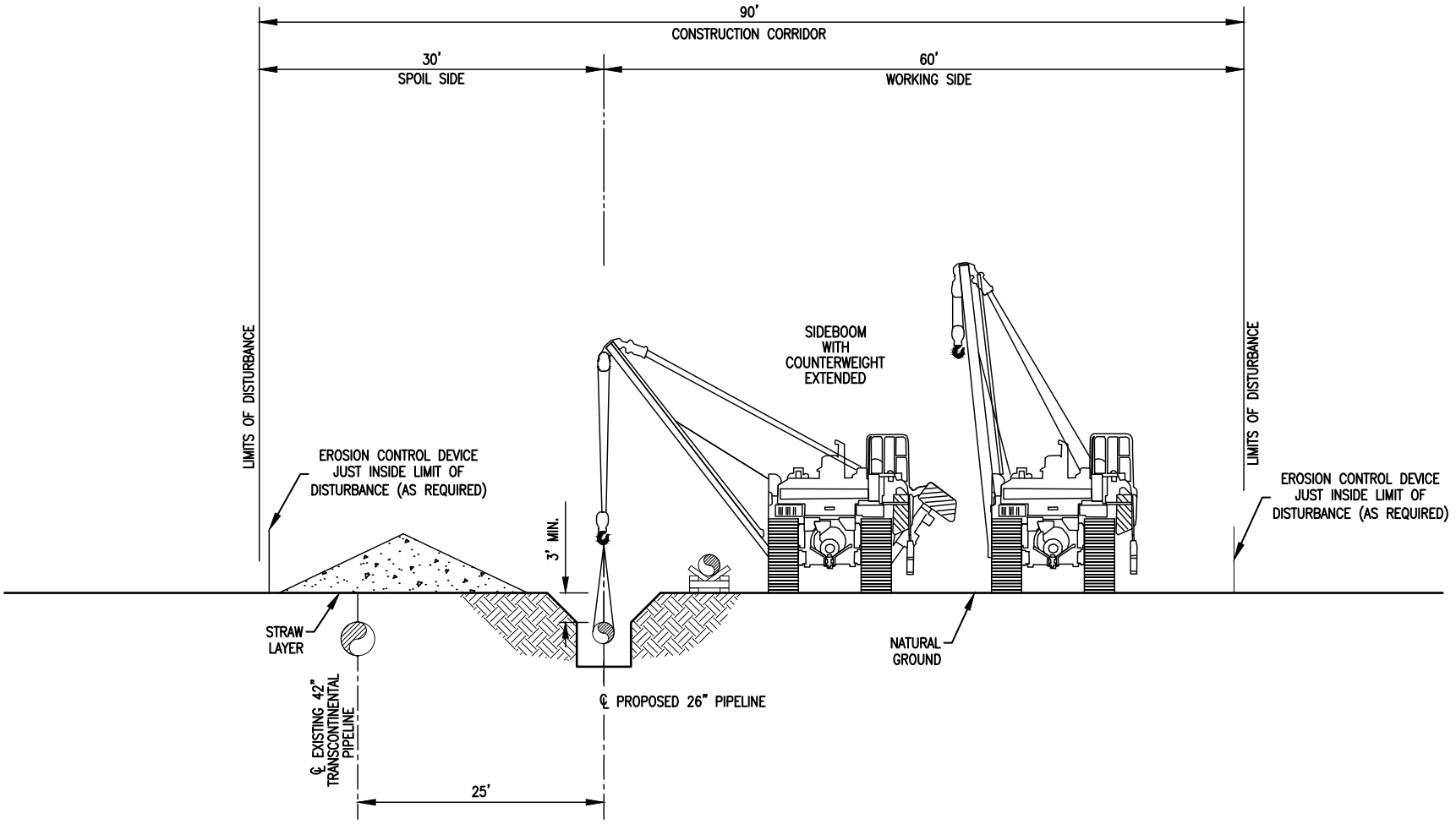
DRAWN BY: VC DATE: 02/01/16
CHECKED BY: JB DATE: 11/01/16
APPROVED BY: EL DATE: 11/01/16
WO: 1185727

ISSUED FOR BID: SCALE: NTS
ISSUED FOR CONSTRUCTION: REV: 0

DRAWING NUMBER: A-9 SHEET 02 OF 13
10:21am 3/21/2017 t3le
K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01_INDEX_SHT2.dwg

MUSTANG OF NEW JERSEY, INC

Drawing A-9 Typical Right-of-Way Cross-Sections



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE

DRAWING NO.	REFERENCE TITLE

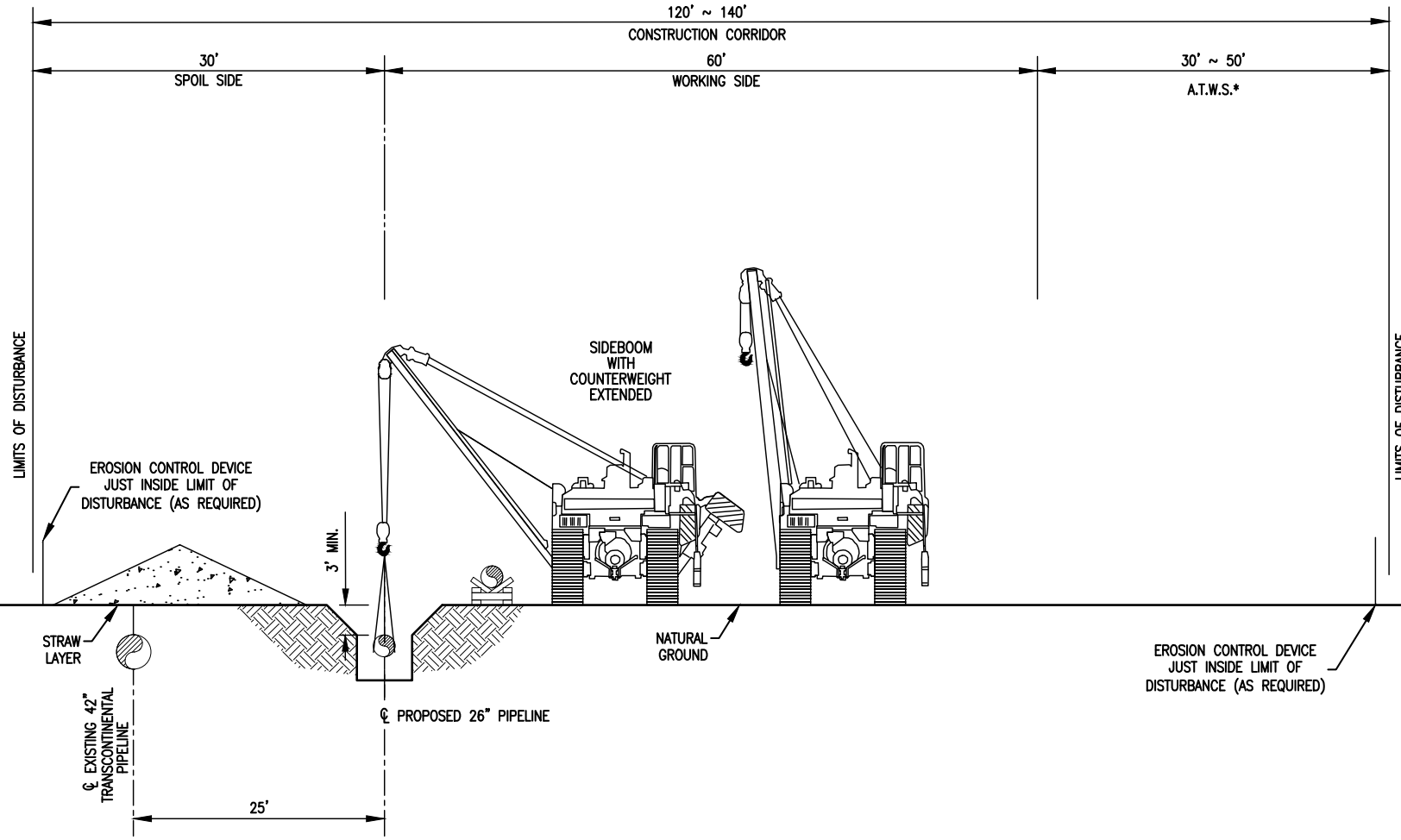
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 03 OF 13
WO: 1185727		4:30pm 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF
NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SOUTH SIDE

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

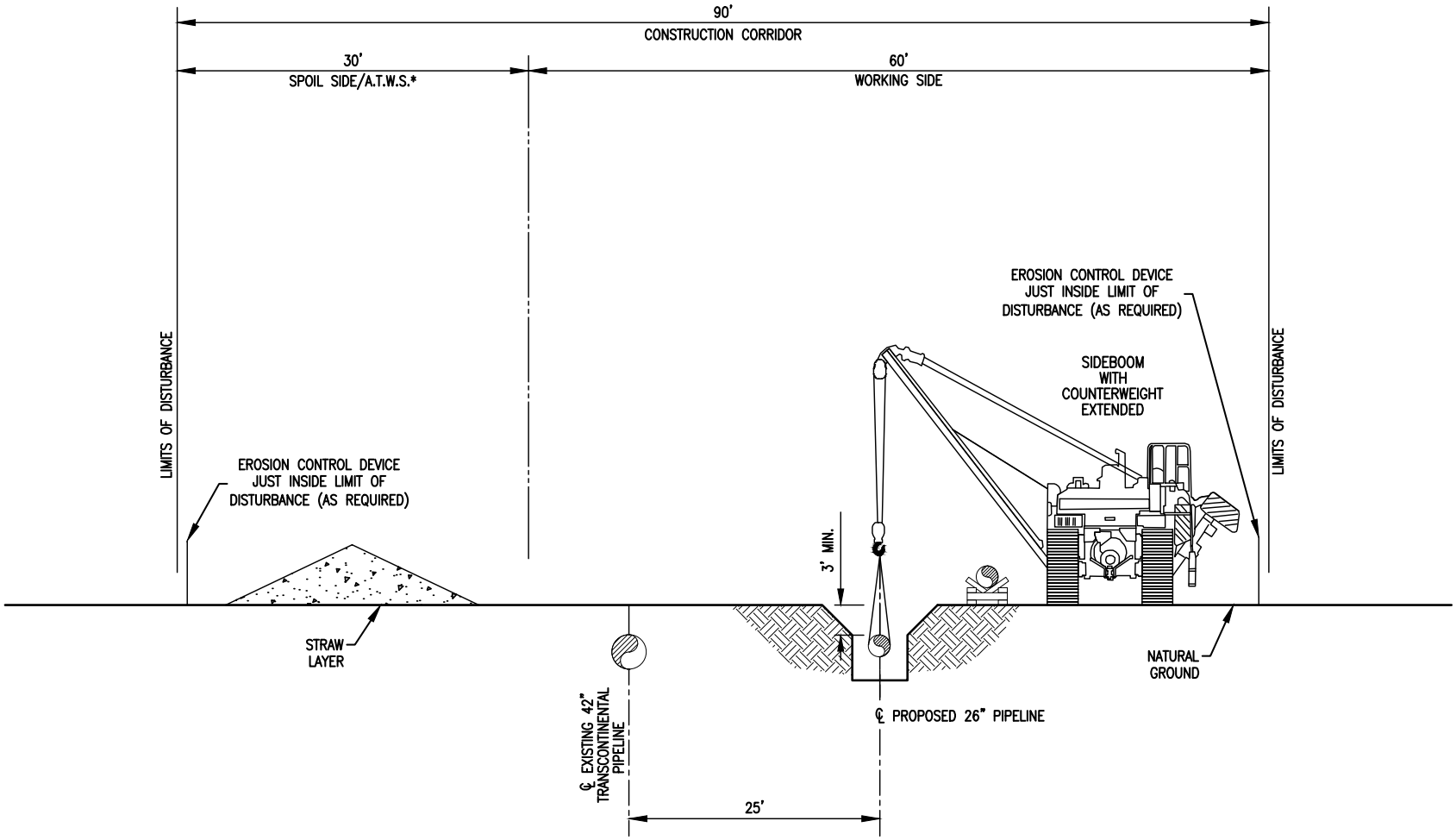
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 04 OF 13
WO: 1185727		10:38am 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

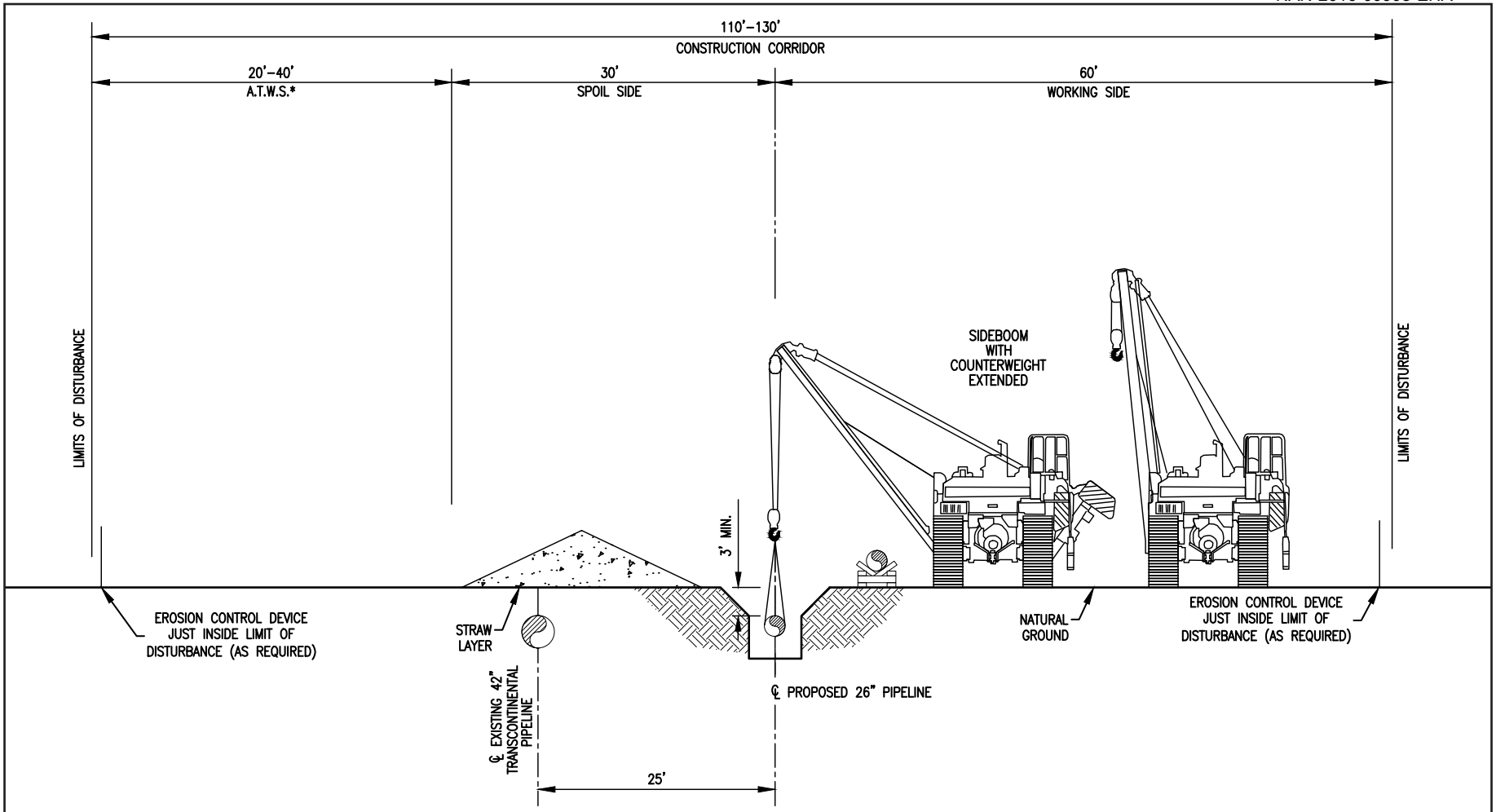
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 05 OF 13
WO: 1185727		4:31pm 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

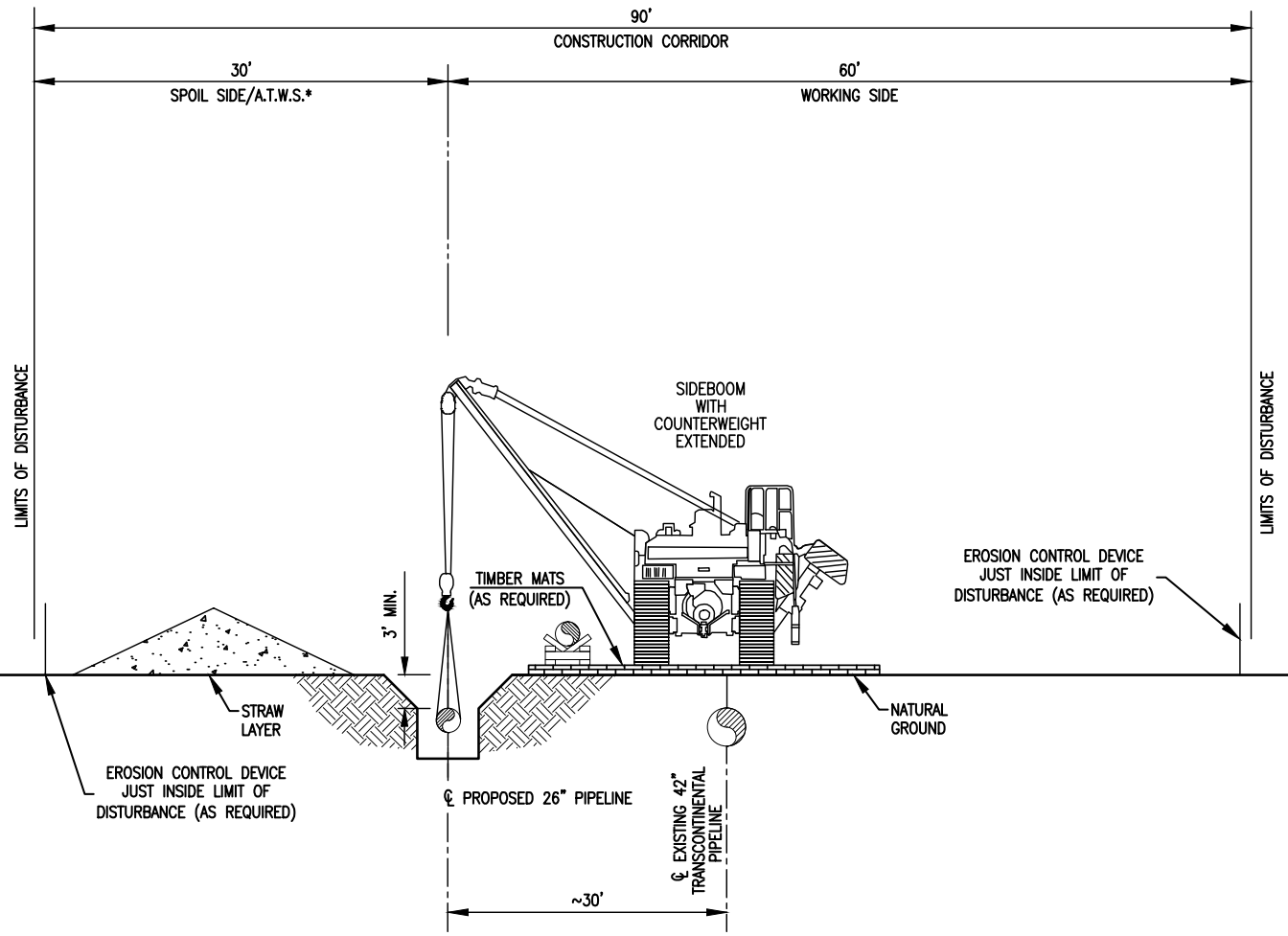
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 06 OF 13
WO: 1185727		10:38am 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

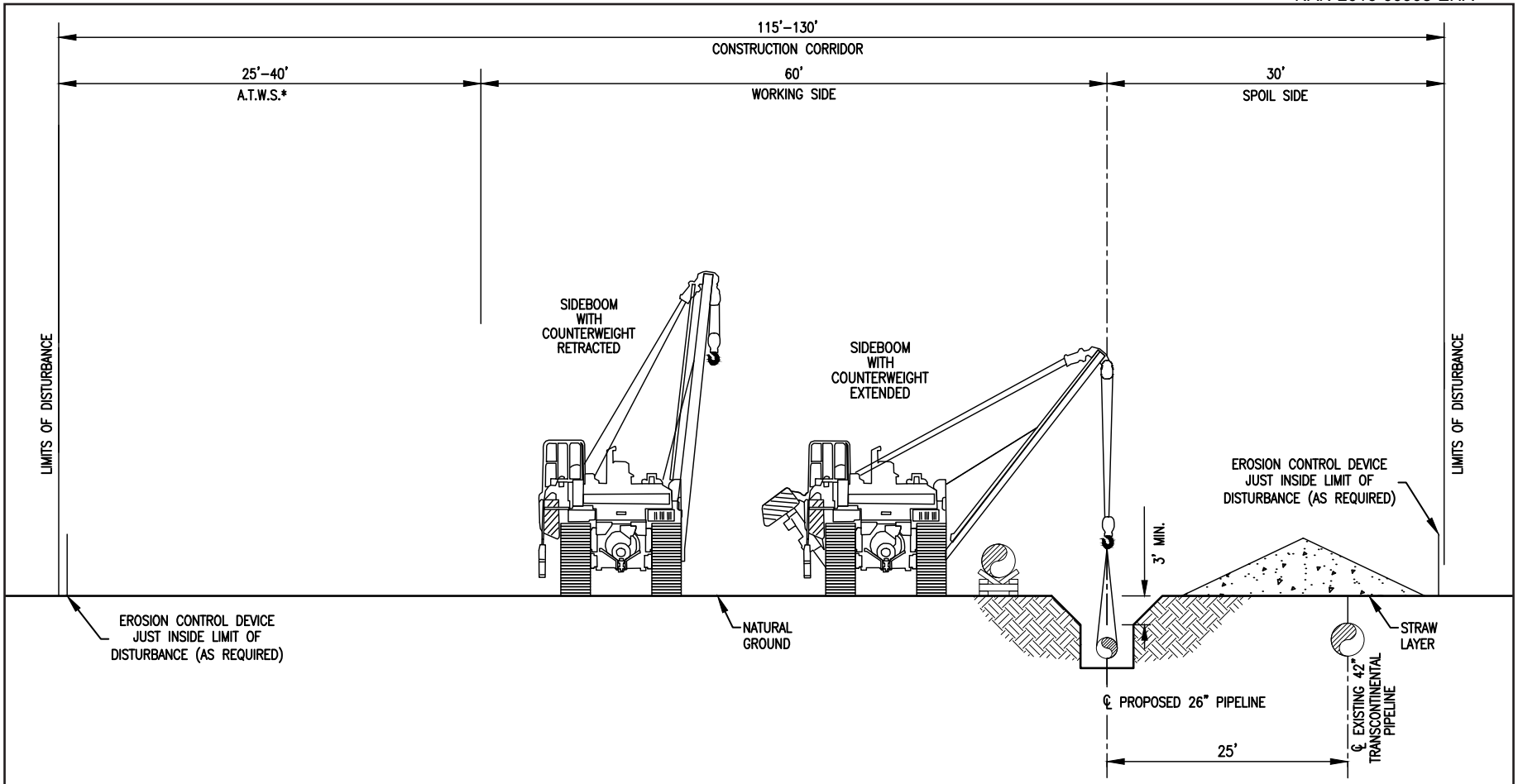
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 07 OF 13
WO: 1185727		10:14am 3/21/2017 t3le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
NO TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

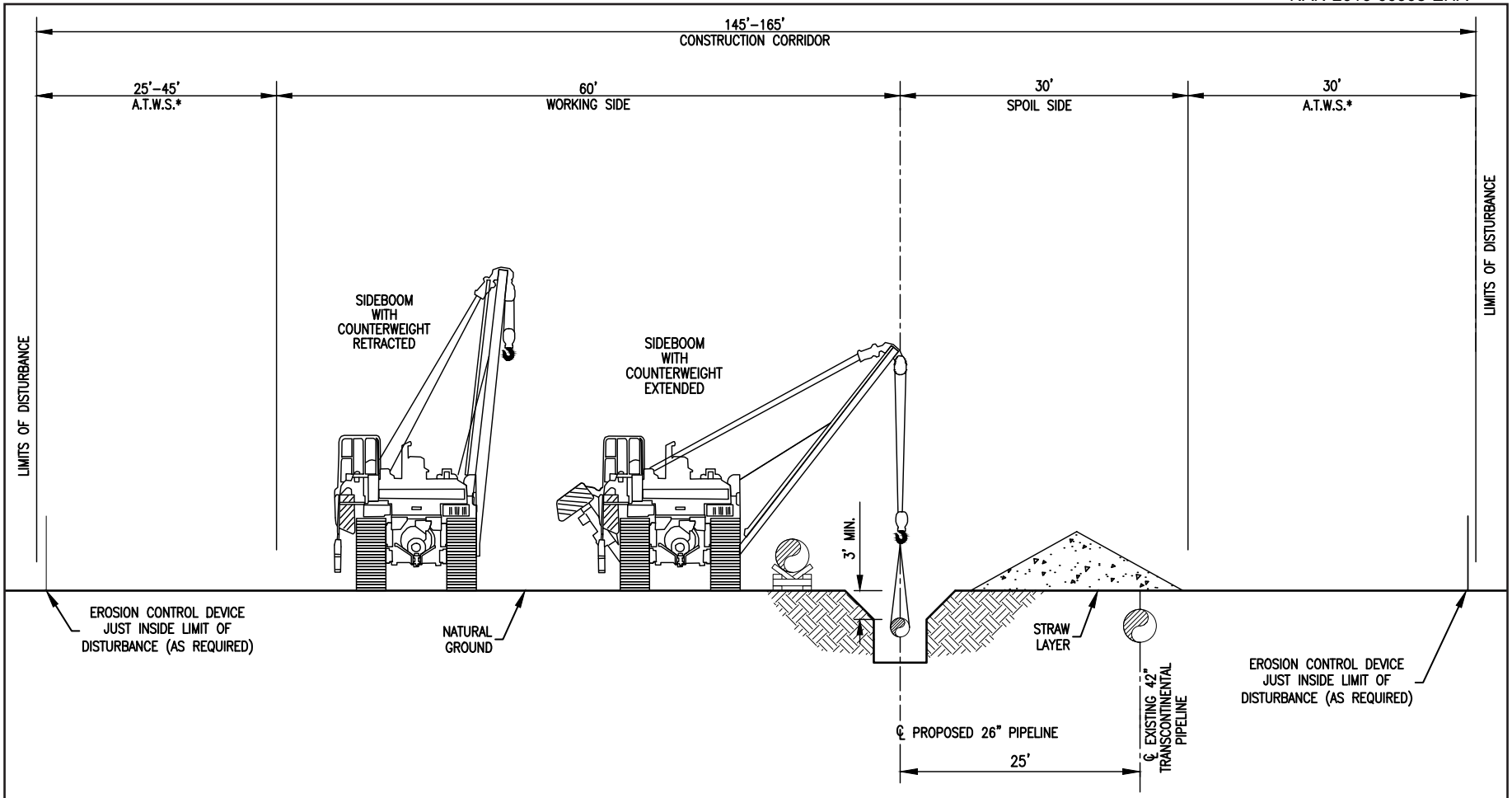
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 08 OF 13
WO: 1185727		10:40am 3/20/2017 t2le K:\MAPPING\N\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

DRAWING NO.	REFERENCE TITLE

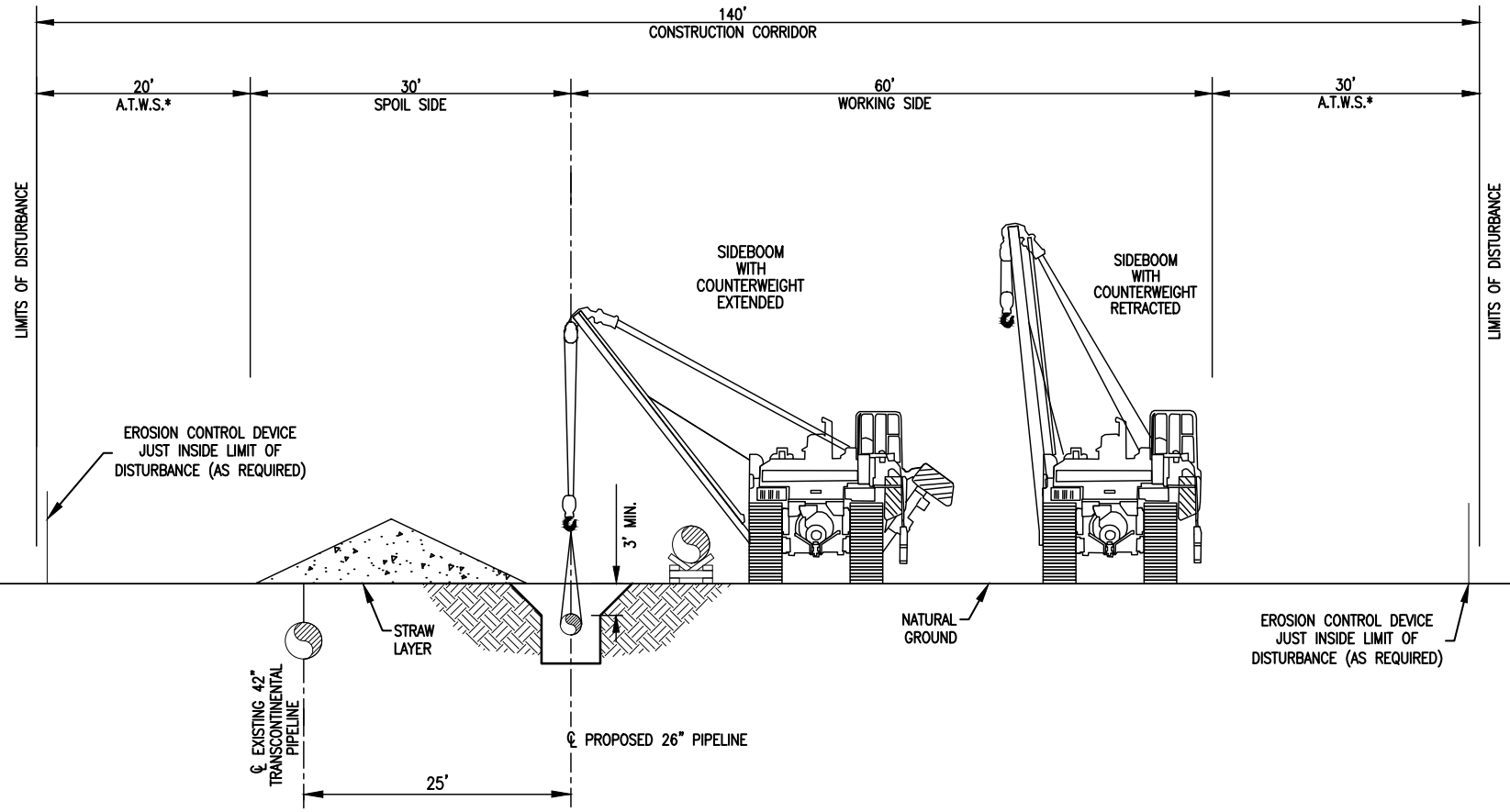
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 09 OF 13
WO: 1185727		4:31pm 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING, TOPSOIL SEGREGATION, AND/OR DRAG SECTION.

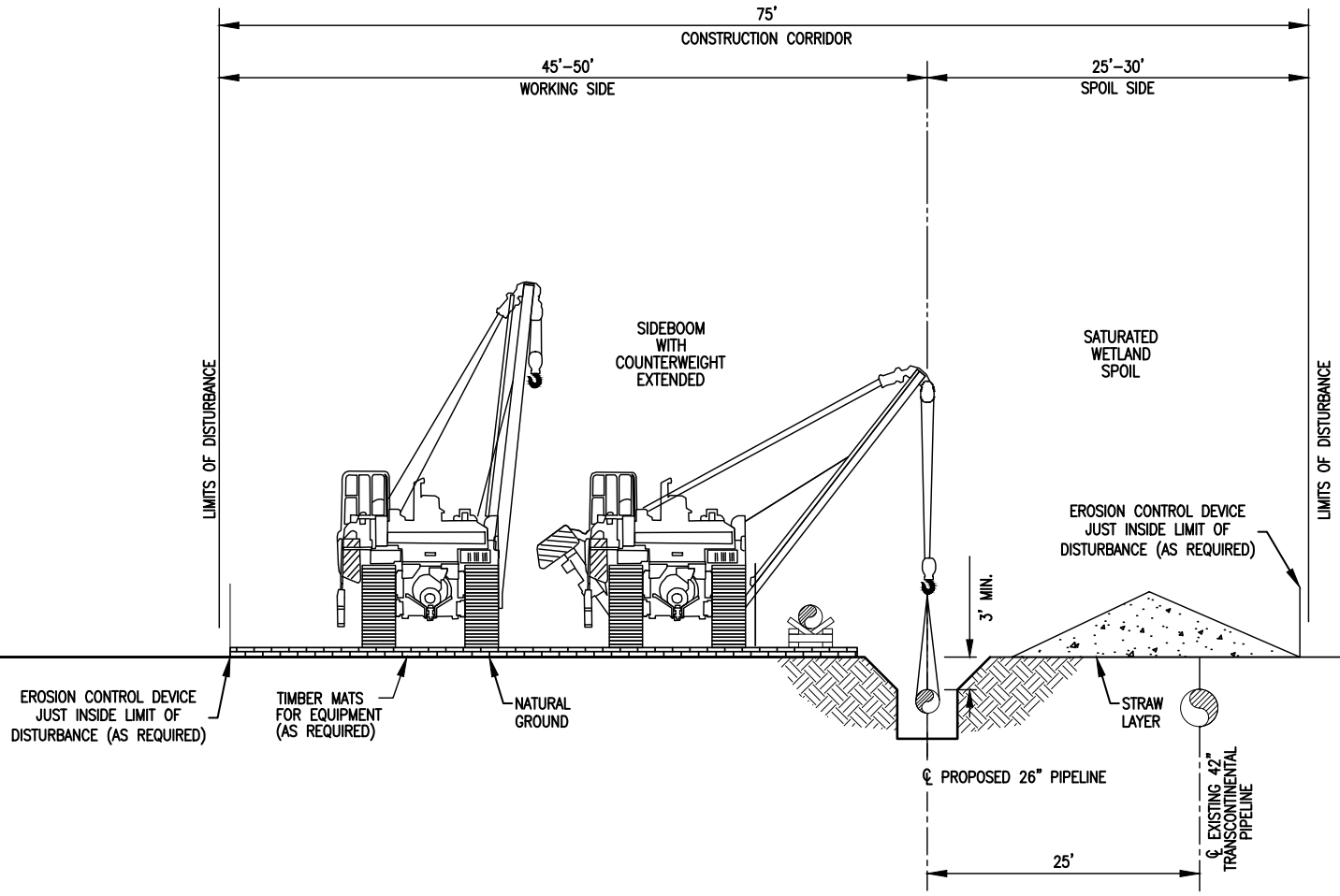
DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 10 OF 13
WO: 1185727		4:32pm 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
WITHIN STREAM AND SATURATED WETLAND AREAS OVER EXISTING TRANSCONTINENTAL PIPELINE

DRAWING NO.	REFERENCE TITLE

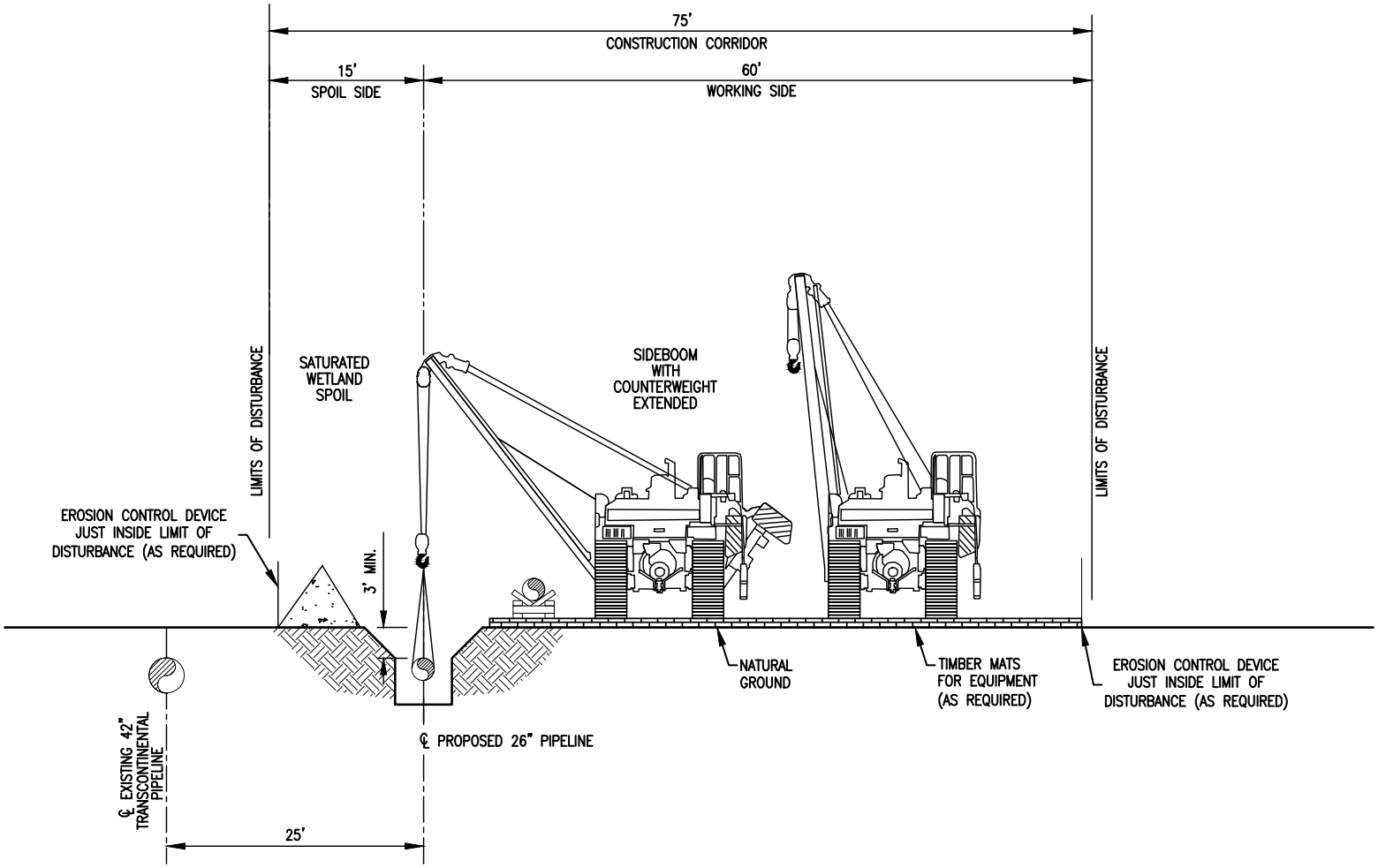
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 11 OF 13
WO: 1185727		10:16am 3/21/2017 t3le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF
NEW JERSEY, INC



TYPICAL CROSS SECTION FOR 26" PIPELINE
WITHIN SATURATED WETLAND AREAS ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 02/01/16	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 11/01/16	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 11/01/16	DRAWING NUMBER: A-9	SHEET 12 OF 13
WO: 1185727		10:47am 3/20/2017 t2le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC

CROSS SECTION TYPICAL NAME	SHEET NUMBER	BEGIN MP	END MP
WITHIN STREAM AND SATURATED WETLAND AREAS OVER EXISTING TRANSCONTINENTAL PIPELINE	11 of 13	8.60	8.63
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	8 of 13	8.65	8.73
WITHIN STREAM AND SATURATED WETLAND AREAS OVER EXISTING TRANSCONTINENTAL PIPELINE	11 of 13	8.73	8.78
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	8 of 13	8.78	8.79
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES	9 of 13	8.79	8.87
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SOUTH SIDE	4 of 13	9.93	9.99
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	9.99	10.00
WITHIN STREAM AND SATURATED WETLAND AREAS OVER EXISTING TRANSCONTINENTAL PIPELINE	11 of 13	10.03	10.05
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	8 of 13	10.05	10.15
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	10.15	10.18
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	8 of 13	10.18	10.27
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	6 of 13	10.43	10.46
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SOUTH SIDE	4 of 13	10.46	10.52
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	6 of 13	10.52	10.53
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES	10 of 13	10.53	10.64
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	10.64	10.70
WITHIN SATURATED WETLAND AREAS ADJACENT TO TRANSCONTINENTAL PIPELINE	12 of 13	10.70	10.80
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	10.80	10.82
ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE A.T.W.S. BOTH SIDES	10 of 13	10.82	10.86
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SOUTH SIDE	4 of 13	10.86	10.87
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	10.87	10.98
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	6 of 13	10.98	11.04
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3 of 13	11.04	11.06
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	5 of 13	11.06	11.12
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	6 of 13	11.30	11.33
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	7 of 13	11.35	11.40
TYPICAL CROSS SECTION ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON NORTH SIDE	6 of 13	11.40	11.42

CROSS SECTION TYPICAL MILEPOST LISTING

DRAWING NO.	REFERENCE TITLE

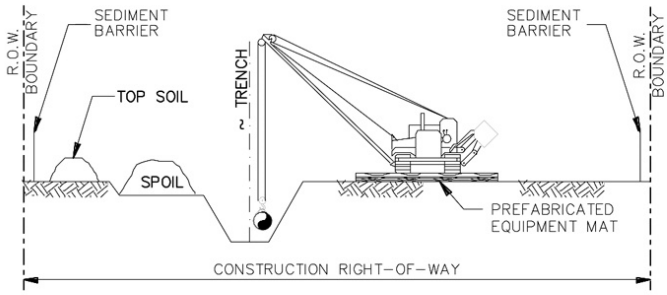
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" MADISON LOOP
MIDDLESEX COUNTY, NEW JERSEY

Williams

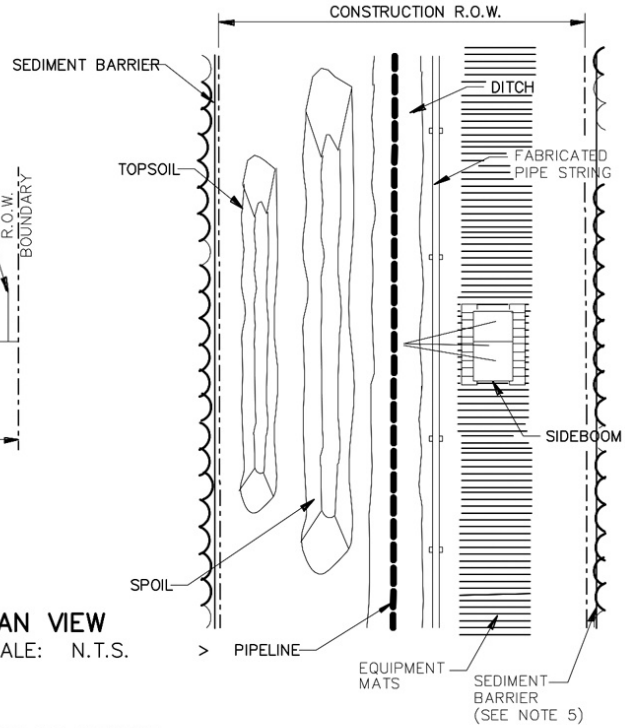
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	03/20/17	AT	ISSUED FOR FERC FILING	1185727	JB	EL

DRAWN BY: VC	DATE: 03/14/17	ISSUED FOR BID:	SCALE: NTS
CHECKED BY: JB	DATE: 03/14/17	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 03/14/17	DRAWING NUMBER: A-9	SHEET 13 OF 13
WO: 1185727		10:17am 3/21/2017 t3le K:\MAPPING\NJ\LAT\LOOP\0857_16\FERC\FERCX\F-XS-MADI-D-01.dwg	

MUSTANG OF NEW JERSEY, INC



CROSS SECTION
SCALE: N.T.S.



PLAN VIEW
SCALE: N.T.S.

CONSTRUCTION PROCEDURE NOTES:

1. FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
4. INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF THE WETLAND. INSTALL SEDIMENT BARRIERS ALONG THE EDGE OF THE SPOIL SIDE OF THE CONSTRUCTION CORRIDOR THROUGH THE WETLAND AND ALONG THE DOWNSLOPE EDGE OF THE WETLAND. IF THE DOWNSLOPE EDGE OF THE WETLAND IS THE SPOIL SIDE, THEN SEDIMENT BARRIERS ARE NOT REQUIRED ON THE WORKING SIDE OF THE CORRIDOR UNLESS EQUIPMENT TRAVERSING THROUGH THE WETLAND CAUSES SPOIL AND SEDIMENT TO EXIT THE CONSTRUCTION CORRIDOR.
6. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCHLINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFTY-RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
7. CONDUCT TRENCH LINE TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED). SALVAGE TOPSOIL TO ACTUAL DEPTH OR A MAXIMUM DEPTH OF 12 INCHES, AS DETERMINED BY THE COMPANY ENVIRONMENTAL INSPECTOR. SEGREGATED TOPSOIL PILE MAY BE LOCATED ON SPOIL SIDE, AS REQUIRED.
8. LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
9. TRENCHING THROUGH WETLANDS MAY PROCEDE WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEDE CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACKFILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
10. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
11. LOWER-IN PIPE. PRIOR TO BACKFILLING TRENCH, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.
13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. SEED DISTURBED WETLANDS AREA AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS.

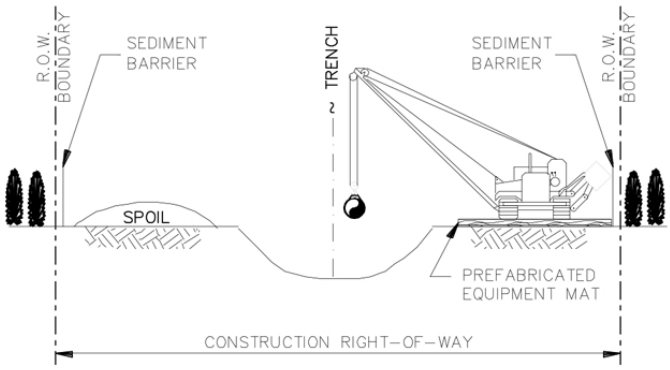
NO.	DATE	REVISION DESCRIPTION	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE LLC
STANDARD ENVIRONMENTAL DETAIL

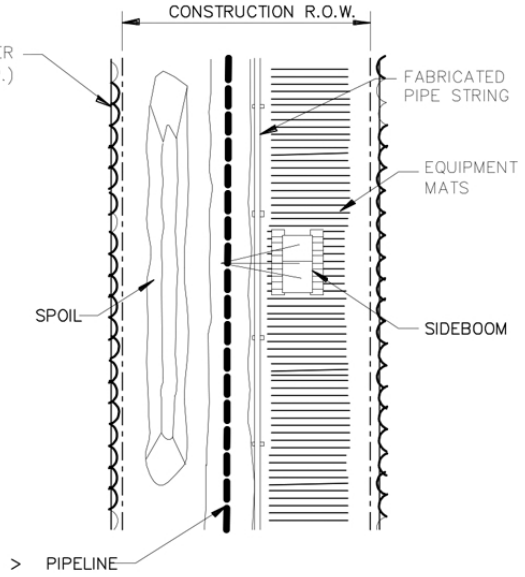
TYPE I "DRY WETLAND"
INSTALLATION PROCEDURE

Williams
GAS PIPELINE

Drawing A-10 Dry Wetland Installation Procedure



CROSS SECTION
SCALE: N.T.S.



PLAN VIEW
SCALE: N.T.S.

CONSTRUCTION PROCEDURE NOTES:

1. FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
2. NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
4. INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
6. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCHLINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
7. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
8. LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
9. TRENCHING THROUGH WETLANDS MAY PROCEDE WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEDE CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACKFILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
10. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY, UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
11. LOWER-IN PIPE. PRIOR TO BACKFILLING, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
12. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
13. REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. SEED DISTURBED WETLAND AREA AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS.

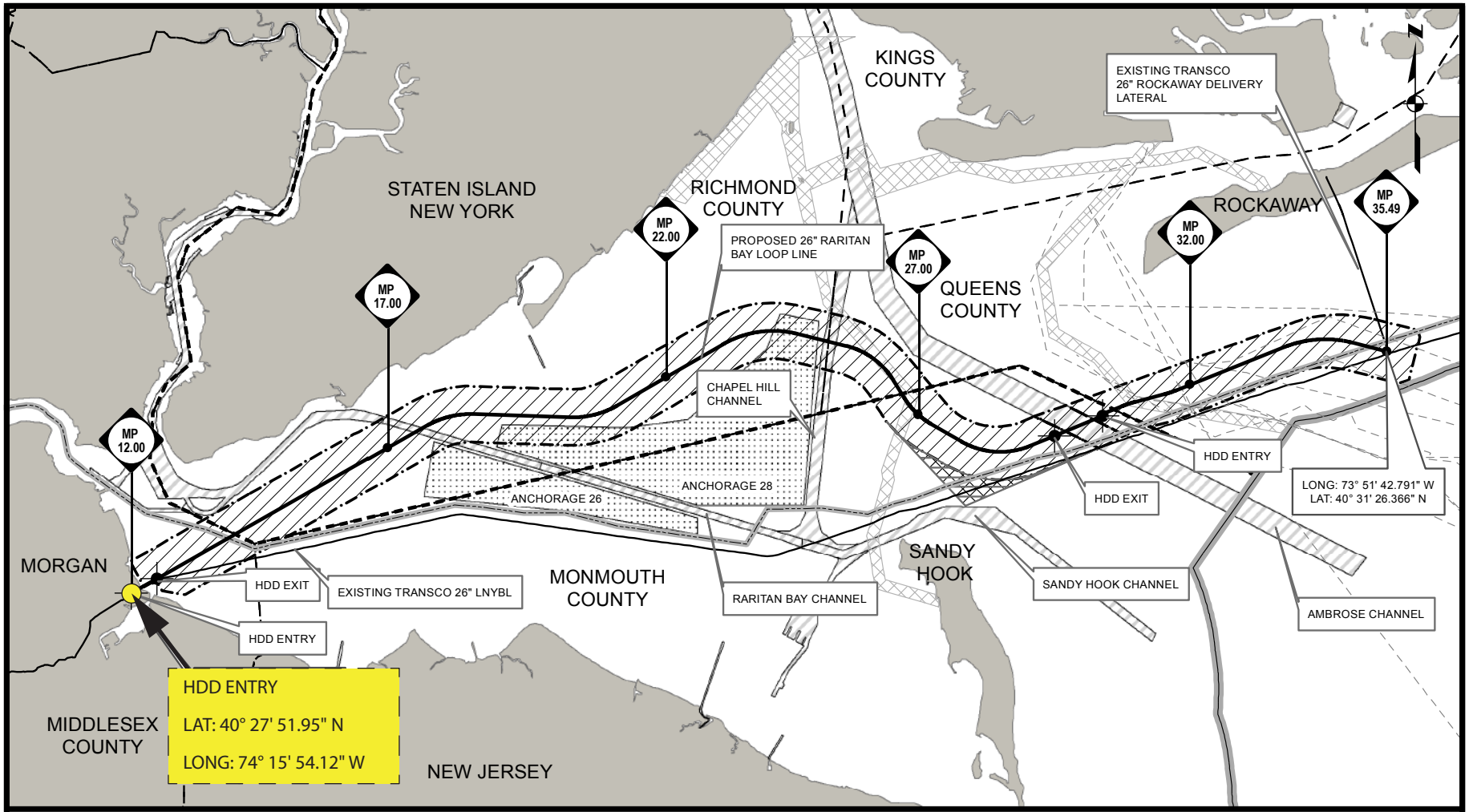
NO.	DATE	REVISION DESCRIPTION	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE LLC
STANDARD ENVIRONMENTAL DETAIL

TYPE II "SATURATED WETLAND"
INSTALLATION PROCEDURE

Williams
GAS PIPELINE

Drawing A-11 Saturated Wetland Installation Procedure



Note: Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route.

CORPS OF ENGINEERS PERMIT DRAWING

0 0.5 1 2 3 4 Miles

Latitude/Longitude Coordinates: Geographic NAD83
Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USACE ANCHORAGE AREA
- MARINE TRAFFIC LANES

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
OVERALL PIPELINE LOCATION MAP
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 12.00 TO MP 35.49
NEW JERSEY/NEW YORK

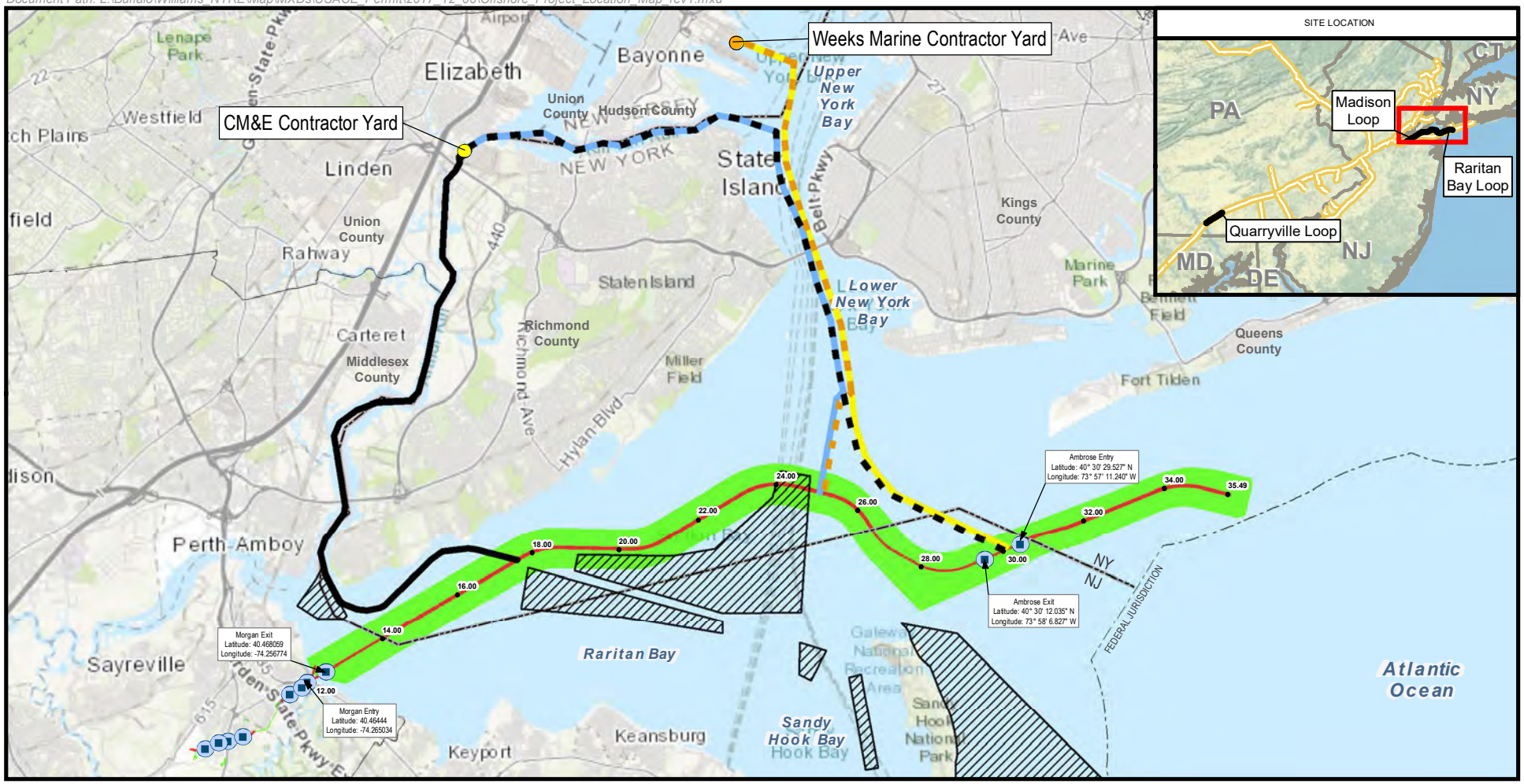
Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=12500'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017	NUMBER: USACE-FQ-RRTN-D	SHEET 1 OF 1
WO: 1185516			

Drawing A-12 Offshore Pipeline Location Map



Potential Access Routes from CM&E and Weeks Marine Contractor Yards

- Approximate Project Vessel Transit Route, Alternative 1
- Approximate Project Vessel Transit Route, Alternative 2
- Approximate Project Vessel Transit Route, Alternative 3
- Approximate Project Vessel Transit Route, Alternative 4
- Approximate Project Vessel Transit Route, Alternative 5
- County Boundary

- Milepost
- Offshore HDD Entry and Exit Locations
- CM&E Contractor Yard
- Weeks Marine Contractor Yard
- Anchorage Areas

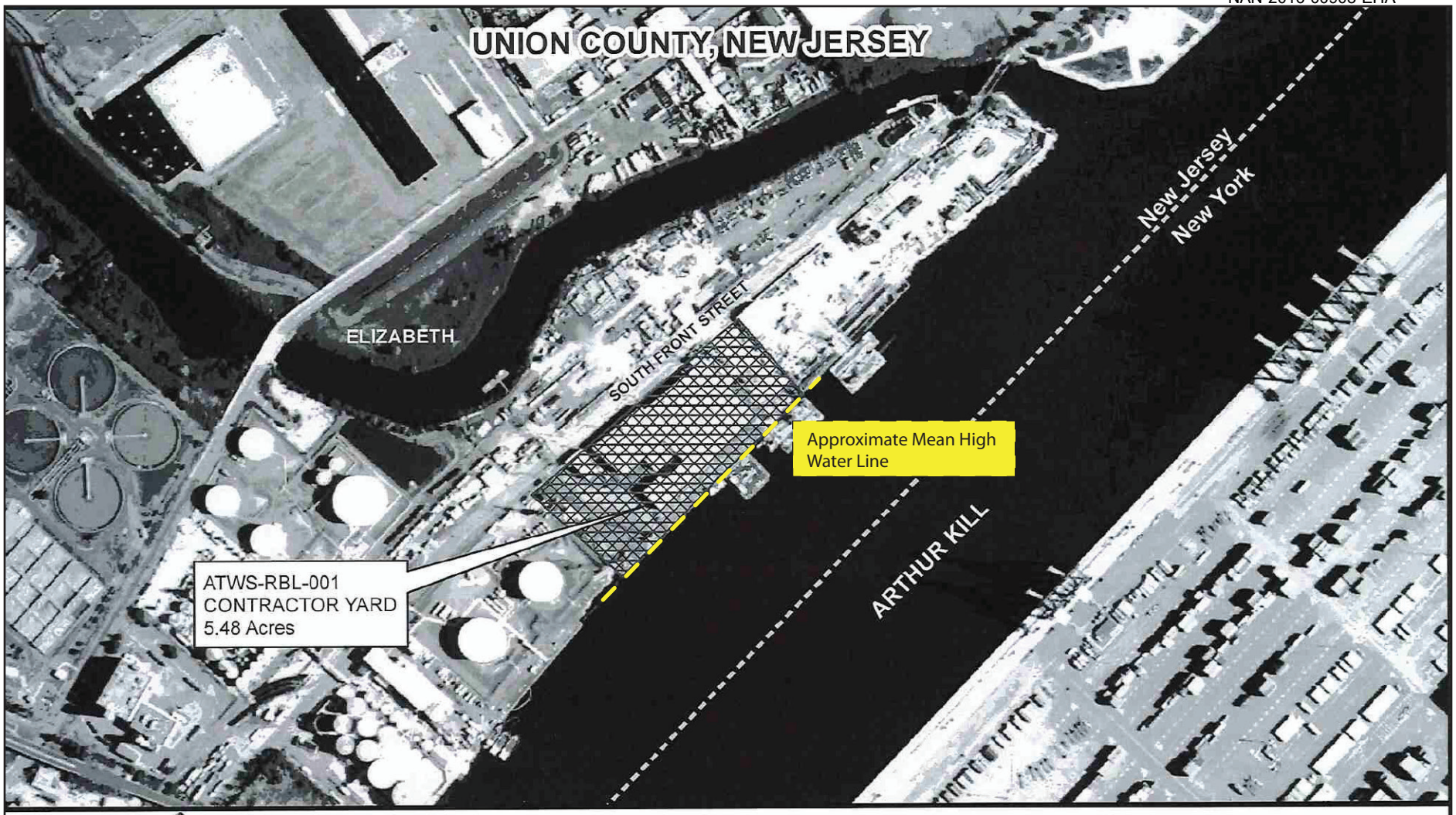
Workspace Type

- Permanent
- Temporary

A-13
Offshore Project Vessel Transit Routes
Northeast Supply Enhancement Project
New Jersey and New York

0 1 2 Miles
0 2 4 6 Kilometers

Data Sources: Williams 2017; E&E 2017; ESRI 2012; NOAA ENC 2013 (Chart # 12327 and # 12326) Seamless Web Service; USCG 2016



CORPS OF ENGINEERS PERMIT DRAWING

0 150 300 600 Feet

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

ADDITIONAL TEMPORARY WORKSPACE

NY/NJ STATE BOUNDARY

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
CONTRACTOR YARD LOCATION MAP
NORTHEAST SUPPLY ENHANCEMENT PROJECT
UNION COUNTY, NEW JERSEY

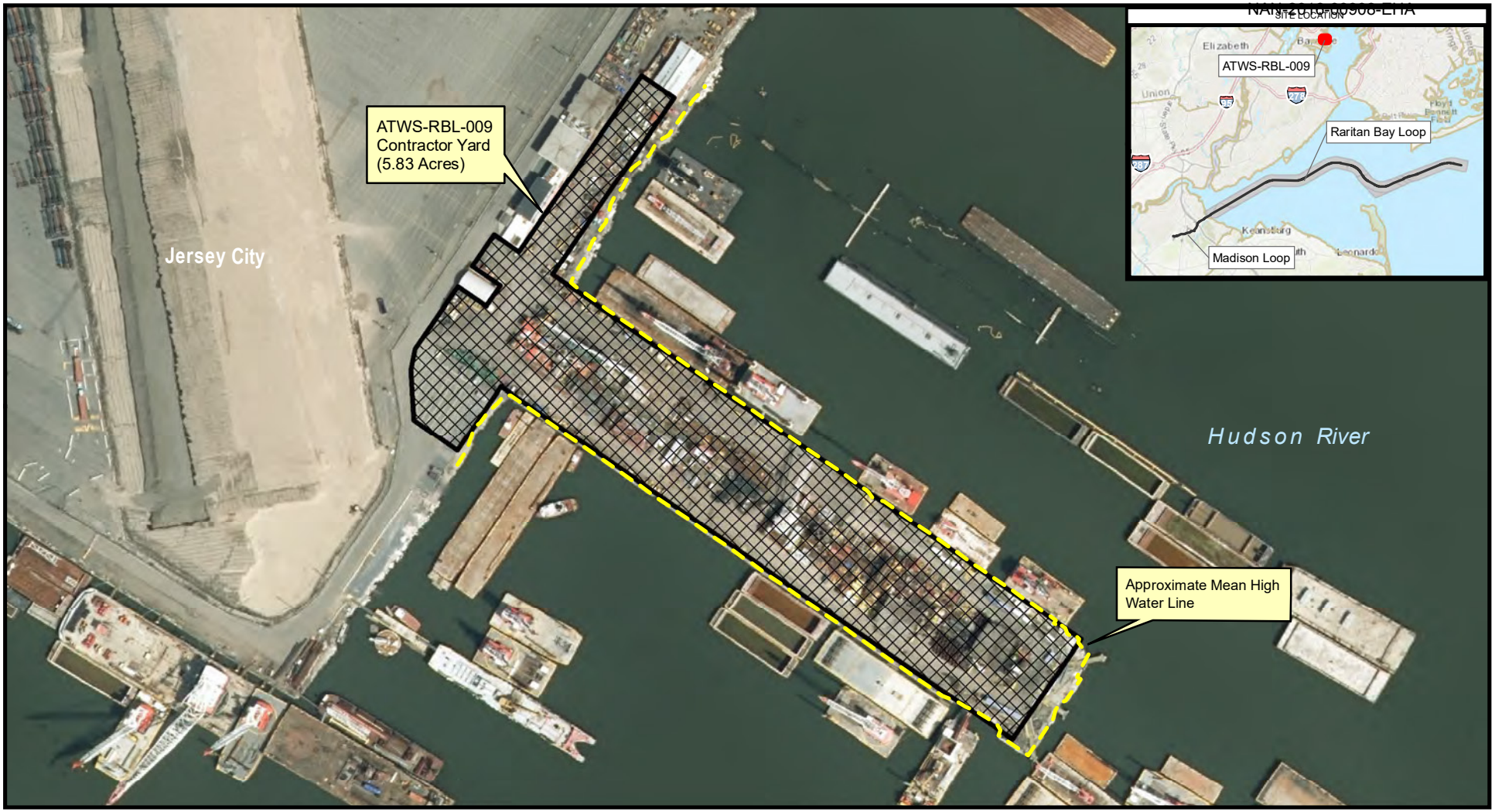
Williams

INTELSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 03/15/2017	ISSUED FOR BID:	SCALE: 1"=400'
CHECKED BY: SM	DATE: 03/15/2017	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: VN	DATE: 03/15/2017	NUMBER: USACE-FQ-RRTN-D/CY	SHEET 1 OF 2
WO: 1185516			

Drawing A-14 Contractor Yard Location Map



CORPS OF ENGINEERS PERMIT DRAWING

Legend

- ATWS-RBL-009
- Approximate Mean High Water Line

Projection: State Plane Coordinate System
Zone: New Jersey NAD 83
Units: US Foot
Background Aerial: Flown 2015, NJOGIS.

0 70 140 210 280
Feet

N

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
CONTRACTOR YARD LOCATION MAP
NORTHEAST SUPPLY ENHANCEMENT PROJECT
NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	11/13/2017	RS	ISSUED FOR PERMITTING	1000891	MK	

DRAWN BY: RS	DATE: 12/8/2017	ISSUE FOR BID: N/A	SCALE: 1:2,842
CHECKED BY: MK	DATE: 12/8/2017	ISSUE FOR CONSTRUCTION: N/A	Project features ver17
APPROVED BY:	DATE:	DRAWING NUMBER: A-14	SHEET 2 OF 2
WO: 1000891	FIELD DATA: 12/8/2017	11:01 AM 12/8/2017	

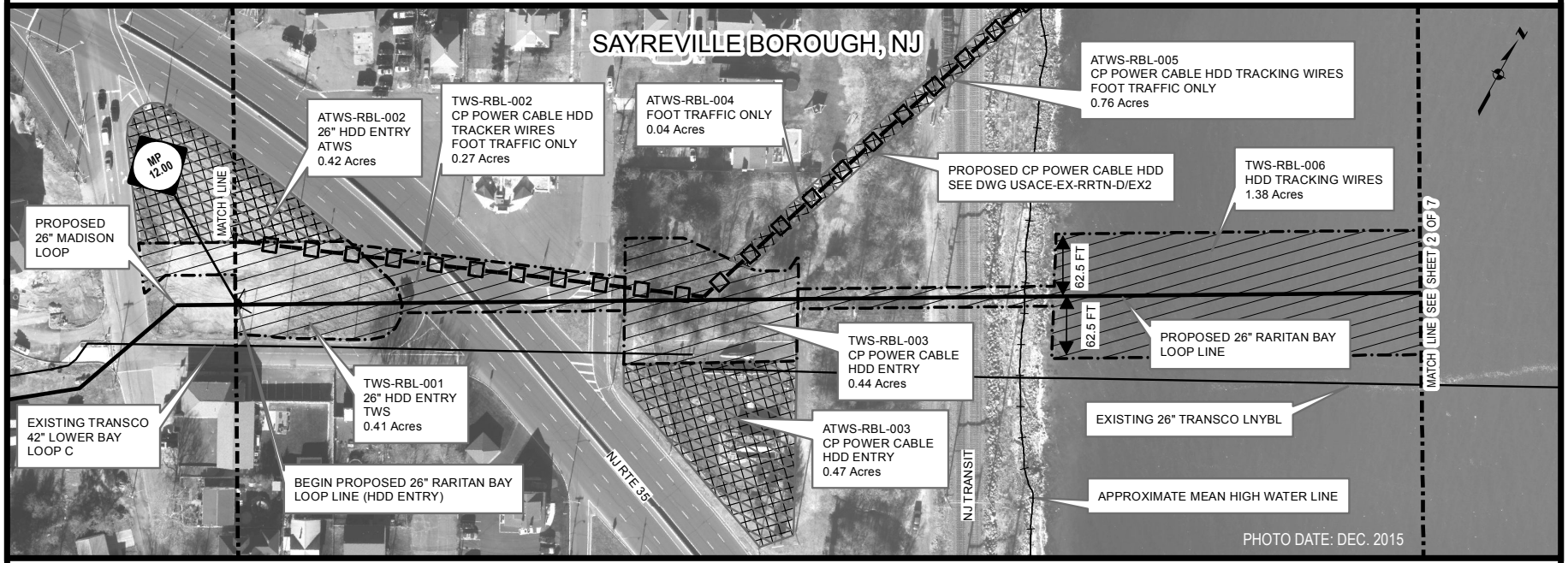
Data Sources: Williams 2017; E&E 2017; ESRI 2012; NJOGIS 2015.

02:1000891.0019.02.14

Drawing A-14 Contractor Yard Location Map

ALL DREDGE VOLUMES ARE REPORTED ON THE RESPECTIVE CROSS-SECTION SHEETS.
NAVD88 Conversion Factors:
a. 0.0 ft SHW = +5.2 ft NAVD88*
b. 0.00 ft MHHW = +2.70 ft NAVD88**
c. 0.00 ft MHW = +2.36 ft NAVD88**
d. 0.00 ft MLW = -2.67 ft NAVD88**
*(Source: Field derived)
**(Source: NOAA VDatum for Lat 40.466862, Long -74.263345)

MP 12.00 BEGIN PROPOSED 26" RARITAN BAY LOOP
MP 12.00 SHORE APPROACH HDD ENTRY
MP 12.00 ENTER NJ-MI-39
MP 12.03 EXIT NJ-MI-39\ ENTER NJ-MI-007.000.RD
MP 12.03 EXIT NJ-MI-007.000.RD ENTER NJ-MI-008.000.RD
MP 12.05 NJ RTE 35
MP 12.06 EXIT NJ-MI-008.000.RD ENTER NJ-MI-009.000.RD
MP 12.07 MORGAN AVE
MP 12.07 EXIT NJ-MI-009.000.RD ENTER NJ-MI-50
MP 12.11 EXIT NJ-MI-50 ENTER NJ-MI-010.000. RD
MP 12.12 EXIT NJ-MI-010.000. RD ENTER NJ-MI-67
MP 12.13 EXIT NJ-MI-67 ENTER NJ-MI-68
MP 12.14 RAILROAD CROSSING
MP 12.14 RAILROAD CROSSING
MP 12.14 POWERLINE CROSSING
MP 12.15 EXIT NJ-MI-68 ENTER NJ-MI-69
MP 12.15 EXIT NJ-MI-69
MP 12.16 SHORELINE CROSSING
MP 12.22



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 50 100 200 Feet

Water levels referenced to Sandy Hook Tide Station 8531680
Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D USACE-EX-RRTN-D/EX2	OVERALL PIPELINE LOCATION MAP ANODE SLED INSTALLATION HDD PLAN AND PROFILE MORGAN SHORE CROSSING

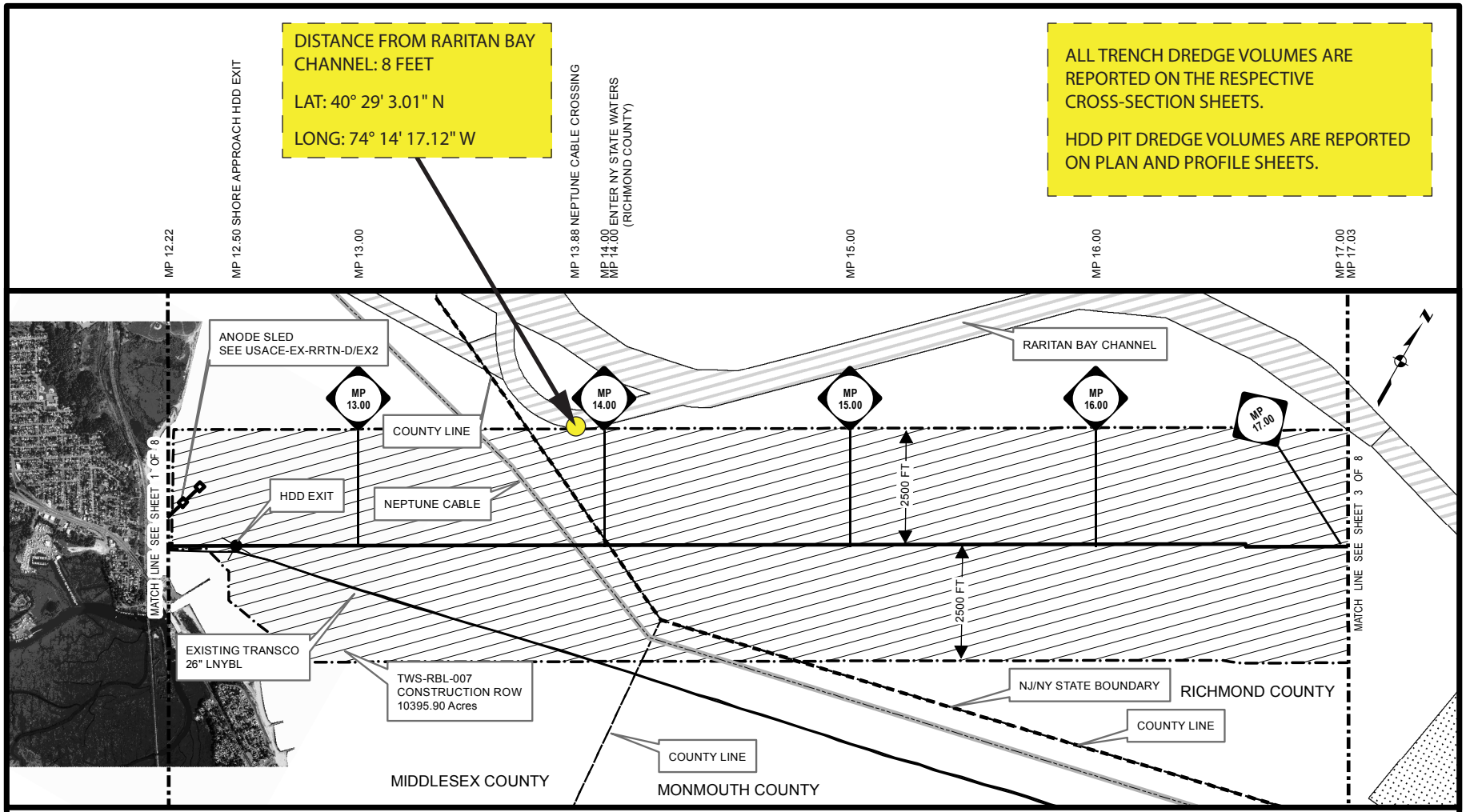
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 12.00 TO MP 12.22
NEW JERSEY

Williams
INTECSEA WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=150'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 1 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D USACE-EX-RRTN-D/EX2	OVERALL PIPELINE LOCATION MAP ANODE SLED INSTALLATION HDD PLAN AND PROFILE MORGAN SHORE CROSSING

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 12.22 TO MP 17.03
NEW JERSEY/NEW YORK

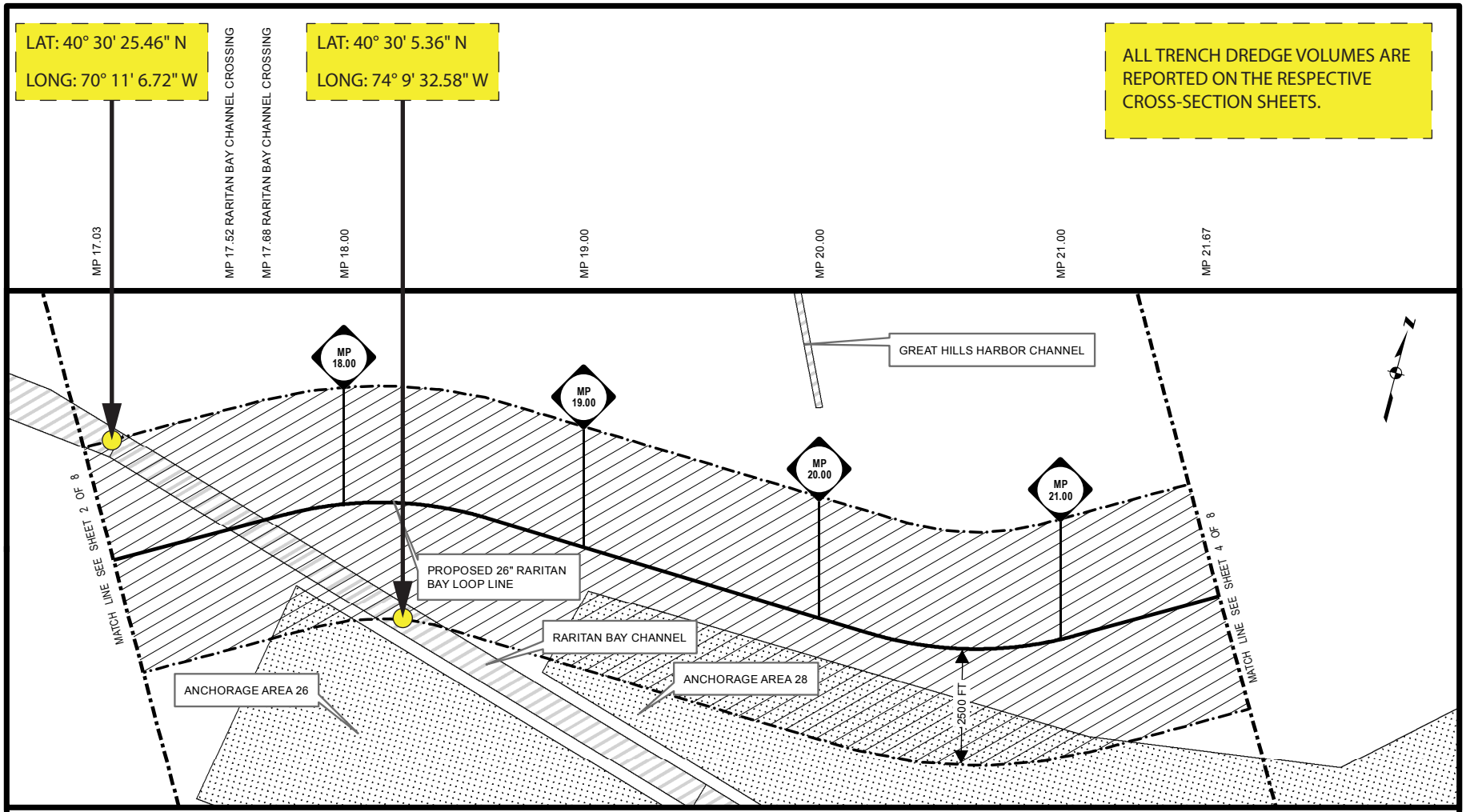
Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 2 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 17.03 TO MP 21.67
NEW JERSEY/NEW YORK

Williams

INTECSEA
WorleyParsons Group

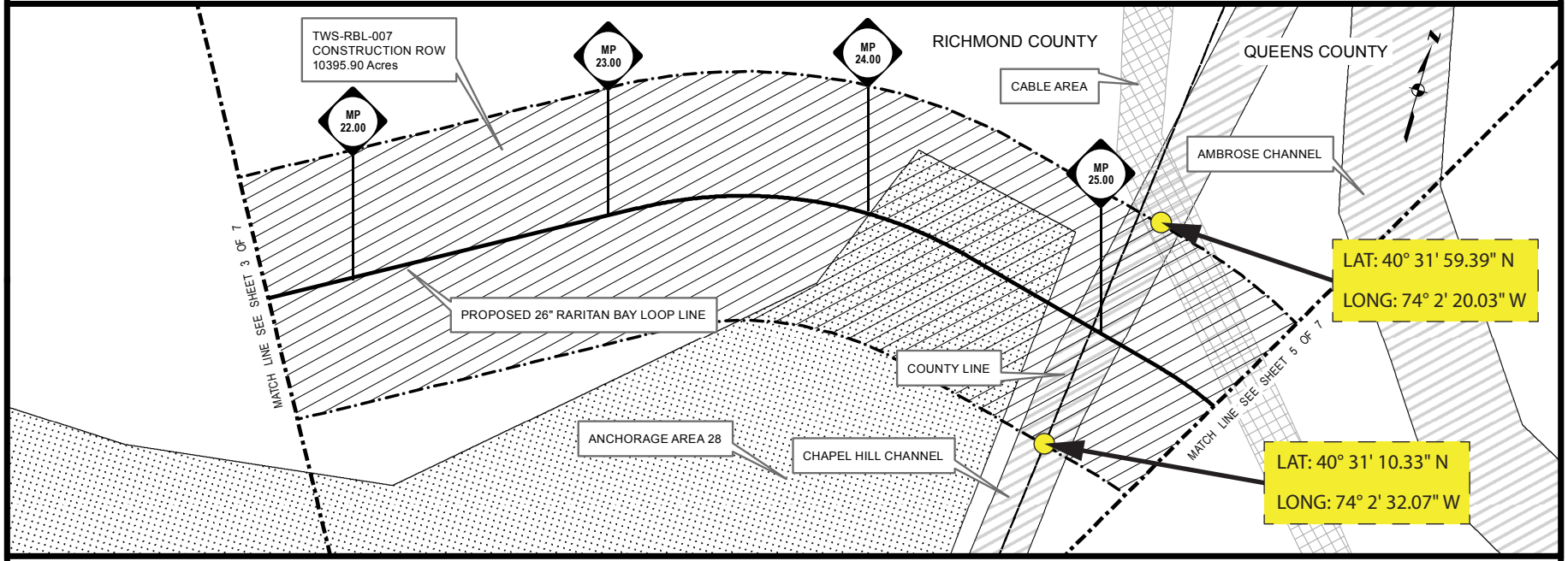
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 3 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets

ALL TRENCH DREDGE VOLUMES ARE REPORTED ON THE RESPECTIVE CROSS-SECTION SHEETS.

MP 21.67
MP 22.00
MP 23.00
MP 24.00 ENTER ANCHORAGE AREA 28
MP 24.00
MP 24.76 EXIT ANCHORAGE AREA 28
MP 24.87 ENTER CHANNEL CROSSING CHAPEL HILL
MP 25.00 ENTER QUEENS COUNTY
MP 25.00
MP 25.09 EXIT CHANNEL CROSSING CHAPEL HILL
MP 25.50



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 21.67 TO MP 25.50
NEW YORK

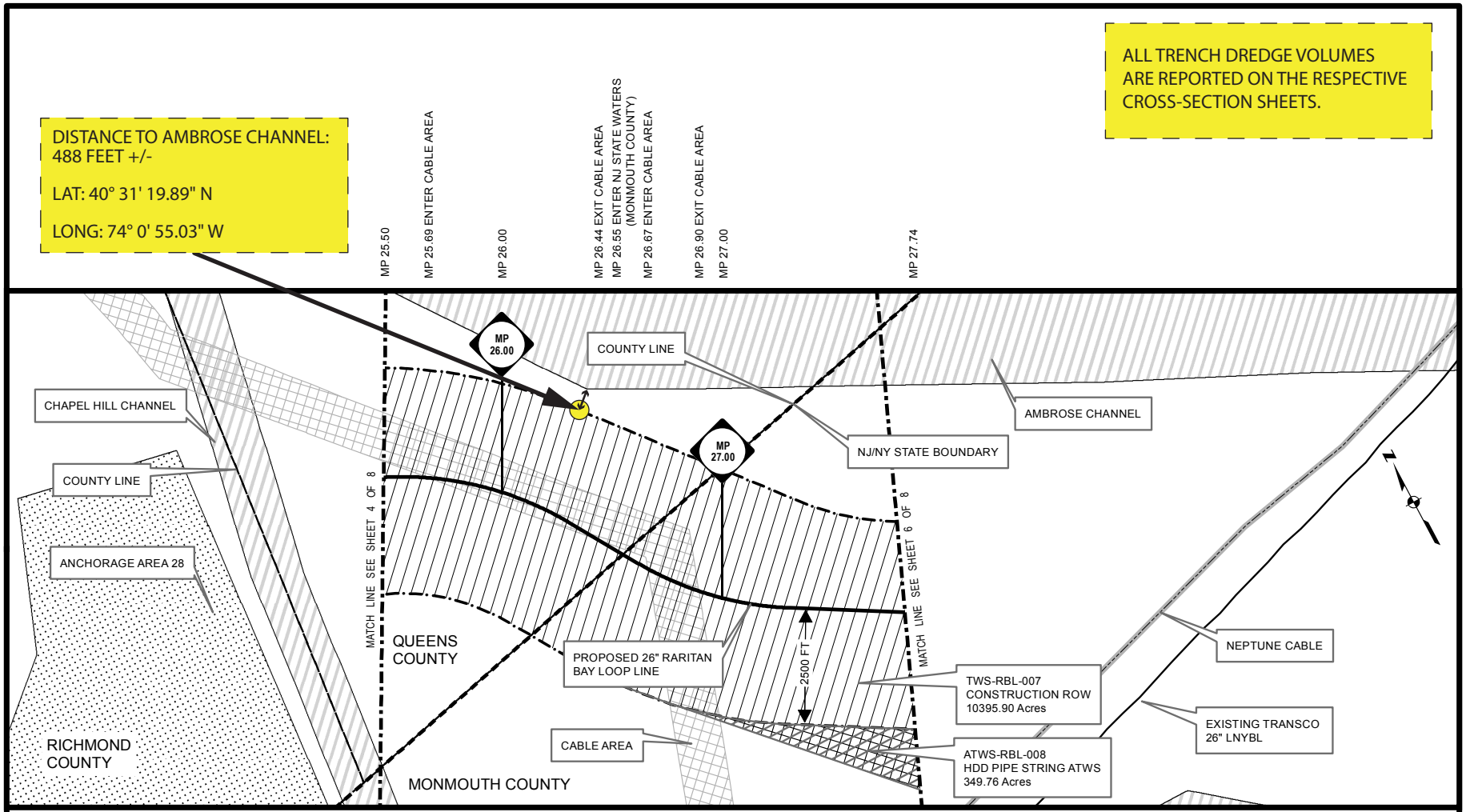
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 4 OF 8

Williams

INTECSEA
WorleyParsons Group

Drawing A-15 Offshore Pipeline Alignment Sheets



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 25.50 TO MP 27.74
NEW JERSEY/NEW YORK

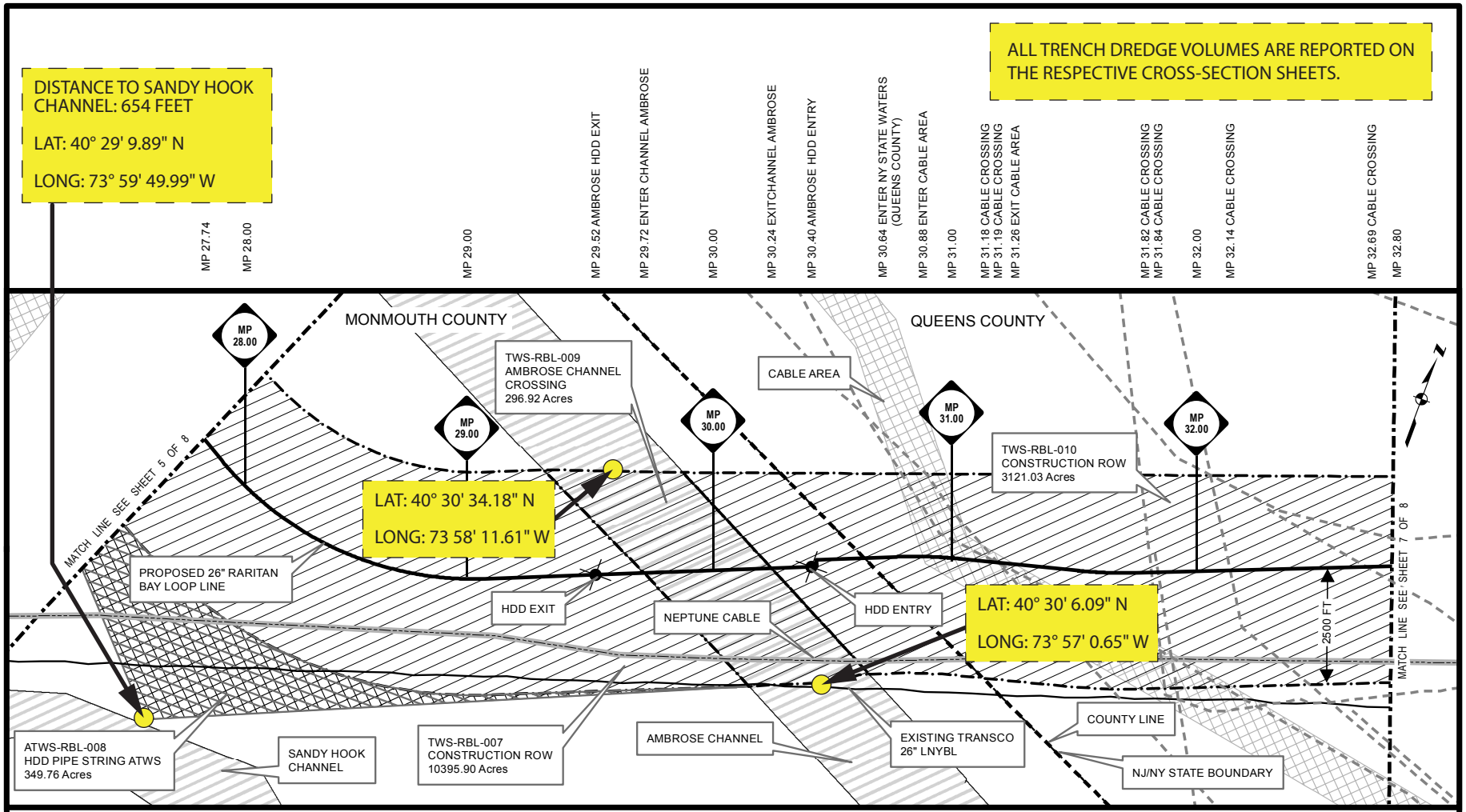
Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 5 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 27.74 TO MP 32.80
NEW JERSEY/NEW YORK

Williams

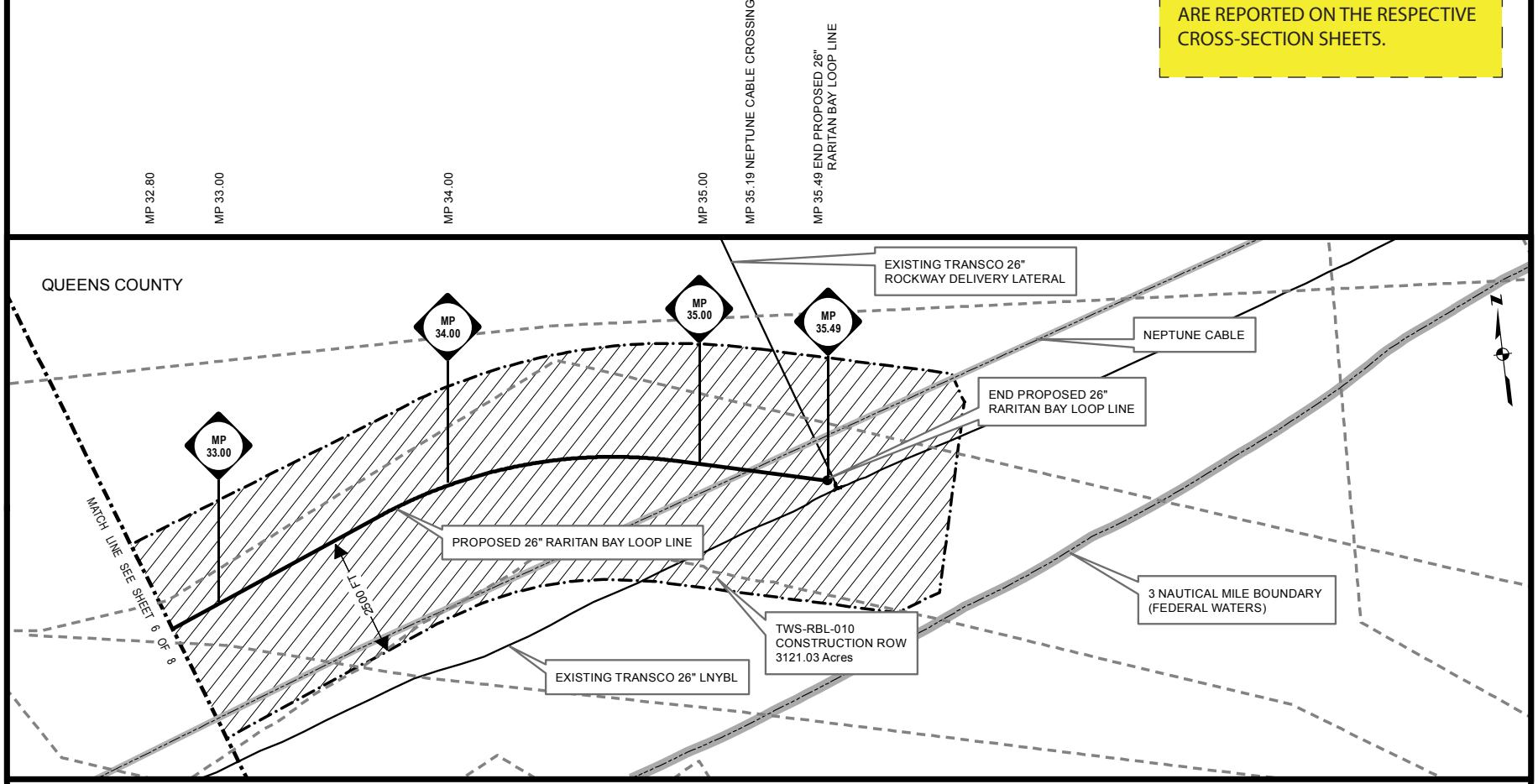
INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 6 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets

ALL TRENCH DREDGE VOLUMES ARE REPORTED ON THE RESPECTIVE CROSS-SECTION SHEETS.



Note: 1. Refer to Sheet 8 for Data Source Listing. 2. Operational Easement is 30 ft. for New Jersey and 200 ft. for New York, Centered on Pipeline Route. 3. TWS: Temporary Workspace 4. ATWS: Additional Temporary Workspace

CORPS OF ENGINEERS PERMIT DRAWING

0 0.25 0.5 1 Miles

Projection: State Plane Coordinate System
Zone: New York - Long Island NAD83
Unit: US Survey Feet

- PROPOSED PIPELINE
- PROPOSED POWER CABLE
- EXISTING PIPELINES
- NEPTUNE CABLE BUNDLE
- NY/NJ STATE BOUNDARY
- COUNTY LINES
- 3 NAUTICAL MILE BOUNDARY
- SUBSEA CABLE
- CABLE AREA
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- USCG ANCHORAGE AREA
- MARINE TRAFFIC LANES
- MEAN HIGH WATER LINE

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
MP 32.80 TO MP 35.49
NEW YORK

Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017		
WO: 1185516		NUMBER: A-15	SHEET 7 OF 8

Drawing A-15 Offshore Pipeline Alignment Sheets

Data Source List

1. Proposed Pipeline Route: INTECSEA, Inc. and Transcontinental Gas Pipe Line Company, LLC
2. HDD Entry/Exit Locations: Lake Superior Consulting and Transcontinental Gas Pipe Line Company, LLC
3. Proposed Power Cable: INTECSEA, Inc. and Transcontinental Gas Pipe Line Company, LLC
4. Existing Pipeline: Transcontinental Gas Pipe Line Company, LLC - As-Built Drawings
5. Neptune Cable: Transcontinental Gas Pipe Line Company, LLC - As-Built Drawings
6. NY/NJ State Boundary: NYS GIS Clearinghouse - Public Domain
7. County Line: NYS Office of Information Technology Services and U.S. Census Bureau - Public Domain
8. Contour Lines: Transcontinental Gas Pipe Line Company, LLC - Rogers Survey 2016 and NOAA - Public Domain
9. 3 Nautical Mile Boundary: NOAA Navigation Charts - Public Domain
10. Subsea Cable: Global Marine Cable Database 2016
11. Cable Area: NOAA Navigation Charts - Public Domain
12. Temporary Work Space: INTECSEA, Inc. and Transcontinental Gas Pipe Line Company, LLC
13. USCG Anchorage Area: USCG - US Coast Guard
14. Marine Traffic Zones: NOAA Navigation Charts - Public Domain
15. Aerial Imagery: Keystone Aerial Surveys and Global Mapper NAIP Imagery-Public Domain
16. Affected Parcels: Transcontinental Gas Pipe Line Company, LLC
17. Mean High Water Line: Transcontinental Gas Pipe Line Company, LLC

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-FQ-RRTN-D	OVERALL PIPELINE LOCATION MAP

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
PIPELINE ALIGNMENT SHEETS
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE
DATA SOURCE LIST
NEW YORK

Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
A	03/02/2017	DZ	ISSUED FOR INTERNAL REVIEW	1185516	SM	VN
B	03/03/2017	DZ	ISSUED FOR CLIENT REVIEW	1185516	SM	VN
0	03/15/2017	DZ	ISSUED FOR USE	1185516	SM	VN
1	04/14/2017	DZ	RE-ISSUED FOR USE	1185516	SM	VN

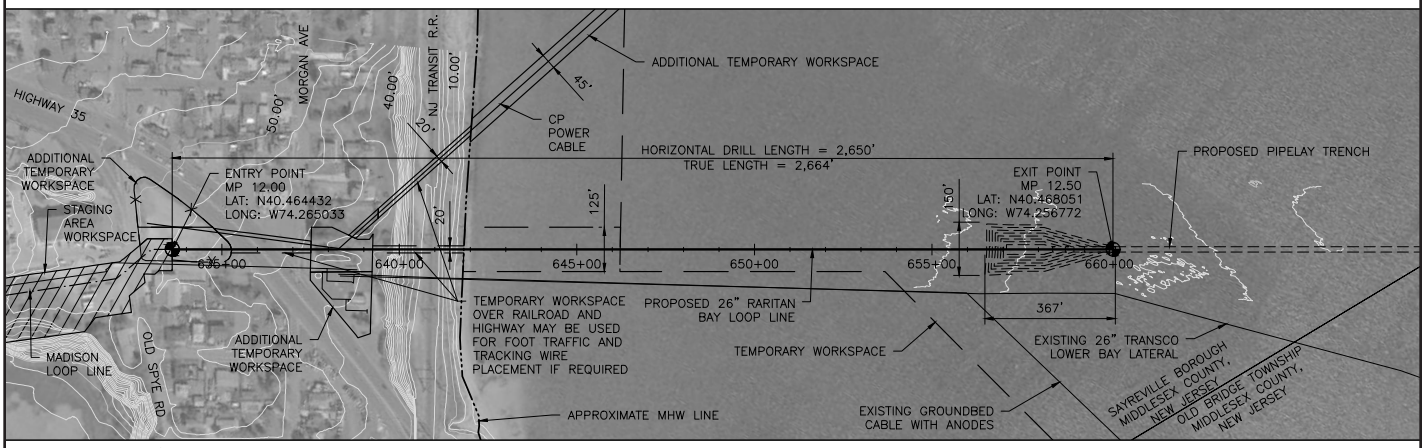
DRAWN BY: DZ	DATE: 04/14/2017	ISSUED FOR BID:	SCALE: 1"=3000'
CHECKED BY: SM	DATE: 04/14/2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY: VN	DATE: 04/14/2017	NUMBER: A-15	SHEET 8 OF 8
WO: 1185516			

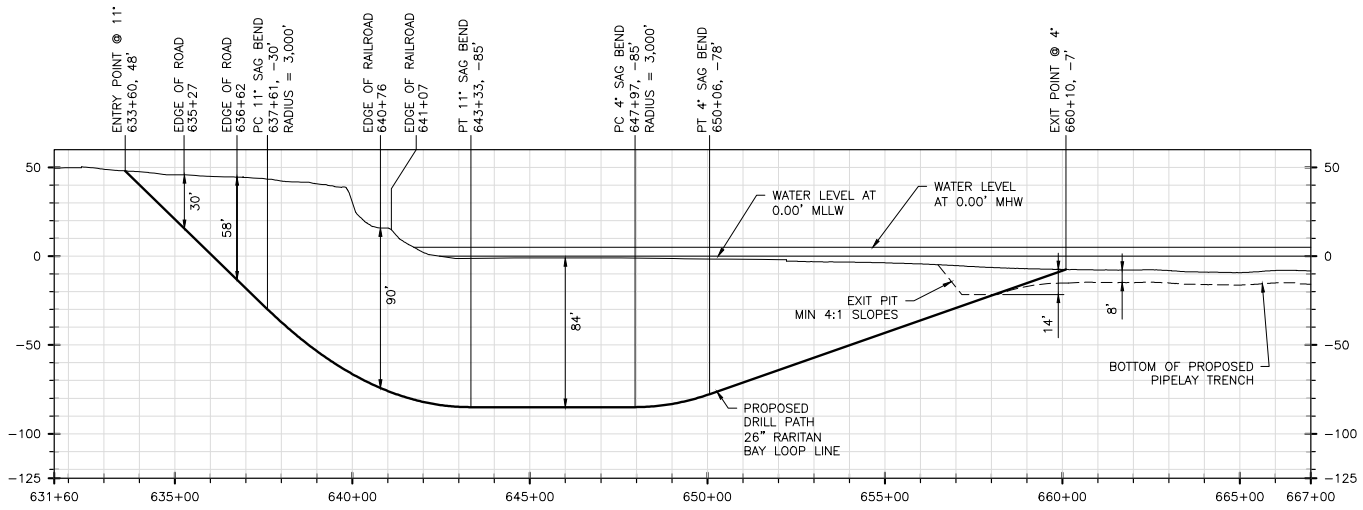
STAMP TO BE PLACED HERE

PLAN

500' 0 500' 1,000'

SCALE: 1" = 500'





NOTES

1. METHOD OF CONSTRUCTION IS HORIZONTAL DIRECTIONAL DRILLING.
2. THIS SITE IS NOT LOCATED IN THE 100 YEAR FLOOD PLAIN.
3. ALL CONSTRUCTION ACTIVITIES SHALL OCCUR WITHIN TEMPORARY AND ADDITIONAL TEMPORARY WORKSPACE BOUNDARIES.
4. DRILLING FLUID CUTTINGS TO BE LEFT IN PLACE AND COVERED WITH AN APPROPRIATE LAYER OF NATIVE AND/OR COMPATIBLE MATERIAL.
5. THE DEFINED HDD EXIT POINT, AS DESIGNED, IS AT THE SEAFLOOR ELEVATION; HOWEVER, THE EXCAVATION REQUIRED AT EXIT AND FOR THE PRE-DREDGED TRENCH WILL REVISE THE LOCATION AND ELEVATION DURING CONSTRUCTION.
6. IMPACTS ASSOCIATED WITH THE STAGING AREA WORKSPACES THAT OVERLAP WITH THE MADISON LOOP ARE ACCOUNTED FOR UNDER THE MADISON LOOP.

PROFILE

HORIZONTAL SCALE: 1" = 500'
VERTICAL SCALE: 1" = 100'

PIT EXCAVATION WILL REQUIRE CLAMSHELL DREDGING OF APPROXIMATELY 9,931 CUBIC YARDS OF MATERIAL.

SURVEY NOTES

1. BEARINGS SHOWN ARE REFERENCED TO WGS84.
2. ALL ELEVATIONS ARE REFERENCED TO MEAN LOWER LOW WATER (MLLW) LEVEL. 0.00' MLLW = -2.8' NAVD88 = -0.2' MLW = -5.1' MHW.
3. DRILL PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO THE CONTROL POSITION ESTABLISHED FOR THE DRILLED SEGMENT.
4. DRILL PATH COORDINATES REFER TO CENTERLINE OF PIPE.

PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
24-1947-80-14-B/0012	PIPELINE ALIGNMENT
24-1947-80-14-C/0012	PIPELINE ROUTE OVERVIEW MAP
24-1947-80-25-D/EX1	ANODE SLED PIT DETAIL

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
MORGAN SHORE APPROACH HDD PLAN & PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
MP 12.00 TO MP 12.50
MIDDLESEX COUNTY, NEW JERSEY

Williams

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/17/17	CEF	ISSUED FOR PERMITTING	-	RJS	GDZ

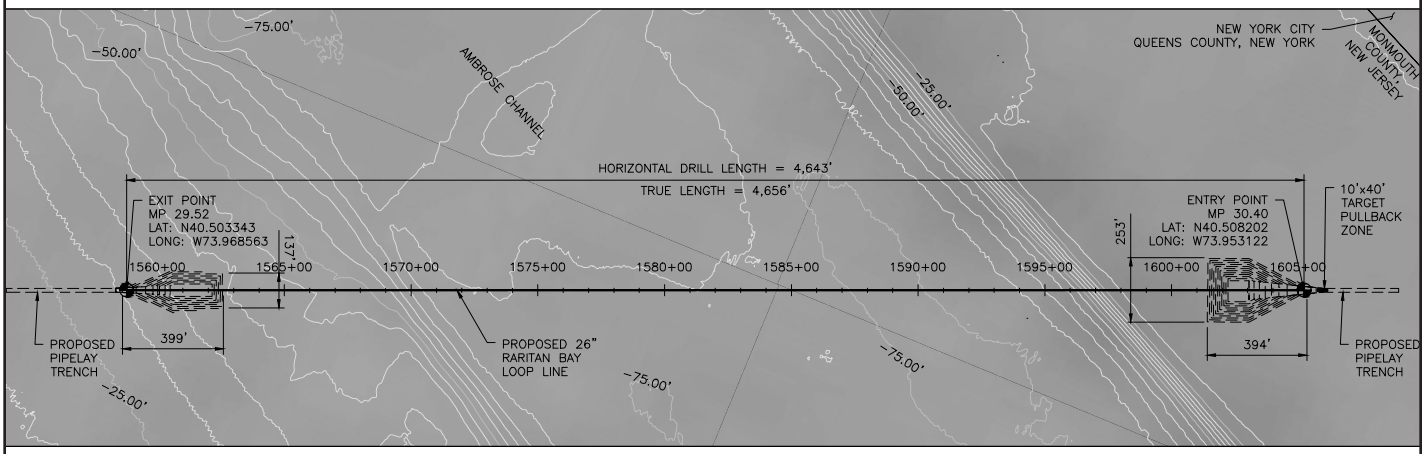
DRAWN BY: CEF	DATE: 02/15/17	ISSUED FOR BID:	SCALE: 1" = 500'
CHECKED BY: RJS	DATE: 02/15/17	ISSUED FOR CONSTRUCTION:	
APPROVED BY: GDZ	DATE: 02/15/17	DRAWING NUMBER: A-16	SHEET 1 OF 1
WO: -			

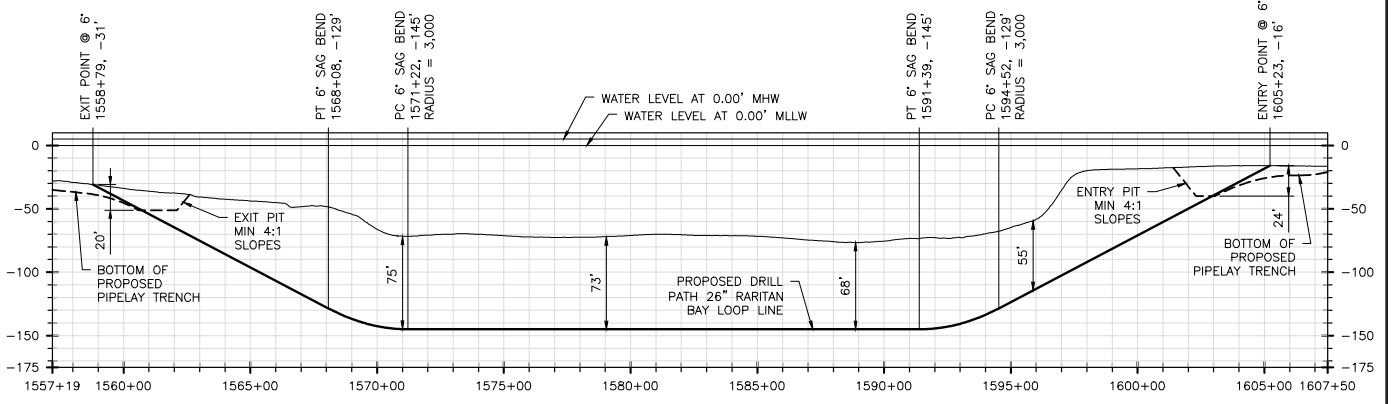
STAMP TO BE PLACED HERE

PLAN

700' 0 700' 1,400'

SCALE: 1" = 700'





PROFILE

HORIZONTAL SCALE: 1" = 700'
VERTICAL SCALE: 1" = 140'

NOTES

1. METHOD OF CONSTRUCTION – HORIZONTAL DIRECTIONAL DRILL.
2. DRILLING FLUID CUTTINGS TO BE LEFT IN PLACE AND COVERED WITH AN APPROPRIATE LAYER OF NATIVE AND/OR COMPATIBLE MATERIAL.
3. THE DEFINED HDD ENTRY AND EXIT POINTS, AS DESIGNED, ARE AT THE SEAFLOOR ELEVATION; HOWEVER, THE EXCAVATIONS REQUIRED AT ENTRY AND EXIT AND FOR THE PRE-DREDGED TRENCHES WILL REVISE THE LOCATIONS AND ELEVATIONS DURING CONSTRUCTION.

SURVEY NOTES

1. BEARINGS SHOWN ARE REFERENCED TO WGS84.
2. ALL ELEVATIONS ARE REFERENCED TO THE MEAN LOWER LOW WATER (MLLW) LEVEL. 0.00' MLLW = -2.8' NAVD88 = -0.2' MLW = -5.1' MHW.
3. DRILL PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO THE CONTROL POSITION ESTABLISHED FOR THE DRILLED SEGMENT.
4. DRILL PATH COORDINATES REFER TO CENTERLINE OF PIPE.

MATERIAL EXCAVATED FROM THE ENTRY AND EXIT PITS WILL BE PLACED ADJACENT TO THE RESPECTIVE PIT AND USED TO BACKFILL EACH PIT FOLLOWING COMPLETION OF HDD ACTIVITIES.

ENTRY PIT EXCAVATION WILL REQUIRE CLAMSHELL DREDGING OF APPROXIMATELY 32,450 CUBIC YARDS OF MATERIAL.
EXIT PIT EXCAVATION WILL REQUIRE CLAMSHELL DREDGING OF APPROXIMATELY 14,050 CUBIC YARDS OF MATERIAL.

PERMIT DRAWING

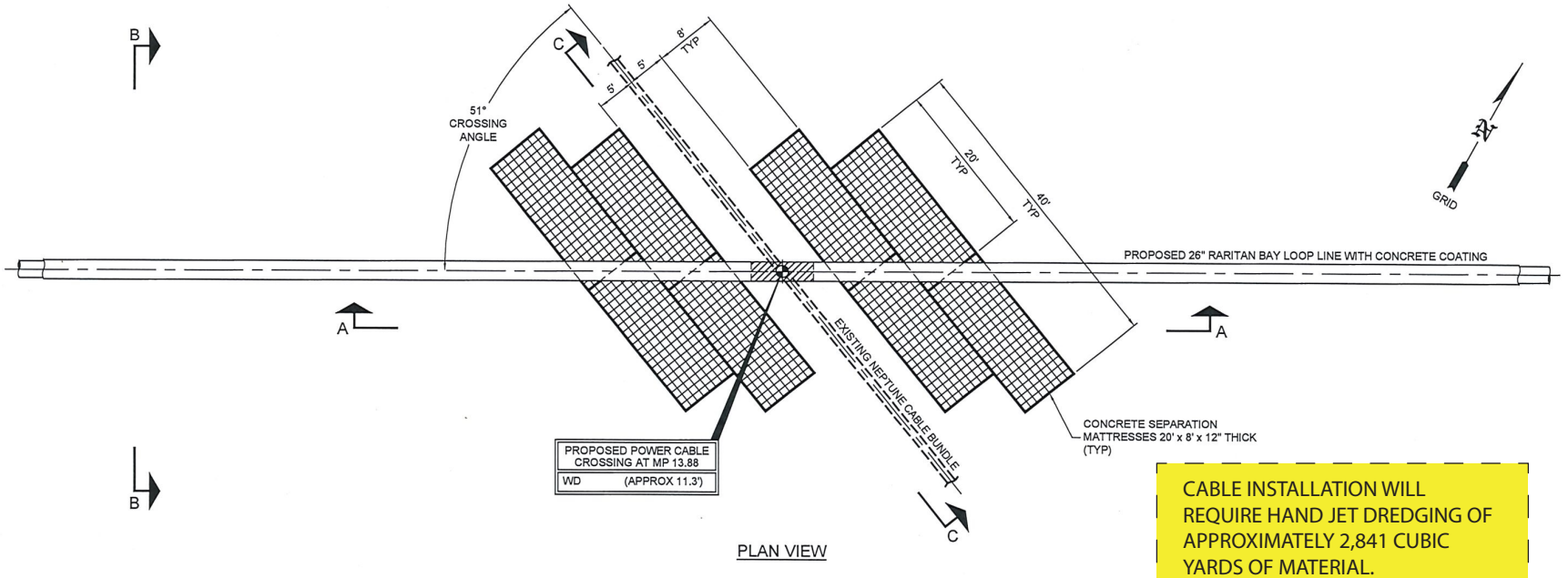
DRAWING NO.	REFERENCE TITLE
24-1947-80-14B-D/0012	PIPELINE ALIGNMENT
24-1947-80-14C-D/0012	PIPELINE ROUTE OVERVIEW MAP
(22-9100) PF-2P-010A	MIDLINE TIE-IN SPOOL AT EAST OF AMBROSE HDD ENTRY

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
AMBROSE CHANNEL HDD INSTALLATION PLAN & PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
MP 29.52 TO MP 30.40
MONMOUTH COUNTY, NEW JERSEY

Williams

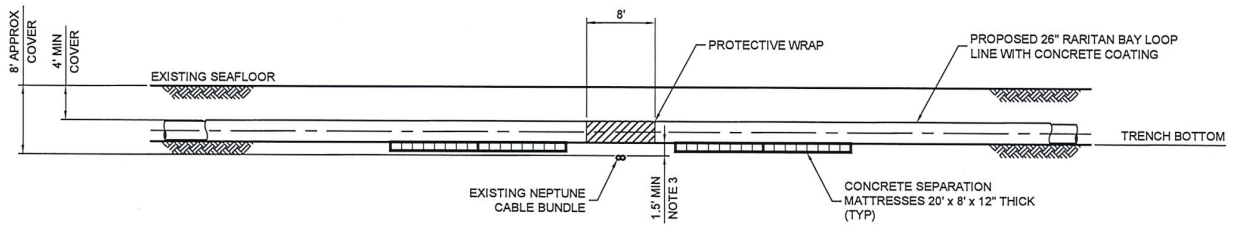
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/17/17	CEF	ISSUED FOR PERMITTING	–	RJS	GDZ

DRAWN BY: CEF	DATE: 02/15/17	ISSUED FOR BID:	SCALE: 1" = 700'
CHECKED BY: RJS	DATE: 02/15/17	ISSUED FOR CONSTRUCTION:	
APPROVED BY: GDZ	DATE: 02/15/17	DRAWING NUMBER: A-17	SHEET 1 OF 1
WO: –			



PLAN VIEW

CABLE INSTALLATION WILL REQUIRE HAND JET DREDGING OF APPROXIMATELY 2,841 CUBIC YARDS OF MATERIAL.



SECTION A-A

CORPS OF ENGINEERS PERMIT DRAWING

NOTES:

1. NUMBER OF SUPPORT MATTRESSES REQUIRED TO BE CONFIRMED BASED ON THE SEDIMENT CONDITION.
2. DURING PIPELINE INSTALLATION, TRENCHING WITHIN 100 FT OF EXISTING NEPTUNE CABLE SHALL BE PERFORMED BY HAND JETTING OR HYDRAULIC SUCTION DREDGING.
3. MINIMUM SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF CABLE TO BE 1.5 FT (18-INCHES).

SCALE (FT)

0 10 20 30 40

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
NEPTUNE CABLE CROSSING AT MP 13.88
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX, NEW JERSEY

Williams

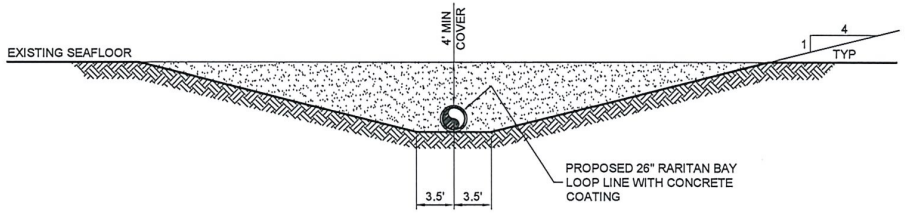
INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-22-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

DRAWN BY: TP TCP	DATE: 03-15-2017	ISSUED FOR BID:	SCALE:	1" = 20'	
CHECKED BY: GA	DATE: 03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION:	0	
APPROVED BY: VN	DATE: 03-15-2017	DRAWING NUMBER: A-18	SHEET	1	
WO: 1185516		2:29:51 PM 3/15/2017	OF	2	

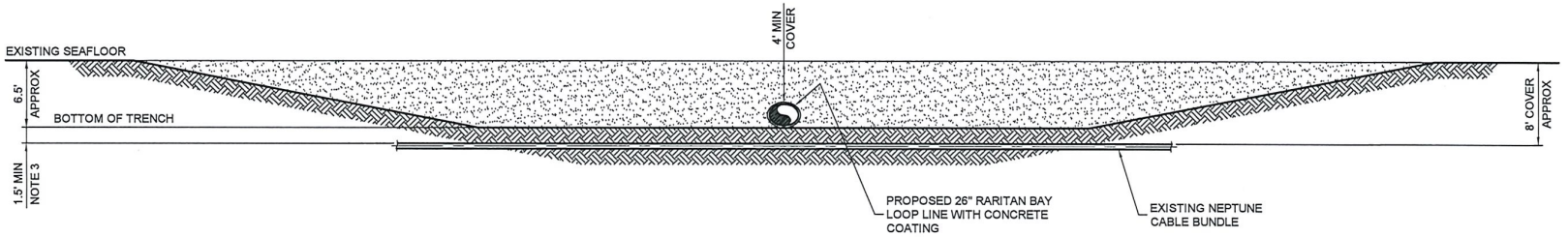
P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-0014.dwg

Drawing A-18 Neptune Cable Crossing at 13.88



SECTION B-B
TRENCH PROFILE AT LOCATION WITHIN 100' OF CROSSING
(NOTE 2)

CABLE INSTALLATION WILL REQUIRE HAND JET DREDGING OF APPROXIMATELY 2,841 CUBIC YARDS OF MATERIAL.



SECTION C-C

CORPS OF ENGINEERS PERMIT DRAWING

NOTES:

1. NUMBER OF SUPPORT MATTRESSES REQUIRED TO BE CONFIRMED BASED ON THE SEDIMENT CONDITION.
2. DURING PIPELINE INSTALLATION, TRENCHING WITHIN 100 FT OF EXISTING NEPTUNE CABLE SHALL BE PERFORMED BY HAND JETTING OR HYDRAULIC SUCTION DREDGING.
3. MINIMUM SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF CABLE TO BE 1.5 FT (18-INCHES).

SCALE (FT)
0 10 20 30

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
NEPTUNE CABLE CROSSING AT MP 13.88
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX, NEW JERSEY

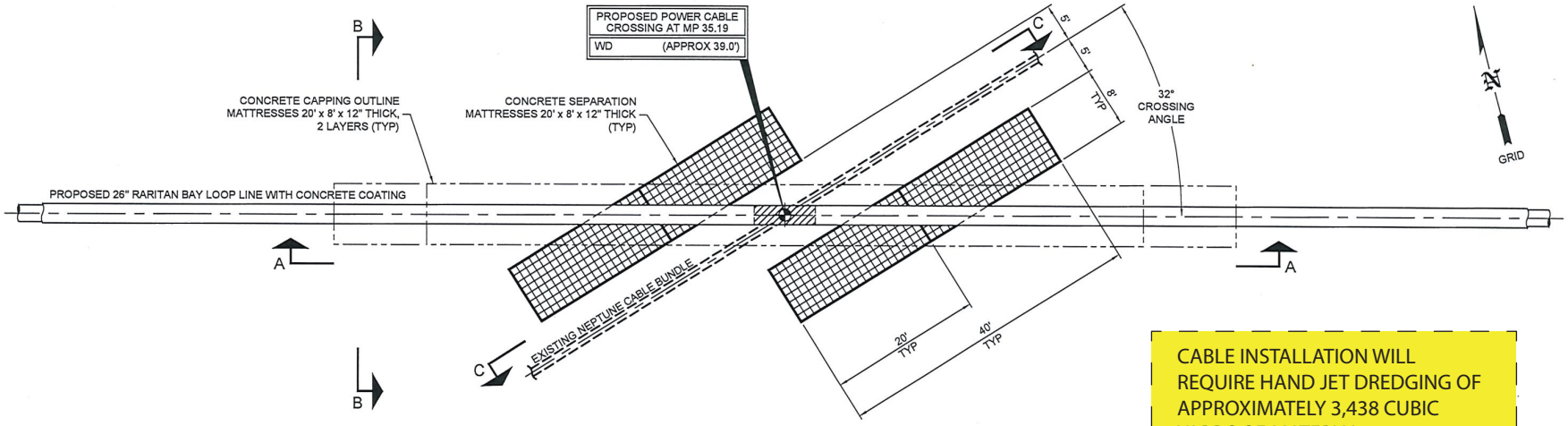
Williams

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-2747

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-22-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

DRAWN BY: TCP	DATE: 03-15-2017	ISSUED FOR BID:	SCALE:	1" = 16'
CHECKED BY: GA	DATE: 03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION:	0
APPROVED BY: VN	DATE: 03-15-2017	DRAWING NUMBER: A-18	SHEET	2
WO: 1185516		2:29:36 PM 3/15/2017	OF	2

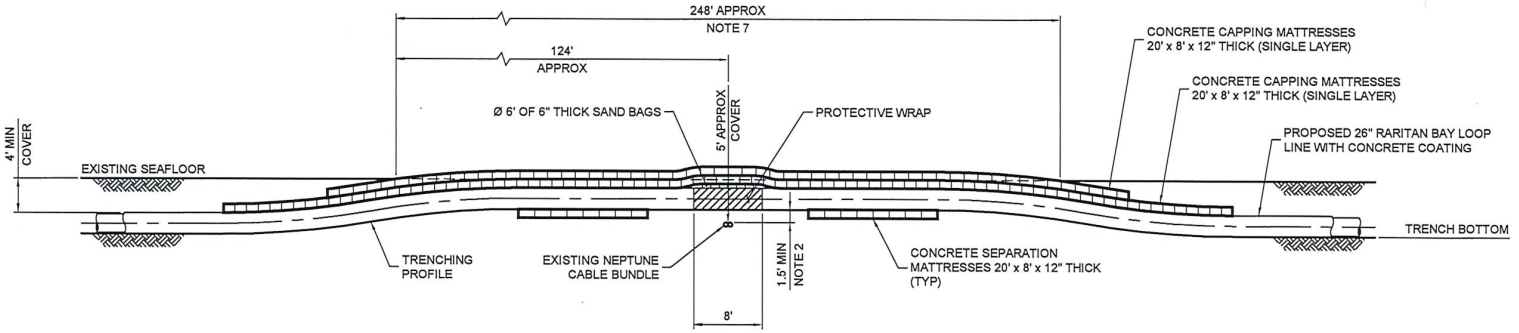
P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-0014.dwg



PLAN VIEW

(CAPPING MATTRESSES AND SAND BAGS ARE NOT SHOWN FOR CLARITY)

CABLE INSTALLATION WILL REQUIRE HAND JET DREDGING OF APPROXIMATELY 3,438 CUBIC YARDS OF MATERIAL.



SECTION A-A

NOTES:

1. DURING PIPELINE INSTALLATION, TRENCHING WITHIN 100 FT OF THE EXISTING NEPTUNE CABLE SHALL BE PERFORMED BY HAND JETTING OR HYDRAULIC SUCTION DREDGING.
2. MINIMUM SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF CABLE TO BE 1.5 FT (18-INCHES).
3. PROPOSED 26" PIPELINE SHALL HAVE A MINIMUM 4 FT OF SEDIMENT COVER OUTSIDE OF THE PROPOSED CABLE CROSSING AREA. WITHIN CROSSING AREA, CAPPING MATTRESSES SHALL BE INSTALLED AS SHOWN.
4. EDGE OF MATTRESSES SHALL BE 3 FT BELOW SEABED (EXCEPT ABOVE THE CABLE WHERE 1.5 FT (18-INCHES) OF SEPARATION IS REQUIRED).
5. NUMBER OF MATTRESSES TO BE REDUCED FROM 2 TO 1 WHEN THE TOP OF PIPE COVER DEPTH IS GREATER THAN 3.25 FT.
6. MAXIMUM / MINIMUM SIDE SLOPE TO BE DETERMINED BASED ON SEDIMENT CONDITION.
7. ESTIMATED MAXIMUM TOTAL SURFACE AREA OF CONCRETE MATTRESSES THAT MIGHT BE EXPOSED / UNBURRIED IS 2,220 SQ FT (APPROX).

SCALE (FT)

0 10 20 30 40

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
NEPTUNE CABLE CROSSING AT MP 35.19
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

QUEENS COUNTY, NEW YORK

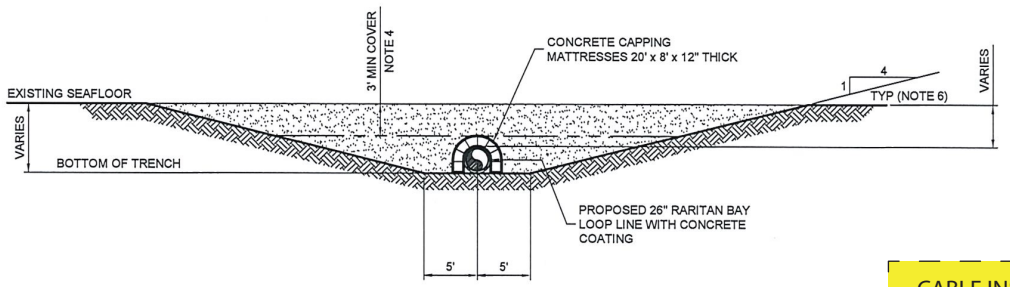
Williams

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

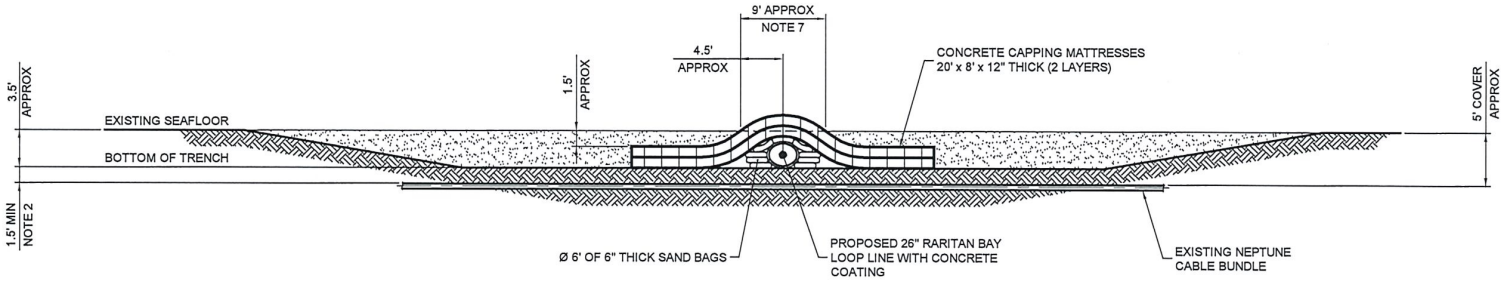
DRAWN BY:	TCP	DATE:	03-15-2017	ISSUED FOR BID:	SCALE: 1" = 20'
CHECKED BY:	GA	DATE:	03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY:	VN	DATE:	03-15-2017	DRAWING NUMBER: A-19	SHEET 1 OF 2
WO:	1185516			2:32:54 PM 3/15/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-0035.dwg



SECTION B-B
TRENCH PROFILE AT LOCATION WITHIN 100' OF CROSSING
(NOTES 1 & 3)

CABLE INSTALLATION WILL REQUIRE HAND JET DREDGING OF APPROXIMATELY 3,438 CUBIC YARDS OF MATERIAL.



SECTION C-C

NOTES:

1. DURING PIPELINE INSTALLATION, TRENCHING WITHIN 100 FT OF THE EXISTING NEPTUNE CABLE SHALL BE PERFORMED BY HAND JETTING OR HYDRAULIC SUCTION DREDGING.
2. MINIMUM SEPARATION BETWEEN BOTTOM OF PIPE AND TOP OF CABLE TO BE 1.5 FT (18-INCHES).
3. PROPOSED 26" PIPELINE SHALL HAVE A MINIMUM 4 FT OF SEDIMENT COVER OUTSIDE OF THE PROPOSED CABLE CROSSING AREA. WITHIN CROSSING AREA, CAPPING MATTRESSES SHALL BE INSTALLED AS SHOWN.
4. EDGE OF MATTRESSES SHALL BE 3 FT BELOW SEABED (EXCEPT ABOVE THE CABLE WHERE 1.5 FT (18-INCHES) OF SEPARATION IS REQUIRED).
5. NUMBER OF MATTRESSES TO BE REDUCED FROM 2 TO 1 WHEN THE TOP OF PIPE COVER DEPTH IS GREATER THAN 3.25 FT.
6. MAXIMUM / MINIMUM SIDE SLOPE TO BE DETERMINED BASED ON SEDIMENT CONDITION.
7. ESTIMATED MAXIMUM TOTAL SURFACE AREA OF CONCRETE MATTRESSES THAT MIGHT BE EXPOSED / UNBURRIED IS 2,220 SQ FT (APPROX).

SCALE (FT)
0 10 20 30

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
NEPTUNE CABLE CROSSING AT MP 35.19
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

QUEENS COUNTY, NEW YORK

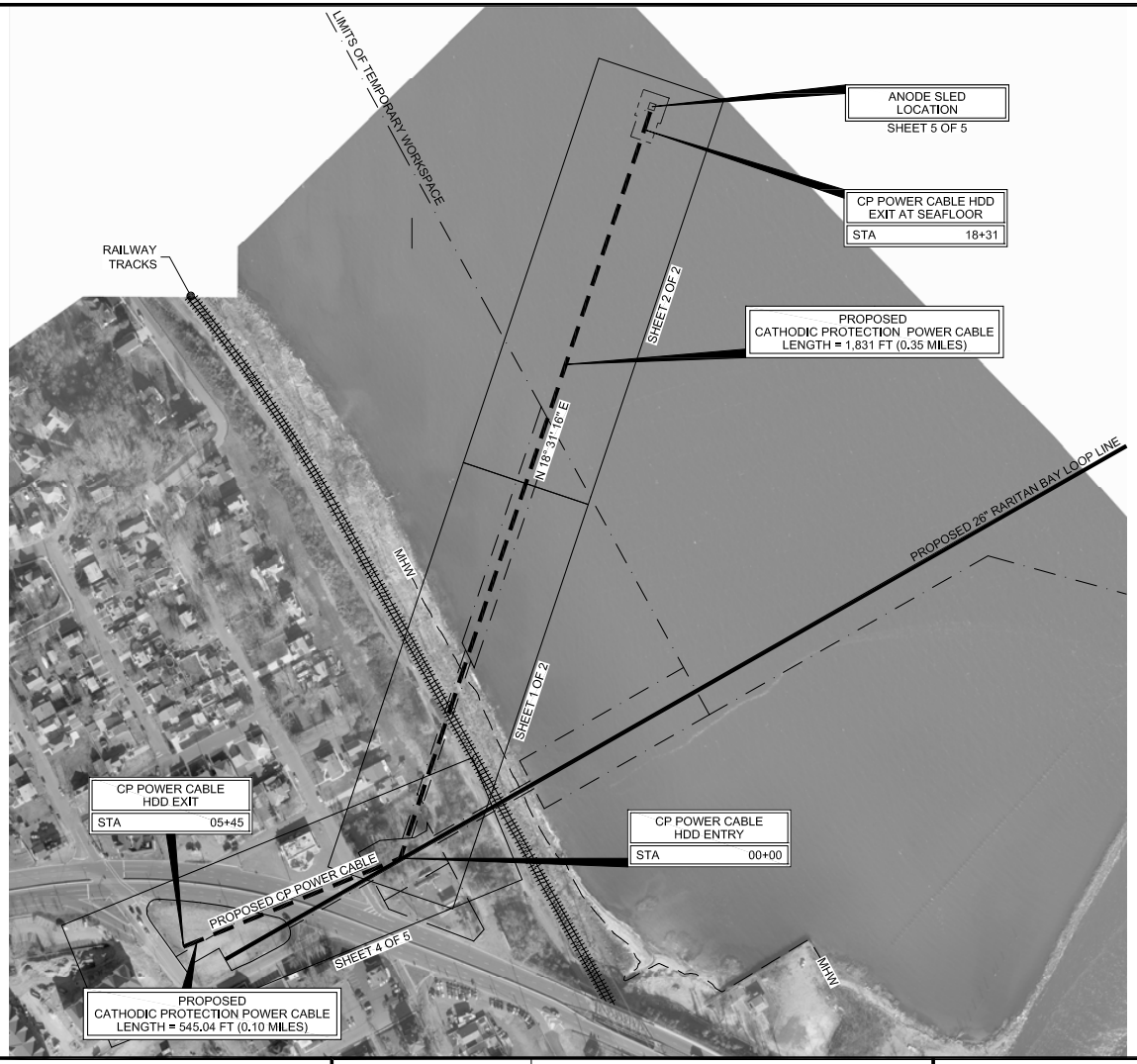
Williams

INTECSEA
WorleyParsons Group

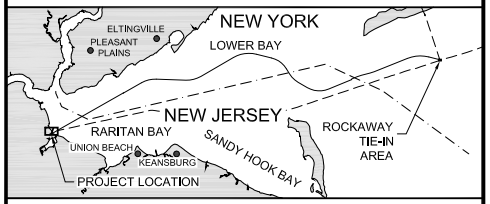
NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

DRAWN BY: TP TCP	DATE: 03-15-2017	ISSUED FOR BID:	SCALE:	1" = 16'
CHECKED BY: GA	DATE: 03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION:	0
APPROVED BY: VN	DATE: 03-15-2017	DRAWING NUMBER: A-19	SHEET	2
WO: 1185516		2:37:58 PM 3/15/2017	OF	2

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-0035.dwg



KEY MAP



LEGEND

- PROPOSED CP POWER CABLE
- PROPOSED 26" RARITAN BAY LOOP LINE
- ANODE SLED EXIT PIT DISTURBED SEAFLOOR
- LAND / SEAFLOOR PROFILE
- TEMPORARY WORKSPACE
- RAILWAY TRACK
- MEAN HIGH WATER LINE (MHW)

NOTES

1. ALL DIMENSIONS AND COORDINATES ARE IN FEET AND ALL ANGLES ARE IN DEGREES UNLESS NOTED OTHERWISE. ALL HEADINGS ARE RELATIVE TO GRID NORTH UNLESS NOTED OTHERWISE.
2. COORDINATES SHOWN ARE APPROXIMATE LOCATIONS AND WILL VARY DURING CONSTRUCTION DEPENDING UPON THE TIE-IN LOCATION SURVEY.
3. THE ONSHORE INFORMATION PRESENTED ON THE DRAWING IS NOT SURVEY GRADE AND SHOULD ONLY BE USED AS REFERENCE.
4. DEPTHS ARE REFERENCED TO NOAA (NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION) MLLW (MEAN LOWER LOW WATER) = 0'-0".
5. CONVERSIONS ARE BASED ON THE NOAA SANDY HOOK TIDAL STATION. MLLW ELEVATION IS BASED ON NOAA's VERTICAL DATUMS:
   - NAVD88 = MLLW + 2.82 FT
   - MLW = MLLW + 0.2 FT
   - MHW = MLLW + 5.2 FT
6. FOR ANODE SLED DETAILS REFER TO USACE-EX-RRTN-D/EX2 SHEET 5.
7. HDD EXIT PIT DESIGNED TO RETAIN DRILLING FLUID AND CUTTINGS.
8. IMPRESSED CURRENT CATHODIC PROTECTION (CP) SYSTEM IS USED TO PROTECT THE PIPELINE FROM EXTERNAL CORROSION.
9. OFFSHORE OPERATION EASEMENT IS 25 FT CENTERED ON CP POWER CABLE ROUTE.

CORPS OF ENGINEERS PERMIT DRAWING

SCALE (FT)
0 200 400 600 800

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
ANODE SLED INSTALLATION AND CP HDD
PLAN AND PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX COUNTY, NEW JERSEY

Williams.

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

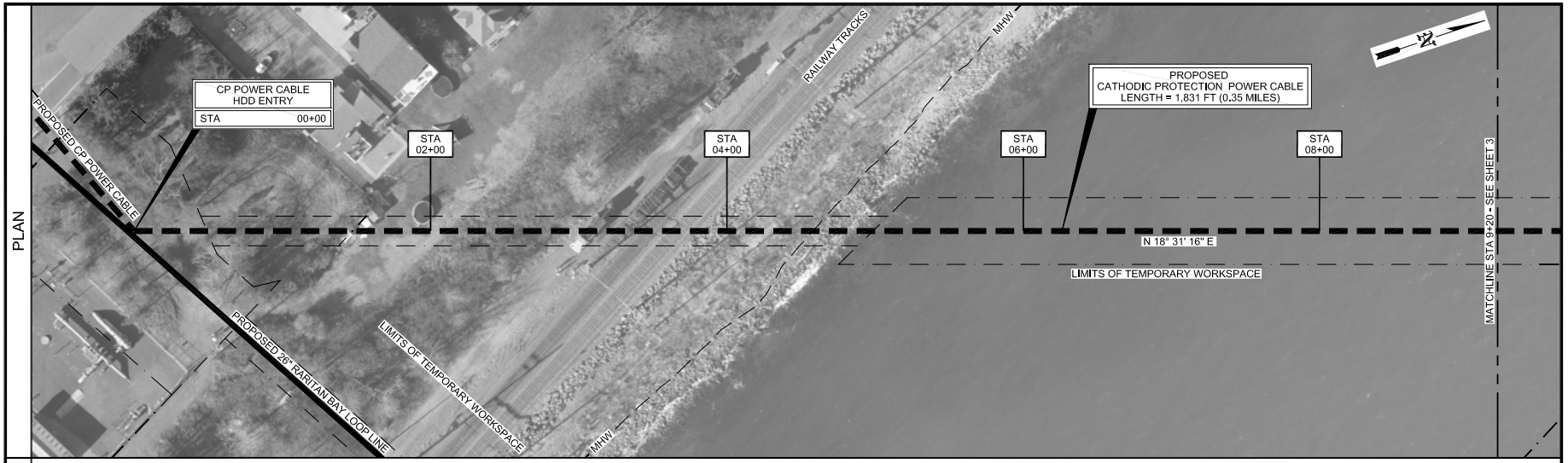
GEODETIC INFORMATION			
PROJECTION:	STATE PLANE	DATUM:	NAD83
ZONE:	NEW YORK-LONG ISLAND	CENTRAL MERIDIAN:	-74° W
SPHEROID:	GRS 1980	GRID UNITS:	US SURVEY FEET

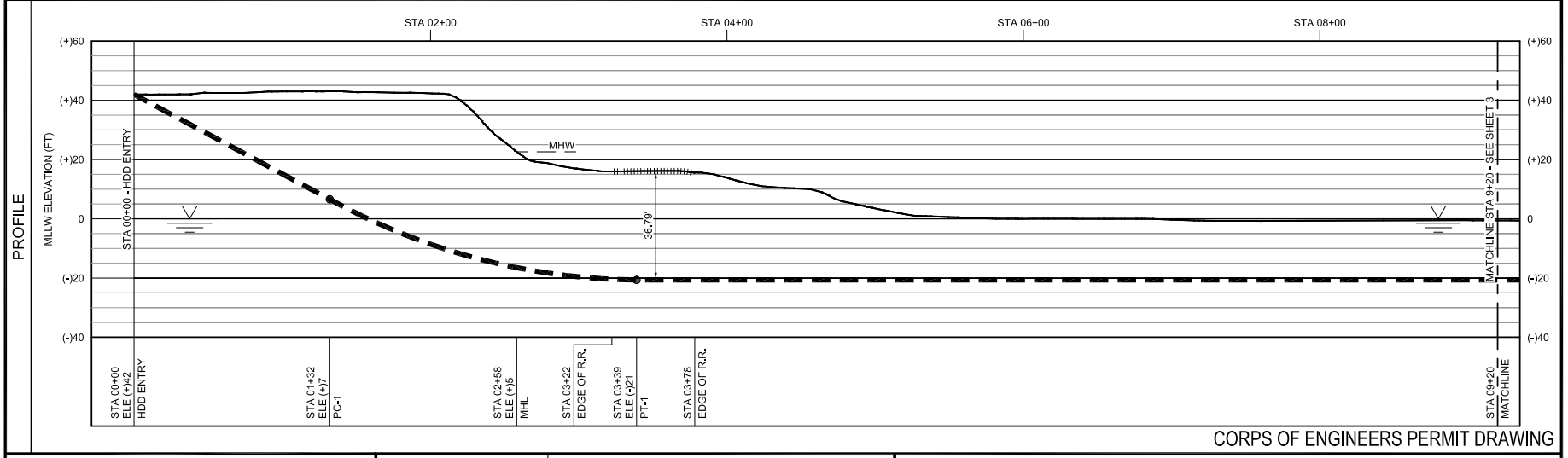
NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-13-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-16-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TD	RE-ISSUED FOR USE	1185516	GA	VN

DRAWN BY:	TD	DATE:	04-17-2017	ISSUED FOR BID:	SCALE: 1" = 400'
CHECKED BY:	GA	DATE:	04-17-2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY:	VN	DATE:	04-17-2017	DRAWING NUMBER: A-20	SHEET 1 OF 5
WO:	1185516			3:34:44 PM 4/19/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-EX2 Sheet 1 Thru 3.dwg

Drawing A-20 Anode Sled Installation and CP HDD Plan and Profile





CORPS OF ENGINEERS PERMIT DRAWING

HORIZONTAL SCALE 1" = 100'

0 50 100 150 200

VERTICAL SCALE 1" = 50'

0 20 40 60 80

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
ANODE SLED INSTALLATION AND CP HDD
PLAN AND PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX COUNTY, NEW JERSEY

Williams.

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

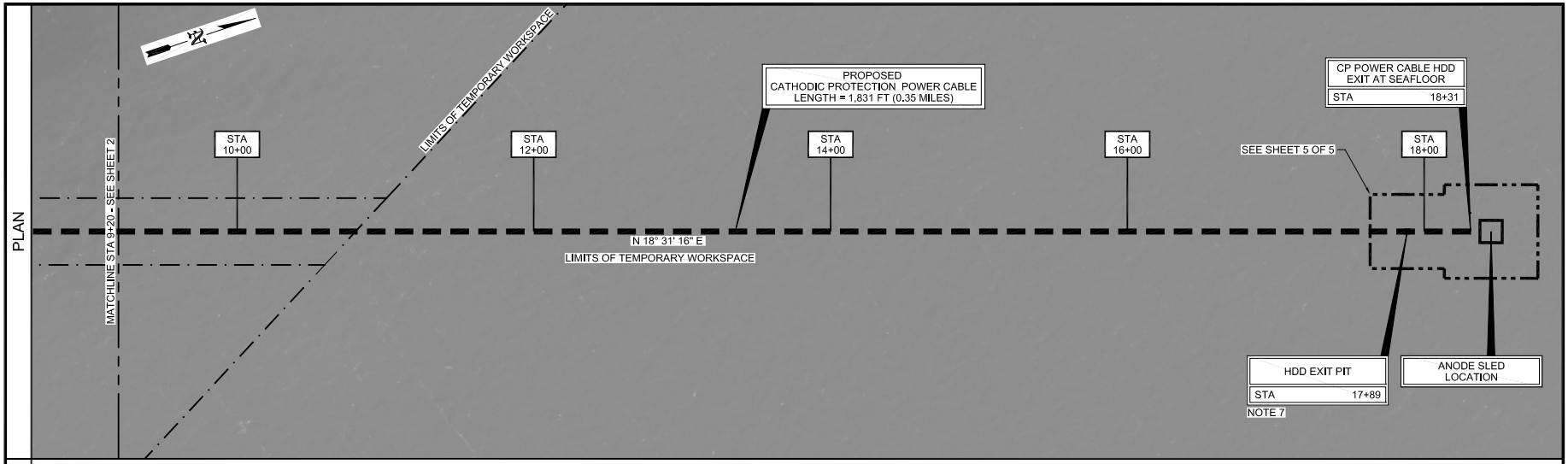
GEODETIC INFORMATION			
PROJECTION:	STATE PLANE	DATUM:	NAD83
ZONE:	NEW YORK-LONG ISLAND	CENTRAL MERIDIAN:	-74° W
SPHEROID:	GRS 1980	GRID UNITS:	US SURVEY FEET

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-13-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-16-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TD	RE-ISSUED FOR USE	1185516	GA	VN

DRAWN BY:	TD	DATE:	04-17-2017	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	GA	DATE:	04-17-2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY:	VN	DATE:	04-17-2017	DRAWING NUMBER: A-20	SHEET 2 OF 5
WO:	1185516			3:35:06 PM 4/19/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-EX2 Sheet 1 Thru 3.dwg

Drawing A-20 Anode Sled Installation and CP HDD Plan and Profile



CORPS OF ENGINEERS PERMIT DRAWING

HORIZONTAL SCALE 1" = 100'
0 50 100 150 200

VERTICAL SCALE 1" = 50'
0 20 40 60 80

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
ANODE SLED INSTALLATION AND CP HDD
PLAN AND PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX COUNTY, NEW JERSEY

Williams.

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

GEODETIC INFORMATION			
PROJECTION:	NY STATE PLANE	DATUM:	NAD83
ZONE:	YORK-LONG ISLAND	CENTRAL MERIDIAN:	-74° W
SPHEROID:	GRS 1980	GRID UNITS:	US SURVEY FEET

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-13-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-16-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TD	RE-ISSUED FOR USE	1185516	GA	VN

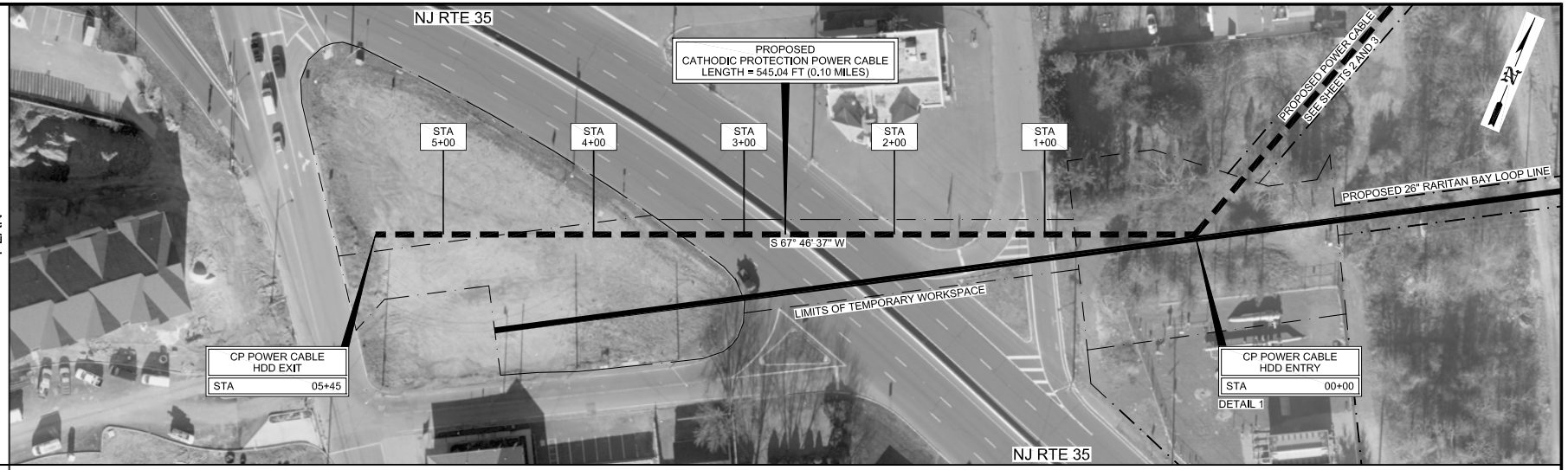
DRAWN BY:	TD	DATE:	04-17-2017	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY:	GA	DATE:	04-17-2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY:	VN	DATE:	04-17-2017	DRAWING NUMBER: A-20	SHEET 3 OF 5
WO:	1185516			3:36:44 PM 4/19/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-EX2 Sheet 1 Thru 3.dwg

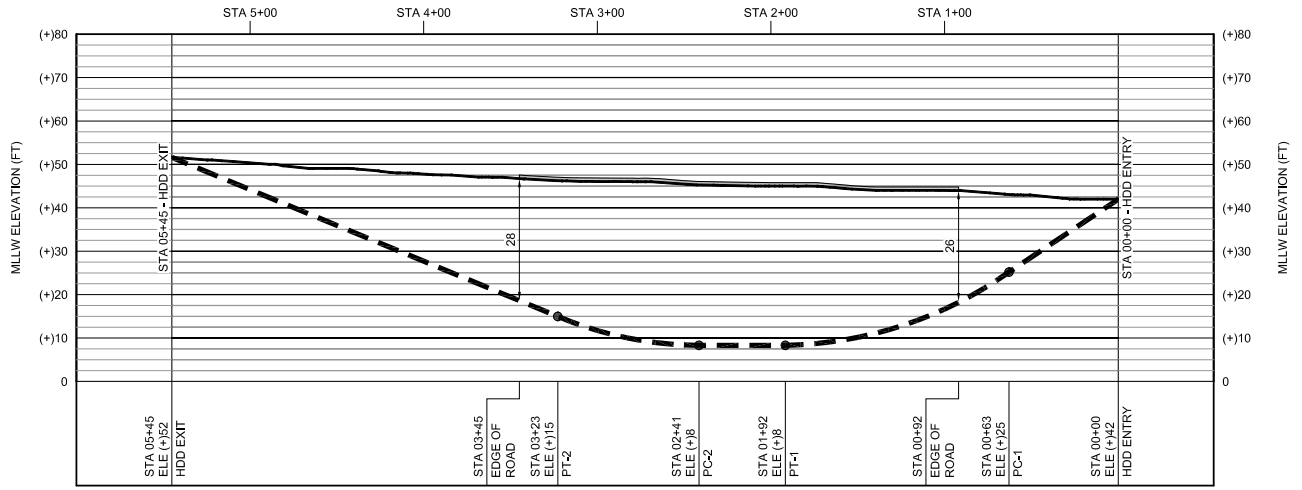
Drawing A-20 Anode Sled Installation and CP HDD Plan and Profile

NAN-2016-00908-EHA

PLAN



PROFILE



CORPS OF ENGINEERS PERMIT DRAWING

HORIZONTAL SCALE 1" = 100'
0 50 100 150 200

VERTICAL SCALE 1" = 40'
0 20 40 60 80

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
ANODE SLED INSTALLATION AND CP HDD
PLAN AND PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX COUNTY, NEW JERSEY

Williams

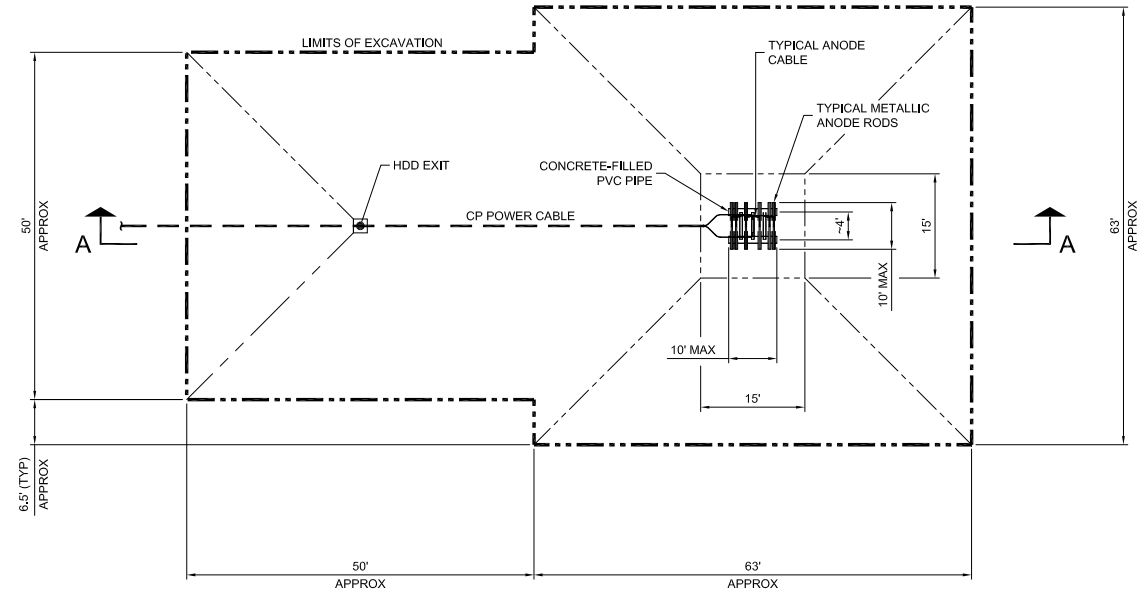
INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

GEODETIC INFORMATION														
PROJECTION:	STATE PLANE	DATUM:	NAD83	NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.	DRAWN BY:	TD	DATE: 04-17-2017	ISSUED FOR BID:
ZONE:	NEW YORK-LONG ISLAND	CENTRAL MERIDIAN:	-74° W	B	03-13-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN	CHECKED BY:	GA	DATE: 04-17-2017	ISSUED FOR CONSTRUCTION:
SPHEROID:	GRS 1980	GRID UNITS:	US SURVEY FEET	0	03-16-2017	TCP	ISSUED FOR USE	1185516	GA	VN	APPROVED BY:	VN	DATE: 04-17-2017	
				1	04-17-2017	TD	RE-ISSUED FOR USE	1185516	GA	VN	WO:	1185516		

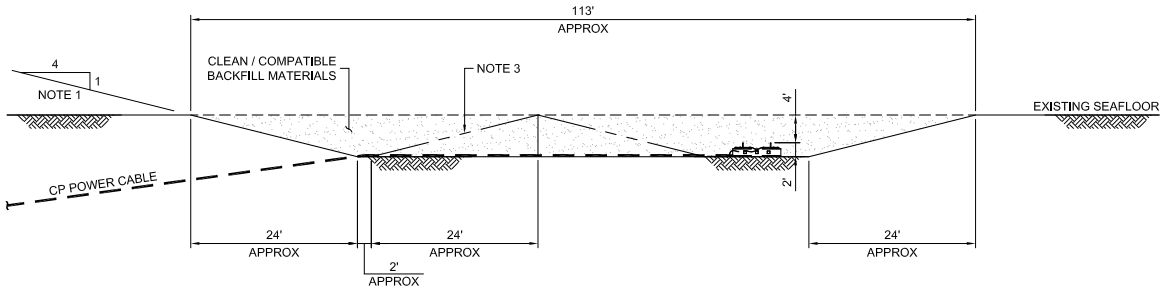
SCALE: 1" = 100'
REVISION: 1
DRAWING NUMBER: A-20
SHEET 4 OF 5
3:38:27 PM 4/19/2017

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-EX2 Sheet 4.dwg

Drawing A-20 Anode Sled Installation and CP HDD Plan and Profile



TYPICAL ANODE SLED PLAN VIEW
(NOTE 1)



ANODE SLED AND EXIT PIT EXCAVATION
SECTION A-A

NOTES

1. TRENCH SIDE SLOPE IS A CONSERVATIVE ASSUMPTION OF SEDIMENT CONDITIONS AND MAY BE REDUCED AFTER SITE SEDIMENT INVESTIGATION.
2. IMPRESSED CURRENT CATHODIC PROTECTION (CP) SYSTEM IS USED TO PROTECT THE PIPELINE FROM EXTERNAL CORROSION.
3. HDD EXIT PIT LIMITS DURING HDD. AFTER COMPLETION OF HDD CP POWER CABLE INSTALLATION, ADDITIONAL EXCAVATION TO BE PERFORMED TO INSTALL CABLE BETWEEN HDD EXIT PIT AND ANODE SLED EXCAVATION.

CORPS OF ENGINEERS PERMIT DRAWING

SCALE (FT)
0 10 20 30 40

DRAWING NO.	REFERENCE TITLE

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
ANODE SLED INSTALLATION AND CP HDD
PLAN AND PROFILE
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

MIDDLESEX COUNTY, NEW JERSEY

Williams.

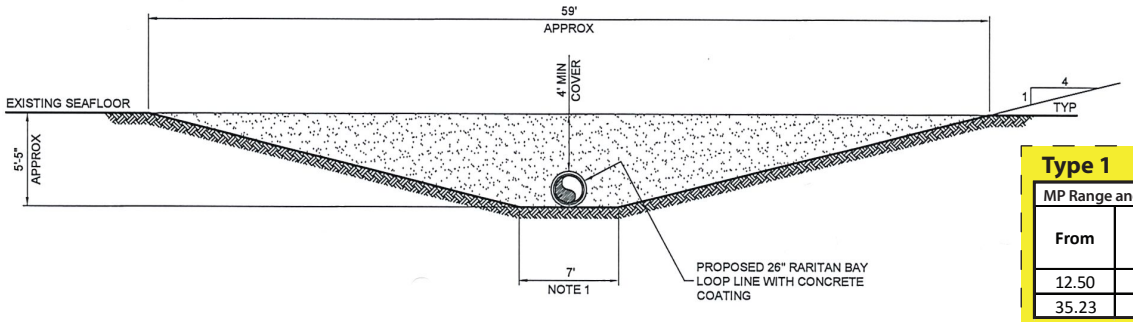
INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

GEODETIC INFORMATION			
PROJECTION:	STATE PLANE	DATUM:	NAD83
ZONE:	NEW YORK-LONG ISLAND	CENTRAL MERIDIAN:	-74° W
SPHEROID:	GRS 1980	GRID UNITS:	US SURVEY FEET

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-13-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-16-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TD	RE-ISSUED FOR USE	1185516	GA	VN

DRAWN BY:	TD	DATE:	04-17-2017	ISSUED FOR BID:	SCALE: 1" = 25'
CHECKED BY:	GA	DATE:	04-17-2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY:	VN	DATE:	04-17-2017	DRAWING NUMBER: A-20	SHEET 5 OF 5
WO:	1185516			3:40:37 PM 4/19/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-EX2 Sheet 5.dwg



TYPE 1 - PRE-PIPELAY TRENCHING: SHALLOW AREA
4 FT MINIMUM COVER

Type 1

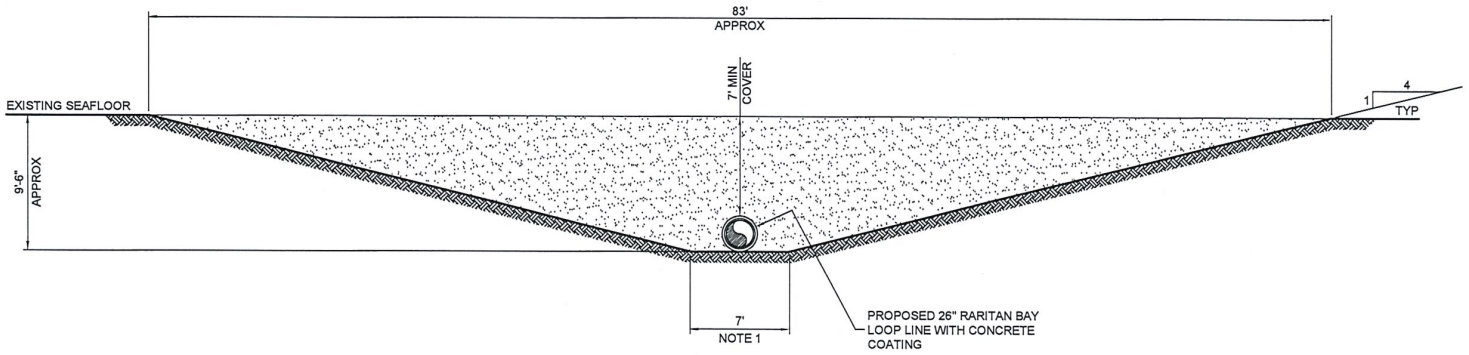
MP Range and Dredge Volume (Approximate)

From	To	Area (Acres)	Volume (cu yd)
12.50	16.60	31.34	210,435
35.23	35.49	0.54	11,358

Type 2

MP Range and Dredge Volume (Approximate)

From	To	Area (Acres)	Volume (cu yd)
24.00	24.87	9.47	97,301



TYPE 2 - PRE-PIPELAY TRENCHING: ANCHORAGE AREA
7 FT MINIMUM COVER

CORPS OF ENGINEERS PERMIT DRAWING

NOTES:

1. TRENCH BOTTOM WIDTH WITHIN THE ROUTE CURVES TO BE INCREASED FROM 7 FT TO 10 FT.
2. MILE POST RANGES ARE APPROXIMATE.
3. ACTUAL SHIPPING CHANNEL SEABED ELEVATION MAY NOT COINCIDE WITH THE NOMINAL CHANNEL DEPTH SET BY THE US ARMY CORPS OF ENGINEERS. THE CHANNEL MAY BE DEEPER.
4. ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.

DRAWING NO.	REFERENCE TITLE
USACE-XS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TRENCH CROSS-SECTION FOR PRE AND POST PIPELAY TRENCHING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

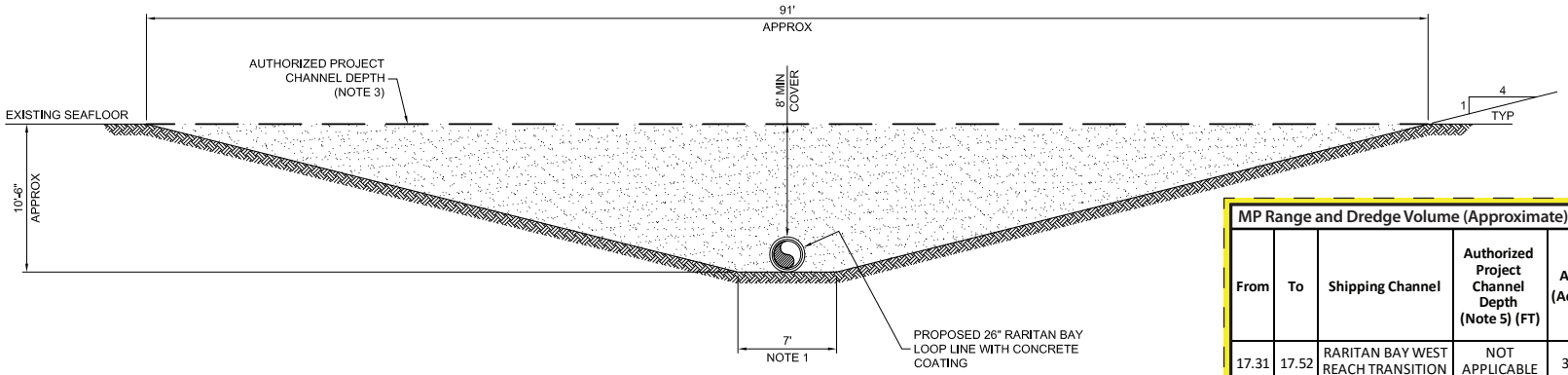
NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TCP	RE-ISSUED FOR USE	1185516	GA	VN

DRAWN BY: TCP DATE: 04-17-2017
CHECKED BY: GA DATE: 04-17-2017
APPROVED BY: VN DATE: 04-17-2017
WO: 1185516

ISSUED FOR BID:
ISSUED FOR CONSTRUCTION:
SCALE: NONE
REVISION: 1
DRAWING NUMBER: USACE-XS-RRTN-D
SHEET 1 OF 3
3:21:25 PM 4/18/2017

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-XS-RRTN-D.dwg

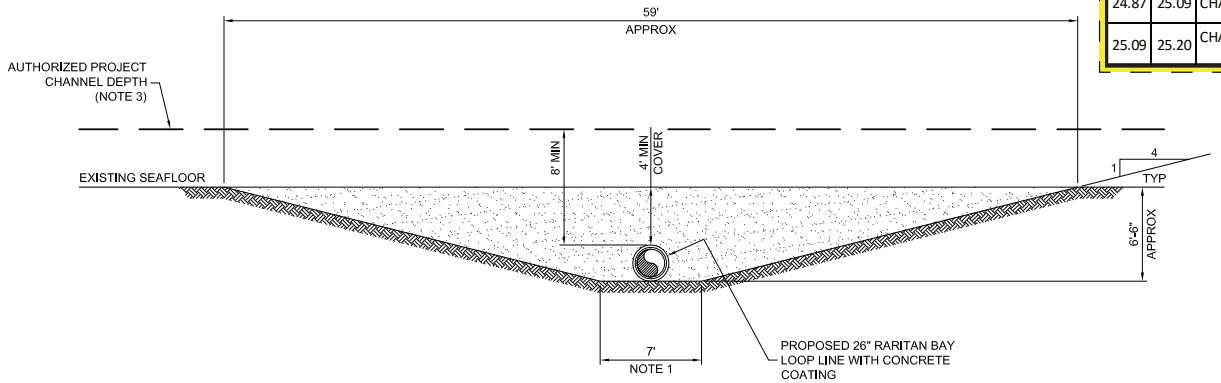
Drawing A-21 Trench Cross Section for Pre and Post Pipelay Trenching



TYPE 3A - PRE-PIPELAY TRENCHING: SHIPPING CHANNELS AT AUTHORIZED PROJECT DEPTH
8 FT MINIMUM COVER

MP Range and Dredge Volume (Approximate)

From	To	Shipping Channel	Authorized Project Channel Depth (Note 5) (FT)	Area (Acres)	Volume (cu yd)
17.31	17.52	RARITAN BAY WEST REACH TRANSITION	NOT APPLICABLE	3.27	89,580
17.52	17.68	RARITAN BAY WEST REACH	35 MLLW	1.28	8,656
17.68	17.89	RARITAN BAY WEST REACH TRANSITION	NOT APPLICABLE	3.27	91,545
24.87	25.09	CHAPEL HILL NORTH	30 MLLW	1.72	11,480
25.09	25.20	CHAPEL HILL NORTH TRANSITION	NOT APPLICABLE	1.07	15,870



TYPE 3B - PRE-PIPELAY TRENCHING: SHIPPING CHANNELS DEEPER THAN AUTHORIZED PROJECT DEPTH
4 FT MINIMUM COVER

CORPS OF ENGINEERS PERMIT DRAWING

NOTES:

1. TRENCH BOTTOM WIDTH WITHIN THE ROUTE CURVES TO BE INCREASED FROM 7 FT TO 10 FT.
2. MILE POST RANGES ARE APPROXIMATE.
3. ACTUAL SHIPPING CHANNEL SEABED ELEVATION MAY NOT COINCIDE WITH THE NOMINAL CHANNEL DEPTH SET BY THE US ARMY CORPS OF ENGINEERS. THE CHANNEL MAY BE DEEPER.
4. ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.
5. "AUTHORIZED PROJECT" CHANNEL DEPTHS SET PER U.S. ARMY CORPS OF ENGINEERS CONTROLLING DEPTH REPORTS DATED 28 MAY 2013 (RARITAN) AND 30 JAN 2015 (CHAPEL HILL).

DRAWING NO.	REFERENCE TITLE
USACE-XS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TRENCH CROSS-SECTION FOR PRE AND POST PIPELAY TRENCHING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

INTECSEA
WorleyParsons Group
ENGINEERING FIRM No. F-3747

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TCP	RE-ISSUED FOR USE	1185516	GA	VN

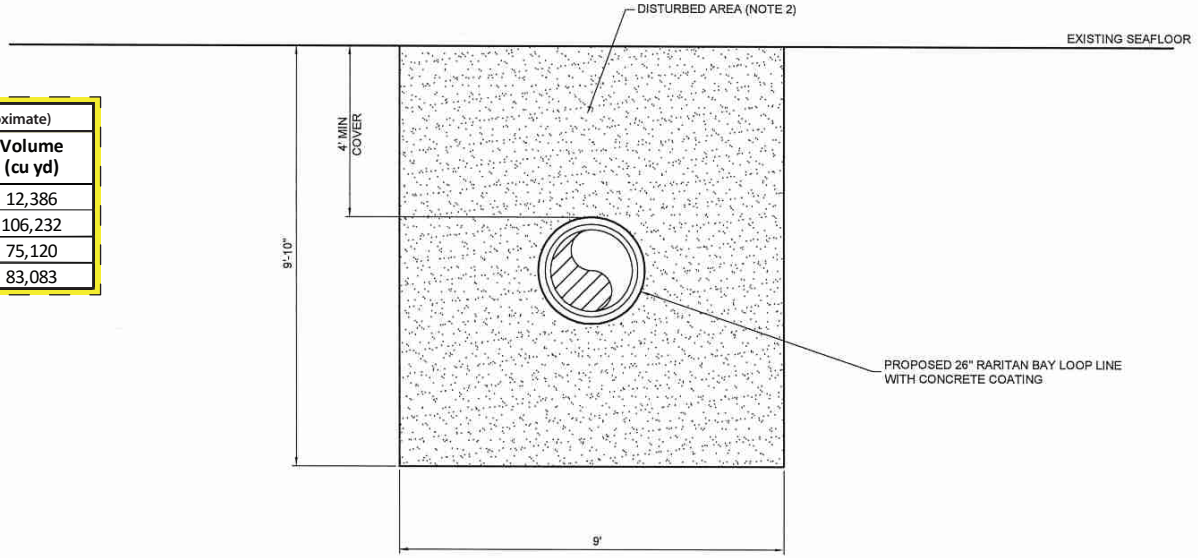
DRAWN BY:	TCP	DATE:	04-17-2017	ISSUED FOR BID:	SCALE: NONE
CHECKED BY:	GA	DATE:	04-17-2017	ISSUED FOR CONSTRUCTION:	REVISION: 1
APPROVED BY:	VN	DATE:	04-17-2017	DRAWING NUMBER: USACE-XS-RRTN-D	SHEET 2 OF 3
WO:	1185516			3:41:36 PM 4/19/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-XS-RRTN-D.dwg

Drawing A-21 Trench Cross Section for Pre and Post Pipelay Trenching

TYPE 4 - POST-PIPELAY TRENCHING BY JET TRENCHER: SHALLOW AREA
4 FT MINIMUM COVER

MP Range and Dredge Volume (Approximate)			
From	To	Area (Acres)	Volume (cu yd)
16.60	17.31	0.78	12,386
17.89	24.00	6.69	106,232
25.20	29.52	4.73	75,120
30.40	35.19	5.23	83,083



CORPS OF ENGINEERS PERMIT DRAWING

NOTES:

1. ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.
2. SHADING INDICATES IMMEDIATE BACKFILL OF TRENCH FROM SLOUGHING AND JET TRENCHER DISCHARGE FOLLOWING FINAL PASS.
3. AS NECESSARY, PIPELINE TRENCH TO BE BACKFILLED TO GRADE WITH CLEAN/COMPATIBLE MATERIAL USING CLAMSHELL DREDGER IMMEDIATELY FOLLOWING POST-INSTALLATION SURVEY.
4. MILE POST RANGES ARE APPROXIMATE.

DRAWING NO.	REFERENCE TITLE
USACE-XS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TRENCH CROSS-SECTION FOR PRE AND POST PIPELAY TRENCHING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

INTECSEA
WorleyParsons Group

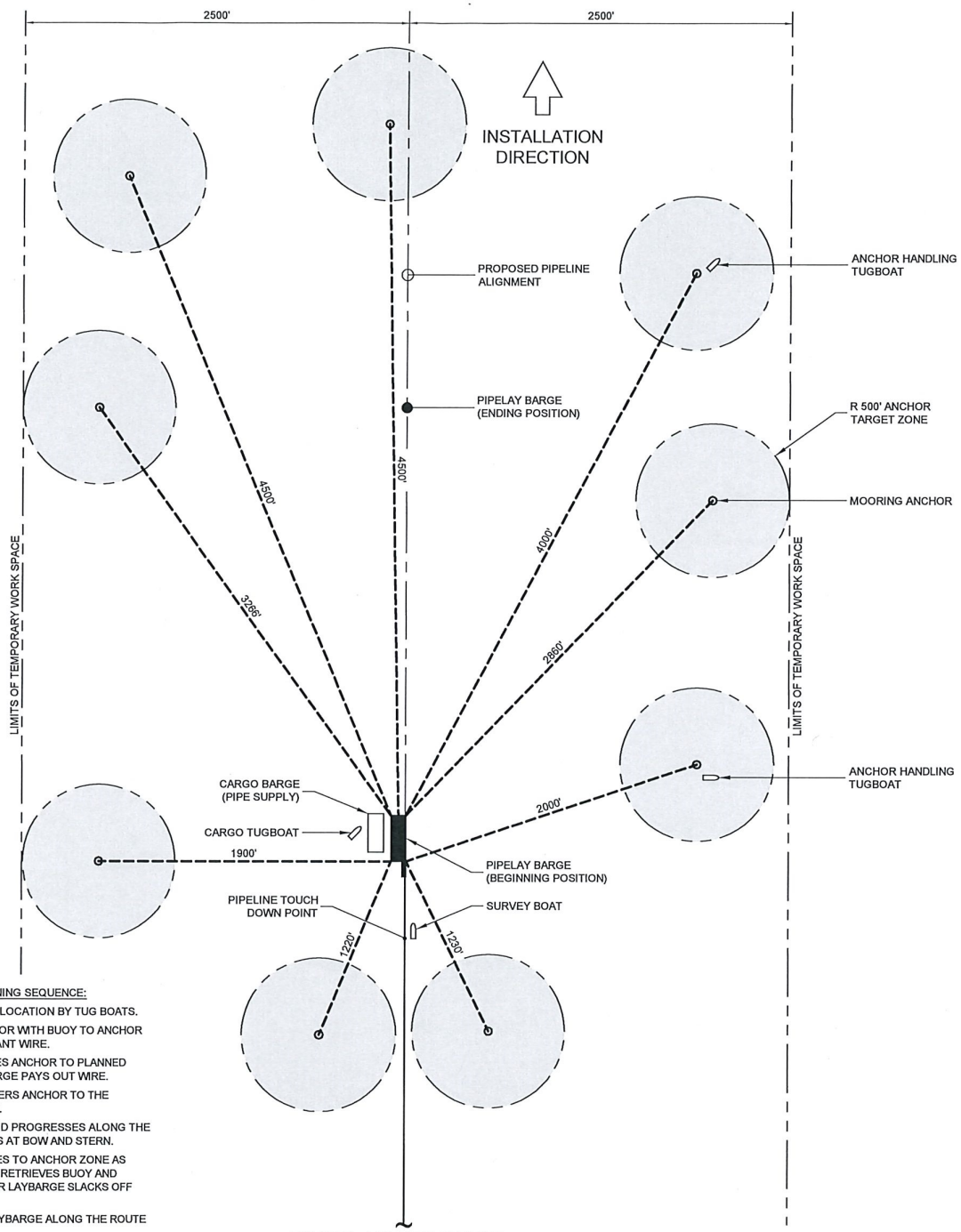
NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN
1	04-17-2017	TCP	RE-ISSUED FOR USE	1185516	GA	VN
2	08-14-2017	TCP	RE-ISSUED FOR USE	1185516	GA	JV

DRAWN BY: TCP DATE: 08-14-2017
CHECKED BY: GA DATE: 08-14-2017
APPROVED BY: JV DATE: 08-14-2017
WO: 1185516

ISSUED FOR BID:
ISSUED FOR CONSTRUCTION:
SCALE: NONE
REVISION: 2
DRAWING NUMBER: USACE-XS-RRTN-D
SHEET 3 OF 3
3:05:19 PM 8/14/2017

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-XS-RRTN-D.dwg

Drawing A-21 Trench Cross Section for Pre and Post Pipelay Trenching



TYPICAL PIPELAY BARGE POSITIONING SEQUENCE:

1. LAYBARGE IS POSITIONED ON LOCATION BY TUG BOATS.
2. LAYBARGE TRANSFERS ANCHOR WITH BUOY TO ANCHOR HANDLING TUGS USING PENNANT WIRE.
3. ANCHOR HANDLING TUG TAKES ANCHOR TO PLANNED TARGET ZONE WHILST LAYBARGE PAYS OUT WIRE.
4. ANCHOR HANDLING TUG LOWERS ANCHOR TO THE SEABED AND RELEASES BUOY.
5. LAYBARGE KEEPS STATION AND PROGRESSES ALONG THE ROUTE BY RUNNING ANCHORS AT BOW AND STERN.
6. ANCHOR HANDLING TUG MOVES TO ANCHOR ZONE AS DIRECTED BY LAYBARGE AND RETRIEVES BUOY AND ANCHOR FROM SEABED AFTER LAYBARGE SLACKS OFF WIRE.
7. REPEAT STEP 3-6 TO MOVE LAYBARGE ALONG THE ROUTE FOR EACH OF THE ANCHORS.

SCALE (FT)

0 500 1,000 1,500 2,000

TYPICAL ANCHOR SPREAD
ON STRAIGHT ROUTE SEGMENTS
BEGINNING CONFIGURATION

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TYPICAL ANCHOR SPREAD DRAWING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

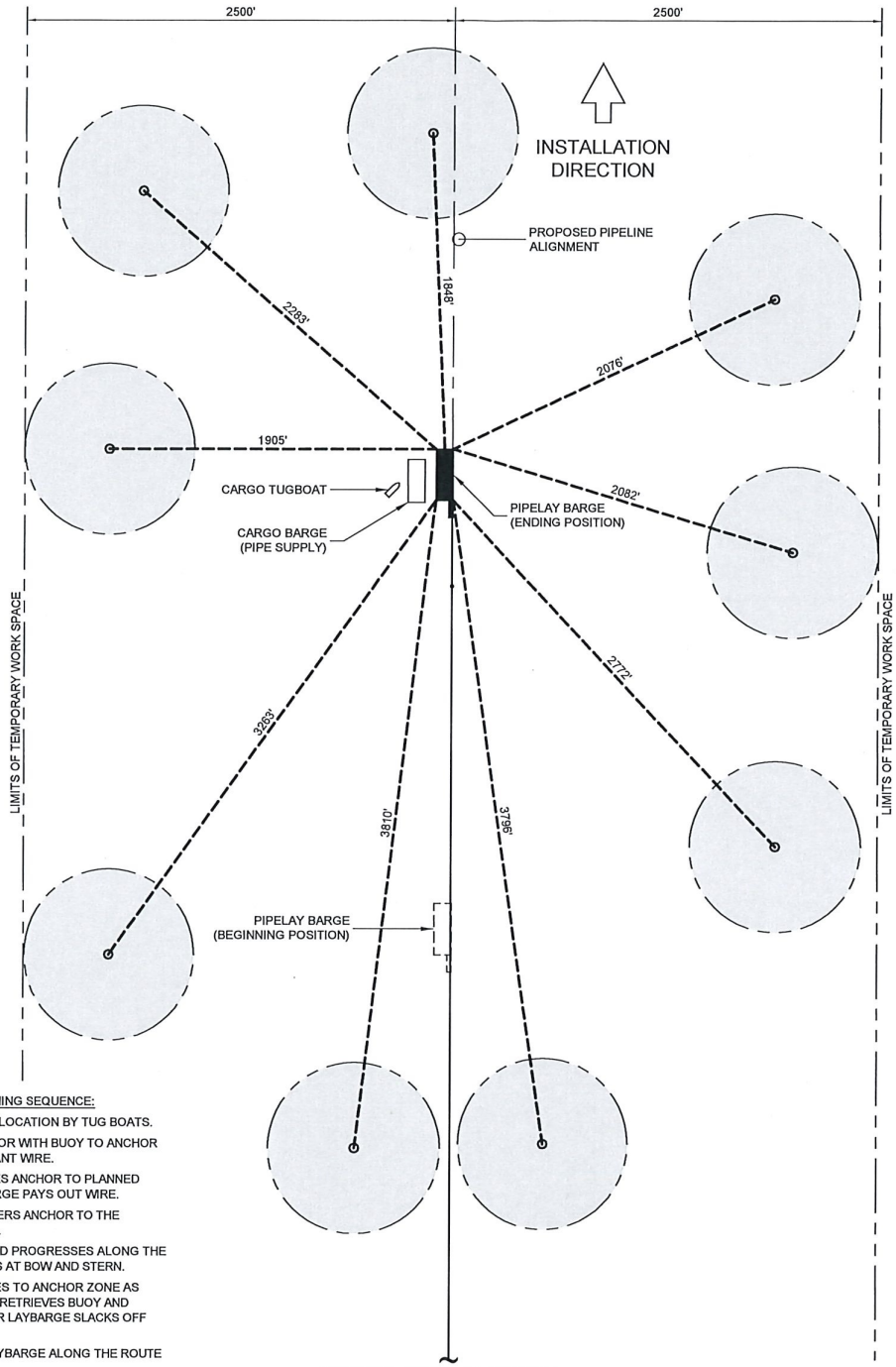
INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

DRAWN BY:	TCP	DATE:	03-15-2017	ISSUED FOR BID:	SCALE: 1" = 1,000'
CHECKED BY:	GA	DATE:	03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY:	VN	DATE:	03-15-2017	DRAWING NUMBER: A-22	SHEET 1 OF 4
WO:	1185516			2:24:05 PM 3/15/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-DET2.dwg

Drawing A-22 Typical Pipelay Barge Anchor Spread



TYPICAL PIPELAY BARGE POSITIONING SEQUENCE:

1. LAYBARGE IS POSITIONED ON LOCATION BY TUG BOATS.
2. LAYBARGE TRANSFERS ANCHOR WITH BUOY TO ANCHOR HANDLING TUGS USING PENNANT WIRE.
3. ANCHOR HANDLING TUG TAKES ANCHOR TO PLANNED TARGET ZONE WHILST LAYBARGE PAYS OUT WIRE.
4. ANCHOR HANDLING TUG LOWERS ANCHOR TO THE SEABED AND RELEASES BUOY.
5. LAYBARGE KEEPS STATION AND PROGRESSES ALONG THE ROUTE BY RUNNING ANCHORS AT BOW AND STERN.
6. ANCHOR HANDLING TUG MOVES TO ANCHOR ZONE AS DIRECTED BY LAYBARGE AND RETRIEVES BUOY AND ANCHOR FROM SEABED AFTER LAYBARGE SLACKS OFF WIRE.
7. REPEAT STEP 3-6 TO MOVE LAYBARGE ALONG THE ROUTE FOR EACH OF THE ANCHORS.

SCALE (FT)

0 500 1,000 1,500 2,000

TYPICAL ANCHOR SPREAD
ON STRAIGHT ROUTE SEGMENTS
ENDING CONFIGURATION

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TYPICAL ANCHOR SPREAD DRAWING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

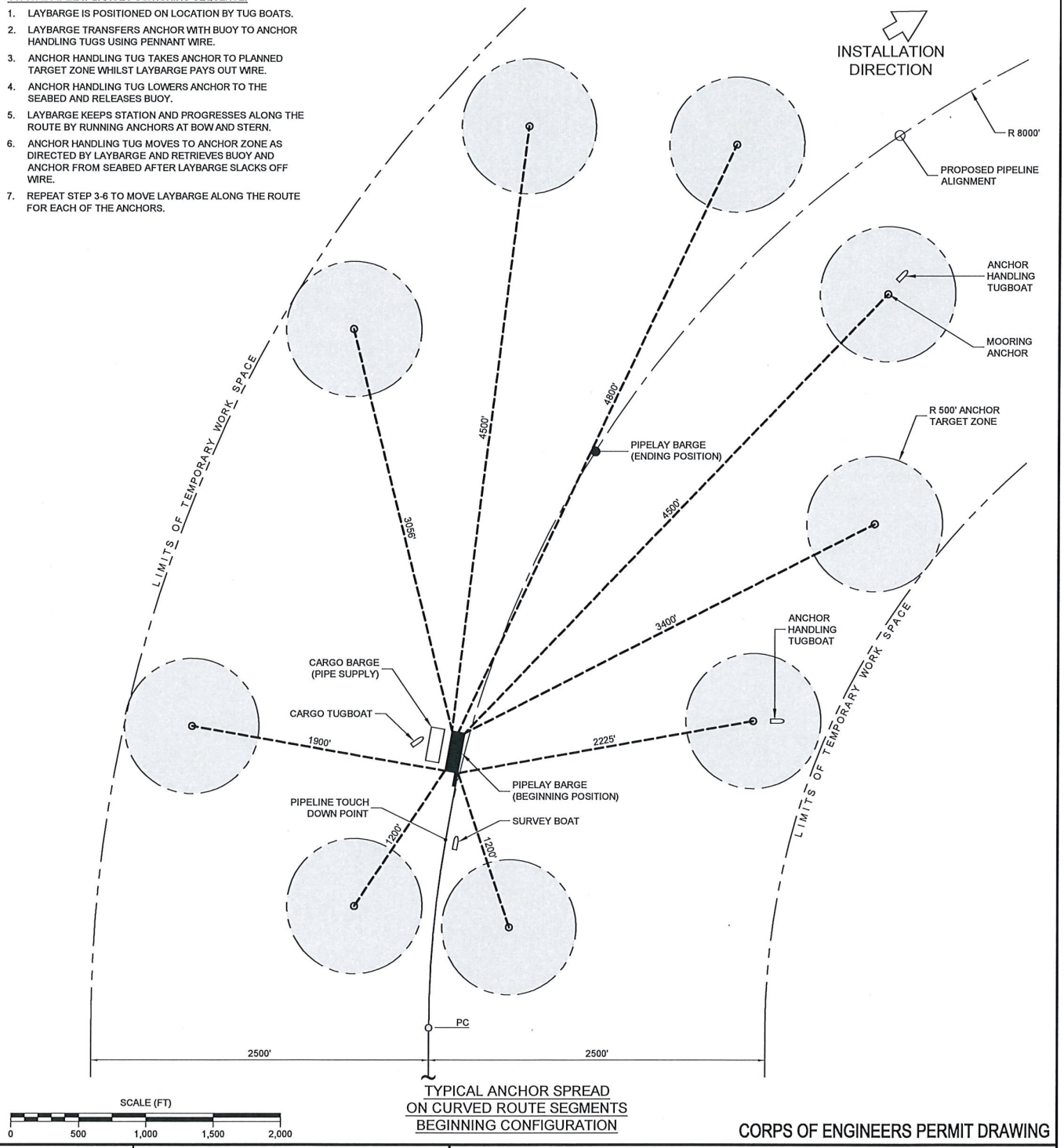
DRAWN BY:	TCP	DATE:	03-15-2017	ISSUED FOR BID:	SCALE: 1" = 1,000'
CHECKED BY:	GA	DATE:	03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY:	VN	DATE:	03-15-2017	DRAWING NUMBER: A-22	SHEET 2 OF 4
WO:	1185516			2:23:56 PM 3/15/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-DET2.dwg

Drawing A-22 Typical Pipelay Barge Anchor Spread

TYPICAL PIPELAY BARGE POSITIONING SEQUENCE:

1. LAYBARGE IS POSITIONED ON LOCATION BY TUG BOATS.
2. LAYBARGE TRANSFERS ANCHOR WITH BUOY TO ANCHOR HANDLING TUGS USING PENNANT WIRE.
3. ANCHOR HANDLING TUG TAKES ANCHOR TO PLANNED TARGET ZONE WHILST LAYBARGE PAYS OUT WIRE.
4. ANCHOR HANDLING TUG LOWERS ANCHOR TO THE SEABED AND RELEASES BUOY.
5. LAYBARGE KEEPS STATION AND PROGRESSES ALONG THE ROUTE BY RUNNING ANCHORS AT BOW AND STERN.
6. ANCHOR HANDLING TUG MOVES TO ANCHOR ZONE AS DIRECTED BY LAYBARGE AND RETRIEVES BUOY AND ANCHOR FROM SEABED AFTER LAYBARGE SLACKS OFF WIRE.
7. REPEAT STEP 3-6 TO MOVE LAYBARGE ALONG THE ROUTE FOR EACH OF THE ANCHORS.



SCALE (FT)

0 500 1,000 1,500 2,000

TYPICAL ANCHOR SPREAD
ON CURVED ROUTE SEGMENTS
BEGINNING CONFIGURATION

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TYPICAL ANCHOR SPREAD DRAWING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

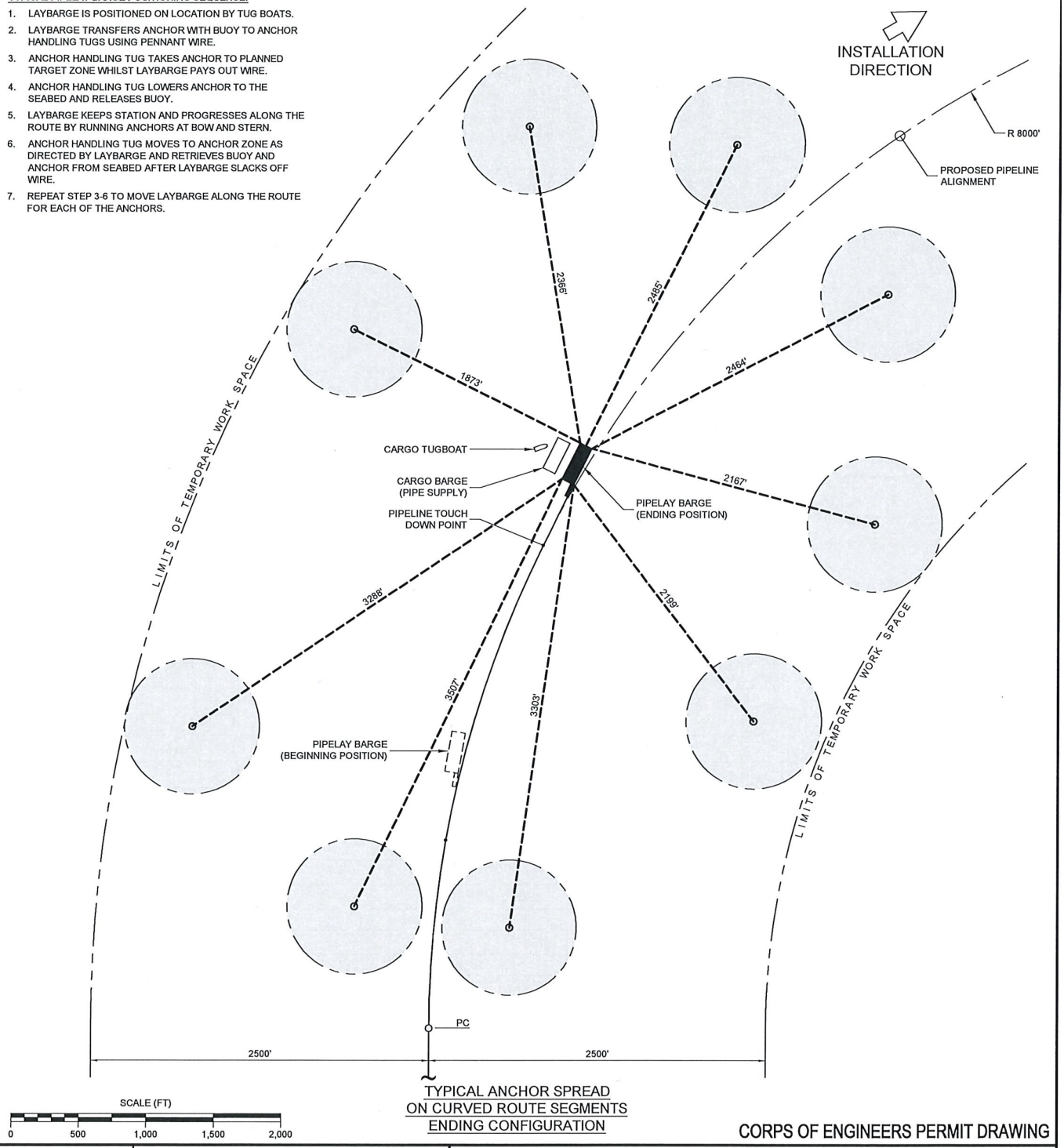
DRAWN BY: TP TCP	DATE: 03-15-2017	ISSUED FOR BID:	SCALE:	1" = 1,000'
CHECKED BY: GA GA	DATE: 03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION:	0
APPROVED BY: VN VN	DATE: 03-15-2017	DRAWING NUMBER: A-22	SHEET	3
WO: 1185516		2:23:47 PM 3/15/2017	OF	4

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-DET2.dwg

Drawing A-22 Typical Pipelay Barge Anchor Spread

TYPICAL PIPELAY BARGE POSITIONING SEQUENCE:

1. LAYBARGE IS POSITIONED ON LOCATION BY TUG BOATS.
2. LAYBARGE TRANSFERS ANCHOR WITH BUOY TO ANCHOR HANDLING TUGS USING PENNANT WIRE.
3. ANCHOR HANDLING TUG TAKES ANCHOR TO PLANNED TARGET ZONE WHILST LAYBARGE PAYS OUT WIRE.
4. ANCHOR HANDLING TUG LOWERS ANCHOR TO THE SEABED AND RELEASES BUOY.
5. LAYBARGE KEEPS STATION AND PROGRESSES ALONG THE ROUTE BY RUNNING ANCHORS AT BOW AND STERN.
6. ANCHOR HANDLING TUG MOVES TO ANCHOR ZONE AS DIRECTED BY LAYBARGE AND RETRIEVES BUOY AND ANCHOR FROM SEABED AFTER LAYBARGE SLACKS OFF WIRE.
7. REPEAT STEP 3-6 TO MOVE LAYBARGE ALONG THE ROUTE FOR EACH OF THE ANCHORS.



SCALE (FT)

0 500 1,000 1,500 2,000

TYPICAL ANCHOR SPREAD
ON CURVED ROUTE SEGMENTS
ENDING CONFIGURATION

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-AS-RRTN-D	PIPELINE ALIGNMENT

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TYPICAL ANCHOR SPREAD DRAWING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

NEW JERSEY / NEW YORK

Williams

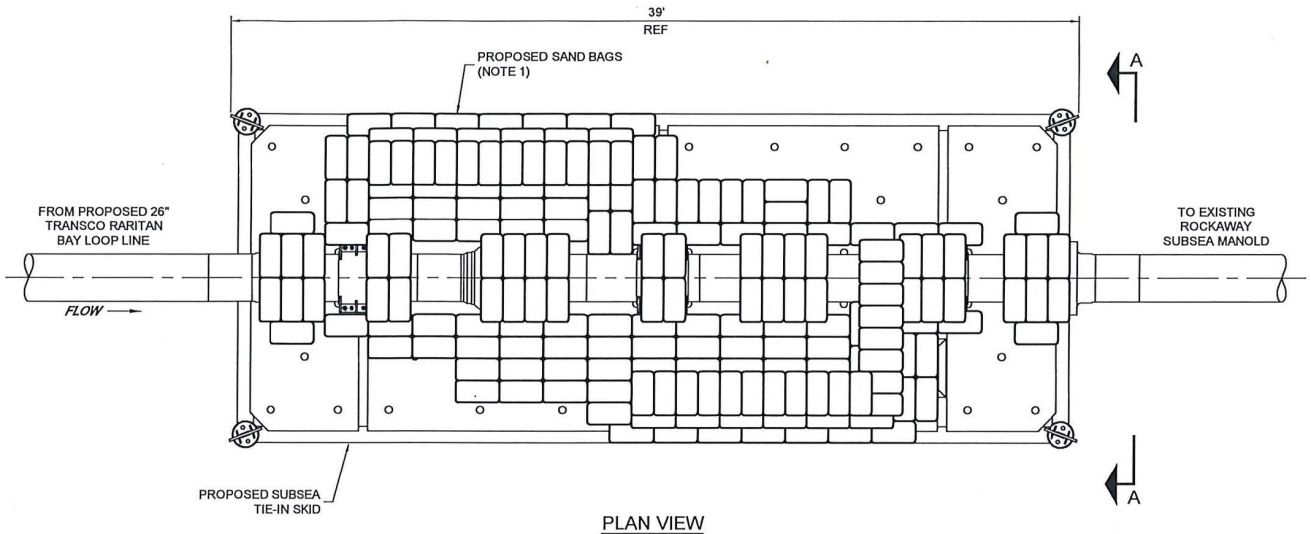
INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-23-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

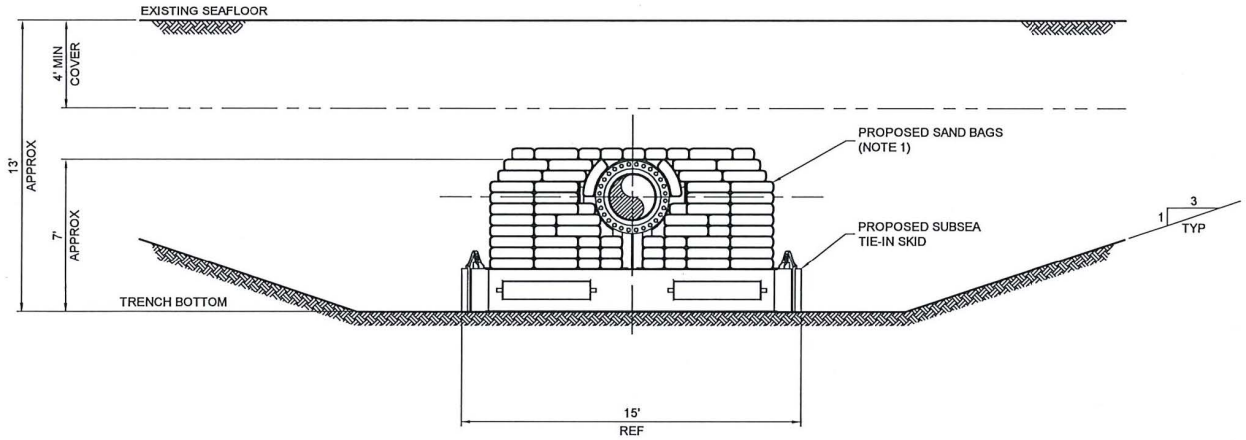
DRAWN BY:	TCP	DATE:	03-15-2017	ISSUED FOR BID:	SCALE: 1" = 1,000'
CHECKED BY:	GA	DATE:	03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY:	VN	DATE:	03-15-2017	DRAWING NUMBER: A-22	SHEET 4 OF 4
WO:	1185516			2:23:38 PM 3/15/2017	

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-DET2.dwg

Drawing A-22 Typical Pipelay Barge Anchor Spread



PLAN VIEW
AT PROPOSED SUBSEA TIE-IN SKID



VIEW A-A
(VIEW ROTATED TO SHOW PROPER ELEVATION)

NOTES:

1. SAND BAGS INSTALLED TO PROTECT CRITICAL COMPONENTS DURING BACKFILL. SAND BAGS MAY BE INSTALLED UNDER CERTAIN COMPONENTS AS A MEANS OF SUPPORT.

SCALE (FT)
0 5 10 15

CORPS OF ENGINEERS PERMIT DRAWING

DRAWING NO.	REFERENCE TITLE
USACE-VS-RRTN-D/EX1	OFFSHORE SKID EQUIPMENT LAYOUT (PIPING FACILITIES)

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC.
TYPICAL EQUIPMENT PROTECTION AND SUPPORT DRAWING
NORTHEAST SUPPLY ENHANCEMENT PROJECT
PROPOSED 26" RARITAN BAY LOOP LINE

QUEENS COUNTY, NEW YORK

Williams

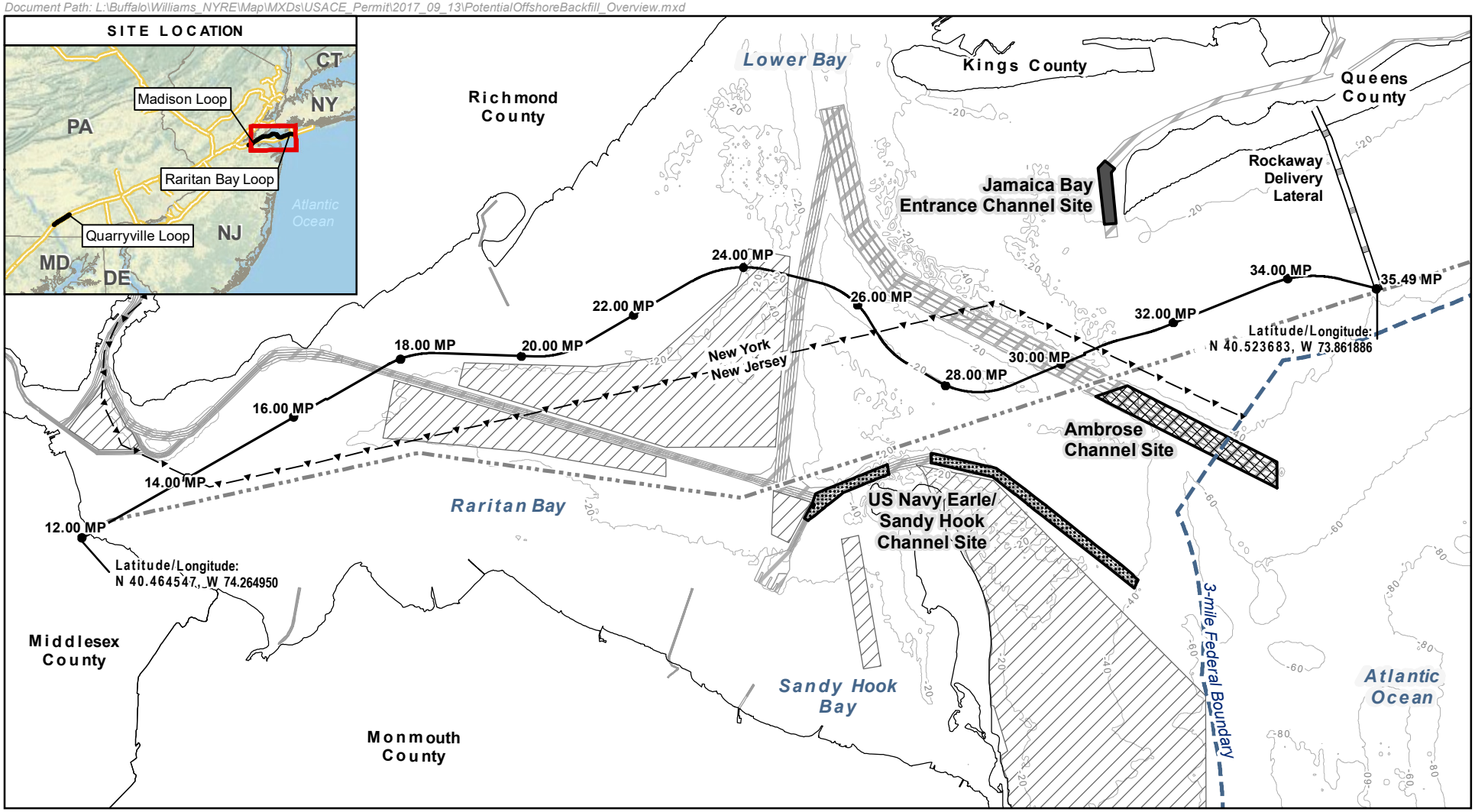
INTECSEA
WorleyParsons Group

NO.	DATE	BY	REVISION DESCRIPTION	WO NO.	CHK.	APP.
A	02-28-2017	TCP	ISSUED FOR INTERNAL REVIEW	1185516	GA	VN
B	03-02-2017	TCP	ISSUED FOR CLIENT REVIEW	1185516	GA	VN
0	03-15-2017	TCP	ISSUED FOR USE	1185516	GA	VN

DRAWN BY: TCP	DATE: 03-15-2017	ISSUED FOR BID:	SCALE:	1" = 8'
CHECKED BY: GA	DATE: 03-15-2017	ISSUED FOR CONSTRUCTION:	REVISION:	0
APPROVED BY: VN	DATE: 03-15-2017	DRAWING NUMBER: A-23	SHEET	1
WO: 1185516		2:41:18 PM 3/15/2017	OF	1

P:\Design\Current_408024\00600 Williams NESE Detail Design_USACE Deliverables\USACE-EX-RRTN-D-DET4.dwg

Document Path: L:\Buffalo\Williams_NYRE\Map\MXDs\USACE_Permit\2017_09_13\PotentialOffshoreBackfill_Overview.mxd



Drawing A-26
Potential Offshore Backfill Source Overview
Northeast Supply Enhancement Project
New Jersey and New York

- Milepost for Offshore Study Area
- Proposed Raritan Bay Loop
- Rockaway Delivery Lateral
- Lower NY Bay Lateral
- NY/NJ Boundary
- 3 nm Federal Boundary
- Bathymetry (ft)
- Maintained Navigation Channel
- Anchorage Areas (2016)

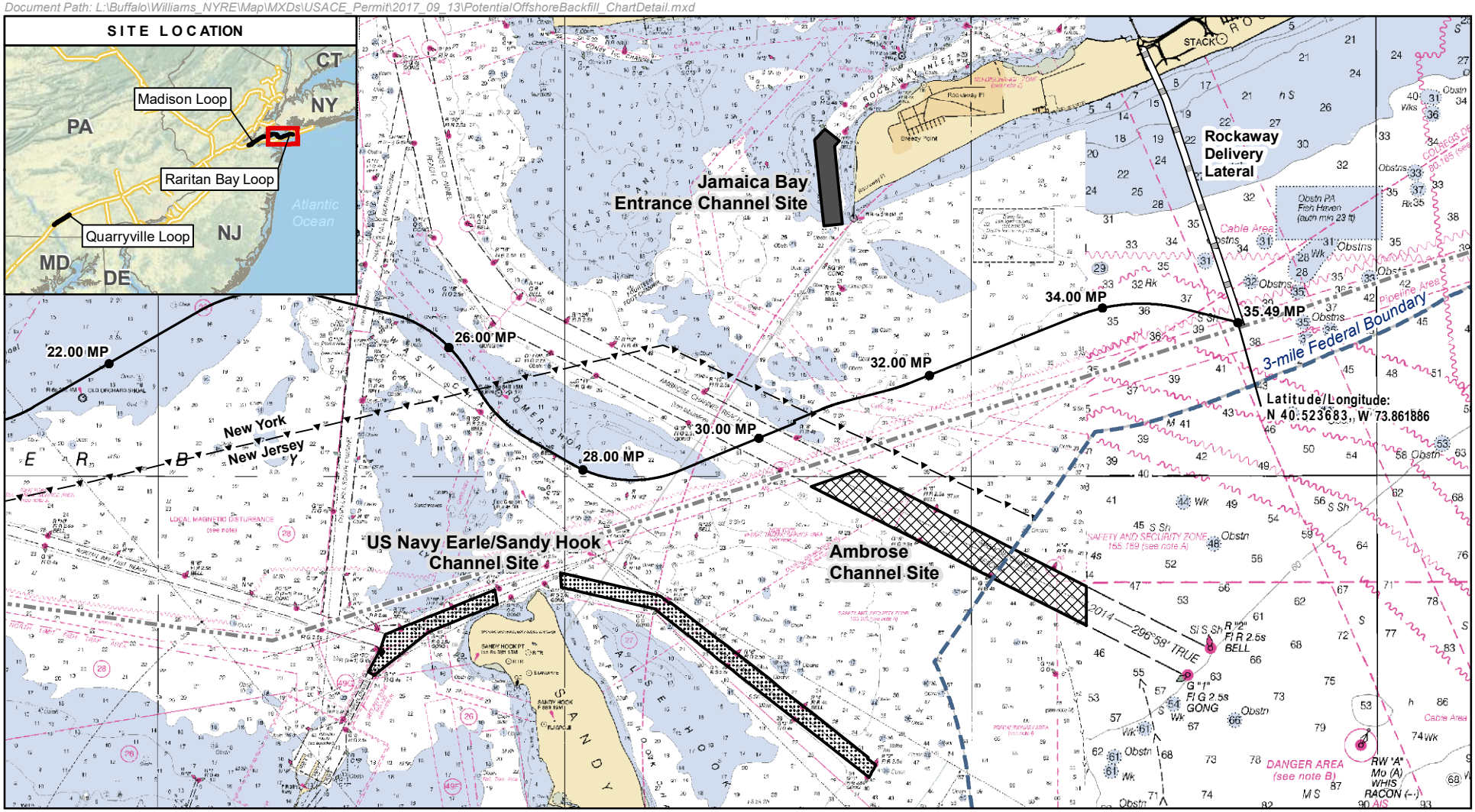
Potential Offshore Backfill Source
- Ambrose Channel
- US Navy Earle/Sandy Hook Channel
- Jamaica Bay Entrance Channel (Rockaway Inlet)

0 1 2 Miles
0 2 4 6 Kilometers
N

Data Sources: Williams 2017; E&E 2017; ESRI 2012; NOAA ENC 2013 (Chart # 12327 and # 12326) Seamless Web Service; USACE 2016

Revision Date: 9/13/2017

Document Path: L:\Buffalo\Williams_NYRE\Map\MXDs\USACE_Permit\2017_09_13\PotentialOffshoreBackfill_ChartDetail.mxd



Drawing A-27
Potential Offshore Backfill Source Chart Map
Northeast Supply Enhancement Project
New Jersey and New York

- Milepost for Offshore Study Area
- Proposed Raritan Bay Loop
- Rockaway Delivery Lateral
- Lower NY Bay Lateral
- NY/NJ Boundary
- 3 nm Federal Boundary

Potential Offshore Backfill Source
- Ambrose Channel
- US Navy Earle/Sandy Hook Channel
- Jamaica Bay Entrance Channel (Rockaway Inlet)

0 1 2 Miles
0 2 4 Kilometers

Data Sources: Williams 2017; E&E 2017; ESRI 2012; NOAA RNC Maps (Chart # 12327 and # 12326); USACE 2016

Revision Date: 9/13/2017