TETRA TECH

PITT-07-19-038

July 19, 2019

Mr. Christopher Smith, P.E.
Chief, Construction Permits Section
Waterways & Wetlands Program
Pennsylvania Department of Protection – Southeast Region
2 East Main Street
Norristown, PA 19401

Re: Incompleteness Review Responses -
Pennsylvania Pipeline Project – Major Amendment
HDD 0280 Permit Application No. ESG 0100015001
Upper Uwchlan Township, Chester County

Dear Mr. Smith:

On behalf of our client, Sunoco Pipeline L.P. (SPLP), Tetra Tech, Inc. provides the following responses to the Pennsylvania Department of Environmental Protection (DEP) Incompleteness Review letter dated May 28, 2019, regarding the above-referenced Major Amendment . The supporting attachments represent clarifications or revisions to the original modification request. We are providing two hard copies containing this letter and supporting attachments as indicated in the comment letter and a hard copy will also be provided to the Conservation District.

For ease of your review, each DEP item is set forth verbatim below, followed by a narrative response with supporting attachments.

Comments and Responses to May 28, 2019 Incompleteness Review Letter

1 a.	Section C, Municipality (page 2) - Please revise this box to refer to the correct Major Amendment that this NOI refers to. It currently states "The 620 Major Modification is located in Upper Chichester Township, Chester County. The 280 Major Modification is located in Middletown Township, Delaware County." This appears to be incorrect and since the application materials appear to reference the 280 Major Modification, this box should only reference 280.	The Site Name has been updated to identify this Major Amendment is for HDD 280 not HDD 620.
b.	Section E, Question 5 (page 5) - The U.S.G.S. 7.5-min. Quad maps listed do not pertain to the Major Amendment in Chester County. Please revise the list to only include the Quad map(s) for the Major Amendment.	This section was edited to only include Quad maps for this Amendment area.
c.	Section E, Question 8 (page 6) - Please verify the response to this question in regards to the Major Amendment.	No other pollutants will be discharged. This response applies for all areas including this Major Amendment area.
d.	Section E, Question 11 (page 6) - Please address all applicable questions in this box.	This section has been revised to reflect the conditions in the area of the HDD 280 Major Amendment. The Geohazard Evaluation is

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		provided as Attachment 12 of the E&S report and as an Attachment to the NOI.
e.	Section E, Questions 15 and 16 (page 6) - Please verify the response to these questions in regards to the Major Amendment.	The response provided applies to the Major Amendment regarding Riparian Forest Buffers and special protection waters.
f.	Section E, Question 18 (page 6) - Please only refer to the Major Amendment that is being applied for in the subject application. Please verify the information listed for the Major Amendment. Please verify if the received waters for the Major Amendment are or are not siltation impaired.	The received waters for the Major Amendment are not siltation impaired and responses to question 18 updated to only include the Amendment area.
g.	Section G, (page 10) – Please verify the information submitted for this section as it pertains to the Major Amendment.	The Pennsylvania Pipeline Project qualifies for an exception of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan. In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. A detailed riparian buffer waiver request has been prepared as an attachment to the ESCGP-3 Notice of Intent.
h.	Section H,(page 11) – Please verify the responses to "Is there an Act 167 Plan?" for the area of the Major Amendment.	There is a County-wide Act 167 Stormwater Management Plan for Chester County, PA that is applicable to this Amendment area. The response to Section H identifies the PCSM/SR Plans are consistent with that approved Act 167 Plan.
i.	Section H (page 11) – Please include a completed Worksheet No. 10 with the application for the area of the Major Amendment.	Worksheet 10 has been added as an attachment to the NOI. It is included at the end of the NOI after the Geohazard Evaluation.
j.	Section H (page 11) – Letter a – Please check all that apply (PCSM BMPs and/or SR BMPs) in regards to the Major Amendment.	This section has been revised to identify Site Restoration BMPs are applicable to this Amendment area and included in the PCSM/SR narrative. The appropriate box has been checked.
k.	Section I (page 15) Part 1 - Please complete the Antidegradation Analysis for the area of the Major Amendment. Please provide an explanation for the nondischarge BMPs that were not checked and an explanation of why the BMPs checked were utilized.	The information in this section was updated to include the BMPs and a discussion for each applicable to the Amended area.

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NOI Completeness Checklist		
2 a.	Item 3.d. — Please provide project site runoff in the narrative for the Major Amendment.	The E&S report has been updated. The original check list identified information as being provided on page 2-3, however it is located on page 3-22 under "Stormwater Runoff Analysis"
b.	Items 3.e. and 7.e. — Please provide surface water classification in the narrative and plan drawings for the areas of the Major Amendment. Only wetlands are highlighted in red font for this Major Amendment.	The Surface Water Hydrology [Section 2.3 of the reports] have been updated to call out the surface water classification. Table 1 Receiving Waters and Receiving Wetlands tables have also been updated to only include the Amended area.
c.	Item 3.g. — Please provide a specific sequence of construction for the Major Amendment.	The construction sequence is located on E&S drawing ES-0.03.
d.	Item 3.j. — Please amend the plan drawings for the Major Amendment to include the maintenance program for BMPs.	The maintenance program is located on E&S drawing ES-0.03A.
e.	Item 3.i. — Please provide a legend, details/specifications on the plan drawings for the Major Amendment.	The legend and details/specifications are located on E&S drawings ES-0.01 through ES-0.23.
f.	Item 3.l. — Please provide Attachment 13 with information regarding the Major Amendment.	The Geohazard Evaluation is provided as Attachment 12 of the E&S report and as an Attachment to the NOI.
g.	Item 5.b. — Please provide documents addressing this item.	Communications with PHMC have been added to Section 6.

SPLP appreciates your timely review of this response. Should you have questions regarding this correspondence, please do not hesitate to contact me at 412-921-8163 or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

Robert F. Simcik
Project Manager
Tetra Tech, Inc.

cc: File 212IC-PB-00387
J. Hohenstein, PADEP Southeast Region
J. Sofranko, Chester County Conservation District
D. Caplan, U.S. Army Corps of Engineers, Philadelphia District
M. Gordon, Sunoco Pipeline L.P.
C. Embry, Sunoco Pipeline L.P.
M. Styles, Sunoco Pipeline L.P.
L. Gremminger, Energy Transfer
B. Schaeffer, Tetra Tech

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PREFACE I: CONSERVATION DISTRICT APPLICATIONS, FEES, AND CHECKS

Chester County Conservation District

688 Unionville Road, Suite 200, Kennett Square, PA 19348-1704
(610) 925-4920 ~ Fax (610) 925-4925 ~ www.chesco.org/conservation

APPLICATION FOR DISTRICT SERVICES – Effective 04.01.2016

Application will not be accepted unless signed and completed in its entirety / Please update this form with each submission / Only folded plans will be accepted

E&SPC Submission:

☑ **New** ☐ **Additional Information** ☐ ***2nd Review** ☐ ***Revision to an Approved Plan** ***Note: Additional Base Fee Due**

NPDES Submission:

☐ **New** ☐ **Revision** ☐ ****Renewal** ☑ ****Major Modification** ****Note: Additional NPDES Fee Due**

Project Name: Pennsylvania Pipeline Project Date: 3/15/19
Project Site Location: HDD 280 Municipality: Upper Uwchlan Tax Parcel ID: _____
Project Acres: _____ Total Cumulative Acres Disturbed Over Project Life: _____
Development Type:

☐ Single Residential ☑ Residential/Industrial/Commercial/Institutional ☐ Timber Harvest ☐ Municipal
☐ Miscellaneous: ○ Small Agricultural ○ Large Agricultural ◉ Chapter 105 ○ Pond/Stream Work

Other Info: _____
Applicant (Owner/Firm): Sunoco Pipeline, L.P. Name: Matthew Gordon
Applicant Mailing Address: 535 Fritztown Road Email: matthew.gordon@energytransfer.com
City: Sinking Spring State: PA Zip Code: 19608 Phone: 610-670-3200 Fax: _____
Plan Designer (Firm): Tetra Tech, Inc Name: Robert Simcik
Plan Designer Mailing Address: 661 Andersen Drive, Suite 200 Email: robert.simcik@tetratech.com
City: Pittsburgh State: PA Zip Code: 15220 Phone: 412-921-8163 Fax: _____

E&SPC Fees: Base Fee: $1500 2nd Review Fee (25% of Original Base Fee): $_____
Tier II Fee: $1000 Emergency Review Fee: $_____

E&SPC fees are payable to Chester County Conservation District – Submit one check for Base Fee and Tier II, if applicable. Submit one check for the 2nd Review Fee, if applicable. Submit one check for Emergency Review, if applicable.

Refer to District Services Fee Schedule, and check appropriate Tier II:

☐ **9% or more slopes** ☐ **deficient infiltration of 2 year storm** ☐ **more than 25% total area disturbance**
☐ **less than 150 foot buffer** ☐ **adjacent property discharge**

NPDES Fees: Base Fee: $_____ Disturbed Acreage Fee: $_____

Base Fee is payable to Chester County Conservation District Clean Water Fund
Disturbed Acreage Fee is payable to Commonwealth of PA Clean Water Fund

Complete the following:

Receiving Stream Name: UNT to Marsh Creek Designation (HQ, EV, etc): HQ-TSF

☑ Fee Attached
☑ Stormwater Narrative
☐ Stormwater Management
☐ Post Construction Stormwater Plans & Details
☐ Act 2 Site (requires Individual NPDES Permit)
☐ Emergency Prep. Plan
☑ E&S Narrative
☑ E&S Calculations
☑ E&S Plans & Details

Incentive BMPs: ☐ Green Roof ☐ Community Redevelopment

Plan Information: Check if the project contains any of the following

☑ Stream Crossing ☐ Public Sewer ☐ Wetlands ☐ On-Site Septic
☑ Flood Plain ☐ Steep Slopes ☐ Open Space ☐ Water Encroachment

Permits Required: Enclose copies if applicable

☐ NPDES Individual Permit ☐ General Permit (Chapter 105)
☐ NPDES General Permit ☐ Water Encroachment ☐ Joint Permit 401/404

Fees and plans showing the required information are to be submitted with this application. Any additional plans or information required by the Chester County Conservation District should be submitted promptly. Emergency plan review requests and BMP incentive fee reduction requests require an additional form that can be found on our website. The requests must be submitted with this application. The undersigned agrees to comply with all of the requirements of TITLE 25, CHAPTER 102, EROSION AND SEDIMENTATION CONTROL RULES AND REGULATIONS as set forth by the Pennsylvania Department of Environmental Protection, and further agrees to obtain all necessary permits in connection with the above referenced project. District Service Fees are non-refundable.

_____
(Applicant Signature)

1. NOTICE OF INTENT CHECKLIST

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF WATER PROGRAMS
OFFICE OF OIL AND GAS MANAGEMENT

NOTICE OF INTENT (NOI) ADMINISTRATIVE COMPLETENESS CHECKLIST EROSION AND SEDIMENT CONTROL GENERAL PERMIT (ESCGP-3) FOR EARTH DISTURBANCE ASSOCIATED WITH OIL AND GAS EXPLORATION, PRODUCTION, PROCESSING, OR TREATMENT OPERATIONS OR TRANSMISSION FACILITIES

Please check the following list to make sure that you have included all the required information. Place a check mark in the column provided for all items completed and/or provided. Failure to provide all of the requested information will delay the processing of the application, may preclude the use of the Expedited Review, and may result in the application being placed ON HOLD with NO ACTION, or being considered withdrawn and the application file closed.

THIS CHECKLIST MUST BE COMPLETED AND ENCLOSED WITH YOUR GENERAL PERMIT NOI

✓CHECKLIST FOR EROSION AND SEDIMENT CONTROL GENERAL PERMIT NOI

☐ **NEW NOI** ☐ **RENEWAL** ☐ **PHASED** ☒ **MAJOR MODIFICATION**

If a Renewal, Phased or Major Modification, identify ESCGP Authorization # ESG0100015001

Minor revisions are not required to be submitted to the regional office for review.

CLIENT NAME Sunoco Pipeline LP

PROJECT and PHASE NAME Pennsylvania Pipeline Project - HDD 280 (If applicable)

				Applicant Check ✓ if Included	Official Use Only
1.	Fully completed, properly signed and notarized Notice of Intent form (1 original and 2 copies for paper application). (Not required for subsequent phases)			☒	☐
2.	Is expedited review requested? If yes, complete items (a) and (b) below. If no, proceed to section 3 of this checklist.			☐ Yes	☒ No
	a. Expedited review eligibility has been completed and determined.	Location: _____	Page: _____	☐	☐
	b. Expedited review process related questions have fully been answered.	Location: _____	Page: _____	☐	☐
3.	Complete **Erosion and Sediment Control (E&S) Plans.** (1 original and 2 copies for paper application) NOTE: Identify locations as Drawings (D), Narrative (N). (Identify Not Applicable as "N/A") The E & S Plan must contain, at a minimum, the following:			☒ Yes	☐ No
	a. Topographic Features Existing topographic features of the project site and immediate surrounding area. Include the project area outlined on an 8 ½" x 11" photocopy of the U.S.G.S. topo map area. The map must include the name of the appropriate 1:24,000 scale U.S.G.S. 7.5 minute series quadrangle map where the project is located.	Location: Section 3; N	Page: Attachment 1	☒	☐
	b. Soil Characteristics Types, depth, slope, locations and limitations of the soils including methods for resolution of all soil limitations.	Location: Section 3; N	Page: Attachment 5	☒	☐
	c. Earth Disturbance Activity The characteristics of the earth disturbance activity, including the past, present and proposed land uses and proposed alteration to the project site.	Location: Section 3; N	Page: 1-1	☒	☐
	d. Project Site Runoff The Volume and rate of runoff from the project site and its upstream watershed area. Runoff impact analysis on downstream watercourse, design computations for protective measures if applicable, discharge analysis for non-surface water discharges.	Location: Section 3; N	Page: 3-22	☒	☐

	e.	**Surface Water Classification** The Location of all surface waters of this Commonwealth which may receive runoff within or from the project site including their classification under Chapter 93 and status as siltation-impaired water. All streams, springs, wetlands, and floodways within, adjacent or receiving water from the project site must be shown on drawings with proper identification of special protection waters and existing uses.	Location: Section 3; N & D	Page: 2-3, Table 1, Attachment 2	☒	☐
	f.	**BMP Description Narrative** A narrative description of the location and type of perimeter and onsite BMPs used before, during, and after the earth disturbance activity.	Location: Section 3; N	Page: 3-5	☒	☐
	g.	**BMP Installation Sequence Narrative** A sequence of BMP installation and removal in relation to the scheduling of earth disturbance activities, prior to, during and after earth disturbance activities that ensures proper functioning of BMPs.	Location: Section 3; N & D	Page: 3-6, Attachment 2	☒	☐
	h.	**Supporting Calculations and Measurements** All BMP design calculations and information must be attached with the E&S plans.	Location: Section 3, N	Page: Attachment 4	☒	☐
	i.	**Plan Drawings** Plan drawings must include locations of proposed BMPs and a legend for all symbols used on the drawing. Construction details, notes, and specifications must be included to explain the drawings.	Location: Section 3; D	Page: Attachment 2	☒	☐
	j.	**Maintenance Program** A maintenance program which provides for the operation and maintenance of BMPs and the inspection of BMPs on a weekly basis and after each stormwater event, including the repair or replacement of BMPs to ensure effective and efficient operation. The program must provide for completion of a written report documenting each inspection and all BMP repair, or replacement and maintenance activities.	Location: Section 3; N	Page: 3-22, Attatchment 2	☒	☐
	k.	**Material Recycling and Disposal** Procedures which ensure that the proper measures for the recycling or disposal of materials associated with or from the project site will be undertaken in accordance with this title.	Location: Section 3; N	Page: 3-18 Attachment 2	☒	☐
	l.	**Naturally Occurring Geologic Formations and Soil Conditions** Identify naturally occurring geologic formations or soil conditions that may have the potential to cause pollution during earth disturbance activities and include the locations on plan drawings. Include BMPs to avoid or minimize potential pollution and its impacts from the formations. If the applicant suspects substantial possibility of potential slope failure, include a geotechnical report prepared by a geotechnical engineer.	Location: Section 3; N	Page: 2-1, Attachment 5	☒	☐
	m.	**Thermal Impacts** Identification of potential thermal impacts to surface waters of this Commonwealth from the earth disturbance activity including BMPs to avoid, minimize or mitigate potential pollution from thermal impacts.	Location: Section 3; N	Page: 3-18	☒	☐

	n.	**E&S Plan and PCSM/SR Plan Consistency** The E&S Plan shall be planned, designed and implemented to be consistent with the PCSM Plan under § 102.8. Unless otherwise approved by the Department, the E&S Plan must be separate from the PCSM Plan and labeled "E&S" or "Erosion and Sediment Control Plan" and be the final plan for construction.	Location: Section 3; D	Page: Attachment 2	☒	☐
	o.	**Riparian Forest Buffers** Identification of existing and proposed riparian forest buffers should be included on the plan drawings if incorporated into the project site.	Location: Section 3; N	Page: 3-19	☒	☐
	p.	**Antidegradation Requirements** Satisfy antidegradation implementation requirements for special protection water and siltation-impaired waters including evaluation of nondischarge alternatives and ABACT.	Location: Section 3; N	Page: 3-23	☒	☐
4.		**Permit NOI Filing Fees** of $500 to the appropriate Clean Water Fund plus $100/Acre of earth disturbance payable to the Commonwealth of PA Clean Water Fund ($500 filing fee not required for subsequent phases) is required. For NOIs submitted to delegated county conservation districts, the administrative fee of $500 must be paid to the conservation district and disturbed acreage fee to the Commonwealth of PA (two checks).	Location: Provided separate from D & N	Page: _____	☒	☐
5.		**Municipal Notification:** (3 copies) Not required for subsequence phases.			☐	☐
	a.	Act 14 Municipal Notifications to the local municipality and county governments that specify that the application is for Erosion and Sediment Control General Permit for Earth Disturbance Associated with Oil and Gas Activities. A "sample" notification letter is provided as Attachment C of the instructions. **Proof or Receipt** of municipal notifications: copies of certified mail receipts, proof of deliver from a commercial carrier or acknowledgment letters from the local municipality and county government.	Location: Provided separate from D & N	Page: Section 4	☒	☐
	b.	Pennsylvania Inventory of Historical Places and the National Register of Historical Places: When conducting earth disturbance activities, the permittee shall protect archaeological specimens and historic resources in accordance with applicable State and Federal laws. For permitted activities on lands of the Allegheny National Forest (ANF) or other federal lands, the permittee should coordinate with the appropriate ANF Ranger or other appropriate federal agency on the protection of historic properties.	Location: Provided separate from D & N	Page: Section 6	☒	☐
6.		**Pennsylvania Natural Heritage Program (PNHP).** Include PNDI receipt, PNDI clearance and other information depending on the permit application option. (3 copies for paper application).	Location: Provided separate from D & N	Page: Section 6	☒	☐
7.		**Complete PCSM/SR Plans.** (1 Original, 2 copies) NOTE: Identify location(s) as Drawing (D), Narrative (N). (Identify Not Applicable as "N/A".) The PCSM/SR Plan must contain, at a minimum, the following:			☒	☐
	a.	**Topographic Features** The existing topographic features of the project site and immediate surrounding area must be shown plan drawings. The name of the USGS quadrangle map must be included.	Location: Section 7; D	Page: Attachment 1	☒	☐

	b.	**Characteristics of Naturally Occurring Geologic Formations and Soil Conditions** The types, depth, slope, locations and limitations of the soils and geologic formations.	Location: Section 7; N	Page: 3, Attachment 2	☒	☐
	c.	**Earth Disturbance Activity Characterization** The characteristics of the project site, including the past, present and proposed land uses Limit of Disturbance (LOD), areas of cuts and fill, proposed impervious areas, locations of roads, proposed contours of project area and the proposed alteration of the project site.	Location: Section 7; N	Page: 2	☒	☐
	d.	**Net Change in Volume and Rate of Runoff** An identification of the net change in volume and rate of stormwater from preconstruction hydrology to post construction hydrology for the entire project site and each drainage area. Include pre-development and post-development drainage area map. Post-development drainage area map must show Point of Discharge(s) (PODs) from PCSM BMPs.	Location: Section 7; N	Page: 15	☒	☐
	e.	**Surface Water Classification** An identification and location of surface waters of this Commonwealth, which may receive runoff within or from the project site and their classification under Chapter 93.	Location: Section 7; N & D	Page: 3	☒	☐
	f.	**BMP Description Narrative** A written description of the location and type of PCSM/Site Restoration BMPs including construction details for permanent stormwater BMPs including permanent stabilization specifications and locations.	Location: Section 7; N	Page: 5, 18	☒	☐
	g.	**BMP Installation Sequence Narrative** A sequence of PCSM/Site Restoration BMP implementation or installation in relation to earth disturbance activities of the project site and a schedule of inspections for critical stages of PCSM/Site Restoration BMP installation.	Location: Section 7; N	Page: 5, 18	☒	☐
	h.	**Supporting calculations** All design information and calculations must be included with the PCSM/SR plan. Include verification of PCSM/SR plan consistency with the Act 167 plan, if a current and DEP approved Act 167 plan exists. Include summary of bio-infiltration BMPs used for the project using Attachment E of the NOI instructions.	Location: N/A	Page:	☐	☐
	i.	**Plan Drawings** The locations of BMPs with tributaries must be shown on the drawings. Notes, specifications, any constructions details, and any other supporting information needed to explain the drawings must also be included.	Location: N/A	Page:	☐	☐
	j.	**Long Term Operation and Maintenance Schedule** A long-term operation and maintenance schedule, which provides for inspection of PCSM/Site Restoration BMPs, including the repair, replacement or other routine maintenance of the PCSM/Site Restoration BMPs to ensure proper function and operation. The program must provide for completion of a written report documenting each inspection and all BMP repair and maintenance activities and how access to the PCSM/Site Restoration BMPs will be provided.	Location: N/A	Page:	☐	☐

	k.	**Material Recycling and Disposal** Procedures which ensure that the proper measures for recycling or disposal of materials associated with or from the PCSM/Site Restoration BMPs are in accordance with Department laws, regulations and requirements.	Location: Section 7; N	Page: 18	☒	☐
	l.	**Addressing Impacts from Naturally Occurring Geologic Formations and Soil Conditions** An identification of naturally occurring geologic formations or soil conditions that may have the potential to cause pollution after earth disturbance activities are completed and PCSM/Site Restoration BMPs are operational and development of a management plan to avoid or minimize potential pollution and its impacts.	Location: Section 7; N	Page: 3	☒	☐
	m.	**Thermal Impacts** An Identification of potential thermal impacts from post construction stormwater to surface water of this Commonwealth including BMPs to avoid, minimize or mitigate potential thermal pollution from thermal impacts.	Location: Section 7; N	Page: 11	☒	☐
	n.	**Riparian Forest Buffer Management Plan** A riparian forest buffer management plan when required under § 102.14.	Location: Section 7; N	Page: 12	☒	☐
	o.	**Antidegradation Requirements** A demonstration of compliance with antidegradation implementation requirements including evaluation of nondischarge alternatives and ABACT for where activities will be conducted in special protection waters or siltation impaired waters.	Location: Section 7; N	Page: 14	☒	☐
8.	**PCSM Plan Stormwater Analysis** Do the regulated activities require site restoration or reclamation? If Yes, skip to Item 9. If No, provide the following information:			☒ Yes ☐ No	☒	☐
	a.	**Site Characterization and Assessment** Predevelopment site characterization and assessment of soil and geology including infiltration and geotechnical studies that identify location and depths of test sites and methods used.	Location: Section 7; N	Page: 2	☒	☐
	b.	**Volume Reduction and Water Quality Requirements** Analysis demonstrating that the PCSM BMPs will meet the volume reduction and water quality requirement specified in an applicable Department approved and current Act 167 stormwater management watershed plan; **or** manage the net change for storms up to and including the 2-year/24-hour storm event when compared to preconstruction runoff volume and water quality.	Location: N/A	Page: _____	☐	☐
	c.	**Rate Requirements** Analyses demonstrating that the PCSM BMPs will meet the rate requirements specified in an applicable Department approved and current Act 167 stormwater management watershed plan; **or** manage the net change in peak rate for the 2-, 10-, 50-, and 100-year/24-hour storm event in a manner not to exceed preconstruction rates.	Location: N/A	Page: _____	☐	☐
	d.	**Calculation Methodologies** Identification of the methodologies for calculating total runoff volume and peak rate of runoff and provide supporting documentation and calculations.	Location: N/A	Page: _____	☐	☐

	e.	**Construction Techniques** Identification of construction techniques or special consideration to address soil and geologic limitations.	Location: N/A	Page: _____	☐	☐
	f.	**Antidegradation Requirements** Demonstration of compliance with antidegradation implementation requirements including evaluation of nondischarge alternatives and ABACT for where activities will be conducted in special protection waters or siltation impaired waters.	Location: Section 7; N	Page: 14	☒	☐
9.	**Phased Projects** Is the activity being conducted as a phased project? ☐ Yes ☒ No If yes, all of the following must be completed:				☐	☐
	a.	Initial Phase - Is the master plan included? ☐ Yes ☐ No				
	b.	Subsequent Phase(s) – Is(are) the subsequent phase(s) identified in the master plan? ☐ Yes ☐ No				
10.	**Preparedness, Prevention and Contingency (PPC) Plan** Will fuels, chemicals, solvents, other hazardous materials be used or stored on site during earth disturbance activities? ☒ Yes ☐ No If yes, a PPC Plan must be maintained on the site during earth disturbance.				☐	☐
11.	**Subsequent Phase Certification for Expedited Reviews** Is the activity being conducted as a phased project? ☐ Yes ☒ No Is an expedited review being requested for subsequent phase? ☐ Yes ☒ No If yes, all of the following must be completed:				☐	☐

I do hereby certify to the best of my knowledge, information, and belief, that the Erosion and Sediment Control and PCSM/Site Restoration Plan are true and correct, represent actual field conditions and are in accordance with the 25 Pa. Code Chapters 78 and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Professional Seal
Company	
Address	
Phone	
Most Recent DEP Training Attended Location _____ Date _____	
e-Mail Address	

EXPEDITED REVIEW PROCESS

In addition to the certification required above, applicants using the expedited permit review process must attach an E&S and PCSM/Site Restoration Plan developed and sealed by a licensed professional engineer, landscape architect, surveyor or professional geologist. The plans shall contain the following certification:

I do hereby certify to the best of my knowledge, information, and belief, that the Erosion and Sediment Control and PCSM/Site Restoration Plan and Post Construction BMPs are true and correct, represent actual field conditions and are in accordance with the 25 Pa. Code Chapters 78 and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

12.	**Permit Renewal** Is a permit renewal being requested? ☐ Yes ☒ No If yes, all of the following must be completed:		☐	☐
	a.	Administratively complete, signed, and notarized Notice of Intent Form, including Items 1-8. (1 signed original and 2 copies of the NOI/application for paper application)	☐	☐
	b.	Permit filing fee of $500 payable to the appropriate clean water fund plus $100/Acre of earth disturbance payable to the Commonwealth of PA Clean Water Fund.	☐	☐

2. NOTICE OF INTENT APPLICATION

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF WATER PROGRAMS
OFFICE OF OIL AND GAS MANAGEMENT

OFFICIAL USE ONLY
ID #
Date Received
AUTH
SITE
CLNT
APS
Fee
Check No.
Check Date

NOTICE OF INTENT (NOI) FOR COVERAGE UNDER THE EROSION AND SEDIMENT CONTROL GENERAL PERMIT (ESCGP-3) FOR EARTH DISTURBANCE ASSOCIATED WITH OIL AND GAS EXPLORATION, PRODUCTION, PROCESSING, OR TREATMENT OPERATIONS OR TRANSMISSION FACILITIES

READ THE INSTRUCTIONS PROVIDED IN THIS PERMIT APPLICATION PACKAGE BEFORE COMPLETING THIS FORM. PLEASE PRINT OR TYPE INFORMATION IN BLACK OR BLUE INK.

SECTION A. APPLICATION TYPE

Check one:

NEW ☐ **RENEWAL** ☐ **MAJOR MODIFICATIONS (Provide ESCGP number)** ☒ ESG0100015001

PHASED ☐ (check only if applicable; *note: Most projects are not submitted as phased projects*)

Check one: EXPEDITED ☐ **STANDARD** ☒

If an Expedited Review Process being requested, be advised that the Expedited Review is not available for all projects. Refer to Section D - Expedited Review Process of the ESCGP-3 NOI Instructions to determine if the project is eligible.

SECTION B. CLIENT INFORMATION

Applicant's Last Name (If applicable)	First Name	MI	Telephone No. 610-670-3200
Gordon	Matthew	L	

Organization Name or Registered Fictitious Name	Telephone No.
Sunoco Pipeline, L.P.	

DEP Client ID No.

Headquarters Mailing Address	City	State	ZIP Code
535 Fritztown Road	Sinking Spring	PA	19608

Email Address matthew.gordon@energytransfer.com

Co-Applicant's Last Name (If applicable)	First Name	MI	Telephone No. (920) 539-0872
Fye	Jamye		

Organization Name or Registered Fictitious Name	Telephone No. (920) 924-4300
Michels Pipeline, A Division of Michels Corporation	

Address	City	State	ZIP Code
817 Main Street	Brownsville	WI	53006

Email Address jfye@michels.us

SECTION C. SITE INFORMATION		
Is there an existing ESCGP associated with this site? ☒ Yes ☐ No If yes, Permit No. ESG0100015001		
Has a well permit application been submitted for this site? ☐ Yes ☒ No If yes, Permit No. _____ Does this site have a 911 address? ☐ Yes ☒ No If yes, provide site location address.		
Site Name Pennsylvania Pipeline Project - Major Modification HDD 280 _ PA Turnpike		
Site Location The revised route for this modification is located near 220 Styer Road, Glennmoore, PA 19343. This area is approximately 400 ft north of PA Turnpike I-76.	Site No. (if another permit has been issued for the site)	
Site Location – City Upper Uwchlan Township, Chester County	State PA	ZIP Code 19343
Detailed Written Directions to Site From the DEP South East Regional Office to 220 Styer Road, Glennmoore, PA 19343 Turn right on US-202/DeKalb St (3.4 mi). Merge onto I-76W toward I-276E. Follow I-76W (15 mi). Take Exit 312 and merge onto PA-100N. Merge onto PA-100N (1.3 mi). Turn left onto Park Road (0.1 mi). Turn right onto Little Conestoga Road (2.6 mi). Turn right onto Styer Road (0.7 mi).		

Primary Location	County	Municipality	City	Boro	Twp.
	Chester	Upper Uwchlan Township	☐	☐	☒

SECTION D. EXPEDITED REVIEW	
I. Expedited Review Eligibility	
1. Is any part of the project in the watershed of a surface water with an existing or designated use of exceptional value or high quality pursuant to Chapter 93 (relating to water quality standards), in an exceptional value wetland in accordance with 25 Pa. Code § 105.17, or in the watershed of an impaired surface water where the cause of the impairment is identified as siltation?	☒ Yes ☐ No
2. Will the project in which the well pad will be constructed be in or on a floodplain?	☐ Yes ☒ No
3. Is any earth disturbance located or proposed to be located on land known to be contaminated by the release of regulated substances as defined in Section 103 of Act 2, 35 P.S. § 6026.103?	☐ Yes ☒ No
4. Will naturally occurring geologic formations or soil conditions provide hazards to the project or surrounding environment or have the potential to cause or contribute to pollution when disturbed?	☒ Yes ☐ No
5. Do any unresolved non-compliance issues exist with the applicant or the facility?	☒ Yes ☐ No
6. Is the project a transmission project?	☒ Yes ☐ No

If yes to any of the above questions the project is not eligible for Expedited Review; If the project is eligible for Expedited Review, all the following items must be completed.	
II. Expedited Review Process	
1. Is the technically and administratively complete and accurate NOI package prepared and certified by a licensed professional?	☐ Yes ☐ No
2. Are E&S and PCSM/Site Restoration Plan drawings and narrative prepared and sealed by a licensed professional? *(Include interim restoration details when needed)*	☐ Yes ☐ No
3. Include a Resource Delineation Report and answer the following questions: (If the answer to question a. is "Yes" then skip to #4. If the answer to a. is "No" the applicant must answer "Yes" to at least one of the questions, b. through d. to be eligible for expedited review.)	
a. Were all wetland resources delineated during the growing season?	☐ Yes ☐ No
b. If not during the growing season, was a follow-up visit conducted during the growing season to verify/adjust boundaries and look for potentially missed resources?	☐ Yes ☐ No
c. Was a quality assurance field review conducted at a later date by an independent qualified wetland professional to verify boundaries and look for potentially missed resources? (If yes, attach Quality Assurance Field Review Report)	☐ Yes ☐ No
d. Was a Jurisdictional Determination (JD) or Preliminary JD conducted by the US Army Corps of Engineers on the whole project? (If yes, attach Preliminary or Jurisdictional Determination Report)	☐ Yes ☐ No
4. If applicable, have you included PNDI clearance letters or other documentation from applicable resource agencies?	☐ Yes ☐ No
5. If the project site contains, is along, or within 100 feet of a river, stream, creek, lake, pond or reservoir, will you establish new or preserve existing riparian forest buffer at least 100 feet in width between the top of streambank or normal pool elevation of a lake, pond or reservoir and areas of earth disturbances. If no, will a waiver be obtained? ☐ Yes ☐ No	☐ Yes ☐ No
6. Name of Licensed Professional Company	
Address	
Phone	

SECTION E. PROJECT INFORMATION

1. Total Project Area/Project Site (Ac):	283	Total Disturbed Area (Ac):	283
Increased disturbed acreage *(for permit modification only)*			4.86
Fee: ***(For additional information regarding fees, refer to NOI Instructions #3 Permit NOI Filing Fees.)***			$ 1000

2. Project Name: Pennsylviana Pipeline Project

3. Project Type (Check all that apply)

- ☐ Oil/Gas Well [1]
- ☐ Gathering Facility
- ☐ Treatment Facility
- ☐ Compressor Station
- ☒ Pipeline
- ☐ Storage Field Facility
- ☐ Other
- ☐ Transmission Facility
- ☐ Processing Facility
- ☐ Well Development Impoundment
- ☒ Non-FERC regulated Transmission Facility
- ☐ Ground/Surface Water Withdrawal Site

[1] If Oil/Gas Well; is the well conventional or unconventional? ☐ Conventional ☐ Unconventional

Project Description

The 280 Major Modification consists of a change in the route and installation method for the 16 and 20-inch diameter pipeline previously permitted as Horizontal Directional Drill (HDD) 280. The permit request is to convert the installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The change in methodology is to minimize impacts to Waters of the Commonwealth and avoid potential future growth requirements of the PA Turnpike I-76. The modification includes an additional 4.86 acres of LOD.

Provide the date of pre-application meeting (if conducted with the Department) NA

4. Provide the latitude and longitude coordinates for the center of the project. The coordinates should be in Decimal degrees and North American Datum 1983. The coordinates must meet the current DEP policy regarding locational accuracy. For linear projects provide the project's termini.

Latitude (DD) 40.0919 Longitude (DD) - 75.7300

Latitude (DD) 40.0872 Longitude (DD) - 75.7230

Horizontal Collection Method: ☐ GPS ☒ Interpolated from U.S.G.S. Topographic Map ☐ DEP's eMAP

5. U.S.G.S. 7.5 min. topographic quadrangle Name Downingtown
(*Include a copy of the project area on the 7.5 min quad map)*

6. Will the project be conducted as a phased permit project? ☐ Yes ☒ No
If Yes, Include Master Site Plan Estimated Timetable for Phased Projects. ☐ Additional sheet(s) attached.

Phase No. or Name	Description	Total Area	Disturbed Area	Start Date	End Date

7. List existing and previous land use for a minimum of the previous 5 years. Forested/rural residential
8. Other Pollutants: Will the stormwater discharge contain pollutional substances other than sediment? ☐ Yes ☒ No If yes, explain and provide any available quantitative data.
9. Will fuels, chemicals, solvents, other hazardous waste or materials be used or stored on site during earth disturbance activities or will Horizontal Directional Drilling (HDD) activities be conducted? Yes ☒ No ☐ ***(If yes, Preparedness, Prevention and Contingency (PPC) Plan must be maintained on site during earth disturbance. See NOI Instructions, E.9 PPC Plan Guidance for further information.)***
10. Is the project in the watershed of an impaired surface water where the cause of the impairment is identified as siltation? Yes ☐ No ☒ ***(If yes, show how the project will not result in a net change in volume, rate or water quality. See section I below, and E.10 of NOI instructions.)***
11. Are there potentially hazardous naturally occurring geological or soil conditions in any portion of the project or surrounding area? Yes ☒ No ☐ If yes, do the potentially hazardous geologic or soil conditions have the potential to cause or contribute to pollution as a result of the proposed earth disturbance activities? Yes, see the Geohazard Evaluation attached to the NOI and E&S Report. If no, provide an explanation. If yes, Geologic Hazard Mitigation Plan must be attached and explain where in this application details are provided.
12. Has the Act 14 Municipal Notification and proof of receipt of notification been attached to the NOI? Yes ☒ No ☐ ***(If not, the NOI is not complete, see E.12 and #4 Municipal Notification in the NOI Instructions for additional guidance.)***
13. Has the PNDI receipt been attached to the NOI? Yes ☒ No ☐ ***(If not, the NOI is not complete, see E.13 and #5 PNHP in the NOI Instructions for additional guidance.)***
14. Have the E&S Plan and PCSM/SR Plan been planned and designed to be consistent? Yes ☒ No ☐
15. Have existing and/or proposed Riparian Forest Buffers been identified? Yes ☒ N/A ☐ ***(If yes, they must be shown on the E&S Plan as well as the PCSM/SR Plans.)***
16. Have antidegradation implementation requirements for special protection waters been addressed? Yes ☒ No ☐ N/A ☐ ***(If yes, antidegradation requirements must be included in the plan.)***
17. Has the seasonal high groundwater level been identified and 20-inch separation established at all excavation locations for pits for conventional operations and Well Development Impoundments for unconventional operations? Yes ☐ No ☐ N/A ☒

18. Receiving Waters	Chapter 93, Designated Use Stream Classification	Chapter 93, Existing Use Stream Classification
UNT to Marsh Creek	☒ HQ ☐ EV ☐ Other TSF ☐ Siltation-impaired	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired
Black Horse Creek	☒ HQ ☐ EV ☐ Other TSF ☐ Siltation-impaired	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired
_____	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired
_____	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired	☐ HQ ☐ EV ☐ Other _____ ☐ Siltation-impaired
Secondary Receiving Water Marsh Creek	Secondary Chapter 93, Designated Use HQ-TSF	Secondary Existing Use

Name of Municipal or Private Separate Storm Sewer Operator, if applicable.
Upper Uwchlan Township

Non-Surface Receiving Water: (include off-site discharges)

SECTION F. EROSION AND SEDIMENT CONTROL (E&S) PLAN

See the attached Instructions for additional guidance with E&S Plans

Erosion and Sediment Control Plan BMPs should be designed to minimize accelerated erosion and sedimentation through limiting the extent and duration of earth disturbance, protection of existing drainage and vegetation, limiting soil compaction and controlling the generation of increased runoff. The Department recommends the use of the *Pennsylvania Erosion & Sedimentation Pollution Control Program Manual (E&S Manual)* (363-2134-008) to achieve this goal. The E&S Plan must meet the requirements of Pa. Code § 102.4(b) and submitted with the NOI. Also, see section 2. of the NOI instruction for detailed information on completing the E&S plan and additional requirements.

a. E&S Plan Summary

Provide a summary of proposed E&S BMPs and their performance to manage E&S for the project.

Compost Filter Socks - This temporary sedimentation control measure consists of wood or metal posts driven through a compost filled mesh tube. Filter socks will be located as needed on side-slope and down-slope boundaries of disturbed areas. Compost filter socks will be sized using the DEP Construction Detail.

Tarpaulin Covers - Tarpaulin covers may be used, as necessary, to protect topsoil storage stockpiles from wind and precipitation erosion. Stockpile slopes will be 2:1 or less. A minimal amount of soil will be stockpiled so that the height of the stockpile is less than 35 feet.

Rock Construction Entrance – Temporary access routes will be established on and proximate to the site to facilitate construction activities. The use of access routes will help confine truck and equipment traffic to specific corridors thus minimizing land disturbance and protecting vegetation. Site traffic during wet weather will be limited. No vehicles will be permitted in streams or rivers.

Wash Racks – Wash racks will be used at rock construction entrances and will be designed to accommodate anticipated vehicular traffic. A water supply will be made available at wash racks to wash the wheels of vehicles exiting the site.

Pumped Water Filter Bag – Pumped water filter bags may be used to filter water pumped from disturbed areas prior to discharging to surface waters. Compost filter socks shall be installed within 50 feet of any receiving surface water or where grassy area is not available.

Erosion Control Blanket - A manufactured erosion control blanket shall be installed on all slopes 3:1 (H:V) or steeper and within 100 feet of stream banks, where applicable. The blanket shall be biodegradable but capable of providing protection for two growing seasons. Straw or similar fiber material shall be placed between two biodegradable nets. The top net shall be heavyweight and UV stabilized; the bottom net shall be a lightweight netting. Erosion control blankets shall be anchored and stapled in place in accordance with the manufacturer's recommendations and the detail on the construction drawings. For slopes between 3:1 and 1:1 (H:V) use erosion control blanket SC 150 as manufactured by North American Green or Owner approved equal material or equal method.

Waterbars – Waterbars shall be installed across the right-of-way on all slopes greater than 5%. Waterbars should be constructed at a slope of 2% and discharge to a well-vegetated area. Waterbars should not discharge into an open trench. Waterbars should be oriented so that the discharge does not flow back onto the right-of-way. Obstructions (e.g. compost filter socks etc.) should not be placed in any waterbars. Where needed, they should be located below the discharge end of the waterbar.

Trench Plugs - To be used to prevent piping along the pipeline.

b. E&S Plan BMP Design

Check those that apply:

☒ E&S Plan is designed using BMPs in the *E&S Manual*.

☐ E&S Plan is designed using an alternative BMP or design standard approved by DEP.

Note: NOI packages submitted with alternate BMPs not approved by the Department will be returned to the Applicant.

c. Do you have any information regarding riparian buffer which differs from Section G, Riparian Buffer?

Yes ☐ No ☒

Explain:

d. Thermal Impacts Analysis

Explain how thermal impacts associated with this project were avoided, minimized, or mitigated. Potential thermal impacts to surface waters will be minimized by minimizing clearing and retaining existing vegetation where possible. The disturbed areas will be reseeded as soon as practicable following construction

e. Off-Site Discharge Analysis

Does the activity propose any off-site discharges to areas other than surface waters? ☒ Yes ☐ No

If yes, it is the applicant's responsibility to ensure that they have legal authority for any off-site discharge to neighboring properties.

The applicant must provide a demonstration in both E&S and PCSM/SR plans that the discharge will not cause erosion, damage, or a nuisance to off-site properties.

SECTION G. RIPARIAN BUFFER

1. Will you be protecting, converting or establishing a voluntary riparian forest buffer as part of this project? ☐ Yes ☒ No
   If yes, as part of the PCSM/SR Plan, provide a Buffer Management Plan.
2. Will proposed earth disturbance activities be conducted in an EV or HQ watershed AND within 150 feet of a perennial or intermittent river, stream, or creek, or lake, pond, or reservoir? ☒ Yes ☐ No

   If no, proceed to the next section/module.
3. Does this project qualify for an exception (see § 102.14(d)(1))? ☒ Yes ☐ No

   If yes, indicate below the type of project for which the exception applies by marking the appropriate box.

   ☐ Oil and gas activities for which site reclamation or restoration is part of the permit authorization in Chapter 78 and 78a.

   ☐ Road maintenance activities.

   ☐ The repair or maintenance of existing pipelines and utilities.

   ☒ Other (see §102.14(d)(1))

   If exceptions are checked, explain how existing riparian buffer will be undisturbed to the extent practicable. Provide a demonstration that the requirements of §102.14(b) are met, or provide the necessary information to request a riparian buffer waiver.
4. Are you requesting a riparian buffer waiver for this project (see § 102.14(d)(2))? ☒ Yes ☐ No

   If yes, indicate below the type of project for which you are requesting a waiver by marking the appropriate box.

   ☒ Linear project that may include pipelines, public roadways, rail lines, or utility lines.

   ☐ Project is of a temporary nature where the site will be fully restored to its preexisting conditions during the ESCGP permit term.

   ☐ Project where compliance with mandatory riparian buffers is not appropriate or feasible due to site characteristics or existing structures at the project site.

   ☐ Other (see §102.14(d)(2)):

   If waivers are checked, explain how existing riparian buffers will be undisturbed to the extent practicable.

   Note: If “Yes” to #2 **AND** “No” to #3 and #4, provide an attachment to demonstrate how the requirements of §102.14 are met.

SECTION H. POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) AND/OR SITE RESTORATION(SR) PLAN

See NOI Instructions for additional guidance with PCSM Plans

PCSM/SR BMPs should be designed to use natural measures to eliminate pollution, infiltrate runoff, not require extensive construction/maintenance, promote pollutant reduction, and preserve the integrity of stream channels. All PCSM/SR BMPs proposed in the PCSM/SR Plan must be designed in accordance with Ch. 102, Ch. 78a for unconventional operations, Ch. 78 for conventional operations and the *Pennsylvania Stormwater Best Management Practices Manual (Stormwater BMP Manual)* (363-0300-002). If alternate design criteria are utilized for the proposed project, they must have prior approval by the Department, or the NOI Application will be returned to the Applicant.

After construction is completed, how much of the entire disturbed area will be restored to meadow in good condition or better, or existing conditions? ☒ All ☐ Partial ☐ None

Include PCSM narrative and drawings for remaining impervious area. Also include a map showing the proposed contours of the site restoration plan.

If there are additional stages of the project prior to permit termination or expiration, list the stages and provide the documents required by subsection 'a' to section 'g' for each stage (e.g. partial restoration or changes to the amount of compacted areas, gravel, and/or impervious areas). Upload a narrative for each additional stage in addition to the drawings.

EXAMPLE

Stage No	Stage Name	PCSM Plan	SR Plan
Stage 1		☐	☐
Stage 2		☐	☐
Stage 3		☐	☐
Stage 4		☐	☐

Act 167 Consistency. Check those that apply.

Is there an Act 167 Plan? ☒ Yes ☐ No

☒ The attached PCSM/SR Plan is consistent with an applicable approved Act 167 Plan.

Complete the following for all approved Act 167 Stormwater Management Plans. (Use additional sheets if necessary)

Act 167 Plan Name	Date Adopted	Consistency Letter Included	
County-wide Act 167 Stormwater Management Plan for Chester County, PA	July 2013	Verification Report Included	☒

Note: A consistency letter is not required if a verification report is provided. See NOI Instructions. The PCSM/SR Plan must satisfy either sub paragraph 1, 2, or 3 below. Check those that apply.

1. ☒ Act 167 Plan approvals on or after January 2005 – The attached PCSM/SR Plan, in its entirety, is consistent with all requirements pertaining to rate, volume, and water quality from an Act 167 Stormwater Management Plan approved by DEP on or after January 2005. Box 1 must be checked if a current, DEP approved Act 167 plan exists.
2. ☒ The PCSM/SR Plan meets the standard design criteria from sections 102.8(g)(2) and (3) and the *Stormwater BMP Manual*. For projects involving oil and gas activities authorized by a permit issued under Chapter 78 or Chapter 78a (well pads) or pipelines and other similar utility infrastructure, post construction stormwater management requirements are met for all areas that are restored to preconstruction conditions or to a condition of meadow in good condition or better. *[Note: PCSM plans must meet both the volume and rate requirements in the regulations, which are provided in the 2 sections mentioned in this paragraph].*
3. ☐ Alternative Design Standard – The attached PCSM/SR Plan was developed using approaches as provided in 102.8(g)(2)(iv) and 102.8(g)(3)(iii). Demonstrate/explain in the space provided below how this standard will be either more protective than what is required in 102.8(g)(2) and 102.8(g)(3) or will maintain and protect existing water quality and existing and designated uses.

PCSM/SR BMP Alternative Standards:

Has the alternative BMP or design standard been approved by the Department?

☐ Yes

☐ No – Do not submit the ESCGP-3 application and see Section (H) of the NOI Instructions concerning the alternative BMP approval process.

Water Quality Compliance:

Does the PCSM/SR plan comply with requirements for volume control? ☒ Yes ☐ No

If yes, is at least 90% of the disturbed area controlled by a PCSM BMP? ☒ Yes ☐ No

If yes, do you have the Standard PCSM Worksheet # 10 attached to show water quality compliance has achieved?
☒ Yes ☐ No

If no, attach Standard PCSM Worksheets # 12 and #13 to show water quality compliance has achieved.

If PCSM/SR plan is not complying with the requirements for volume control, attach Standard PCSM Worksheets # 11, # 12 and #13 to show water quality compliance has achieved.

a. PCSM/SR Plan Summary

Provide a summary of proposed BMPs and their performance to manage PCSM/SR for the project.

The right-of-way and the area where the major modification will take place will be returned to meadow in good condition.

Check all that apply ☐ PCSM BMPs ☒ SR BMPs

b. Do you have any information regarding riparian buffer which differs from what was submitted in the Section G, Riparian Buffer?

☐ Yes ☒ No

Explain:

c. Thermal Impacts Analysis

Explain how thermal impacts associated with this project were avoided, minimized, or mitigated. Explain how thermal impacts associated with this project were avoided, minimized, or mitigated. Potential themal impacts to surface waters will be minimized by minimizing clearing and retaining existing vegetation where possible. Permanent seeding will occur as soon as practicable during germinating months.

d. Off-Site Discharge Analysis.

Does the activity propose any off-site discharges to areas other than surface waters? ☒ Yes ☐ No

If yes, it is the applicant's responsibility to ensure that they have legal authority for any off-site discharge to neighboring properties.

The Applicant must provide a demonstration in both the E&S and PCSM/SR Plans that the discharge will not cause erosion, damage, or a nuisance to off-site properties.

e. Summary Table for Supporting Calculation and Measurement Data
(See NOI Instructions for additional guidance with this section)

The remainder of this section (Summary Table for Calculation and Measurement Data) does not need to be completed for areas of projects involving oil and gas activities authorized by Chapter 78 or Chapter 78a (well pads) or pipelines and other similar utility infrastructure which will be restored to meadow in good condition or better or existing conditions.

Watershed Name: No change for major modification, see original permit NOI, permit # ESG0100015001

Volume Control design storm frequency _____ Rainfall amount _____ inches	Pre-construction	Post Construction	Net Change
Impervious area (acres)			
Volume of stormwater runoff (acre-feet) without planned stormwater BMPs			
Volume of stormwater runoff (acre-feet) with planned stormwater BMPs			
Stormwater discharge rate for the design frequency storm	Pre-construction	Post Construction	Net Change
1) 2-Year/24-Hour			
2) 10-Year/24-Hour			
3) 50-year/24-Hour			
4) 100-year/24-Hour			

f. Summary Description of PCSM/SR BMPs

In the lists below, check the BMPs identified in the PCSM Plan. The primary function(s) of the BMP listed in the functions column (infiltration/recharge; detention/retention; water quality). Additional functions may be added if applicable to that BMP. List the stormwater volume and area of runoff to be treated by each BMP type when calculations are required. If any BMP in the PCSM/SR Plan is not listed below, describe it in the space provided after "Other". A summary table with infiltration testing information (Attachment E, included in the NOI Instructions) must be submitted for all Bio-infiltration BMPs included in PCSM/SR plan.

For Rate control provide the volume of stormwater treated and acres treated for the 100-year/24-hour storm event.

For volume control and water quality provide the volume of stormwater treated and acres treated for the 2-year/24-hour storm event.

Key for BMP purpose(s): VC = Volume Control; RC = Rate Control; and WQ = Water Quality

BMP	Function(s)	Purpose(s)	Volume of stormwater treated	Acres treated
Site Restoration ONLY				
☒ Restore Site to Meadow in Good Condition or Better, or Existing Conditions	Infiltration/Recharge Detention/WQ Treatment	☒ VC ☒ RC ☒ WQ	_____	_____
Bio-infiltration areas	Infiltration/Recharge			
☐ Infiltration Trench		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Infiltration Bed		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Infiltration Basin		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Rain Garden/ Bioretention		☐ VC ☐ RC ☐ WQ	_____	
☐ Infiltration Berm		☐ VC ☐ RC ☐ WQ	_____	_____
Natural Area Conservation	Infiltration/Recharge			
☐ Streamside Buffer Zone		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Wetland Buffer Zone		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Sensitive Area Buffer Zone		☐ VC ☐ RC ☐ WQ	_____	_____
☒ Pre-Construction Drainage Pattern Intact		☒ VC ☒ RC ☒ WQ	_____	_____
Stormwater Retention	Detention/Retention			
☐ Constructed Wetlands		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Wet Ponds		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Retention Basin		☐ VC ☐ RC ☐ WQ	_____	_____
Sediment and Pollutant Removal	Water Quality Treatment			
☐ Vegetated Filter Strips		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Compost Filter Sock		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Detention Basins		☐ VC ☐ RC ☐ WQ	_____	_____
Access Road Design	Infiltration/Recharge			
☐ Road Crowning		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Ditches		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Turnouts		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Culverts		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Roadside Vegetated Filter Strips		☐ VC ☐ RC ☐ WQ	_____	_____

Stormwater Energy Dissipaters	Infiltration/Recharge			
☐ Level Spreaders		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Riprap Aprons		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Upslope Diversions		☐ VC ☐ RC ☐ WQ	_____	_____
☐ Other_____		☐ VC ☐ RC ☐ WQ	_____	_____

g. Critical PCSM Plan stages

Identify and list critical stages of implementation of the PCSM Plan for which a licensed professional or designee shall be present on site.

There are no PCSM BMPs proposed for the HDD 280 Major Modification.

SECTION I. ANTIDEGRADATION ANALYSIS

This section must be completed where earth disturbance activities will be conducted in the watershed of a surface water with an existing or designated use of exceptional value or high quality pursuant to Chapter 93 (relating to water quality standards), projects where any part is located in an exceptional value wetland in accordance with 25 Pa. Code § 105.17, and projects where any part is located in the watershed of an impaired surface water where the cause of impairment is identified as siltation.

Part 1 - NONDISCHARGE ALTERNATIVES EVALUATION

The applicant must consider and describe any and all non-discharge alternatives for the entire project area which are environmentally sound and will**:**

- Minimize accelerated erosion and sedimentation during the earth disturbance activity
- Achieve no net change from pre-development to post-development volume, rate and concentration of pollutants in water quality

E & S Plan	PCSM/SR Plan
Check off the environmentally sound nondischarge Best Management Practices (BMPs) listed below to be used prior to, during, and after earth disturbance activities that have been incorporated into your E & S Plan based on the site analysis. For non-discharge BMPs not checked, provide an explanation of why they were not utilized. Also for BMPs checked, provide an explanation of why they were utilized. (Provide the analysis and attach additional sheets if necessary) Alternative Siting: The best possible pipeline route was selected based on landowner agreements, minimization of environmental impacts, avoidiance of future PA Turnpike expansion, and engineering/constructibiliy factors. Riparian Buffers- Ripairian buffers will be protected to the extent practicable during construcion activities at stream crossings. Riparian Forest Buffers- Ripairian Forest Buffers will be protected to the extent practicable during construction activities at stream crossings. Limited Disturbed Area and Limiting Extent & Duration of Disturbance-The project's disturbed area will be limited to the area required for construction, and the duration of construction will be minimized to the extent practicable.	Check off the environmentally sound nondischarge Best Management Practices (BMPs) listed below to be used after construction that have been incorporated into the PCSM/SR Plan based on your site analysis. For non-discharge BMPs not checked, provide an explanation of why they were not utilized. Also for BMPs checked, provide an explanation of why they were utilized. (Provide the analysis and attach additional sheets if necessary) Alternative Siting: The best possible pipeline route was selected based on landowner agreements, minimization of environmental impacts, avoidiance of future PA Turnpike expansion, and engineering/constructibiliy factors. Riparian Buffers- Ripairian buffers will be protected to the extent practicable during construcion activities at stream crossings. Riparian Forest Buffers- Ripairian Forest Buffers will be protected to the extent practicable during construction activities at stream crossings. Limited Disturbed Area and Limiting Extent & Duration of Disturbance-The project's disturbed area will be limited to the area required for construction, and the duration of construction will be minimized to the extent practicable.
Nondischarge BMPs ☐ Alternative Siting ☐ Alternative location ☐ Alternative configuration ☐ Alternative location of discharge ☒ Limited Disturbed Area ☒ Limiting Extent & Duration of Disturbance (Phasing, Sequencing) ☐ Riparian Buffers (150 ft. min.) ☐ Riparian Forest Buffer (150 ft. min.) ☐ Other _____	**Nondischarge BMPs** ☐ Alternative Siting ☐ Alternative location ☐ Alternative configuration ☐ Alternative location of discharge ☐ Low Impact Development (LID / BSD) ☐ Riparian Buffers (150 ft. min.) ☐ Riparian Forest Buffer (150 ft. min.) ☐ Infiltration ☐ Water Reuse ☒ Other re-construction drainage pattern intact within the right-of-way

Will the non-discharge alternative BMPs eliminate the net change in rate, volume and quality during construction? ☐ Yes ☒ No If yes, antidegradation analysis is complete. If no, proceed to Part 2.	Will the non-discharge alternative BMPs eliminate the net change in rate, volume and quality after construction? ☐ Yes ☒ No If yes, antidegradation analysis is complete. If no, proceed to Part 2.

PART 2 - ANTIDEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES (ABACT)

If the net change in stormwater discharge from or after construction is not fully managed by nondischarge BMPs, the applicant must utilize ABACT BMPs to manage the difference. The Applicant must specify whether the discharge will occur during construction, post-construction or both, and identify the technologies that will be used to ensure that the discharge will be a non-degrading discharge. ABACT BMPs include but are not limited to:

E & S Plan	PCSM/SR Plan
☒ **Treatment BMPs:** ☐ Sediment basin with skimmer ☐ Sediment basin ratio of 4:1 or greater (flow length to basin width) ☐ Sediment basin with 4-7 day detention ☐ Flocculants ☒ Compost Filter Socks ☐ Compost Filter Sock Sediment Basin ☒ RCE w/ Wash Rack ☐ **Land disposal:** ☐ Vegetated filters ☐ Riparian buffers <150ft. ☐ Riparian Forest Buffer <150ft. ☐ Immediate stabilization ☒ **Pollution prevention:** ☒ PPC Plans ☐ Street sweeping ☐ Channels, collectors and diversions lined with permanent vegetation, rock, geotextile or other non-erosive materials ☐ **Stormwater reuse technologies:** ☐ Sediment basin water for dust control ☐ Sediment basin water for irrigation ☒ **Other <u>Rock construction entrances with wash rocks, compost filter sock, and erosion control blanket,placed within 100 feet of streams.</u>**	☐ **Treatment BMPs:** ☐ Infiltration Practices ☐ Wet ponds ☐ Created wetland treatment systems ☐ Vegetated swales ☐ Manufactured devices ☐ Bio-retention/infiltration ☐ Green Roofs ☐ **Land disposal:** ☐ Vegetated filters ☐ Riparian Buffers <150ft. ☐ Riparian Forest Buffer <150ft. ☐ Disconnection of roof drainage ☐ Bio-retention/bio-infiltration ☒ **Pollution prevention:** ☐ Street sweeping ☐ Nutrient, pesticide, herbicide or other chemical application plan alternatives ☒ PPC Plans ☐ Non-structural Practices ☒ Restoration BMPs ☐ **Stormwater reuse technologies:** ☐ Divert rainwater into impoundment ☐ Underground storage ☐ Spray/Drip Irrigation ☐ **Other** _____
Are the ABACT BMPs selected sufficient to minimize E&S discharges to the extent that existing or designated surface water uses are protected? ☒ Yes ☐ No If yes, Antidegradation analysis is complete. If no, NOI Application will be returned to the Applicant.	Are the ABACT BMPs selected sufficient to achieve no net change and assure that existing or designated surface water uses are protected? ☒ Yes ☐ No If yes, Antidegradation analysis is complete. If no, NOI Application will be returned to the Applicant.

SECTION J. COMPLIANCE HISTORY REVIEW

Is/was the applicant(s) in violation of any Department regulation, order, schedule of compliance or permit or in violation of any department regulated activities within the past five years?

☒ Yes ☐ No

If yes, provide the permit number or facility name, a brief description of the violation, the compliance schedule (including dates and steps to achieve compliance) and the current compliance status. (Attach additional information on a separate sheet, when necessary)

Permit Program or Activity: ESCGP-2 **Permit Number (if applicable):** ESG0100015001

Brief Description of non-compliance:

Descriptions are included in the table provided in Section 9.

Steps taken to achieve compliance	Date(s) compliance achieved
Steps taken are included in the "date resolved" column of the Section 9 table.	See the "date resolved" column of the Section 9 table.

Current Compliance Status: ☐ In-Compliance ☒ In Non-Compliance

If in non-compliance, attach schedule for achieving compliance.

SECTION K. CERTIFICATION BY PERSON PREPARING E&S AND PCSM/SR PLANS

I do hereby certify to the best of my knowledge, information, and belief, that the Erosion and Sediment Control and PCSM/Site Restoration Plans are true and correct, represent actual field conditions, and are in accordance with the 25 Pa. Code Chapters 78/78a and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Print Name Robert Simcik	Signature	Professional Seal
Company Tetra Tech, Inc.		
Address 661 Andersen Drive, Suite 200, Pittsburgh, PA 15220		
Phone 412-921-8163		
Most Recent DEP Training Attended	Location: Greensburg, PA	Date: 04/03/2014
e-Mail Address robert.simcik@tetratech.com		

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT F. SIMCIK
ENGINEER
PE-050435-E

EXPEDITED REVIEW PROCESS

In addition to the certification required above, applicants using the expedited permit review process must attach an E&S and PCSM/Site Restoration Plans developed and sealed by a licensed professional engineer, surveyor or professional geologist. The plans shall contain the following certification:

I do hereby certify to the best of my knowledge, information, and belief, that the E & S Control and PCSM/SR BMPs are true and correct, represent actual field conditions and are in accordance with the 25 Pa. Code Chapters 78 / 78a and 102 of the Department's rules and regulations. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SECTION L. APPLICANT CERTIFICATION

Applicant Certification

I certify under penalty of law, as provided by 18 Pa. C.S.A. § 4904, that this application and all related attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my own knowledge and on inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. The responsible official's signature also verifies that the activity is eligible to participate in the ESCGP, and that the applicant agrees to abide by the terms and conditions of the permit. BMP's, E&S Plan, PPC Plan, PCSM Plan, and other controls are being or will be, implemented to ensure that water quality standards and effluent limits are attained.

I grant permission to the agencies responsible for the permitting of this work, or their duly authorized representative to enter the project site for inspection purposes. I will abide by the conditions of the permit if issued and will not begin work prior to permit issuance.

(For individuals no indication of title is necessary, choose the box below. All others proceed to the next paragraph)

☐ **Individual; proceed to signature portion.**

I hereby certify under penalty of law, as provided by 18 Pa. C.S.A. § 4904, that I am the person who is responsible for decision-making regarding environmental compliance functions for Enter Entity name, the manager of one or more manufacturing, production, or operating facilities of the applicant and am authorized to make management decisions which govern the operation of regulated facility including having explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure the applicant's long term environmental compliance with environmental laws and regulations; and I am responsible for ensuring that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements.

(choose one of the following; not applicable for individuals):

☐ The responsible corporate officer ☐ president ☐ vice president ☐ secretary
☐ treasure of _____ Corporation/Company
Entity name

☒ The ☐ member or ☒ manager of ENERGY TRANSFER LLC
Entity name

☐ The general partner of _____ partnership/LP/LLP
Entity name

☐ The principal executive officer or ranking elected official of _____ Municipality/State/Federal/other public agency
Entity name

☐ Power of Attorney/delegation of contractual authority (documentation supporting delegation of contracting authority must be provided) for _____
Entity name

Matthew Gordon, Senior Director
Print Name and Title of Applicant

Signature of Applicant

3/28/2019
Date Application Signed

Jayme Fye, Project Manager
Print Name and Title of Co-Applicant (if applicable)

Signature of Co-Applicant

Date Application Signed

Notarization

Sworn to and subscribed to before me this
28TH day of MARCH, 2019

Ronald J. Furman
Notary Public

Commonwealth of Pennsylvania
County of _____

My Commission expires _____

AFFIX SEAL

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Ronald J. Furman, Notary Public
Spring Twp., Berks County
My Commission Expires April 4, 2020
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

(choose one of the following; not applicable for individuals):

☐ The responsible corporate officer ☐ president ☐ vice president ☐ secretary
☐ treasure of _____ Corporation/Company
Entity name

☐ The ☐ member or ☐ manager of _____ LLC
Entity name

☐ The general partner of _____ partnership/LP/LLP
Entity name

☐ The principal executive officer or ranking elected official of _____ Municipality/State/Federal/other public agency
Entity name

☐ Power of Attorney/delegation of contractual authority (documentation supporting delegation of contracting authority must be provided) for _____
Entity name

Matthew Gordon, Senior Director
Print Name and Title of Applicant

_____
Signature of Applicant

_____
Date Application Signed

Jayme Fye, Project Manager
Print Name and Title of Co-Applicant (if applicable)

J.F.
Signature of Co-Applicant

3/26/19
Date Application Signed

Notarization
Sworn to and subscribed to before me this

_____ day of _____, 20_____

_____
Notary Public

AFFIX SEAL

Commonwealth of Pennsylvania

County of CHESTER

My Commission expires OCT 28 - 2022

Commonwealth of Pennsylvania - Notary Seal
Michael J. Gaydosh, Notary Public
Indiana County
My commission expires October 28, 2022
Commission number 1227953
Member, Pennsylvania Association of Notaries

SECTION M. ADDITIONAL CONTACT INFORMATION				
Contact's Last Name	First Name	MI	Phone	412-921-8163
Simcik	Robert	F	FAX	412-921-4040
Mailing Address	City		State	ZIP + 4
661 Andersen Drive, Suite 200	Pittsburgh		PA	15220
e-Mail Address Robert.Simcik@tetratech.com				

Summary of Bio-Infiltration BMPs														
	Infiltration Information					Drainage Information				BMP Information				
Proposed Structural bio-Infiltration BMPs (site specific)	Measured Infiltration Rate[1] (in./hr)	Factor of safety (min. of 2)	Design Infiltration rate (in./hr)	De-watering time[2] (hr)	Elevation of limiting zone-water table bedrock, etc.[3]	Total drainage area to BMP (sq. ft)	Total impervious drainage area to BMP (sq. ft)	Infiltration BMP Surface area (sq. ft)	Volume of runoff tributary to BMP during the 2yr/24 hr design storm[4] (cf)	Calculated removed volume (cf)	Maximum water surface elevation in BMP from 2yr storm[6]	Infiltration elevation bottom of bed/basin[6]	Elevation of infiltration test[7]	Elevation of E&S sediment basin bottom (if applies)

All information should be based on the 2-yr/24-hr storm.
Provide page numbers from the stormwater narrative identifying the location of the above information.

[1]The infiltration testing information should be located on the plan view of the PCSM plan and should include infiltration test elevation and rate
[2]Can include active infiltration time-dewatering time should not exceed 72 hours after the 2-yr/24-hr storm
[3]Depth to limiting zone is recommended to be at least 2 ft below infiltration
[4]The value should be greater than or equal to the volume to be infiltrated or managed by the BMP
[6]A maximum of 2 ft hydraulic head is recommended
[7]Provide supporting field notes/documentation from soil evaluation

Any deviation from the recommendations above should be adequately justified by a qualified professional and included with the application.

Note: This chart is for summary purposes only and should be consistent with all design calculations and worksheets.

Geohazard Evaluation

TETRA TECH

MEMO

To:	Rob Simcik, Tetra Tech
Cc:	Megan Carson, Tetra Tech
From:	Bill Smith, PE, Tetra Tech
Date:	2/25/2019
Subject:	**PPP Turnpike 280 Reroute Major Modification - Desktop Geohazard Evaluation**

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WILLIAM C. SMITH
ENGINEER
038102E

2/25/19

Tetra Tech performed a desktop geotechnical review of the proposed Turnpike 280 reroute using publicly available information to identify areas of potential concern along the proposed alignment and access roads with respect to potential geologic hazards. References included the following:

- PASDA, LiDAR topography, 2006 (UTM NAD83 Zone 17 Feet).
- PASDA, Karst features, PADCNR, 2007.
- PADCNR Scans of USGS Landslide Inventory Maps for PA. PADCNR 8/29/2017.
- NCRS Soil Survey for Chester County, PA, Web Soil Survey.
- Chester County Multi-Jurisdictional Hazard Mitigation Plan, 2015. Chester County Department of Emergency Services, October 2015.
- PADEP (2018) https://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Arsenic-in-Drinking-Water.aspx
- PADEP (2016) Technology Enhanced Naturally Occurring Radioactive Materials (TENORM) Study Report
- http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5815&DocName=01%20PENNSYLVANIA%20DEPARTMENT%20OF%20ENVIRONMENTAL%20PROTECTION%20TENORM%20STUDY%20REPORT%20REV%201.PDF%20
- US Geological Survey (2006). Arsenic in Coal. Fact Sheet 2005-3152
- US Geological Survey (2013). Arsenic Concentrations, Related Environmental Factors, and the Predicted Probability of Elevated Arsenic in Groundwater in Pennsylvania. Scientific Investigations Report 2012-5257.

Figure 1 depicts the pipeline right-of-way and the 600' study corridor for the geohazard evaluation. This figure shows documented and suspected landslides, steep slopes, karst features, and soils that are prone to slipping.

A separate coal and mining review was conducted and is included as Attachment A.

Tetra Tech, Inc.
661 Andersen Drive, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

USGS Landslide Inventory Review

The Major Modification alignment does not intersect any areas of old landslides or active or recently active landslides as designated by USGS. The Chester County Multi-Jurisdictional Hazard Mitigation Plan indicates that landslides in Chester County are unlikely given its topography.

Topographic Review for Recent Landslides

Recent PASDA LiDAR topography was reviewed for evidence of suspected landslides or earthflow. The Major Modification alignment does not intersect any suspected landslides based on topographic review.

Steep Slopes

Steep slopes (greater than 2 horizontal to 1 vertical) were evaluated along the pipeline alignment. Steep slopes along the pipeline alignment are located in the following approximate areas:

- Station 14751+70 to 14752+10,
- Station 14752+30 to 14752+50, and
- Station 14752+80 to 14752+90.

Soil Type Review

The soil types were assessed to ascertain which types intersected the pipeline and access roads. Each soil type and the corresponding Soil Slippage Potential, as designated by NCRS, are listed below. The soil slippage potential is the hazard that a mass of soil will slip when vegetation is removed, soil water is at or near saturation, and other normal practices are applied.

Soils along the Turnpike 280 Major Modification include:

Soil Symbol	Map Unit Name	Slippage Rating
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	NR
GeD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	NR
Ha	Hatboro silt loam	NR
UugB	Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes	NR
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	NR

NR = No Rating

Soil types are overlaid on the alignment on Figure 1. There are no soils that have a high soil slippage rating along the pipeline LOD.

Karst/Sinkhole Formations

There are no PA DCNR karst features in the major modification alignment.

Coal and Mining Review

The coal and mining review is provided in Attachment A and summarized here.

There are no coal seams or coal bearing units in Chester County. Research of available published information indicates no deep, underground or surface mining has occurred or is permitted along the modification route

In the Piedmont physiographic province, dark shales, sulfide mineralized areas, fractured rocks and rocks with little calcareous material have the potential to produce acidic discharges; however, according to PGS (2005), Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss are not noted as acid-producing.

If coal or black shales are encountered during excavation for the project, the potential impact from acid producing minerals is expected to be minimal due to the shallow excavation and most of these shallow areas would not contain pollution-forming minerals as the material is expected to be highly weathered. BMPs will be used to mitigate potential impacts from encountering acid-producing rock formations.

Radiation

Most soils and rocks contain low-levels of naturally occurring radioactive material (NORM). This material can be concentrated through physical or chemical processing resulting in technologically enhanced NORM called TENORM. Examples of TENORM containing materials include fire brick, water and wastewater treatment residuals, coal ash and decorative polished rock commonly used in building or home construction. The three primary naturally radioactive elements are potassium, thorium, and uranium. Both potassium and thorium are typically found in insoluble minerals and unlikely to present any issues. Uranium is common in marine, organic-rich, black shales, which are the primary radioactive mineral bearing formations, but sometimes occurs in non-marine, organic-rich, black shales.

Formations designated by the PADEP that pose a high radioactive risk include the Antes Formation (Utica), Mandata Formation, Marcellus Formation, Burket Member of the Harrell Formation, and Lockatong Formation. None of these formations are found near the surface in southwestern Pennsylvania or the project area, and this project will not involve Marcellus/Utica drill cuttings or flowback fluids.

Arsenic

Arsenic occurs naturally in trace amounts in soil, water, rocks, including coal (within the pyrite and organic portions), and can be in mine drainage. While coal and associated trace mineral Arsenic, is prevalent throughout southwest Pennsylvania and the project area, the project is not crossing any known mining waste areas which may have elevated levels of arsenic.

Mitigation Plan

The following areas of the Turnpike 280 Major Modification are at an increased risk of soil slippage or sliding from a geologic hazard.

Station	Potential Geologic Hazard	Mitigation Measures
14751+70 to 14752+10	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles.

		If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.
Station 14752+30 to 14752+50	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles. If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.
Station 14752+80 to 14752+90	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles. If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.

Conclusions/Recommendations

Based on this desktop geohazard evaluation, the Turnpike 280 Major Modification does not intersect any known or suspected landslide areas but does intersects several areas of steep slopes that constitute potential geohazards, and mitigation measures may be warranted. Suggested mitigation measures are outlined above to focus inspection efforts and call attention to several areas requiring special attention by inspectors and engineers during construction and restoration to enable prevention and early detection of a problem if one develops.

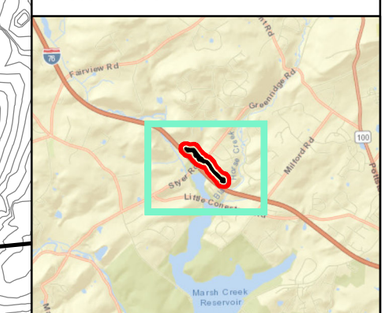
*** End ***

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\TURNPIKE_280_GEOHAZARD.MXD 04/01/19 PD

Legend

- PA State Road
- PA Local Road
- 16in Centerline
- 20in Centerline
- DCNR Karst Feature
- Limit of Disturbance
- 300ft Buffer
- Soil Boundary
- Active or Recently Active Landslide, USGS
- Old Landslide, USGS
- Suspected Landslide Area, Topographic Review
- Slope>3:1
- 0+00 2' Contour
- Pipe Station

Sheet Identifier



Feet: 0 250 500

Meters: 0 76.2 152.4

FIGURE 1
GEOHAZARD EVALUATION
PENNSYLVANIA PIPELINE PROJECT
TURNPIKE 280 MAJOR MODIFICATION
SUNOCO LOGISTICS, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

PASDA LIDAR TOPOGRAPHY, 2006
(UTM NAD83 ZONE 17 FEET).

Attachment A

Coal and Mining Review

PPP Turnpike 280 Major Modification

April 1, 2019

Sunoco Pipeline L.P.
535 Fritztown Road
Sinking Spring, PA 19608

Subject: Pennsylvania Pipeline Project- 280 Major Modification
Acid-Forming Formations, Coal, and Mining Review
Chester County, Pennsylvania

Tetra Tech, Inc. (Tetra Tech) has prepared this review for Sunoco Pipeline L.P. (SPLP) to evaluate the coal and mining along the proposed HDD 280 Major Modification Project located in Upper Uwchlan Township, Chester County, Pennsylvania.

The purpose of this modification for a change in the route and installation method for the 16-inch and 20-inch diameter pipeline previously permitted as a Horizontal Directional Drill (HDD) to an open cut and conventional bore installation. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration.

Site Description
The project area crosses the Piedmont Upland Section of the Piedmont Province. Bedrock underlying the modification project area consists of Precambrian, Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss. Gneiss is a medium to coarse grained metamorphic rock and commonly consists of quartz, orthoclase, hornblende, biotite, and graphite.

Coal and Mining Conditions
There are no coal seams or coal bearing units in Chester County, refer to attached DCNR Map 11, Distribution of Pennsylvania Coals. Research of available published information indicates no deep, underground or surface mining has occurred or is permitted for the modification route (eMap).

Evaluation of Potential of Encountering Acid-Producing Formations
In the Piedmont physiographic province, some sulfide mineralization material has the potential to produce acidic discharges, particularly in the Pickering Gneiss (PGS, 2005). Acidic discharges are the result of down-dip drainage of ground water that has intersected and reacted with the sulfide-bearing minerals. However, acidic drainage may not always occur within those units.

If coal or black shales are encountered during excavation for the project, the potential impact from acid producing minerals is expected to be minimal due to the shallow excavation for the pipeline trench (less than 7 feet). It is our opinion that most of these shallow areas would not contain pollution-forming minerals as the material is expected to be highly weathered and the majority of the pollution-forming minerals leached from the material due to years of weathering cycles. The low risk of acid drainage from shallow weathered material is also noted in PADEP's *How to Avoid and Handle Acid-Producing Rock Formations Encountered during Well Site Development*.

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No coal-bearing rocks or AMD discharges are noted within the project area on eMAP. According to PGS (2005), the Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss are not noted as acid-producing.

Measures to Prevent or Mitigate Acidic Discharges

If the trench excavation encounters an acidic discharge, changes to the volume or chemistry are not anticipated. The trenching would not increase or decrease the volume of acidic discharges because the volume is controlled by precipitation and hydro-geologic parameters. The chemistry of acidic discharges is not anticipated to change due to the shallow excavation into weathered material.

Several measures will be implemented to reduce the potential and mitigate for pollution from trench excavation activities that encounter coal, black shale, or acidic discharges. These measures are as follows:

- When coal, black shale, or other acid-forming material is encountered during the excavation, the excavated material will be covered with tarps, mats, or blankets. Water is to be directed away from the temporary stockpiled material and the trench until the material is returned to the trench.
- If water accumulates in the trench within the areas of excavated acid-forming material, use a field pH meter to test the pH of the water. If the pH is between 6.0 to 9.0 standard units, inclusive, pump water that accumulates in the trench through a filter bag and slowly discharge to a well vegetated area. If the water pH is not within 6.0 to 9.0 range, collect the water and transfer to an approved treatment facility.
- Backfill the trench with the removed material and conduct alkaline addition by following PADEP's *How to Avoid and Handle Acid-Producing Rock Formations Encountered during Well Site Development*. Fact Sheet 5600-FS-DEP4284.
- Additional trench plugs may be needed to limit water encountering the coal material along the sides of the trench. Trench plugs to seal off the acid-forming material should consist of clay.
- Perform immediate stabilization of the pipe ROW after installation of the pipe by returning the area to original topographic grade.
- Prepare the disturbed area for permanent seeding with the use of lime and fertilizer. It is recommended to test the soil in areas of past surface/strip mines, or where coal or black shale are near the surface to determine the optimum liming rate. In the absence of testing, apply at 6 tons/acre. Limestone is applied to neutralize the acidity in soil. Blending of soils is recommended to mix potentially acidic materials with materials that have buffering capacity.
- Immediately mulch and seed all disturbed areas with the temporary and/or permanent seed mixture. PADEP and Penn State University have identified seed mixes that are more suited to acidic conditions and should be applied when acid-forming materials are near the surface.
- Monitor the areas until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established.
- If acid-forming material is to be hauled offsite, waste materials are to be disposed of at an approved DEP waste site (permitted coal refuse area or landfill).

TETRA TECH

Closing

If you have any questions or comments, please feel free to contact me at 412-921-8051 or heather.trexler@tetratech.com.

Sincerely,

Heather Trexler

Heather Trexler, P.G.
Project Manager, Energy and Natural Resources Department

COMMONWEALTH OF PENNSYLVANIA
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Enclosures

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Pennsylvania Department of Environmental Protection. 2019. eMapPA http://www.depgis.state.pa.us/emappa/

Pennsylvania Department of Environmental Protection (PADEP). 2014. How to avoid and handle acid-producing rock formations encountered during well site development. Fact Sheet 5600-FS-DEP4284

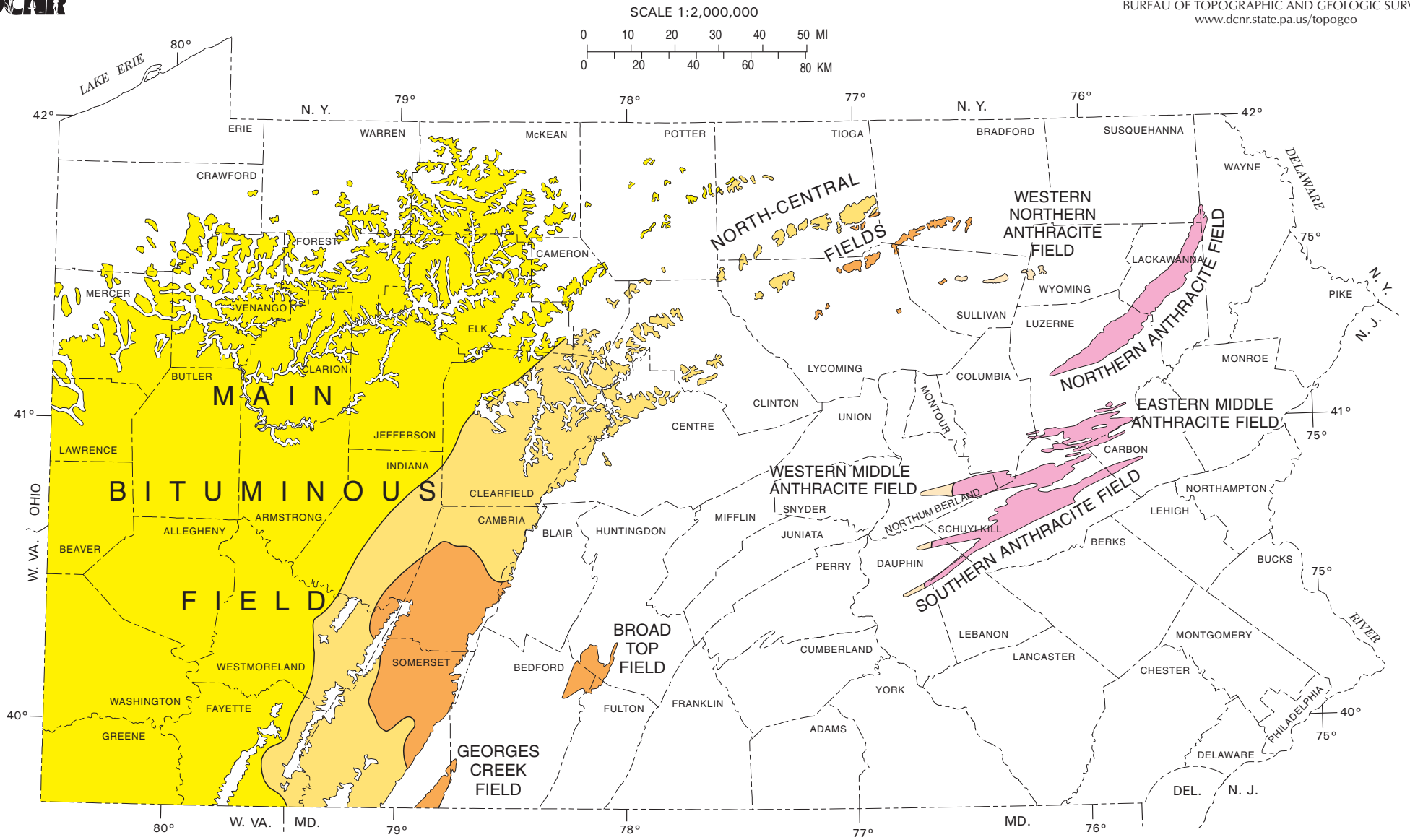
Pennsylvania Geologic Society (PGS). 2005. Geologic units containing potentially significant acid-producing sulfide minerals. Pennsylvania Geological Survey. 4th Ser. Open-File Report OFMI 05-01.1.

Figures

MAP 11

DISTRIBUTION OF PENNSYLVANIA COALS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

BITUMINOUS FIELDS

- High-volatile bituminous coal
- Medium-volatile bituminous coal
- Low-volatile bituminous coal

ANTHRACITE FIELDS

- Semi-anthracite
- Anthracite

Prepared by Bureau of Topographic and Geologic Survey.
Third Edition, Revised, 2000; Third Printing, 2008.

2200–MP–DCNR0855
Printed on Recycled Paper

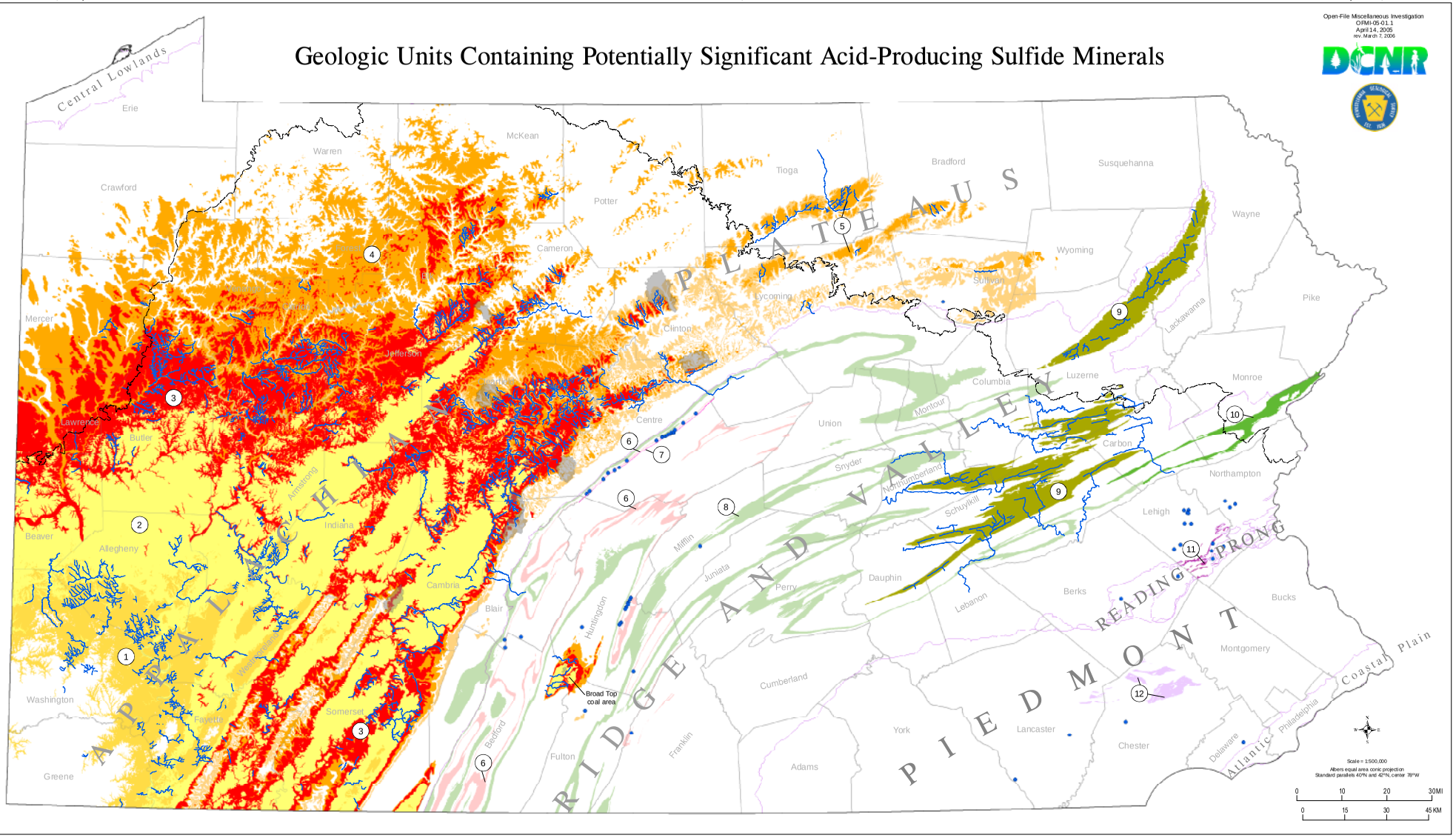
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Michael DiBerardinis, Secretary

COMMONWEALTH OF PENNSYLVANIA
Edward G. Rendell, Governor

BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
Jay B. Parrish, Director

Open-File Miscellaneous Investigation
OFMI-05-01.1
April 14, 2005
rev. March 7, 2006

Geologic Units Containing Potentially Significant Acid-Producing Sulfide Minerals



EXPLANATION

Map Compilation Notes

Original map scale is 1:500,000. The map is not intended to be used for detailed or site-specific analyses, nor is it intended to be used at any scale finer than 1:250,000 (for example, use at 1:24,000 or 1:100,00 scales is inappropriate).

Map rock formation color does not imply "risk" or potential of acid drainage, but only represents different geologic units.

Bedrock geology units are based on the digital compilation by Miles and Whitfield, 2001.

Map Layers

Point locations of potentially significant sulfide mineralization based on published and unpublished information, Pennsylvania Geological Survey (PaGS).

Late Wisconsinan glacial border (PaGS, 1995).

Preliminary landform subdivisions of Pennsylvania (PaGS, 1998).

Streams impaired by abandoned mine drainage from 1998 to 2004 with problems listed as including pH and/or metals, Pennsylvania Department of Environmental Protection, 2004.

Areas declared by Pennsylvania Department of Environmental Protection to be unsuitable for mining due to potential AD.

Appalachian Plateaus

(1) Monongahela Group and Waynesburg Formation. Includes known problematic coals such as the Pittsburgh and Waynesburg coals (and underclays), and the Sewickley coals, which can also have acidic drainage.

(2) Conemaugh Group. Includes the Casselman and Glenshaw Formations, and the Conemaugh Formation of the Broadtop coal region in northeastern Bedford and southern Huntingdon Counties. Although typically not as problematic as other coal-bearing units, the Conemaugh can produce acid drainage.

(3) Allegheny Formation. Includes problematic coals such as the Clarion, Lower Kittanning, and Middle Kittanning coals. Fewer problems occur with the Upper Kittanning and Freeport coals.

(4) Pottsville Formation, in western Pennsylvania, and Pottsville and Allegheny Formations, undivided, in north-central Pennsylvania. Especially east and southeast of the plateau along the Allegheny Front; includes the Mercer coals, which can be problematic. Calcareous minerals are rare in the Pottsville.

(5) Burgoon Formation, in north-central Pennsylvania and along the Allegheny Front.

Ridge and Valley

(6) The Tuscarora Formation in Huntingdon, Bedford, Blair, and Centre Counties, and in the Metal Township area, Franklin County.

Ridge and Valley

(7) The Bald Eagle Formation along Bald Eagle ridge in Centre County.

(8) The top of Ridgeley Formation through base of Marcellus Formation (including the Onondaga Formation). Map units shown are the Ridgeley member of the Old Port Formation, Onondaga Formation, Onondaga and Old Port Formations, undivided, and the Hamilton Group, but only the top of the Ridgeley and the base of the Marcellus are targets.

(9) The anthracite coal fields in eastern Pennsylvania (includes the Pottsville and Llewellyn Formations).

(10) In the Carbon and Monroe Counties area, the top of Palmerton Sandstone through base of Marcellus Formation, Carbon County. Map units include Buttermilk Falls Limestone through Esopus Formation, undivided, and the Marcellus Formation, but only the top of Palmerton Sandstone and the base of Marcellus Formation are targets.

Piedmont and Reading Prong

(11) The base of Hardyston Formation in Lehigh County. All of the Hardyston Formation in Lehigh County is shown.

(12) The Pickering Gneiss. Map unit is the graphitic felsic gneiss.

Potential Acidic Rock Units in Pennsylvania

Typical geologic weathering of undisturbed rock is a slow process involving the natural stability of minerals on the Earth's surface. In most cases in Pennsylvania, acidic drainage involves iron sulfide minerals such as pyrite and its exposure to air to create iron oxides and acidic water. Naturally occurring acute acid drainage is uncommon in Pennsylvania. In every significant case, it is the exposure of iron sulfides to air by dropping the water table or *excavating rock*, the lack of any inherent buffering capability, and the flow of water through the rocks that create acidic drainage.

The chemistry of acid drainage (AD) is understood, and prediction of AD is possible through a combination of several methods. Experience and understanding of specific geologic formations and combinations of geologic units on a regional and local scale are used to assess the potential for acidic drainage. Quantitative onsite prediction of acidic drainage has become possible through the geochemical analysis of the rocks. Calculations of acid-base balance based on neutralization potential and potential acidity can be used to quantitatively predict whether disturbance of a site will cause AD. Such calculations in conjunction with site history and experience, along with judgments with regard to geology and site hydrology, allow accurate predictions to be made.

Although specific geologic units are known to possibly cause problems, numerous factors influence the outcome of mining or excavation of the rock unit. The presence of buffering substances (mainly calcareous minerals) is a chief factor in preventing the development of AD. The occurrence of calcareous minerals is related to the rock type and the depositional environment of rocks at the site. Calcareous minerals can prevent the occurrence of AD in rocks that contain acid-forming minerals. In addition, the kinetics of the reaction may not allow AD to be seen for years.

Coal-bearing rocks of Pennsylvania have been a particular source of AD. However, all coal units and associated formations are not equal sources. Some geologic units are typically AD free; others are commonly sources of AD. Some units will produce AD depending on the overburden composition at the site.

In the Appalachian plateaus of western Pennsylvania, the extent of knowledge is typically based on the mining of coal. Less is known about units that have not traditionally been mined. For specific information about coal mine prediction of these mainly coal containing units, see the report *Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania* (Brady and others, 1998). The source of acidity (iron sulfides) is typically depositional, although structural features may have enhanced the occurence of sulfides.

The abundance and distribution of sulfides in the Appalachian plateaus are often related to depositional environment, whereas the sulfides in the Ridge and Valley physiographic province have been more affected by Alleghanian structural features (faults, fractures, lineaments, etc.) and fluid movement. To the southeast in the Piedmont, structural complexities and metamorphism combine to defy simple explanation of the occurrence of sulfide mineralization. Where sulfides are not areally large or discontinuous, scattered point occurrences of sulfide mineralization are shown on the map.

This map indicates formations that may have acid-forming minerals, primarily pyrite. Although this map is useful for general planning and preliminary site studies, it does not substitute for site-specific subsurface investigations of the rock units that will be disturbed through excavation, mining, or drilling. The occurrence of AD depends on numerous factors, including rock type, mineralogy, geochemistry, geologic structure (e.g., fractures, joints, and faults), changing the water table, surface and sub-surface hydrology, extent of geologic weathering, and depositional environments.

In addition, the extent of Wisconsinan glaciation is indicated on the map. The Wisconsinan glaciation may have removed weathered (oxidized) rocks. Thus the "inert" oxidized zone that typically blankets most rocks in Pennsylvania may be thin or absent in glaciated areas. The effect of older glacial episodes on the oxidized bedrock is not well understood.

The map indicates geologic units and points that may have the potential to generate AD. It of course does not guarantee that AD will occur or conversely, that AD cannot occur in other areas and formations not shown on this map. The occurrence of AD, therefore, is not restricted to the areas delineated on the map.

Site-specific assessment of AD potential is the only reliable way to predict it. Pre-site investigation data is often available from previous studies, including college theses, consultant reports, geologic survey reports, aerial photographs, existing geophysical surveys, and the like. There is, however, no substitute for site specific information including interviews with local residents, geologic logs of borings, analysis of site geochemistry (water and rock), and other sources of information.

General guidelines on recognizing potential acid-producing rock in Pennsylvania

The presence of sulfide-bearing rock formations and isolated occurrences of sulfide deposits in Pennsylvania depends on a wide variety of factors including the rock's depositional and structural history, its mineralogy and geochemistry, and present surface and subsurface hydrologic and geochemical environment.

The common iron-sulfide minerals pyrite (FeS_2) and less common pyrrhotite (FeS) and marcasite (FeS_2) are the dominant sources of acidity. However, specific buffering minerals can offset their presence, and the groundwater and surface water setting can control the development of AD.

Appalachian Plateaus

(1) (2) (3) (4) (5)

In the Appalachian Plateaus physiographic province, the source of acidity (iron sulfides) is typically depositional, although structural features such as faults and lineaments may enhance the occurrence of sulfides or flow of groundwater. Sulfide minerals are associated with coal-bearing rocks, some underclays, and black shales.

Every coal-bearing unit in western Pennsylvania has some potential for AD. Potentially acid-producing rocks include underclays beneath coals, the coal beds themselves, or rocks of the coal overburden. Black shales may contain significant quantities of iron sulfides. The overburden of coals associated with marine or fresh water units are less likely to yield AD than marginal marine (brackish) units due to the association of limestones and other calcareous units with marine and freshwater environments.

Some geologic units may contain only moderate levels of pyrite, but lack buffering calcareous minerals. Sandstones in the Allegheny and Pottsville Formations and the Burgoon Sandstone fall into this category.

A history of AMD, presence of black shales, rocks with low amounts of calcareous minerals, or rocks with pyritic minerals are those that should be especially considered as having the potential to produce AD. However, an unmined area with no acidic drainage does not necessarily mean that there is not a possibility of AD when rocks are excavated or the water table drops and exposes acidic rocks.

Ridge and Valley

(6) (7) (8) (9) (10)

Dark shales, sulfide mineralized areas, fractured rocks, and rocks with little calcareous material are zones that should be considered as having the potential to produce AD in the Ridge and Valley physiographic province. This could include formations with thin dark shale layers that are not listed on the map (for example, the Mifflintown Formation in central Pennsylvania).

Dark shales commonly hold primary sulfide minerals derived from its specific depositional environment. The Tuscarora Formation, a sandstone, is the host of some secondary mineralization based on its proximity to a source of sulfide minerals, insignificant calcareous material, and its tendency to fracture. Mobile sulfide-bearing solutions amassed in secondary spaces of the rock based on complex factors such as intersecting fractures and source fluid movement. Similar conditions may occur in carbonate rocks, but because of their dominant calcareous composition, they pose no known threat of AD.

Concentrated sulfide mineralization may be evident on the surface in the form of oxidized pyrite, leaving behind various iron oxide minerals as gossan. Newly excavated material beneath a gossan cap should be monitored for its ability to produce AD. The presence of sulfide minerals is typically apparent because of their production of iron oxide minerals. However, the potential of AD by rocks such as black shales that can have disseminated microscopic pyrite may be evident only through geochemical analysis.

Anthracite Region

(9)

The Anthracite Region is part of the Ridge and Valley physiographic province. Acid problems can occur when pyritic coal associated rocks are disturbed. The chemistry of the rock between the coals is poorly understood, but the presence of acid mine drainage from more than a century of mining indicates that the potential for acid drainage exists and caution should be exercised when excavating material.

Piedmont and Reading Prong

(11) (12)

Some sulfide mineralization is associated with the Pickering Gneiss and other formations. However, lithologic and structural complexity and regional metamorphism combine to make prediction of sulfide mineralization difficult. It is unlikely that all mineralization has been discovered. Scattered point occurrences of sulfide mineralization attest to the wide distribution of such mineralized areas.

As noted previously, site-specific assessment of AD potential is the only reliable way to predict it.

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Acknowledgements

Information compiled from published and unpublished information. Major contributions to this map are from:

S. Berkheiser, S. Reese, and R. Smith (retired) of the Pennsylvania Geological Survey; and D. Bisko, K. Brady, M. Gardner, M. Hill, K. Laslow, M. McCommons, M. Smith, and J. Tarantino of the Pennsylvania Department of Environmental Protection.

Worksheet 10

Worksheet 10 – Water Quality Compliance for Nitrate		
Does the site design incorporate the following BMPs to address nitrate pollution? A summary "yes" rating is achieved if at least 2 Primary BMPs for nitrate are provided across the site or 4 secondary BMPs for nitrate are provided across the site (or the equivalent) "provided across the site" is taken to mean the specifications for that BMP set forward in Sections 5 and 6 are satisfied. Proposed BMPs from PA Stormwater Best Management Practices Manual Chapter 5 & 6		
	Yes	**No**
Primary BMPs for Nitrate:	☐	☐
NS BMP 5.4.2 – Protect/Conserve/Enhance Riparian Buffers	☐	☒
NS BMP 5.5.4 – Cluster Uses at Each Site	☐	☒
NS BMP 5.6.1 – Minimize Total Disturbed Area	☒	☐
NS BMP 5.6.3 – Re-Vegetate/Re-Forest Disturbed Areas (Native Species)	☒	☐
NS BMP 5.9.1 – Street Sweeping/Vacuuming	☐	☒
Structural BMP 6.7.1 – Riparian Buffer Restoration	☐	☒
Structural BMP 6.7.2 – Landscape Restoration	☐	☒
	☐	☐
Secondary BMPs for Nitrate:	☐	☐
NS BMP 5.4.1 – Protect Sensitive/Special Value Features	☐	☒
NS BMP 5.4.3 – Protect/Utilize Natural Drainage Features	☒	☐
NS BMP 5.6.2 – Minimize Soil Compaction	☒	☐
Structural BMP 6.4.5 – Rain Garden/Bioretention	☐	☒
Structural BMP 6.4.8 – Vegetated Swale	☐	☒
Structural BMP 6.4.9 – Vegetated Filter Strip	☐	☒
Structural BMP 6.6.1 – Constructed Wetland	☐	☒
Structural BMP 6.7.1 – Riparian Buffer Restoration	☐	☒
Structural BMP 6.7.2 – Landscape Restoration	☐	☒
Structural BMP 6.7.3 – Soils Amendment/Restoration	☐	☒

Riparian Buffer Evaluation

Attachment 6 - Riparian Buffer

Pennsylvania Pipeline Project - South East Region: Spread 6

Major Modification-HDD 280

March 2019

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PENNSYLVANIA PIPELINE PROJECT - RIPARIAN BUFFER

The HDD 280 Major Modification qualifies for an exemption of the riparian buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area where the pipeline corridor crosses perpendicular to the riparian area. In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area exemption. The E&S plan drawings located in Attachment 2 of the E&S report show the 150 foot riparian buffer areas along HQ/EV streams for which this waiver is being prepared. It is assumed that all riparian forest buffers consist predominantly of native trees, shrubs and forbs and provide at least 60% uniform canopy cover. The plans show the location and limits of the work and earth disturbance. Table 1 indicates the location for which the waiver is being requested. Table 1 also indicates the designated use of the receiving water, if the water is impaired and if the water has a total maximum daily load, TMDL.

DEMONSTRATION OF WAIVER NECESSITY

A riparian buffer waiver is necessary to complete the intended scope of the pipeline project including the Major Modification. The project crosses through Chester County for approximately 23.6 miles, and Delaware County for approximately 11.4 miles. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

According to Chapter 102.14(d)(2)(ii), linear pipeline projects are eligible for a waiver from subsections (a) and (b) if the Project demonstrates there are reasonable alternatives for compliance with these subsections, the riparian buffer is undisturbed to the extent practicable, and the Project meets the requirement of this chapter. In addition, the Project must still satisfy the requirements in subsection (c) (Compliance with Subsection–Mandatory Requirements for all Riparian Buffers)

The HDD 280 Major Modification qualifies for an exemption of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. In addition to the exemption, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

ALTERNATIVES ANALYSIS

During the development and siting of the proposed Major Modification, SPLP considered a number of different alternatives alternate routes and construction design methods. While it is impractical to document all the actions taken by SPLP to avoid/minimize impacts on a project of this size, the intent of this section is to provide a summary of the major actions SPLP has taken to accomplish this goal.

For the Major Modification at the HDD 280 an alternate route was selected based on several factors. The crossing of aquatic resources is unavoidable due to the linear nature of the proposed PPP Project. Therefore, to avoid direct impacts to these resources, SPLP originally planned to HDD under a few wetlands and streams.

However, during the HDD of the 16-inch pipe there were a number of loss of circulation (LOC) occurrences that significantly slowed the HDD progress.

The existing HDD profile/plan for both the 16 and 20-inch pipelines is in proximity to the Marsh Creek State Park/Marsh Creek Lake Natural Heritage Area. Accordingly, SPLP wants to protect these sensitive areas from potential IRs associated with the continuation of HDD activities in the area based on the difficulties experienced during the initial attempts to install the 16-inch pipe. An open cut along the existing/permitted route would require impacting two wetlands and 3 streams and is located within the potential build-out areas of Pennsylvania Turnpike 76.

SPLP evaluated other routes that would minimize environmental impacts and avoid potential future growth requirements of the PA Turnpike 76. A reroute to the west would align the pipelines directly through the Marsh Creek State Park and Marsh Creek Lake Natural Heritage Area. A reroute to the east would minimize impacts to these areas and reduce the number of aquatic resource crossings to one stream. In addition, a reroute in this area could utilize the existing right-of-way of Meadow Creek Lane and avoid a new “greenfield” corridor for the majority of the route.

In conclusion, the subsurface geology at this particular location is not considered suitable for an HDD crossing based on the LOCs experienced during the 16-inch HDD. In addition, an open cut installation through this area is not desirable due to resource impacts and potential future development plans. An alternative route to the west of the proposed crossing would result in more environmental (forested areas, wetlands, parks, NHA) impacts. Consequently, it is the professional opinion of the HDD Reevaluation Team, consisting of the Geotechnical Evaluation Leader, Professional Geologists, Professional Engineers, and other construction specialists that a reroute to the east using the open cut, dry construction method for the one stream crossing will have the least impact, as the work area and stream flow will be managed in accordance with all permit conditions and can be completed in the most efficient and timely manner, including restoration/stabilization of the stream.

DEMONSTRATION OF MINIMIZING IMPACTS

All disturbance activities, including those which impact riparian buffers, have been reduced to the maximum extent practicable. The limit of disturbance (LOD) has been reduced to 50 feet within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the PADEP manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control best management practices (BMPs). In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less.

Workspaces that provide additional space for stream crossing activities have been placed outside of riparian buffers where possible.

MEETING REQUIREMENTS OF CHAPTER 102

All other requirements of Chapter 102 to minimize impacts to riparian buffers are being met in the project's Erosion and Sediment Control Plan and Site Restoration/Post-Construction Stormwater Management Plans which have been designed in accordance with Chapter 102 and in HQ/EV watersheds to implement ABACT controls where non discharge alternatives do not exist. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas through the use of properly designed E&S bmp's such as, but not limited to, waterbars, compost filter sock, diversion berms, slope pipes and erosion control blanket. A site restoration plan is proposed to revegetate the buffer areas within the right of way.

Table 1:
Riparian Buffer Waiver Information
South East Region

E&S SHEET NUMBER	STREAM NAME	PERPENDICULAR OR NON-PERPENDICULAR	STATIONING	DESIGNATED USE	IMPAIRMENT	TMDL (Yes/No)	LENGTH OF BUFFER	WIDTH OF BUFFER	AREA OF BUFFER	LENGTH OF TIME OF DISTURBANCE
CHESTER										
ES-6.25	UNT to Chester Creek	Perpendicular	14756+25	HQ-TSF	No	Yes	198'	130'	0.25	30 days

Note: The waiver requests are a direct result of locating the line within and adjacent to the existing right of way.

Table 2:
Alternatives Information
HDD 280 Major Modification

STREAM NAME	PERPENDICULAR OR NON-PERPENDICULAR	DESIGNATED USE	LENGTH OF BUFFER	WIDTH OF BUFFER	AREA OF BUFFER	Alternatives Considered
Chester						
UNT to Marsh Creek	Perpendicular	HQ-TSF	198'	130'	0.25	Original ROW not viable. Major Modification re-route minimizes impacts to Waters of the Commonwealth and avoid future proposed PA Turnpike expansion.

Off Site Discharge Analysis

Attachment 8 –Off Site Discharge Analysis

Pennsylvania Pipeline Project -

South East Region: Spreads 6

Major Modification-HDD 280

March 2019

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PENNSYLVANIA PIPELINE PROJECT – MAJOR MODIFICATION HDD 280

The Major Modification consists of a change in the route and installation method for the 16 and 20-inch diameter pipeline previously permitted as Horizontal Directional Drill (HDD) 280. The permit request is to convert the installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The change in methodology is to minimize impacts to Waters of the Commonwealth and avoid potential future growth requirements of the PA Turnpike 76.

There are several locations along the Major Modification length of the pipeline which have off-site discharges to areas other than surface waters and a list of these locations can be found in table 1. All of these discharges are from waterbars installed throughout the length of the pipeline installation. These water bars are designed in accordance with the PADEP's Erosion and Sediment Pollution Control Program Manual (363-2134-008) and the Pennsylvania Stormwater Best Management Practices manual (363-0300-002) and is a non-erosive discharge. Details of these measures can be found in the E&SC plan.

Table 1:
Off-Site Discharge to Non Surface Water Locations

E&S SHEET NUMBER	STREAM NAME	STATIONING
CHESTER		
ES - 6.25	UNT to Marsh Creek	14752+25 through 14758+50

3. E&S REPORT AND ATTACHMENTS

Erosion and Sediment Control Plan

Pennsylvania Pipeline Project – Southeast Region: Spread 6

Major Modification-HDD 280

March 2019

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LIST OF ACRONYMS

ACRONYM	MEANING
% CCE	Calcium carbonate equivalent
% ENV	Effective neutralizing value
ABACT	Antidegradation Best Available Combination of Technologies
BMPs	Best management practices
CWF	Cold water fisheries
DELCORA	Delaware County Regional Water Quality Control Authority
E&S	Erosion and sediment
E&SC	Erosion and sediment control
EV	Exceptional value

FEMA	Federal Emergency Management Agency
HDD	Horizontal directional drill
HQ	High quality
LOD	Limit of disturbance
NGL	Natural gas liquid
OSHA	Occupational Safety and Health Administration
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PASDA	Pennsylvania Spatial Data Access
PCSM	Post Construction Stormwater Management
PWS	Public water source
Pls	Pure live seed
ROW	Right of way
SPLP	Sunoco Pipeline, L.P.
SPPP	Sunoco Pennsylvania Pipeline Project
SWS	Surface water source
Tt	Tetra Tech, Inc.
TSF	Trout stock fishery
UNT	Unnamed tributary
USGS	United States Geological Survey
WWF	Warm water fisheries

1.0 INTRODUCTION

Tetra Tech, Inc. (Tt) has prepared this Erosion & Sediment Control (E&SC) Plan for Sunoco Pipeline, L.P. (SPLP) – Pennsylvania Pipeline Project, South East Region: Spread 6. Spread 6 (South East Region) of this project is located in Chester and Delaware Counties, Pennsylvania (PA). The plan addresses activities associated with a major modification to the Sunoco Pennsylvania Pipeline Project (SPPP) installation. The 280 HDD modification is located in Upper Uwchlan, Chester County. Site location maps are provided in Attachment 1. This E&SC Plan, if properly implemented, will provide for effective E&SCs throughout construction.

1.1 PROJECT DESCRIPTION

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project that would expand existing pipeline systems to provide natural gas liquid (NGL). The project involves the installation of approximately two parallel pipelines within a 306.8-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in Delaware County, The 20-inch pipeline and 16-inch line will be installed in the same trench. Any temporary stabilization required will be implemented in accordance with this Erosion and Sediment (E&S) Plan. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration. The additional LOD for this Amendment in Chester County is 4.86 Acres.

The HDD 280 Major Modification consists of a change in the route and installation method for the 16 and 20-inch diameter pipeline previously permitted as Horizontal Directional Drill (HDD) 280. The permit request is to convert the installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The change in methodology is to minimize impacts to Waters of the Commonwealth and avoid future expansions of PA Turnpike I-76. The requested reroute will cross the floodways of streams S-Q83, S-16r, and S-Q84. Stream S-Q83 will be crossed in accordance with one of the approved open-trench excavation methods for installation of the pipeline across waterbodies. The reroute includes an additional 4.86 acres of LOD. This E&S plan specifically relates to impacts associated with the proposed 280 HDD Major Modification.

For a conventional lay, the pipelines would be installed within the same area of disturbance to the maximum extent practicable. Any temporary stabilization required would be implemented in accordance with project's E&S Plans.

Past and present land use of the project area and surrounding area for this Amended area is residential and under existing township owned roadway. Future land use will be a maintained vegetated natural gas pipeline ROW in residential areas and restore roadway in those areas. Relevant topographic features including streams, streets, pipelines, structures, utility lines, fences, paving and other significant items along the gas line alignment are indicated on the plans, where applicable.

1.2 APPROACH AND OVERVIEW

This E&SC Plan was developed using Pennsylvania Department of Environmental Protection (PADEP) guidance documents and sound engineering judgment. When implemented properly, the E&SC practices identified herein will minimize uncontrolled surface water runoff from disturbed areas and minimize the migration of construction-generated sediment. The following general principals apply:

- Planning. Site topography, soil types, and potential effects of construction-related activities on E&S migration have been considered in developing this E&SC Plan. Areas of steep, erodible slopes and erodible soils, if encountered during construction activities, will not be disturbed without instituting proper engineering controls to minimize these concerns.

- Minimize Land Disturbance. To the extent possible and practical, disturbed areas and the duration of exposure to erosion elements will be minimized. Clearing of vegetation will be limited to only those areas of the site to be disturbed. To the extent possible and practical, existing vegetation will be retained and protected.

- Installation of Erosion and Sediment Controls. E&SC best management practices (BMPs) will be constructed, stabilized, and functional before earth disturbance activities begin within the tributary areas of those BMPs.

- Maintenance of Erosion and Sediment Controls. Until the site is stabilized, E&SCs will be properly maintained. Maintenance will entail inspections of E&SC features on a weekly basis and after runoff events. Preventative and corrective maintenance work, including clean out, repair, replacement, regrading, reseeding, and remulching will be performed as soon as practical. If E&SCs fail to perform as expected, replacements or modifications of those installed will be required.

- Stabilization of Disturbed Areas. If a cessation of earth disturbance activities lasts 4 days or longer, the site will be immediately seeded, mulched, or otherwise protected from accelerated E&S. BMPs will remain in place and be maintained until permanent stabilization is achieved. Disturbed areas will be stabilized as soon as is practical, including areas disturbed during the removal of BMPs. Temporary and permanent vegetation, mulch, gravel cover, repaving or a combination of these measures, will be employed immediately following the completion of backfilling and final grading activities. Any areas adversely impacted while acquiring access to the dig sites will be repaired to previous conditions.

- Floodplain. (See 25 Pa. Code § 105.1) – The lands adjoining a river or stream that have been or may be expected to be inundated by flood waters in a 100-year frequency flood. Unless otherwise specified, the boundary of the floodplain is as indicated on maps and flood insurance studies provided by Federal Emergency Management Agency (FEMA). In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodplain, it is assumed absent evidence to the contrary, that

the floodplain extends from (1) any perennial stream to 100 feet horizontally from the top of the bank, and (2) from any intermittent stream to 50 feet horizontally from the top of the bank of such intermittent stream.

- Floodway – The channel of the watercourse and portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area where no FEMA maps or studies have defined the boundary of the 100-year frequency floodway, it is assumed, absent evidence to the contrary, that the floodway extends from the stream to 50 feet from the top of the bank of the stream (See 25 Pa. Code § 105.1). The FEMA boundary is shown on the E&S Sheets (Attachment 2), when this information is available. When this information is not available, the floodway is shown as defined above for perennial and intermittent streams only.

2.0 SITE DESCRIPTION

The South East Region of SPPP will involve the installation of a 20-inch and a 16-inch diameter NGL pipeline approximately 35 miles long, primarily across agricultural and forested areas from the western border of Chester County to the eastern portion of Delaware County. Past and present land use of the project area and surrounding area is agricultural and forested land. The 280 HDD PA Turnpike Major Modification consists of a change in route and installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The reroute includes an additional 4.86 acres of LOD.

Relevant topographic features including streams, streets, pipelines, structures, utility lines, fences, paving and other significant items along the gas line alignment are indicated on the E&S plans, where applicable (Attachment 2). The E&S Plan Sheets also provide information regarding the typical controls and construction sequence to be followed. The construction details provided in Attachment 4 are the standard E&SCs to be used.

2.1 TOPOGRAPHY

The work zone is located on ground of varying elevations. Site elevations vary from 380 feet (Station 14756+00) to 472 feet (Station 14772+00) above mean sea level based on the Pennsylvania Spatial Data Access (PASDA). The construction plans show the topography of the site and the surrounding area.

2.2 GEOLOGY AND SOILS

The soils and geologic formations surrounding the project are shown on the figures provided in Attachment 5. Attachment 5 also provides the soil descriptions and properties of the soils found at the site. Attachment 5 also provides the Void Mitigation Plan for Karst Terrain and Underground Mining. Attachment 12 is a geohazard evaluation of the HDD 280 Major Modification reroute which details and provides mitigation recommendations for documented and suspected landslides, steep slopes, karst features, and soils that are prone to slope failure. In general, the following actions will be taken to counteract soil limitations:

- E&S BMPs will be in place and functional prior to earth disturbance to counteract erodible soils. Prompt stabilization practices will be implemented.
- Cut slopes will be stabilized as soon as possible with seed and mulch or erosion control blanket to prevent sliding. Cut slopes are not designed to exceed 3:1.
- The pipeline being installed will be coated steel.
- If a high groundwater table is encountered, water will be drained away from disturbed areas to a well vegetated area or a placed compost filter sock prior to being discharged off the site. If dewatering is required during construction activities or diversion of a stream is required, the water will be pumped

through a pumped water filter bag in accordance with the details provided. Saturated soils are to be dried prior to being used on site.

- Soils will be evaluated throughout the construction process to determine whether additional measures will need to be taken to make the soil suitable for its intended use on site.
- Where necessary, trench plugs will be used to prevent piping.
- Soil amendments will be added to site soils to promote vegetative growth.
- A wetland delineation and stream investigation has been conducted to determine the presence and location of hydric soils.
- If a sinkhole is encountered, repair should be done under the direct observation and supervision of a professional geologist or licensed geotechnical engineer. Site specific sinkhole repairs should be developed on a case by case basis.

In accordance with PADEP's guidance for avoiding and handling acid-producing rock formations encountered during site development, this plan has been prepared to address acid-producing rock formations which may be present at the Pennsylvania pipeline project. USGS topographic mapping shows that the pipeline traverses through areas that were previously strip mined.

PADEP recommends two strategies for handling acid-producing rock formations – avoidance and handling. Acid-producing rock formations will be avoided to the maximum extent practicable at the site. If coal or other acid-producing rock is encountered at the project site, the acid producing rock will either be removed from the site or handled onsite. If coal or other acid-producing rock must be handled on site is should be sampled and analyzed for total percent sulfur. The percent sulfur can be used to predict if the material is acid-producing and can also provide the ability to develop remedial strategies, such as using neutralizing agents and encapsulating with a layer of low permeability clay. Determination of percent sulfur shall be conducted in accordance with PADEP's guidance.

Soil Maps were generated and the soil types are shown on the Limiting Soil Characteristics Table of Attachment 5. **Detailed descriptions of the soil types are presented in Attachment 5.**

To prevent sediment from leaving the site, E&SCs will be in place and functional prior to earth disturbances, and stabilization practices will be implemented in disturbed areas as soon as practical. Geologic formations or soil conditions that may have the potential to cause pollution after earth disturbance were not observed during field activities.

2.3 SURFACE WATER HYDROLOGY

The SPPP area surface water runoff drains to surface waters and unnamed tributaries (UNT's) designated as high quality (HQ), warm water fisheries (WWF), exceptional value (EV), cold water fisheries (CWF), and trout stock fisheries (TSF) under Pa. Code 25 Chapter 93. The receiving waters for the 280 HDD Major Modification LOD is a UNT to Marsh Creek, which is designated as HQ-TSF in Pa. Code 25 Chapter 93. The project will also drain to an additional PEM wetland. Descriptions of the Primary Receiving Waters can be found in Table 1. This E&S plan contains Antidegradation Best Available Combination of Technologies (ABACT) BMPs to maintain the designated use of the receiving waters. The locations of the receiving waters relative to the project area can be seen on the USGS location map in Attachment 1 and the plan drawings in Attachment 2.

The proposed pipeline route has been designed to maximize the use of existing utility corridors, and minimize the number and linear footage of crossings of all surface waters, including those classified as High Quality (HQ) or Exceptional Value (EV). The Trenchless Construction Feasibility Study sets forth an analysis of the possible implementation of trenchless construction methods at each stream or wetland crossing, and indicates the use of trenchless crossing installation methods where feasible. For those surface water crossings crossed by the open cut installation method, the E&S Plan identifies and incorporates ABACT E&S best management practices (BMPs).

Descriptions of the Primary Receiving Waters are presented in Table 1.

3.0 EROSION AND SEDIMENT CONTROL PRACTICES

Two general types of E&SCs will be used on site during construction: stabilization controls and structural controls. Stabilization controls are implemented as needed to preserve existing vegetation or disturbed areas. Structural controls are used to divert or convey runoff, prevent sediment migration, and reduce the erosive runoff forces. For the purposes of this plan, structural controls are mainly temporary; however, some of the controls may be permanent. The following sections describe the construction sequence and the E&SCs.

3.1 CONSTRUCTION SEQUENCE

Refer to the E&SC plan drawings for the location of the proposed work and the associated BMPs. A generalized construction sequence is provided below. The construction sequence is intended to provide a general course of action in order to conform to the applicable regulatory agency requirements for temporary and permanent soil erosion and sedimentation controls. Necessary parts for proper and complete execution of work pertaining to this plan, whether specifically mentioned or not, are to be performed by the contractor. It is not intended that the drawings and this report show detailed information on methods and materials. The contractor will comply with all requirements listed in this section. The contractor may be required to alter controls based on effectiveness of controls or differing conditions encountered in the field. A preconstruction meeting is required prior to the start of any construction activity. The PADEP, contractors, the landowner, appropriate municipal officials, and the E&S plan preparer must be invited to this meeting at least seven days in advance.

This E&SC Plan does not outline specific steps for the protocols for the construction of pipelines in regards to Health and Safety. A Site-Specific Health and Safety Plan should be developed and followed during the construction of the pipeline; however, general guidelines are attached as follows:

- **Attachment 6 includes OSHA Trenching and Shoring Tables and Construction Sequence.**
- **Attachment 7 includes OSHA Construction Standard 1926 Subpart P – Excavations**.

1. Make all appropriate modifications as indicated in general notes on plan sheet ES-0.01.
2. Flag or fence project limits of disturbance and approved access. Sign and flag wetland boundaries and streams.
3. Orange construction fence will be provided and installed at wetland areas adjacent to the LOD and not planned to be impacted to identify and deter construction equipment, vehicles and personnel from entering wetland.
4. Locate staging areas and access points including construction entrances. Install compost filter socks down slope of these areas.

5. Install rock construction entrances as needed. Refer to the rock construction entrance detail on plan sheet ES-0.05.

6. Construct the proposed access roads and implement temporary improvements as identified in access road summary table and detailed on the plan sheets.

7. Install compost filter socks as shown on the construction drawings. Installations sizing, and spacing must conform to the chart and details provided on plan sheet ES-0.05. Install temporary upslope diversions and temporary slope pipes as shown on plan sheets and details.

8. Clearing, grubbing, and topsoil stripping shall commence along the pipeline route and be limited to those areas described in each stage of the construction sequence. General site clearing, grubbing and topsoil stripping may not commence in any stage or phase of the project until the E&S BMPs specified by the bmp sequence for that stage or phase have been installed and are functioning as described in this E&S plan. For clearing, grubbing, and topsoil removal in all stream, river, wetland or other water body crossings, refer to construction sequence notes below. Topsoil will be segregated at locations throughout the project where topsoil exists.

9. Temporary waterbars or approved interceptor dykes will be installed along the alignment prior to pipe installation at the end of each work day. During the periods of time where pipe trench is open contractors will provide positive control of all storm water on site, temporary waterbars will be constructed by the end the work day, or during each work day if required contractor will install compost filter sock to control erosion until 70% vegetation growth has been achieved.

10. Minimize total area of disturbance. Maintain temporary soil stockpiles within existing soil erosion and sediment controls. Should excavation enter streams, follow specific details for these areas shown on the drawings and include the steps detailed in the specific sections below. Pullback areas for HDDs will be cleared and prepared as needed to support staging, welding and testing of the HDD pipe sections. Areas not utilized for construction activities should be avoided to minimize impacts.

11. Install pipe and trench plugs in accordance with details on plan sheet ES-0.07. When open cutting driveways and access roads, contractor shall have road plates available to maintain access for landowners. The 20-inch pipeline will be installed first, followed by the 16-inch line. Any temporary stabilization required between the two installations will be implemented in accordance with this E&S Plan. Both pipelines will be installed within the same limit of disturbance and in the same construction period.

12. For open-cut areas, the length of time required to clear and grade the area, excavate the trench, install the pipelines, backfill the trench and begin stabilization of disturbed areas will not exceed 30 calendar days for most installations. Longer time periods may be approved on a case-by-case basis.

13. Backfill excavated area and cover with topsoil (where topsoil was segregated).

14. Before restoration of grade, the second 16-inch pipeline will be installed. All temporary BMPs will be implemented between the two installations in accordance with the notes and details for temporary seeding and cover.

15. Restore grade to original surface elevations as soon as practicable following completion of installation of pipes. Install permanent waterbars in accordance with plan sheet ES-0.08. Immediately seed and mulch disturbed areas or prepare for paving in roadway areas.

16. Install erosion control blanket on all slopes 3:1 or greater and all areas, regardless of slope and within 100 feet of special protection waters or 50 feet of non-special protection surface waters. Locations are shown on plan sheets.

17. In areas that used stone or timber mats for temporary stabilization and/or access, the stone or mats will be removed and, if needed, the soil will be scarified or ripped to a depth of 8-12 inches to de-compact the soil. After reestablishing preconstruction contours, topsoil will be replaced to a minimum depth of 4-8 inches and seeded and mulched. Vehicular traffic after site restoration should be restricted from areas to prevent soil compaction.

18. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70% perennial vegetative cover is established. Remove soil and erosion sediment control measures upon establishment of a uniform 70% perennial vegetative coverage over the disturbed area. Re-grade and revegetate areas disturbed during the removal of the soil erosion and sediment controls.

19. As part of the ongoing storm water bmp inspection and maintenance program any structural bmp recorded on this project will be inspected maintained, and repaired in accordance with the plan filed with the deed.

20. In accordance with 25 Pa code 102.7, upon completion of all steps in the construction sequence, a notice of termination form will be submitted to terminate the authorization of coverage indicating all activities under this permit have been completed.

21. For all EV wetland and stream crossings, SPLP will install the second pipeline immediately following the installation of the first pipeline, as long as no unanticipated, extraneous circumstances or safety issues are encountered. The two pipes will be installed in a single disturbance that will not require interim temporary stabilization/restoration.

For stream, river, wetlands or other water body utility crossings that will be open cut:

1. No work shall commence through a stream, river, wetlands or other water body during inclement weather.

2. A utility line crossing of a stream channel 10 feet in bottom width or less shall be completed within 24 hours from start to finish including trench backfill, stabilization of stream banks and stabilization of the area 50 feet back from the top of each stream bank.

3. A utility line crossing of a stream channel between 10 feet and 100 feet in bottom width shall be completed within 48 hours from start to finish including trench backfill, stabilization of stream banks and stabilization of the area 50 feet back from the top of each stream bank.

4. Wetland crossings are to be completed along with the mainline installation and will be dependent upon the length of the crossing.

5. Facilities for removing sediment from pumped water should be available at the stream crossing site before trenching commences and maintained until trench backfilling is completed. Assembly areas, temporary equipment and non-hazardous material storage areas shall be located at least 50 feet back from the top of any bank.

6. Install temporary equipment crossings at streams and temporary timber mats at wetland crossings in accordance with notes and details.

7. For dry stream crossings install pump bypass, dry flume, or cofferdam in accordance with notes and details.

8. Dewatering work area. Water from the excavation shall be pumped to a sediment filter bag. Where possible, excavation shall be from the top of the stream bank, where technically feasible.

9. Stabilize channel excavation and stream banks prior to redirecting stream flow.

For conventional and HDD bore crossings:

<u>Conventional bores</u>

1. Conventional bores will be conducted along with main line installation to limit the time of disturbance in those areas.

2. Install compost filter socks downgradient of the bore and receiving pits.

3. Excavate pits as shown in the typical stream crossing detail on plan sheet ES-0.17

4. Bore beneath streams where indicated on the construction drawings.

5. Water from the bore pits and work areas shall be pumped to a pumped water filter bag in accordance with detail on plan sheet ES-0.07.

6. Upon completion, backfill all pits.

HDD bores

1. Install compost filter socks at staging and pullback areas in accordance with E&S plan sheets. Where applicable temporary grading of staging areas is provided on plan sheets.

2. Bore and pullback areas shall be located a minimum of 50 feet back from each top of stream bank unless authorized by PADEP.

3. The HDD bore alignment shall be monitored for inadvertent returns. An inadvertent return plan has been developed for this project. This plan is to be reviewed, onsite, and implemented for each drill conducted.

4. Upon completion of HDD bore, restore bore and pullback areas to pre-construction conditions in accordance with E&S plans and details.

See Attachment 3 for the HDD Plans and Profiles.

For working within a wetland area:

1. Locate staging areas and access points. Staging areas should be located at least 50 feet from the edge of the wetland. Install sediment barriers down slope of these areas.

2. Install rock construction entrance as needed. Refer to the rock construction entrance detail on drawings for suggested dimensions.

3. Install orange flagging around perimeter of wetland and sediment barriers along the perimeters of the site as shown on the construction drawings.

4. Mats, pads, or similar devices shall be used during the crossings of wetlands. Original grades through wetlands must be restored after trenching and backfilling. Any excess fill materials must be removed from the wetland and not spread on-site.

5. Soil excavated from wetland areas shall be carefully removed with the roots intact. This soil should be placed in a separate stockpile to be reused during the wetland surface restitution.

6. Dewater work area; water from the excavation shall be pumped to a sediment trap or a filter bag.

7. Install pipe.

8. Install trench plugs in wetland areas to prevent the trench from draining the wetland or changing its hydrology.

9. Backfill pipe trench. Backfill the top 12-inches of the excavated trench with the stockpiled wetland soil to match original surface grades.

10. No soil amendments such as agricultural lime, fertilizer, etc. Will be used within wetland areas.

11. Compact backfill and grade the surface of the trench area to allow for positive drainage to soil erosion and sediment controls and to prepare disturbed areas for permanent trench restoration.

12. Maintain all erosion and sedimentation control devices until site work is complete and a uniform 70% perennial vegetative cover is established.

13. Remove all soil and erosion sediment control measures upon establishment of a uniform 70% vegetative cover over the disturbed area. Re-grade and revegetate areas disturbed during the removal of the soil erosion and sediment controls.

For temporary stream and wetland crossings:

1. Install temporary equipment crossings and temporary timber mat wetland crossings in accordance with plan sheet ES-0.10.

2. Temporary stream crossings shall be inspected on a daily basis. Damaged crossings shall be repaired within 24 hours of the inspection and before any subsequent use. Sediment deposits on the crossing or its approaches shall be removed within 24 hours of the inspection.

3. As soon as the temporary crossing is no longer needed, remove temporary crossing. All materials shall be disposed of properly and disturbed areas stabilized. Remove all soil and erosion sediment control measures upon establishment of a uniform 70% vegetation cover over the disturbed area.

3.2 BEST MANAGEMENT PRACTICES

An effective method to minimize E&S migration is to promote and implement BMPs. BMPs are relatively simple, inexpensive, and cost-effective protocols to prevent E&S migration. The basic BMPs that are anticipated to be employed during the construction activities include:

- Minimizing disturbances to site areas, especially those currently covered with pavement or vegetation.
- Minimize the time that soil is exposed.
- Prevent the runoff from flowing across disturbed areas (divert the flow to vegetated areas).
- Stabilize disturbed soils as soon as possible.

- Slow down the runoff flowing across the site.
- Remove sediment from surface water runoff before it leaves the site.

3.3 SEQUENCE OF BMP INSTALLATION

General stabilization and structural controls will be used in E&SC practices to (1) divert stormwater flows away from exposed areas, (2) convey runoff, (3) prevent sediments from moving off-site, and (4) reduce the erosive forces of runoff waters. Compost filter socks and other structural controls that will be utilized during construction activities will include the following:

Vegetative Stabilization Controls

Grounds disturbed by any of the operations necessary to complete the work for this project are to be permanently seeded, or if specified, sodded, unless occupied by structures or paved. A temporary cessation of earth disturbance activities that lasts for four days or longer requires temporary stabilization. Disturbed areas, which are at final grade, will be seeded and mulched immediately.

If seeding cannot be completed immediately after the area reaches final grade due to weather conditions, the disturbed area will be stabilized and mulched with straw at the rate of 3 tons per acre. This straw will be anchored using a method described under Mulching of this narrative.

Structural Controls

Temporary control facilities to be used during construction include the use of compost filter socks and rock construction entrances. Other structural controls as described below may also be used as deemed necessary based on conditions encountered in the field. Installation guidelines and locations for the below devices are as shown on standard drawings and plans. The temporary control measures that will be used on this project include, but are not limited to:

- Compost Filter Socks - This temporary sedimentation control measure consists of wood or metal posts driven through a compost filled mesh tube. Filter socks will be located as needed on side-slope and down-slope boundaries of disturbed areas. Both ends of each compost filter sock should be extended at least 8 feet upslope. Compost filter socks will be sized using the PADEP Construction Detail provided in Attachment 4. Compost filter socks will be used in drainage areas with HQ and EV waters.
- Rock Filter Outlet – Rock filter outlets will be used, as necessary, to address problems of concentrated flows to sediment barriers. In the event of unanticipated concentrated flow and sediment barrier failure, install a rock filter outlet unless the concentrated flow can be diverted away from the barrier. Rock filter outlets used in drainage areas with HQ and EV waters need a 6” layer of compost installed on the upslope side of the rock.

- Rock Filter – Rock filters are proposed to trap sediment in a newly constructed channel, diversion of channels, and at the inlet of pipe diversions.

- Compost Sock Sediment Trap - This temporary sedimentation control measure is useful in controlling runoff from access roads and may also be used at other locations where a temporary sediment trap is appropriate. The minimum base width will be equivalent to the height of the trap and sediment accumulation will not exceed 1/3 the total height of the trap. Ends of the trap will be a minimum of 1 foot higher in elevation that the mid-section, which will be located at the point of discharge. Compost sock sediment trap will be sized using the PADEP Construction Detail provided in Attachment 4. Compost sock sediment traps can be used in drainage areas with HQ and EV waters.

- Tarpaulin Covers - Tarpaulin covers will be used, as necessary, to protect topsoil storage stockpiles from wind and precipitation erosion. Stockpile slopes will be 2:1 or less. A minimal amount of soil will be stockpiled so that the height of the stockpile is less than 35 feet. Compost filter sock is also proposed to protect sediment runoff from stockpile areas.

- Rock Construction Entrance – Temporary access routes will be established on and proximate to the site to facilitate construction activities. The use of access routes will help confine truck and equipment traffic to specific corridors thus minimizing land disturbance and protecting vegetation. Site traffic during wet weather will be limited. No vehicles will be permitted in streams or rivers.

- Wash Racks – Wash racks will be used at rock construction entrances and will be designed to accommodate anticipated vehicular traffic. A water supply will be made available at wash racks to wash the wheels of vehicles exiting the site. Reasonable methods which are sanctioned by the PADEP as alternatives to installation of tire wash stations on public road access points for gathering pipeline projects in EV/HQ or siltation impaired watersheds include:

    1. For paved surface public roads: use of a vacuum truck sweeper or sweeper with a catch bin attachment.

    2. For dirt or gravel surface public roads: rigorous manual removal of mud/dirt from vehicle/equipment tires prior to exiting construction site, supplemented by immediate recover, by manual or mechanical means, of soil which may become discharged onto public roadways. Dust control and/or compaction via rolling of the dirt public road surface will be implemented as needed.

    A predicate for utilizing alternative 1 and 2 above is that the rock pad construction entrance must be extended to a minimum total length of 100 feet and will be constantly maintained including structure thickness to insure its effectiveness remains intact at all times.

Frequency of mechanical and/or manual controls will be dependent upon construction traffic intensity, weather, and soil moisture conditions. At a minimum for paved roads – any day in which construction traffic is exiting the rock construction entrance, the vacuum truck sweeper or sweeper with a catch bin attachment will clean the roadway at the end of the work day and prior to any forecasted rain event. The requirement is to not introduce sediment load from construction traffic onto public road surfaces and into road ditches which will flow into the EV/HQ or siltation impaired water resources which are the subject of the increased protection measures.

- Pumped Water Filter Bag – Pumped water filter bags may be used to filter water pumped from disturbed areas prior to discharging to surface waters. Compost filter socks will be installed within 50 feet of any receiving surface water or where grassy area is not available. Filter bags will be installed according to the details shown in the PADEP Construction Detail provided in Attachment 4.

- Erosion Control Blanket - A manufactured erosion control blanket will be installed on all slopes 3:1 or steeper and within 50 feet of surface water or 100 feet of special protected water. The blanket will be biodegradable but capable of providing protection for two growing seasons. Straw or similar fiber material will be placed between two biodegradable nets. The top net will be heavyweight and UV stabilized; the bottom net will be a lightweight netting. Erosion control blankets will be anchored and stapled in place in accordance with the manufacturer's recommendations and the detail on the construction drawings. For slopes between 3:1 and 1:1 use erosion control blanket SC 150 as manufactured by North American Green or Owner approved equal material or equal method. In areas where livestock is kept use erosion control blanket BioNet SC150BN as manufactured by North American Green or Owner approved equal material or equal method

- Waterbars – Waterbars will be installed across the ROW on all slopes greater than 5 percent. Waterbars will be constructed at a slope of 2 percent and discharge to a well-vegetated area. Waterbars will not discharge into an open trench. Waterbars will be oriented so that the discharge does not flow back onto the ROW. Obstructions (e.g. compost filter socks etc.) will not be placed in any waterbars. Where needed, they will be located below the discharge end of the waterbar. Waterbars will be installed in accordance with the detail provided in Attachment 4.

- Trench Plugs – Impervious trench plugs are required for all stream, river, wetland, or other water body crossings. Trench plugs are also used on slope run spacing. See drawings.

- Upslope Diversion Berms – Diversion berms are proposed to divert clean water runoff around the disturbed area for the project.

- Slope Pipes – Slope pipes are proposed to convey the water from the upslope diversion berms through the disturbed area. The slope pipes will outlet to a triple stack of compost filter sock to act as a level spreader to minimize outlet velocities so that they are non-erosive and dissipate flows.

- Water Deflectors – Water deflectors are proposed to direct runoff off of rock construction entrances and temporary access roads to discharge to stabilized vegetated areas. Compost filter socks can also be used at the outlet ends to trap sediment and minimize velocities.

- Public Rights of Way - In an effort to reduce the tracking of sediment onto public ROW, stabilized construction entrances of crushed stone located at points where traffic will be entering or leaving the site will be installed. Mud and soil accumulating on roadways, as a result of construction activities, will be removed with hand tools, such as shovels, and disposed of properly. The contractor will check the road a minimum of twice daily to verify cleanliness at road crossings and take necessary corrective action. Gravel will be used to limit dust and erodability.

- Restoration - All improved areas disturbed by construction will be restored.

- Additional Requirements – Any additional requirements to adequately control E&S pollution will be the responsibility of the contractor and will be considered incidental to construction activities.

3.4 PRIMARY CONSTRUCTION ACTIVITIES

Clearing and Grubbing

When required, brush, scrub growth, saplings and trees so directed to be cut and removed will be completely removed from the site of the work. The contractor will remove stumps and large roots and refill the depressions with suitable compacted earth fill where necessary to bring the grade back to its original elevation or final design grade. The contractor will protect exposed bare earth by mulch, or other appropriate measures if clearing and grubbing operations are completed more than two days prior to pipeline installation.

Vegetation clearing, grubbing, or removal within the permanent ROW is not anticipated to occur as part of the operations and maintenance of the pipelines to be installed via an HDD or bore except in the areas within the LOD, which is depicted in the plan drawings. However, in instances where the LOD extends into wetlands, floodplains, and floodways, no maintenance clearing, cutting, removal, or other alteration will occur. Instead, alternative methods of inspections (e.g., foot patrol) will be employed to maintain the pipeline ROW in wetlands, floodplains, and floodways.

Grading and Topsoil Stockpiling

Before beginning excavation and/or filling work, the topsoil from all areas to be affected will be stripped and stockpiled in a separate stockpile from the other excavated soil material. After completion of the major construction work, the topsoil will then be replaced as the upper layer of backfill. In general, all topsoil stockpiles will be located within the LOD away from nearby streams and/or drainage ditches or watercourses. Temporary erosion protection devices such as compost filter socks will be used to protect

all stockpiled topsoil from being carried into nearby water courses by the action of any overland runoff water.

As topsoil stockpiles become completely depleted, the disturbed areas will be graded and revegetated. The compost filter socks will be removed only after a uniform 70-percent perennial vegetative coverage has been established across the disturbed area.

Topsoil will not be placed when the subgrade is frozen or when it is excessively wet or dry, and will not be handled when in a frozen or muddy condition.

Vegetation

Grounds disturbed by any of the operations necessary to complete the work for this project are to be permanently seeded, unless occupied by structures or paved. *The disturbed areas will be restored to meadow conditions or to the pre-existing condition (residential lawn or previously existing paved, gravel, or dirt roads).* Any temporary cessation of earth disturbance activities which lasts for four days or longer requires temporary stabilization. Disturbed areas, which are at final grade, will be seeded and mulched immediately.

If seeding cannot be completed immediately after the area reaches final grade due to weather conditions, the disturbed area will be stabilized and mulched with straw at the rate of 3 tons per acre. This straw will be anchored using a method described under Mulching of this narrative.

Seeded areas will be inspected weekly and after each runoff event. Necessary repairs will be made by the end of the week.

Permanent Seeding

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED) WELL-DRAINED VARIABLE DRAINAGE	 1 PLUS 1 PLUS	 3, 5, 8, OR 12 (1) 3 OR 7
SLOPES AND BANKS (MOWED) WELL-DRAINED SLOPES AND BANKS (GRAZED/HAY) WELL-DRAINED	1 PLUS 1 PLUS	2 OR 10 2,3, OR 13

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
GULLIES AND ERODED AREAS EROSION CONTROL FACILITIES (BMPS)	1 PLUS	3, 5, 7, OR 12 (1)
SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS	1 PLUS	2, 3, OR 4
DRAINAGE DITCHES		
SHALLOW, LESS THAN THREE FEET DEEP	1 PLUS	2, 3, OR 4
DEEP, NOT MOWED	1 PLUS	5 OR 7
POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS		
MOWED AREAS	1 PLUS	2 OR 3
NON-MOWED AREAS	1 PLUS	5 OR 7
FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS	3 OR 13
HIGHWAYS (2)		
NON-MOWED AREAS		
WELL-DRAINED	1 PLUS	5, 7, 8, 9, OR 10
VARIABLE DRAINED	1 PLUS	3 OR 7
POORLY DRAINED	1 PLUS	3 OR 9
AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS	2, 3, OR 10
UTILITY ROW		
WELL-DRAINED	1 PLUS	5, 8, OR 12 (1)
VARIABLE DRAINED	1 PLUS	3 OR 7
WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS	2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES		
SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST)	1 PLUS	3, 4, 5, 7, 8, 9,11 (1) OR 12(1)
SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS	3 OR 13

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES
1 (2)	spring oats (spring), or 64 96	64	96
	annual ryegrass (spring or fall), or	10	15
	winter wheat (fall), or	90	120
	winter rye (fall)	56	112
2 (3)	tall fescue, or 75	60	75
	fine fescue, or 40	35	40
	kentucky bluegrass, plus 25 30	25	30
	redtop(4), or	3	3
	perennial ryegrass	15	20
3	birdsfoot trefoil, plus 6 10	6	10
	tall fescue	30	35
4	birdsfoot trefoil, plus	6	10
	reed canarygrass	10	15
5 (5)	Big Bluestem, plus	10	15
	tall fescue, or	20	25
	perennial ryegrass	20	25
6 (5,6)	Big Bluestem, plus	10	15

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	**SPECIES**	**SEEDING RATES – PLS (1)**	
		MOST SITES	ADVERSE SITES
	annual ryegrass	20	25
7 (5)	birdsfoot trefoil, plus	20	30
	Big Bluestem, plus	20	30
	tall fescue	20	25
8	flatpea, plus	20	30
	tall fescue, or	20	30
	perennial ryegrass	20	25
9 (7)	serecia lespedeza, plus	10	20
	tall fescue, plus	20	25
	redtop(4)	3	3
10	tall fescue, plus	40	60
	fine fescue	10	15
11	deertongue, plus	15	20
	birdsfoot trefoil	6	10
12(8)	switchgrass, or	15	20
	big bluestem, plus	15	20
	birdsfoot trefoil	6	10
13	orchardgrass, or	20	30
	smooth bromegrass, plus	25	35
	birdsfoot trefoil	6	10

1. Pure live seed (pls) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds pls shown on the seed tag. Thus, if the pls content of a given seed lot is 35 percent, divide 12 pls by 0.35 to obtain 34.3 pounds of seed required to plant one-acre. All mixtures in this table are shown in terms of pls.

2. If high-quality seed is used, for most sites seed spring oats at a rate of two bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at one bushel per acre. If germination is below 90 percent, increase these suggested seeding rates by 0.5 bushel per acre.

3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.

4. Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.

5. Use for highway slopes and similar sites where the desired species after establishment is Big Bluestem.

6. Use only in extreme southeastern or extreme southwestern PA. Serecia lespedeza is not well adapted to most of PA.

7. Do not mow shorter than 9 to 10 inches.

8. If liming, fertilization, and preparation of seedbed are properly done and if care is taken to drill and cover the seed (or mulch applied), the rate for "most sites" should suffice. However, on eroded or coarse and poorly prepared seedbeds, particularly if the soil is very acidic or infertile, the rate for "adverse sites" should be used.

9. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.

In lawn areas, permanent cover will be established using the following PENNDOT seed mixture:

PENNDOT FORMULA B				
Seeding Rate	3 lbs. per 1,000 square feet			
Species	**% by Weight**	**Purity %**	**Minimum % Germination**	**Maximum % Weed Seed**
Kentucky Bluegrass	50	98	80	0.20
Perennial Rye	20	98	90	0.15
Red Fescue	30	98	85	0.15

PEM WETLAND SEED MIX		
ERNST CONSERVATION SEED MIX NO. ERNMX-122 FACW Meadow Mix		
Seeding Rate	20 lb per acre, or ½ lb per 1,000 sq ft	
Mix Type	Wet Meadow & Wetland Sites	
Species List	31%	Fox Sedge (Carex vulpinoidea)
	20%	Virginia Wildrye (Elymus virginicus)
	14%	Lurid (Shallow) Sedge (Carex lurida)
	5%	Green Bulrush (Scipus atrovirens)
	4%	Blue Vervain (Verbena hastate)
	3.5%	Wood Reedgrass (Cinna arundinacea)
	3%	Soft Rush (Juncus effuses)
	3%	Blunt Broom Sedge (Carex scoparia)
	3%	Hop Sedge (Carex luputina)
	2%	Sensitive Fern (Onoclea sensibilis)
	2%	Oxeye Sunflower (Heliopsis helianthoides)
	1%	Rattlesnake Grass (Glyceria Canadensis)
	1%	Woolgrass (Scirpus cyperinus)
	1%	Swamp Milkweed (Asclepias incarnata)
	1%	New England Aster (Aster novae-angliae (Symphyotrichum n.))
	1%	Flat Topped White Aster (Aster umbellatus (Doellingeria umbellate))
	0.5%	Joe Pye Weed (Eupatorium fistulosum)
	0.5%	Boneset (Eupatorium perfoliatum)
	0.5%	Ditch Stonecrop (Penthorum sedoides)
	0.5%	Narrowleaf Blue Eyed Grass (sisyrinchlum angustifolium)
	0.5%	Seedbox (Ludwigia alternifolia)

0.5%	Great Blue Lobelia (Lobelia siphilitica)
0.5%	Mud Plantain (Water Plantain) (Alisma subcordatum (A. plantago-aquatica))
0.5%	Square Stemmed Monkeyflower (Mimulus ringens)
0.4%	Bladder (Star) Sedge (Carex intumescens)
0.1%	Slender Mountainmint (Pycnanthemum tenuifolium)
Total 100%	

Planting Specifications for PFO or PSS Wetland Restoration Areas (see ES-0.17 for restoration detail)

Vegetation Planting Type	Size	Species [a]		Wetland Status [b]
Shrub Species	Two to three-foot whip[c]	*Alnus serrulata*	Smooth Alder	OBL
		Cornus amomum	Silky Dogwood	FACW
		Lindera benzoin	Spicebush	FAC
		Viburnum dentatum	Northern arrow-wood	FAC
Tree Species	Containerized (1-inch DBH)[c]	*Acer rubrum*	Red maple	FAC
		Betula alleghaniensis	Yellow Birch	FAC
		Platanus occidentalis	American Sycamore	FACW
		Quercus bicolor	Swamp White Oak	FACW
		Salix nigra	Black Willow	OBL

a – If the listed species is unavailable during planting, a comparable native substitute will be used.

b - USACE Eastern Mountains and Piedmont Wetland Status Trees and shrubs will be planted at a density of at least 400 plants/trees per acre in accordance with USACE guidance.

c - DBH = Diameter at breast height

Liming Rates

Minimum 6 tons per acre at 100% effective neutralizing value (% ENV), unless the soil test determines that a lesser amount is needed. To determine the actual amount of regular lime to apply, divide the amount called for by the soil test by the % ENV for the product used. For example, if 6 tons per acre is needed and the env for the lime used is 88%, divide 6 by 0.88 resulting in 6.8 tons needing to be applied. For dolomitic lime, which has a significant amount of magnesium in it, divide the amount called for by the soil test by the % calcium carbonate equivalent (% CCE) listed for the product instead of the % ENV. The % CCE may be above 100% which accounts for the fact that magnesium has a greater effect per pound than the calcium

in regular lime. Note: When a soil test requires more than 8,000 pounds of lime per acre, the lime must be mixed into the top 6 inches of soil.

Fertilization Rates

Apply 10-20-20 at 600 pounds/acre, if top dressed or 1,000 pounds/ac, if incorporated, unless the soil test determines that the rate can be less than these minimums.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS				
Soil Amendment	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yds.	
AGRICULTURAL LIME	6 TONS	240 LBS.	240 LBS.	or as per soil test; may not be required in agricultural fields
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	25 LBS.	or as per soil test; may not be required in agricultural fields

Temporary Seeding

Temporary grass cover will be established in the following areas:

1. Where soil stockpiles are to be exposed for a period greater than four (4) days, the stockpile will be seeded.

2. Where vegetative filters must be established below filter bags, a minimum distance of 10 feet will be seeded down slope of the trap outlet.

Temporary Cover - Seed mixture for temporary cover will consist of 100-percent annual ryegrass. Seed will be applied at the rate of 40 lb per acre or as recommended by a local recognized seed supplier approved by the owner's representative. Prior to seeding, apply 1 ton of agricultural grade limestone per acre plus 10-10-10 fertilizer at the rate of 500 lb. per acre and work into soil.

Mulching

The purpose of mulch is to reduce runoff and erosion, prevent surface compaction or crusting, conserve moisture, and control weeds. Mulch will be applied on any area subject to erosion, or which has unfavorable conditions for plant establishment and growth. The practice may be used alone or in conjunction with other structural and vegetative conservation practices, such as waterways, ponds, sedimentation traps or critical area planting. On sediment producing areas where the period of exposure is less than 2 months, mulch materials will be applied according to the following guidelines:

1. Straw mulch will be applied at the rate of three tons per acre. Chemically treated or salted straw is not acceptable as mulch.

2. Straw mulch will be anchored immediately after application by at least one of the following methods.

    A. "Crimped" into the soil using tractor drawn equipment (straight bladed coulter or similar). This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended)

    B. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.

    C. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided sufficient documentation is provided to show that it is non-toxic to native plant and animal species.

    D. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

Mulched areas will be checked periodically and after each runoff event (e.g. rain, snowmelt, etc.) for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

Protection of Streams and Wetlands

If a stream or wetland crossing or encroachment is required, work will be in accordance with all PADEP permits. Refer to E&SC detail sheets for stream and wetland crossing details for diversion of stream channel flow and protection of wetlands.

1. Contractor will minimize construction area through and along streams. When wetland areas are temporarily disturbed, isolate and stockpile soil for replacement after grading is completed.
2. Native stream bed material will be separated from other spoil for reinstallation after restoration (see the E&S Plan provided in Attachment 2). An evaluation was completed for sheer stress of stream flow against restored native stream bed material. If the evaluation indicated that the stream will not be stable with native material, then rip rap will be used. Site specific waterbody crossing and restoration plans providing direction for the installation of rip rap at these streams are included within the E&S Plans provided in Attachment 2. In these cases where rip rap is used and the stream bed is composed of rock, cobble, or gravel, then the native stone will be used for the top six inches of rip rap. Every effort will be made to segregate the entire top layer of native stone in streams with less than six inches of native stone where rip rap is proposed.

Furthermore, stream restoration will involve the application of rip rap for bank stabilization must comply with site specific drawings included within the E&S Plan provided in Attachment 2. Rip rap will be used to the minimum extent necessary to stabilize the stream bank, which is typically no more than 12 inches above the normal flow depth often evidenced by a lack of vegetation or a strand line. Stream banks above this elevation will be stabilized with erosion control blanket and revegetated.

3. Immediately upon completion of encroachment or crossing, stabilize stream bed and banks (i.e. seeding, erosion blanket, and native substrate material) prior to removal of temporary E&SC devices.
4. Should excavation extend to within 50 feet of the stream bank, construct compost filter socks (Standard Details on construction plans) parallel to the stream, a minimum of 1 foot beyond disturbed earth, to protect the stream. Disturbed areas within 50 feet of a stream or wetland will be blanketed or matted within 24 hours of initial disturbance for minor streams or 48 hours of initial disturbance for major streams unless otherwise authorized. Seed and mulch all disturbed areas.

Temporary Stream and Wetland Equipment Crossings

No vehicular traffic will be permitted in the streams at any time during construction.

If crossing a stream by vehicles is required to facilitate construction, a temporary stream crossing will be installed for this purpose. Work will be in accordance with PADEP Permit Requirements.

Travel Lanes

Portions of the project LOD have been identified as travel lanes. These areas exist along the project ROW and will be used for travel between HDD workspaces. Some of these areas will also be mechanically-cleared of trees and brush to improve travel and/or line-of-sight for HDD activities. For travel lanes involving mechanical clearing, the LOD limits have been sighted outside of wetlands and most floodplains and floodways. For any portions of the travel lanes that are crossing resources, an equipment bridge/working platform will be installed per details provided in the E&S Plan Sheets (Attachment 2).

Travel lanes have also been labeled on the E&S Plan Sheets and designated as either “ROW-Travel LOD” (temporary impacts) or “ROW-Travel and Clearing LOD” (permanent impacts). Necessary E&S control have been added as well.

Minimization of Soil Compaction

Pre-construction planning and final design has reduced the LOD, and therefore the area subjected to compaction, to the maximum extent while allowing safe installation of the pipeline. During construction, all land disturbance is limited to the defined LOD. Within the LOD, contractors are to minimize land disturbance to the maximum extent. Repeated travel is restricted to travel lanes and travel throughs are limited to those

necessary to complete the work. Implementation of construction sequencing ensures the number of passes with equipment and duration of the project is minimized. In wetlands and other sensitive areas, the installation of timber mats (or equal such as composite matting), and limiting equipment and vehicle travel, ensures compaction is minimized. In addition, top soil segregation and restoration BMPs offer significant protection to the layer most vulnerable to compaction. Upon completion of pipeline installation and trench backfill, replace segregated topsoil to pre-construction grades. Contractor is to take every precaution to minimize compaction during placement of topsoil. Provide surface roughening in accordance with PADEP E&S Pollution Control Program Manual. Surface roughing is the practice of providing a rough soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. During the preparation for seeding on slopes 3H:1V or steeper, unless a stable rock face is provided, surface roughening is to be conducted by tracking the slopes by running tracked equipment (with blades up) across the surface as to leave track marks parallel to the contour. Any area where stone and/or timber mats are used for temporary stabilization, soil will be decompacted through multiple passes using tracked equipment to roughen the surface. The tracking method can be used elsewhere to aid in the decompaction of soils as deemed necessary to facilitate successful restoration. This tracking method can be used on the subsoil before topsoil replacement and/or on the topsoil prior to seeding. In agricultural areas, severely compacted areas are to be plowed with a harrow, paraplow, paratill or other equipment before subsoil replacement. Vehicular traffic is to be restricted from areas that are ready to be seeded.

A note consistent with the Department's Manual will be included on all construction plans which states that any area that used stone and/or timber mats for temporary stabilization and/or access will be completely removed, soil will be decompacted by using tracked equipment making multiple passes over area, reestablish preconstruction contours, and replace topsoil to a minimum of 4-8 inches deep and seed and mulch areas. Vehicular traffic should be restricted from areas to prevent soil compaction.

Waste Considerations

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with the PADEP's solid waste management regulations at 25 Pa. Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. Expected construction wastes will consist of packaging material and sediment cleaned from BMPs. Packaging from the materials brought on site will be disposed of by a licensed hauler. Sediment removed from BMPs will either be spread in a protected area to dry and then recycled as fill material or disposed of off-site. In cases where disposal is necessary, waste materials are to be disposed of at an approved PADEP waste disposal site.

Thermal Impacts

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation. However, a singular linear crossing of minimal width and vegetation clearing is not considered a contributing factor to thermal impacts.

Potential pollution to surface waters from thermal impacts will be minimized by minimizing the clearing of riparian vegetation at stream crossings along the ROW and avoiding the addition/creation of impervious surfaces in riparian areas, The Project does not have thermal impacts. Following construction, permanent seeding will occur as soon as practicable to facilitate vegetative growth during germinating months.

Specifically, thermal impacts will be avoided by implementing the following:

- Siting parallel to and overlapping with existing ROWs to minimize vegetation clearing at stream crossings;
- Reducing the construction ROW width and additional temporary workspaces at stream crossings;
- No grubbing, grading, or clearing of trees will occur within 50 feet of the top of stream bank until pipeline construction/installation is ready to proceed through that area.
- Restoring (seeding) disturbed areas/ROW as soon as practicable and /or directing runoff to vegetated areas to reduce the temperature of runoff prior to discharge into the streams; and,
- Restoring the stream banks and seeding/planting as soon as practicable to facilitate vegetative growth along the stream channel.

Riparian Forest Buffers

A separate waiver request has been prepared and is provided as Attachment 6 to the NOI application. The following summarizes that request. The HDD 280 Major Modification qualifies for an exemption of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

In addition to the exemption, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area.

Demonstration of Waiver Necessity

A riparian buffer waiver is necessary to complete the intended scope of the pipeline project including the Major Modification. The project crosses through Chester County for approximately 23.6 miles, and Delaware County for approximately 11.4 miles. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

Alternatives Analysis

During the development and siting of the proposed Major Modification, SPLP considered several alternate routes and construction design methods. Impacts to environmental resources, including riparian forest buffers, were evaluated during the major modification routing. Field teams were deployed to evaluate alternate routes based on environmental and constructability constraints. The final route that was selected minimizes environmental impacts to the maximum extent practicable while still maintaining the project's overall constructability and ensuring a safe working environment while also taking landowner constraints into consideration. Additionally, several variations of horizontal direction drill profiles were evaluated to minimize pullback areas, additional workspaces, and overall disturbance within riparian forest buffers. A summary of the alternatives analysis is provided as Attachment 6 of the NOI.

Demonstration of Minimizing Impacts

All disturbance activities, including those which impact riparian buffers, have been reduced to the maximum extent practicable. The limit of disturbance (LOD) has been reduced to 50 feet within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the PADEP manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control best management practices (BMPs). In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less. Workspaces that provide additional space for stream crossing activities have been placed outside of riparian buffers where possible.

Meeting Requirements of Chapter 102

All other requirements of Chapter 102 to minimize impacts to riparian buffers are being met in the project's Erosion and Sediment Control Plan and Site Restoration/Post-Construction Stormwater Management Plans which have been designed in accordance with Chapter 102 and in HQ/EV watersheds to implement ABACT

controls where non discharge alternatives do not exist. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas through the use of properly designed E&S bmp's such as, but not limited to, waterbars, compost filter sock, diversion berms, slope pipes and erosion control blanket. A site restoration plan is proposed to revegetate the buffer areas within the right of way.

Stormwater Runoff Analysis

The pre-construction drainage patterns surrounding the project will be maintained. All disturbed areas within the Major Modification LOD will be restored to existing conditions or better. As a result of restoring the pipeline ROW and associated workspaces associated with the Major Modification to existing conditions or better and maintaining pre-construction drainage patterns, there will be no increase in stormwater runoff rate or volume attributed to those areas.

3.5 MAINTENANCE AND INSPECTION PROCEDURES

Maintenance to the temporary E&SC structures will be performed by the contractor during the construction period. A log or written report showing dates that E&S bmp's were inspected as well as any deficiencies found and the date they were corrected shall be maintained on the site and be made available to regulatory agency officials at the time of inspection.

Compost Filter Socks

- Accumulated sediment will be removed as required, and in all cases where uniform accumulations are half the above ground height of the filter sock. Any accumulated earth behind the filter sock will be disposed of by the contractor in such a manner that the removed earth will not be excessively eroded and transported into a waterbody.

- The filter sock/silt fence installation will be inspected weekly and after every runoff event. Loosened support stakes will be removed and new stakes driven. Filter socks will be maintained and repaired as per manufacturer specifications.

- Temporary E&SCs will be removed by the contractor only after a uniform 70-percent perennial vegetative coverage has been established across the disturbed area. Temporary E&SCs will be disposed of by the contractor at an approved PADEP waste disposal facility.

Rock Construction Entrances

- Rock construction entrance thickness will be constantly maintained to the specified dimensions by adding rock. A stockpile will be maintained on site for this purpose.

Access Road

- The proposed access roads will be inspected weekly and after runoff events. Additional aggregate will be applied to the road as needed to maintain an adequate thickness, and ruts will be smoothed to prevent channelizing flow.

Water bars

- Water bars will be inspected weekly, daily on active roads, and after each runoff event.
- Damaged or eroded water bars will be restored to original dimensions within 24 hours of inspection.
- Maintenance of water bars will be provided until roadway, skid trail or ROW has achieved permanent stabilization.

Pumped Water Filter Bags

- Filter bags will be replaced when they become half full of sediment.
- Filter bags will be inspected daily. If any problem is detected, pumping will cease immediately and not resume until the problem is corrected.

Vegetation

Seeded areas will be inspected weekly and after each runoff event. Necessary repairs will be made immediately.

Mulch

Mulched areas will be checked periodically and after severe storms for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

Inspection and Maintenance

Until the site is stabilized, E&SC BMP's will be maintained properly. Preventative and corrective maintenance work, including clean-out, repair, replacement, regarding, reseeding, mulching, and reknitting will be performed as soon as practical. If E&SC BMP's fail to perform as expected, replacement BMP's, or modifications to those installed will be required. The following inspection and maintenance practices will be used to maintain E&SCs on-site during activities.

- E&SC measures will be in-place and inspected at the end of the workday. E&SC measures will also be inspected after each runoff event. The contractor will immediately repair any deficiencies.
- Maintenance and inspection of sediment control facilities will conform to PADEP Chapter 102 and 105 rules and regulations.

- Sediment will be removed when it accumulates half the aboveground height of the compost filter sock. All undercutting of erosion of the toe anchor will be repaired with compacted backfill material. The contractor will adhere to the manufacturer's recommendations for replacing filter socks due to weathering.
- Sediment removed from filter socks and any other control devices will be mixed in with the other waste soil on the construction site and properly disposed of as discussed in Section 3.4.
- Sediment will be removed from the sediment removal facilities associated with wash racks as necessary. Sediment deposited on paved roadways will be removed and returned to the construction site daily, at a minimum.
- Re-vegetated areas will be inspected for bare spots, washouts, and healthy growth during the construction. Identified bare spots and washouts will be repaired as soon as practical.
- All soil stockpiles that are to remain more than 4 days will be seeded with temporary grass, as noted in the seeding specification on the construction drawings.
- The contractor will make certain that all runoff is directed to the sedimentation control devices.
- All sedimentation control measures will remain in place until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established. Any area not achieving a 70-percent vegetative cover will be re-seeded and mulched within 24 hours of detection.

If E&S BMPs are found to be inoperative or ineffective during an inspection, PADEP should be contacted within 24 hours, followed by the submission of a written noncompliance report to PADEP within 5 days of the initial contact.

3.6 ANTIDEGRADATION

The 280 HDD Major Modification reroute is located within an HQ watershed. A combination of non-discharge alternatives and the use of ABACT BMPs will be implemented during construction to protect and maintain the existing water quality of the receiving waters. For HQ/EV special protection watersheds 25 Code §§102.8 (h) was followed, and for all the HQ/EV special protection watersheds listed in Table 1 non-discharge alternatives were evaluated and included, when possible. For areas where non-discharge alternatives were not available the ABACT site restoration BMPs were incorporated. Due to the linear nature of this project all of the HQ/EV special protection watersheds received the same incorporation of ABACT site restoration BMPs throughout the pipeline.

Non-discharge alternatives were evaluated to minimize accelerated E&S and achieve zero net change in runoff between the pre- and post-construction conditions. Non–discharge alternatives exist when the

existing land use is re-vegetated and grade is restored, and therefore no increase in runoff rate or volume from pre- to post-construction results. Other non-discharge alternatives implemented are limiting and minimizing the extent of disturbed areas and limiting the extent and duration of disturbance (phasing and sequencing), then stabilizing disturbed areas as soon as practicable. ABACT BMPs will be used onsite to protect and maintain the existing water quality of receiving waters also in areas where non-discharge alternatives exist.

Where non-discharge alternatives do not exist, ABACT BMPs will be used onsite to protect and maintain the quality of the receiving HQ and EV resources. The extent of the disturbed area will be minimized, and the duration of disturbance will be minimized by stabilizing disturbed areas as soon as practicable. ABACT BMPs will be used onsite to protect and maintain the existing water quality of receiving waters.

The following ABACT E&S BMPs will be used onsite:

- Wash racks located at rock construction entrances,
- Compost filter sock is to be used,
- Erosion control blanket on disturbed areas within 100 feet of a receiving surface waters, where applicable, and on slopes 3:1 or steeper,
- Implementation of a PPC plan.

4.0 SITE RESTORATION PRACTICES

Following completion of pipeline installation and trench backfilling, the pipeline right of way, associated workspaces, and temporary access roads shall be returned to the general grade present prior to pipeline installation to maintain pre-construction drainage patterns. After completion of major construction work, topsoil that was stockpiled during construction will be placed along the ROW. Grounds disturbed by any of the operations necessary to complete the work for this project within the ROW are to be permanently seeded, or if specified, sodded, unless occupied by structures, paved, or designated as a permanent access road. Disturbed areas, which are at final grade, shall be seeded and mulched once final grades are achieved. The permanent seed mixture will restore disturbed areas to a meadow in good condition or better. If seeding cannot be completed within a four (4) day period due to weather conditions, the disturbed area will be mulched with straw at the rate of three (3) tons per acre. This straw will be anchored using a method described in Section 3.4.

4.1 BMP DESCRIPTION AND CONSTRUCTION SEQUENCE

A generalized construction sequence is provided below. The construction sequence is intended to provide a general course of action to conform to the applicable regulatory agency requirements for restoration and post-construction stormwater management of the site. Necessary steps for proper and complete execution of work pertaining to this plan, whether specifically mentioned or not, are to be performed by the contractor. The contractor will comply with all requirements listed in this section. The contractor may be required to alter controls based on the effectiveness of controls or differing conditions encountered in the field. The appropriate county conservation district and DEP shall be contacted and must approve any deviation to the authorized plans.

A pre-construction meeting is required prior to the start of any construction activity. The Pennsylvania Department of Environmental Protection (PADEP) or applicable county conservation district, contractors, the landowner, appropriate municipal officials, and the plan preparer must be invited to this meeting at least 7 days in advance.

General Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.

2. Surface roughening will be utilized to rough the soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are

recommended. Surface roughening shall be accomplished using dozers affixed with grouser tracked equipment. Dozers shall run up and down the slopes leaving horizontal grooves perpendicular to the slope. Dozer blades shall be raised and not used during surface roughening. Where compaction does occur, contractor shall scarifiy the soil or provide additional roughening such as deep ripping or chisel ripping to restore the area to a minimal compacted state. In areas of proposed infiltration, soils shall be amended to 2' below grade. See Soil Amendment and Restoration construction sequence below.

3. Place topsoil from topsoil stockpiles as the upper layer of backfill. Topsoil shall not be placed when the subgrade is frozen or when it is excessively wet or dry and shall not be handled when in a frozen or muddy condition.

4. Remove gravel and geotextile from the temporary access roads and scarify the soil. Refer to step 2 of this sequence to address compaction at access roads. After addressing compaction concerns, place topsoil that was stripped prior to installation of the access roads.

5. Immediately seed and mulch disturbed areas in accordance with the permanent seeding schedule once final grade is established and topsoil is placed.

6. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70-percent perennial vegetative cover is established. Regrade and revegetate areas disturbed during the removal of the erosion and sediment controls.

Soil Amendment and Restoration Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.

2. In the designated soil amendment area, till the ground and mix in the compost at a ratio of 2:1 (soil:compost) to a depth of 24 inches.

3. Immediately seed and mulch disturbed areas once final grade is established in accordance with the permanent seeding schedule.

4. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70% perennial vegetative cover is established.

5.0 HYDROSTATIC TESTING AND ASSOCIATED PERMITTING

There are no changes to the hydrostatic testing locations as a result of the HDD 280 Major Modification.

6.0 REFERENCES

Erosion and Sediment Pollution Control Program Manual, Commonwealth of Pennsylvania, Department of Environmental Protection, Office of Water Management, March 2012.

Stormwater Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices, United States Environmental Protection Agency, Office of Water, 1993.

Pennsylvania Stormwater Best Management Practices Manual Draft, Pennsylvania Department of Environmental Protection, Bureau of Watershed Management, October 2009.

Downingtown, Elverson, Pottstown, Wagontown, Malvern, West Chester, and Media Quadrangles, Pennsylvania – Chester County, Geological Survey, United States Department of Interior.

Soil Survey of Chester County, Pennsylvania, United States Department of Agriculture, Soil Conservation Service.

DCNR, 2016. *Invasive Plants in Pennsylvania, Crown Vetch,* Coronilla varia. Accessed October 25, 2016. http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_010284.pdf.

TABLE 1:

Receiving Waters

Receiving Waters Table
Pennsylvania Pipeline Project
HDD 280 Major Modification

Stream Name	County	Township	Chapter 93 Designated Use	Chapter 93 Code	Siltation Impaired
UNT to Marsh Creek	Chester	Upper Uwchlan	HIGH QUALITY-TROUT STOCKING	HQ	No
Marsh Creek	Chester	Upper Uwchlan	HIGH QUALITY-TROUT STOCKING	HQ	No
Black Horse Creek	Chester	Upper Uwchlan	HIGH QUALITY-TROUT STOCKING	HQ	No
UNT to Black Horse Creek	Chester	Upper Uwchlan	HIGH QUALITY-TROUT STOCKING	HQ	No

Receiving Wetlands Table
Pennsylvania Pipeline Project
HDD 280 Major Modification

Municipality	Recieveing Water	Number of Wetlands	Number of EV Wetlands (classification)
Upper Uwchlan	UNT to Marsh Creek	19	0
Upper Uwchlan	UNT to Black Horse Creek	4	2 (wild Trout/Bog Turtle)

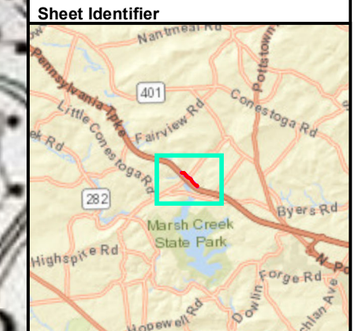
ATTACHMENT 1:

USGS Location Maps

Legend

- Major Modification
- Alignment Centerline

Sheet Identifier



N

0 300 600 Feet

0 91.5 183 Meters

PROJECT LOCATION MAP
ATTACHMENT 1
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangle displayed is Downingtown.

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP ESC\GIP\PENNPIPELINE_SOUTHEAST_USGS_ESCGP_OPT3_20190920.MXD 09/24/19 TT

ATTACHMENT 2:

E&S Plan Sheets

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL AND
SITE RESTORATION PLAN

FEBRUARY 2017

DRAWING INDEX	
SHEET No.	DRAWING TITLE
ES-0.01 TO ES-0.23	EROSION & SEDIMENT CONTROL & SITE RESTORATION PLAN NOTES AND DETAILS
ES-0.24 TO ES-0.25	KEY PLAN
ES-6.01 TO ES-6.74	EROSION & SEDIMENT CONTROL & SITE RESTORATION PLANS

PREPARED BY:

TETRA TECH

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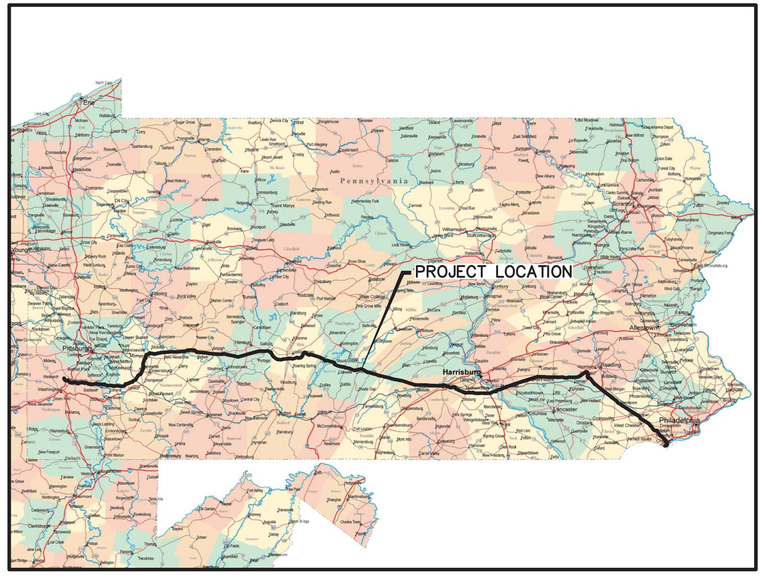
PREPARED FOR:

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA



LOCATION MAP
PENNSYLVANIA PIPELINE PROJECT
HOUSTON, PENNSYLVANIA TO MARCUS HOOK, PENNSYLVANIA

GENERAL EROSION & SEDIMENT CONTROL PLAN NOTES:

1. TOPOGRAPHIC MAPPING AND FEATURES COMPILED FROM WWW.PASDA.PSU.EDU.
2. THE PROJECT TAKES PLACE WITHIN CHESTER COUNTY, PENNSYLVANIA.
3. TOWNSHIP BOUNDARIES TAKEN FROM WWW.PASDA.PSU.EDU.
4. 100-YEAR FEMA FLOODPLAINS TAKEN FROM WWW.PASDA.PSU.EDU.
5. SEE SHEET ES-0.02 FOR STREAM AND WETLAND CROSSING TABLE.
6. ~~A PRECONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY. THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, AND A REPRESENTATIVE FROM THE LOCAL PADEP OR CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING AT LEAST SEVEN DAYS IN ADVANCE.~~ FOR EARTH DISTURBANCE ACTIVITIES AUTHORIZED BY THIS PERMIT, AT LEAST ONE PRE-CONSTRUCTION MEETING IS REQUIRED. THE PERMITTEE SHALL CONTACT DEP TO SCHEDULE THE PRE-CONSTRUCTION MEETING AND PROVIDE AT LEAST SEVEN (7) DAYS' NOTICE OF THE PRE-CONSTRUCTION MEETING TO ALL INVITED ATTENDEES, UNLESS OTHERWISE APPROVED BY DEP IN WRITING. PERMITTEES, CO-PERMITTEES, OPERATORS, AND LICENSED PROFESSIONALS, OR DESIGNEES RESPONSIBLE FOR EARTH DISTURBANCE ACTIVITY, INCLUDING IMPLEMENTATION OF E&S, PCSM AND PPC PLANS AND CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN, SHALL ATTEND THE PRE-CONSTRUCTION MEETING(S). PERMITTEES, CO-PERMITTEES, OPERATORS AND LICENSED PROFESSIONALS ARE RESPONSIBLE FOR ENSURING THAT ALL ACTIVITIES ON THE SITE COMPLY WITH THE REQUIREMENTS OF THE PERMIT. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION VI OF THE APPROVED CHAPTER 102 PERMIT).
7. A COPY OF THE APPROVED E&S PLANS MUST BE AVAILABLE AT THE PROJECT SITES AT ALL TIMES.
8. AT LEAST THREE DAYS PRIOR TO STARTING EARTH DISTURBANCE ACTIVITY, ALL CONTRACTORS INVOLVED IN THESE ACTIVITIES SHALL NOTIFY PENNSYLVANIA ONE CALL SYSTEM, INC. AT 8-1-1. CONTRACTOR MUST RECEIVE ALL CLEARANCES BEFORE STARTING CONSTRUCTION ACTIVITIES.
9. PIPELINE LOCATIONS AND LIMIT OF DISTURBANCE (LOD) FROM SUNOCO PIPELINE L.P.
10. GENERAL LOCATION AND SPACING FOR WATER BARS ARE SHOWN ON THE PLAN. WATER BARS LOCATION MAY BE ADJUSTED IN THE FIELD DUE TO ACTUAL SITE CONDITIONS; HOWEVER, INSTALLATION AND SPACING MUST CONFORM TO THE DETAIL PROVIDED ON THE PLAN SHEET ES-0.05.
11. THE RIGHTS-OF-WAYS AND EASEMENTS SHOWN ON THIS PLAN ARE THE RESPONSIBILITY OF SUNOCO PIPELINE L.P. TO SECURE WITH THE INDIVIDUAL PROPERTY OWNER. THE RIGHTS-OF-WAY AND EASEMENTS SHOWN ON THIS PERMIT DRAWING REPRESENT THE BEST AVAILABLE PROPERTY INFORMATION AS PROVIDED TO TETRA TECH, INC. BY SUNOCO PIPELINE L.P. THE RIGHTS-OF-WAY AND EASEMENTS SHALL BE VERIFIED AND LOCATED IN THE FIELD BY SUNOCO PIPELINE L.P.
12. GENERAL E&S CONTROLS FOR SOIL STOCKPILE LOCATIONS ARE SHOWN ON THE TYPICAL DETAILS. ALONG THE ALIGNMENT, TOPSOIL WILL BE PUSHED TO ONE SIDE OF THE RIGHT OF WAY. THE TOPSOIL WILL BE PUSHED BACK DURING SITE RESTORATION. TOPSOIL WILL BE SEGREGATED AT ALL LOCATIONS THROUGHOUT THE PROJECT WHERE TOPSOIL EXISTS.
13. COMPOST FILTER SOCK INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
14. IN-STREAM CONSTRUCTION IS RESTRICTED IN STOCKED TROUT STREAMS FROM MARCH 1 THROUGH JUNE 15 WHERE NOTED.
15. IN-STREAM CONSTRUCTION IS RESTRICTED IN WILD TROUT STREAMS FROM OCTOBER 1 THROUGH DECEMBER 31 WHERE NOTED.
16. THIS PROJECT WILL REQUIRE WATER FOR DUST CONTROL, PIPELINE CLEANING, HORIZONTAL DIRECTIONAL DRILLING AND HYDROSTATIC TESTING OF THE PIPELINE AND MAINLINE VALVES. ALL WATER FOR THESE ACTIVITIES WITHIN THE DELAWARE RIVER BASIN WILL BE SOURCED FROM MUNICIPAL WATER SOURCES. NO SURFACE WATER WITHDRAWAL WITHIN THE DELAWARE RIVER BASIN IS PROPOSED FOR THIS PROJECT.
17. ALL WATER USED FOR HYDROSTATIC TESTING OF THE PIPELINE AND MAINLINE VALVES WITHIN THE DELAWARE RIVER BASIN WILL BE DISCHARGED THROUGH THE DELAWARE COUNTY REGIONAL WATER QUALITY CONTROL AUTHORITY VIA SUNOCO FACILITIES AT MARCUS HOOK, DELAWARE COUNTY, PA.
18. PORTIONS OF THE PROJECT LOD HAVE BEEN DESIGNATED "TRAVEL LANES" WITH THE FOLLOWING CLASSIFICATIONS:
    A. TRAVEL AND CLEARING LOD – MECHANICAL CLEARING OF LAND BETWEEN HORIZONTAL DIRECTIONAL DRILL HDD WORKSPACES FOR LINE OF SIGHT AND, IN SOME CASES, ACCESS PURPOSES.
    B. TRAVEL LOD – AREA NEEDED TO TRAVEL BETWEEN HORIZONTAL DIRECTIONAL DRILL WORKSPACES OR DOWN THE RIGHT-OF-WAY TO GET TO A HORIZONTAL DIRECTIONAL DRILL WORKSPACE.
19. VOID MITIGATION PLAN FOR KARST TERRAIN AND UNDERGROUND MINING IS TO BE REVIEWED PRIOR TO CONSTRUCTION AND IMPLEMENTED AS NECESSARY OR REQUIRED THROUGHOUT CONSTRUCTION.
20. AT BLOCK VALVE SITES, FIELD SURVEYS WERE CONDUCTED TO ACCURATELY REFLECT FIELD CONDITIONS TO FACILITATE THE DESIGN OF THE SITES. THESE SURVEYS WERE CONDUCTED IN THE IMMEDIATE VICINITY OF THE PAD AND ROAD TO BE DESIGNED. DUE TO THE NATURE OF POST CONSTRUCTION STRORMWATER DESIGN CRITERIA, SURVEY COULD NOT BE CONDUCTED FOR THE ENTIRE DRAINAGE AREAS AT EACH LOCATION. IN THESE AREAS, LIDAR DATA WAS SUBSTITUTED.

DRAWINGS BY TOWNSHIP

COUNTY	TOWNSHIP	PLAN SHEETS
CHESTER	ELVERSON BOROUGH	ES-6.01 TO ES-6.03
	WEST NANTMEAL	ES-6.03 TO ES-6.14
	EAST NANTMEAL	ES-6.09 TO ES-6.12
	WALLACE	ES-6.14 TO ES-6.23
	UPPER UWCHLAN	ES-6.23 TO ES-6.34
	UWCHLAN	ES-6.34 TO ES-6.43
	WEST WHITELAND	ES-6.43 TO ES-6.54
	WEST GOSHEN	ES-6.54 TO ES-6.58
	EAST GOSHEN	ES-6.58 TO ES-6.69
	WESTTOWN	ES-6.69 TO ES-6.74

LIMIT OF DISTURBANCE/PROJECT AREA TABLE

	LIMIT OF DISTURBANCE	PROJECT AREA
CHESTER COUNTY	171 ACRES	171 ACRES

DETAIL INDICATOR

DETAIL NUMBER

SHEET SHOWN ON

LEGEND

- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- EXISTING FENCELINE
- EXISTING STREAM WITH FLOW DIRECTION
- EXISTING ELECTRIC OVERHEAD
- EXISTING ELECTRIC UNDERGROUND
- EXISTING LIGHT POLE
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING DOMINION GAS LINE
- EXISTING SANITARY SEWER LINE
- EXISTING BUILDING
- PROPERTY LINE
- COUNTY BOUNDARY
- TOWNSHIP BOUNDARY
- 100-YEAR FLOODWAY
- 100-YEAR FEMA FLOODWAY
- 100-YEAR FEMA FLOODPLAIN
- WATERSHED BOUNDARY
- ORANGE CONSTRUCTION FENCE
- EXISTING PEM WETLAND
- EXISTING PFO WETLAND
- EXISTING PSS WETLAND
- PROPOSED PIPE LOCATION
- PROPOSED PERMANENT RIGHT-OF-WAY
- PROPOSED TEMPORARY RIGHT-OF-WAY
- PROPOSED TEMPORARY WORKSPACE
- RIPARIAN FOREST BUFFER
- OUTFALL FLOW DIRECTION ARROW
- LIMIT OF DISTURBANCE (ESCGP-2 PERMIT BOUNDARY)/ AREA TO BE RESTORED
- ROCK CONSTRUCTION ENTRANCE — 1 / 0.05
- ROCK CONSTRUCTION ENTRANCE WITH WASH RACKS — 3 / 0.05
- AGGREGATE STOCKPILE
- PERMANENT WATER BAR — 2 / 0.05
- TEMPORARY WATER BAR — 2 / 0.05
- EROSION CONTROL BLANKET — 4 / 0.05
- 12" COMPOST FILTER SOCK
- 18" COMPOST FILTER SOCK
- 24" COMPOST FILTER SOCK
  (5 / 0.05)
- COMPOST SOCK SEDIMENT TRAP — 6 / 0.06
- TRENCH PLUGS — 10 / 0.07
- TEMPORARY TIMBER MAT — 16 / 0.10
- TEMPORARY EQUIPMENT CROSSING — 15 / 0.10
- WATER DEFLECTOR — 13 / 0.07
- SPOIL STOCKPILE
- AREA TO BE BORED — HORIZONTAL DIRECTIONAL DRILL
- AREA TO BE BORED — CONVENTIONAL BORE
- ROW – TRAVEL AND CLEARING LOD
- ROW – TRAVEL LOD
- TEMPORARY UPSLOPE DIVERSION BERM
- TEMPORARY SLOPE PIPE
- A — TROUT STREAM RESTRICTION – NO IN-STREAM WORK BETWEEN OCT-DEC
- B — TROUT STREAM RESTRICTION – NO IN-STREAM WORK BETWEEN OCT-APR
- C — TROUT STREAM RESTRICTION – NO IN-STREAM WORK BETWEEN MAR-JUN & OCT-DEC
- D — TROUT STREAM RESTRICTION – NO IN-STREAM WORK BETWEEN MAR-JUN
- PFO — SPECIAL RESTORATION AREA – PFO TO PFO; SEE PFO RESTORATION PLANTING NOTES
- PSS — SPECIAL RESTORATION AREA – PSS TO PSS; SEE PSS RESTORATION NOTES
- SITE SPECIFIC PLAN DRAWING AREA. SITE SPECIFIC TOPOGRAPHIC SURVEY CONDUCTED IN THIS APPROXIMATE AREA. E&S CONTROL LAYOUT ON E&S PLAN MAY DIFFER FROM THE SITE SPECIFIC PLAN DUE ADDITIONAL SURVEY CONDUCTED IN THESE AREAS. SITE SPECIFIC PLAN SUPERSEDES E&S PLAN IN THESE AREAS.

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — ROBERT F. SIMCIK — 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-0.01

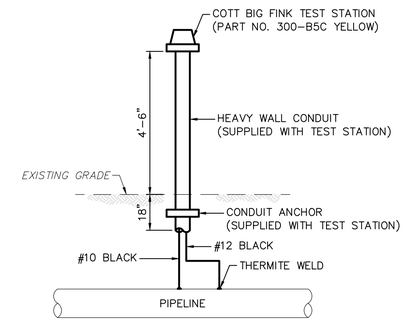
SHEET 0.01 OF 99

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\17 – Chester\E&S\5958ES000.01.dwg PIT NICHOLE.NAJESKI 3/30/2017 10:21:07 AM

STREAM & WETLANDS CROSSING TABLES

Stream ID	Stream Name	Coordinates	Flow Regime	Bank to Bank Width (feet)	Crossing Method	PAFBC Stream Designation	Siltation Impaired	E&S Plan Sheet Number
S-A66	UNT to South Branch French Creek	40.1470, -75.8274	Ephemeral	3	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.04
S-A68	UNT to South Branch French Creek	40.1375, -75.8106	Ephemeral	3	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.07
S-A70	UNT to Marsh Creek	40.1329, -75.8028	Ephemeral	4	Dry Crossing	n/a	No	ES - 6.09
S-A71	Marsh Creek	40.1310, -75.8001	Perennial	8	~~Dry Crossing~~ Bore/Temporary Bridge	n/a	No	ES - 6.09, 6.10
S-B14	South Branch French Creek	40.1436, -75.8209	Perennial	11	Dry Crossing	n/a	No	ES - 6.05
S-B15	UNT to Marsh Creek	40.1246, -75.7923	Perennial	~~6~~ 7	~~Dry Crossing~~ Bore/Temporary Bridge	n/a	No	ES - 6.11
S-B18	UNT to Marsh Creek	40.1029, -75.7571	Perennial	~~5~~ 8	Dry Crossing	n/a	No	ES - 6.19
S-B19	UNT to Marsh Creek	40.1027, -75.7575	Intermittent	2	Dry Crossing	n/a	No	ES - 6.19
S-B20	UNT to Marsh Creek	40.1032, -75.7568	Intermittent	2.5	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.19
S-B34	UNT to Chester Creek	39.9525, -75.5128	Intermittent	2	~~HDD~~ HDD Floodway	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.73
S-B35	UNT to Chester Creek	39.9514, -75.5117	Ephemeral	3	HDD	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.73
S-B79	UNT to Valley Creek	40.0297, -75.6187	Perennial	7	HDD	Drains to ATW	Yes	ES - 6.47, 6.48
S-B81	Valley Creek	40.0314, -75.62	Perennial	12	HDD	ATW, Drains to STS	Yes	ES - 6.47
S-C56	UNT to South Branch French Creek	40.1392, -75.8135	Perennial	6	Dry Crossing	n/a	No	ES - 6.07
S-C57	UNT to South Branch French Creek	40.1390, -75.8136	Ephemeral	3	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.07
S-C58	UNT to South Branch French Creek	40.1384, -75.8126	Perennial	4	Dry Crossing	n/a	No	ES - 6.07
S-C59	UNT to Valley Creek	40.0379, -75.6328	Perennial	8	HDD	Drains to STS, ATW	Yes	ES - 6.44, 6.45
S-C60	UNT to Valley Creek	40.0376, -75.6326	Ephemeral	3	HDD	Drains to STS, ATW	Yes	ES - 6.45
S-C61	UNT to Valley Creek	40.0381, -75.6339	Perennial	9	~~Dry Crossing~~ HDD/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.44
S-C62	UNT to Valley Creek	40.0385, -75.6338	Intermittent	6	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.44
S-C63	UNT to Valley Creek	40.0477, -75.6503	Perennial	8	HDD	Drains to STS, ATW	Yes	ES - 6.41
S-C64	UNT to Valley Creek	40.0496, -75.6552	Perennial	5	~~HDD~~ HDD/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.40
S-C65	UNT to Valley Creek	40.0494, -75.6557	Perennial	3	~~Floodway Crossing~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.40
S-C66	UNT to Valley Creek	40.0368, -75.6288	Ephemeral	4	Dry Crossing/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.45
S-C67	UNT to Shamona Creek	40.0636, -75.6813	Intermittent	1.5	HDD	n/a Drains to TNR	Yes	ES - 6.35
S-C68	UNT to Shamona Creek	40.0634, -75.681	Intermittent	3	HDD	n/a Drains to TNR	Yes	ES - 6.35
S-C69	UNT to Shamona Creek	40.0632 -75.6803	Ephemeral	2	HDD	n/a Drains to TNR	Yes	ES - 6.35
S-C72	UNT to Black Horse Creek	40.0845, -75.7203	Perennial	4	Dry Crossing	Drains to TNR	No	ES - 6.27
S-C73	Blackhorse Creek	40.0852 -75.7227	Perennial	~~20~~ 40	Dry Crossing	TNR	No	ES - 6.26
S-C74	UNT to Black Horse Creek	40.0857, -75.7223	Ephemeral	4	Floodway Only	Drains to TNR	No	ES - 6.26
S-C87	UNT to Marsh Creek	40.0718, -75.6959	Perennial	10	HDD	n/a	No	ES - 6.31, 6.32
S-C89	UNT to Marsh Creek	40.0720, -75.6963	Ephemeral	4	HDD	n/a	No	ES - 6.32
S-C90	UNT to Marsh Creek	40.0721, -75.6965	Ephemeral	3	HDD	n/a	No	ES - 6.31
S-C91	UNT to Marsh Creek	40.0723, -75.6973	Intermittent	4	HDD	n/a	No	ES - 6.31
S-C92	UNT to Marsh Creek	40.0726, -75.6972	Ephemeral	2.5	HDD	n/a	No	ES - 6.31
S-C93	UNT to Marsh Creek	40.0752, -75.7028	Intermittent	2.5	~~Dry Crossing~~ Dry Crossing/Temporary Bridge	n/a	No	ES - 6.30
S-C94	UNT to Marsh Creek	40.0753, -75.7025	Ephemeral	2	Dry Crossing	n/a	No	ES - 6.30
S-C96	UNT to Marsh Creek	40.0779, -75.7076	Perennial	6	Dry Crossing/Temporary Bridge	n/a	No	ES - 6.29
S-C97	UNT to Marsh Creek	40.0769, -75.7062	Perennial	4	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.29, 6.30
S-C98	UNT to Marsh Creek	40.0770, -75.7055	Intermittent	3	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.30
S-H2	UNT to Shamona Creek	40.0653, -75.6841	Ephemeral	3	~~HDD~~ HDD Floodway	n/a Drains to TNR	Yes	ES - 6.34
S-H3	UNT to Shamona Creek	40.0642, -75.6824	Perennial	10	HDD	n/a Drains to TNR	Yes	ES - 6.34
S-H4	UNT to Shamona Creek	40.0644, -75.6825	Ephemeral	1	HDD	n/a Drains to TNR	Yes	ES - 6.34
S-H5	Shamona Creek	40.0615, -75.6776	Perennial	12	HDD	n/a TNR	Yes	ES - 6.35
S-H6	UNT to Shamona Creek	40.0616 -75.6773	Ephemeral	1	HDD Floodway	n/a Drains to TNR	Yes	ES - 6.35
S-H9	UNT to Marsh Creek	40.1002, -75.7524	Perennial	8	Dry Crossing	n/a	No	ES - 6.20
S-H10	UNT to Marsh Creek	40.0794, -75.7103	Intermittent	3	HDD	n/a	No	ES - 6.29
S-H11	UNT to Marsh Creek	40.0793, -75.7105	Intermittent	1.5	HDD	n/a	No	ES - 6.29
S-H30	Chester Creek	40.0088, -75.5921	Perennial	10	HDD	ATW	Yes	ES - 6.54
S-H31	UNT to Chester Creek	40.0088, -75.5918	Perennial	3	HDD Floodway	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.54
S-H32	UNT to Chester Creek	40.0085, -75.5917	Intermittent	7	HDD Floodway	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.54
S-H33	UNT to Chester Creek	40.0086, -75.5915	Ephemeral	4	HDD Floodway	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.54
S-H52	Marsh Creek	40.0916, -75.7322	Perennial	~~20~~ 45	Dry Crossing	n/a	No	ES - 6.24
S-Q81	UNT to Marsh Creek	40.0923, -75.7323	Intermittent	5	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.24
S-Q200	UNT to Marsh Creek	40.0927, -75.733	Intermittent	4	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.24
S-Q61	UNT to Ridley Creek	40.0053, -75.5798	Ephemeral	3	Dry Crossing	Drains to ATW and STS	No	ES - 6.57
S-Q82	UNT to Marsh Creek	40.0913 -75.7296	Unknown	4	~~Open Cut Floodway~~ Floodway Only	n/a	No	ES - 6.25
S-Q83	UNT to Marsh Creek	40.0908, -75.7287	Perennial	5	HDD	n/a	No	ES - 6.25
S-Q84	UNT to Marsh Creek	40.0909, -75.7285	Intermittent	2	~~HDD~~ HDD Floodway	n/a	No	ES - 6.25
S-Q85	UNT to Marsh Creek	40.0893, -75.7271	Intermittent	5	~~HDD~~ HDD Floodway	n/a	No	ES - 6.25
S-Q86	UNT to Marsh Creek	40.0896, -75.7271	Ephemeral	7	HDD	n/a	No	ES - 6.25
					65 Streams			

Wetland ID	USFWS Cowardin Classification	Coordinates	Crossing Method	Exceptional Value	E&S Plan Sheet Number
A46	PEM	40.1472, -75.8272	Open Cut	n/a Scenic; EV Stream	ES - 6.04
B12	PEM	40.1436, -75.8217	Open Cut	EV-Stream	ES - 6.05
B13	PEM	40.1437, -75.8212	Open Cut	EV-Stream	ES - 6.05
B14	PEM	40.1437, -75.8204	Open Cut	EV-Stream	ES - 6.05
B15	PEM	40.1246, -75.7921	~~Open Cut~~ Bore/Temporary Matting	n/a	ES - 6.11
B19	PEM	40.1029,-75.7571	Open Cut	n/a	ES - 6.19
B71	PFO	40.0306, -75.6195	HDD	n/a	ES - 6.47, 6.48
C33	PEM	40.1392, -75.8135	Open Cut	n/a EV Stream	ES - 6.07
C34	PEM	40.1390, -75.8127	Open Cut	n/a EV Stream	ES - 6.07
C35	PEM	40.1387, -75.8125	Open Cut	n/a EV Stream	ES - 6.07
C37	PEM	40.0635, -75.6809	HDD	~~Bog Turtle~~ Wild Trout	ES - 6.35
	~~PSS~~ PFO	40.0633, -75.6809	HDD	~~Bog Turtle~~ Wild Trout	ES - 6.35
C38	PEM	40.0845, -75.7211	Open Cut/ Temp Matting	Wild Trout-Trib; Bog Turtle Adj.	ES - 6.26
C40	PEM	40.0845, -75.7227	Open Cut/ Temp Matting	Wild Trout; Bog Turtle Adj.	ES - 6.27
C42	PEM	40.0705, -75.6936	Open Cut	n/a	ES - 6.32
C43	PEM	40.0721, -75.6963	HDD	~~Bog Turtle~~ n/a	ES - 6.31, 6.32
	PFO	40.0719, -75.6966	HDD	~~Bog Turtle~~ n/a	ES - 6.31, 6.32
C47	PEM	40.0775, -75.7068	Open Cut/Temporary Matting	n/a	ES - 6.29, 6.30
C48	PEM	40.0786, -75.7087	Open Cut/Temporary Matting	n/a	ES - 6.29
C49	PEM	40.1089, -75.7676	Open Cut	n/a	ES - 6.17
H15	PEM	40.0995, -75.7505	Open Cut	n/a	ES - 6.20
	PFO	40.0996, -75.7509	Open Cut	n/a	ES - 6.20
H16	PEM	40.1003, -75.7522	Open Cut	n/a	ES - 6.20
H17	PEM	40.0794, -75.7104	HDD	n/a	ES - 6.29
K21	PEM	40.0222, -75.6132	HDD	n/a	ES - 6.50
Q75	PFO	40.0925, -75.7324	Bore/ Open Cut	~~Wild Trout~~ n/a	ES - 6.24
Q76	PSS	40.0909, -75.7290	HDD	~~Wild Trout~~ n/a	ES - 6.25
Q77	PEM	40.0898, -75.7275	HDD	~~Wild Trout~~ n/a	ES - 6.25
			25 Wetlands		



NOTES:

1. TEST WIRES SHALL BE STRANDED COPPER WITH THW OR MTW INSULATION.
2. TEST WIRES SHALL BE OF THE GAUGE INDICATED AND PROVIDED WITH WIRE LABELS (WITHIN TEST STATION) TO IDENTIFY THE PIPELINE ATTACHMENT LOCATION. THE NO. 1 TEST WIRE SHALL BE ATTACHED TO THE PIPELINE AT THE LOWER STATION NO. WITH THE ADDITIONAL TEST WIRE ATTACHED AT THE SPACING INDICATED AND IN ORDER OF ADVANCING STATION NOS.
3. TEST WIRES ARE TO BE CONNECTED USING THE THERMITE WELD PROCESS.
4. COAT THERMITE WELD CONNECTION & ALL BELOW GRADE EXPOSED COPPER AS SPECIFIED FOR EXISTING PIPELINE COATING OR AS SPECIFIED FOR BARE PIPE.
5. INSTALL TEST WIRES WITHIN PIPE TRENCH AT THE FIVE OR SEVEN O'CLOCK POSITION OF THE PIPE. TEST WIRES SHALL NOT BE IN IMMEDIATE CONTACT WITH THE PIPE.
6. BACK-FILL AROUND WIRES MUST BE FREE OF SHARP MATERIALS WHICH COULD DAMAGE THE TEST WIRE INSULATION.

TYPICAL CATHODIC PROTECTION TEST STATION

NOT TO SCALE

AVOIDANCE MEASURES TABLE

Species or Area	Agency	Water	County/AOC/ Survey Area	Population	Pre-Construction, Construction and Restoration, Post-Construction Activity	Clearance Letter	Conservation Plan
Bog turtle	USFWS	All	All	NA	Construction, Restoration	10/31/16	Bog Turtle Conservation Plan (April 2016)
Bog turtle	USFWS	All	All	NA	Construction, Restoration	10/31/16	Bog Turtle Conservation Plan (April 2016)

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	4/5/18	UPDATED STREAM AND WETLAND CROSSING TABLE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT F. SIMCIK
ENGINEER
075364425-E
4/5/18

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-0.02

SHEET 0.02 OF 99

TEMPORARY EROSION AND SEDIMENT CONTROLS INSPECTION AND MAINTENANCE SCHEDULE

BMP	INSPECTION FREQUENCY	MAINTENANCE TO BE PERFORMED
COMPOST FILTER SOCK	WEEKLY AND AFTER RUNOFF EVENTS	MAINTENANCE SHALL BE PERFORMED AS NEEDED, SEDIMENT SHALL BE REMOVED ONCE IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BARRIER. COMPOST FILTER SOCK SHALL BE REPLACED WHENEVER IT HAS DETERIORATED TO SUCH AN EXTENT THAT THE EFFECTIVENESS OF COMPOST FILTER SOCK IS REDUCED. COMPOST FILTER SOCKS SHALL REMAIN IN PLACE UNTIL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED. ALL SEDIMENT ACCUMULATION AT THE COMPOST FILTER SOCK SHALL BE REMOVED AND PROPERLY DISPOSED OF BEFORE THE COMPOST FILTER SOCK IS REMOVED.
ROCK CONSTRUCTION ENTRANCE	DAILY	CONTRACTOR SHALL MAINTAIN/REPLACE MATERIAL AS NEEDED THROUGHOUT CONSTRUCTION TO MAINTAIN EFFECTIVENESS AND SPECIFIED MINIMUM THICKNESS DURING USE OF ACCESS ROAD. A STOCKPILE OF ROCK WILL BE MAINTAINED ON SITE FOR THIS PURPOSE
MULCH STABILIZATION	WEEKLY AND AFTER RUNOFF EVENTS	REPLACE MULCH AS REQUIRED. RESTORE SEEDING IN AFFECTED AREA IF NECESSARY.
TIMBER MAT	WEEKLY AND AFTER RUNOFF EVENTS	INSPECT THE TIMBER MAT FOR EROSION AND MAKE ANY NECESSARY REPAIRS.
WATERBARS	WEEKLY AND AFTER RUNOFF EVENTS	WATERBARS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RUNOFF EVENT. DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION.
PUMPED WATER FILTER BAGS	DAILY	FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES:

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING, CUTS, FILLS, TRENCHING, AND TEMPORARY ROAD CONSTRUCTION OR IMPROVEMENT, SHALL BE DONE IN ACCORDANCE WITH AN APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
2. ~~AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.~~ FOR EARTH DISTURBANCE ACTIVITIES AUTHORIZED BY THIS PERMIT, AT LEAST ONE PRE-CONSTRUCTION MEETING IS REQUIRED. THE PERMITTEE SHALL CONTACT DEP TO SCHEDULE THE PRE-CONSTRUCTION MEETING AND PROVIDE AT LEAST SEVEN (7) DAYS' NOTICE OF THE PRE-CONSTRUCTION MEETING TO ALL INVITED ATTENDEES, UNLESS OTHERWISE APPROVED BY DEP IN WRITING. PERMITTEES, CO-PERMITTEES, OPERATORS, AND LICENSED PROFESSIONALS, OR DESIGNEES RESPONSIBLE FOR EARTH DISTURBANCE ACTIVITY, INCLUDING IMPLEMENTATION OF E&S, PCSM AND PPC PLANS AND CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN, SHALL ATTEND THE PRE-CONSTRUCTION MEETING(S). PERMITTEES, CO-PERMITTEES, OPERATORS AND LICENSED PROFESSIONALS ARE RESPONSIBLE FOR ENSURING THAT ALL ACTIVITIES ON THE SITE COMPLY WITH THE REQUIREMENTS OF THE PERMIT. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION VI OF THE APPROVED CHAPTER 102 PERMIT).
3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.

4A. THE STAGING OF EARTH DISTURBANCE ACTIVITIES AND MAINTENANCE REQUIREMENTS CONTAINED IN THE APPROVED E&S PLAN MUST BE FOLLOWED. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION C OF THE APPROVED CHAPTER 102 PERMIT).

5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
6. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. ~~GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.~~ GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING SHALL NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE E&S PLAN FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THE E&S PLAN. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION F OF THE APPROVED CHAPTER 102 PERMIT).
7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND/OR FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAPS(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER. SEGREGATION OF TOPSOIL SHALL OCCUR WHERE TOPSOIL EXISTS WITHIN THE WORK AREA.
9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.
10. ~~ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET. SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.~~ ALL BUILDING MATERIALS AND WASTES MUST BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED IN ACCORDANCE WITH DEP'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE CHAPTER 260A (RELATING TO HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL), CHAPTER 271 (RELATED TO MUNICIPAL WASTE MANAGEMENT SYSTEM -- GENERAL PROVISIONS), AND CHAPTER 287 (RELATING TO RESIDUAL WASTE MANAGEMENT SYSTEM -- GENERAL PROVISIONS). NO BUILDING MATERIAL OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT OR FROM THE SITE. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION V OF THE APPROVED CHAPTER 102 PERMIT).
11. ~~ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.~~ AN E&S PLAN OR OTHER AUTHORIZATION MEETING THE REGULATORY REQUIREMENTS DETAILED IN 25 PA. CODE § 102.4(B) SHALL BE RECEIVED AND APPROVED BY DEP OR AN AUTHORIZED CONSERVATION DISTRICT AND IMPLEMENTED FOR ALL SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.(IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION VII, CONDITION A OF THE APPROVED CHAPTER 102 PERMIT).
12. ~~THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.~~ CLEAN FILL REQUIREMENTS -- ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE DEP FORM FP-001 (CERTIFICATION OF CLEAN FILL) TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIALS AS CLEAN FILL. THE FORM MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. FILL MATERIAL NOT QUALIFYING AS CLEAN FILL IS REGULATED FILL AND MUST BE MANAGED IN ACCORDANCE WITH DEP'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 271 OR 287, WHICHEVER IS APPLICABLE. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION VII, CONDITION B OF THE APPROVED CHAPTER 102 PERMIT).
13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.

13A. UPON THE INSTALLATION OR STABILIZATION OF ALL PERIMETER SEDIMENT CONTROL BMPS AND AT LEAST THREE (3) DAYS PRIOR TO PROCEEDING WITH THE BULK EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE OR THE CO-PERMITTEE SHALL PROVIDE NOTIFICATION TO DEP OR AN AUTHORIZED CONSERVATION DISTRICT. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION D OF THE APPROVED CHAPTER 102 PERMIT).

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES (CONTINUED):

14. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, RE-MULCH AND RE-NETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
15. NO SOIL AMENDMENTS SUCH AS AGRICULTURAL LIME, FERTILIZER, ETC. WILL BE USED WITHIN WETLAND AREAS.
16. A LOG SHOWING DATES THAT E&S BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND BE MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.
17. SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE AT THE END OF EACH DAY, OR AS NEEDED, OR AS DIRECTED BY THE CONSERVATION DISTRICT OR LOCAL MUNICIPALITY, AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
18. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.
19. IN AREAS OF TOPSOIL SEGREGATION THE TOPSOIL SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES -- 6 TO 12 INCHES ON COMPACTED SOILS -- PRIOR TO THE RESTORATION OF THE TOPSOIL. AREAS TO BE REVEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILLOUT SLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
20. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
21. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS.
22. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
23. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
24. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
25. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
26. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 100 FEET OF A SPECIAL PROTECTION SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
27. UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY WHERE CESSATION OF EARTH DISTURBANCE ACTIVITIES IN NON-SPECIAL PROTECTION WATERSHEDS WILL EXCEED 4 DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION. PENDING FUTURE EARTH DISTURBANCE ACTIVITIES IN A SPECIAL PROTECTION WATERSHEDS TEMPORARY STABILIZATION SHALL BE IMMEDIATE.
28. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
29. E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
30. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.
31. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORM WATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON. ~~THE TIME PERIOD BETWEEN THE TRENCH EXCAVATION TO THE BEGINNING OF DISTURBED AREA STABILIZATION FOR THE MAIN LINE PIPELINE INSTALLATION SHALL NOT EXCEED THIRTY (30) CALENDAR DAYS, UNLESS SUFFICIENT JUSTIFICATION FOR AN EXTENSION OF TIME IS PROVIDED TO AND APPROVED BY DEP IN WRITING.~~

31A. THE TIME PERIOD BETWEEN THE TRENCH EXCAVATION TO THE BEGINNING OF DISTURBED AREA STABILIZATION FOR THE MAIN LINE PIPELINE INSTALLATION SHALL NOT EXCEED THIRTY (30) CALENDAR DAYS, UNLESS SUFFICIENT JUSTIFICATION FOR AN EXTENSION OF TIME IS PROVIDED TO AND APPROVED BY DEP IN WRITING. UPON TEMPORARY CESSATION OF ANY EARTH DISTURBANCE ACTIVITY, INCLUDING TOPSOIL AND SOIL STOCKPILES, FOR WHICH THE CESSATION OF THE EARTH DISTURBANCE ACTIVITIES WILL EXCEED FOUR (4) CALENDAR DAYS, THE DISTURBED AREA SHALL BE TEMPORARILY STABILIZED IN ACCORDANCE WITH THE E&S PLAN AND WITH 25 PA. CODE § 102.22(B). PROPER E&S BMPS SHALL BE IMPLEMENTED AND MAINTAINED THROUGHOUT THE ENTIRE PROJECT UNTIL PERMANENT STABILIZATION AND NOTICE OF TERMINATION APPROVAL. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION XI OF THE APPROVED CHAPTER 102 PERMIT).

32. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT TO SCHEDULE A FINAL INSPECTION.
33. FAILURE TO CORRECTLY INSTALL E&S BMPS, FAILURE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPS MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO$10,000 PER DAY IN CIVIL PENALTIES, UP TO $10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO $25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.
34. ALL CHANNELS SHALL BE KEPT FREE OF OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO FILL, ROCKS, LEAVES, WOODY DEBRIS, ACCUMULATED SEDIMENT, EXCESS VEGETATION, AND CONSTRUCTION MATERIAL/WASTES.
35. UNDERGROUND UTILITIES CUTTING THROUGH ANY ACTIVE CHANNEL SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL RESTORED TO ITS ORIGINAL CROSS-SECTION AND PROTECTIVE LINING. ANY BASE FLOW WITHIN THE CHANNEL SHALL BE CONVEYED PAST THE WORK AREA IN THE MANNER DESCRIBED IN THIS PLAN UNTIL SUCH RESTORATION IS COMPLETE.
36. ~~EROSION CONTROL BLANKETING SHALL BE INSTALLED ON ALL SLOPES 3H:1V OR GREATER AND ALL AREAS, REGARDLESS OF SLOPE WITHIN 50 FEET OF NON-SPECIAL PROTECTION AND 100 FEET OF A SPECIAL PROTECTION SURFACE WATER AND ON ALL OTHER DISTURBED AREAS SPECIFIED ON THE PLAN MAPS AND/OR DETAIL SHEETS.~~ REGARDLESS OF SLOPE, EROSION CONTROL BLANKETS SHALL BE USED FOR ALL SEEDED AREAS WITHIN 100 FEET OF A HIGH QUALITY OR EXCEPTIONAL VALUE SURFACE WATER. FOR ALL SLOPES THAT ARE 3H:1V OR STEEPER OR WHERE POTENTIAL EXISTS FOR SEDIMENT POLLUTION TO RECEIVING WATERS, EROSION CONTROL BLANKETS SHALL BE USED FOR ALL SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION G OF THE APPROVED CHAPTER 102 PERMIT).
37. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY IN A SPECIAL PROTECTION WATERSHED, THAT PORTION OF THE PROJECT SITE TRIBUTARY TO THE SPECIAL PROTECTION WATERS MUST BE IMMEDIATELY STABILIZED.
38. IF COAL OR OTHER ACID-PRODUCING ROCK IS ENCOUNTERED AT THE PROJECT SITE, THE ACID PRODUCING ROCK WILL EITHER BE REMOVED FROM THE SITE OR HANDLED ONSITE. IF COAL OR OTHER ACID-PRODUCING ROCK MUST BE HANDLED ON SITE IS SHOULD BE SAMPLED AND ANALYZED FOR TOTAL PERCENT SULFUR IN ACCORDANCE WITH PADEP'S GUIDANCE. ON-SITE HANDLING METHODS SHOULD BE BASED ON TESTING AND PADEP GUIDANCE.
39. IF A SINKHOLE IS ENCOUNTERED, REPAIR SHOULD BE DONE UNDER THE DIRECT OBSERVATION AND SUPERVISION OF A PROFESSIONAL GEOLOGIST OR LICENSED GEOTECHNICAL ENGINEER. SITE SPECIFIC SINKHOLE REPAIRS SHOULD BE DEVELOPED ON A CASE BY CASE BASIS.
40. IN-STREAM WORK TO OCCUR IN MINOR WATER BODIES (>10 FEET WIDE) WITHIN 24 HOURS, AND IN MAJOR WATER BODIES (10 TO 100 FEET WIDE) WITHIN 48 HOURS UNLESS APPROVED IN WRITING BY THE DEPARTMENT.

CONSTRUCTION SEQUENCE:

REFER TO THE E&SC PLAN DRAWINGS FOR THE LOCATION OF THE PROPOSED WORK AND THE ASSOCIATED BMPS. A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. THE CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION IN ORDER TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENTATION CONTROLS. NECESSARY PARTS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. IT IS NOT INTENDED THAT THE DRAWINGS AND THIS REPORT SHOW DETAILED INFORMATION ON METHODS AND MATERIALS. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED IN THE FIELD.

1. MAKE ALL APPROPRIATE NOTIFICATIONS AS INDICATED IN GENERAL NOTES ON PLAN SHEET ES-0.01.
2. FLAG OR FENCE PROJECT LIMITS OF DISTURBANCE AND APPROVED ACCESS. SIGN AND FLAG WETLAND BOUNDARIES AND STREAMS.
3. ORANGE CONSTRUCTION FENCE WILL BE PROVIDED AND INSTALLED AT WETLAND AREAS ADJACENT TO THE LOD AND NOT PLANNED TO BE IMPACTED TO IDENTIFY AND DETER CONSTRUCTION EQUIPMENT, VEHICLES AND PERSONNEL FROM ENTERING WETLAND.
4. LOCATE STAGING AREAS AND ACCESS POINTS INCLUDING CONSTRUCTION ENTRANCES. INSTALL COMPOST FILTER SOCKS DOWN SLOPE OF THESE AREAS.
5. INSTALL ROCK CONSTRUCTION ENTRANCES AS NEEDED. REFER TO THE ROCK CONSTRUCTION ENTRANCE DETAIL ON PLAN SHEET ES-0.05.
6. CONSTRUCT THE PROPOSED ACCESS ROADS AND IMPLEMENT TEMPORARY IMPROVEMENTS AS IDENTIFIED IN ACCESS ROAD SUMMARY TABLE AND DETAILED ON THE PLAN SHEETS.
7. INSTALL COMPOST FILTER SOCKS AS SHOWN ON THE CONSTRUCTION DRAWINGS. INSTALLATIONS SIZING, AND SPACING MUST CONFORM TO THE CHART AND DETAILS PROVIDED ON PLAN SHEET ES-0.05. INSTALL TEMPORARY UPSLOPE DIVERSIONS AND TEMPORARY SLOPE PIPES AS SHOWN ON PLAN SHEETS AND DETAILS.
8. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL COMMENCE ALONG THE PIPELINE ROUTE AND BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. ~~GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.~~ FOR CLEARING, GRUBBING, AND TOPSOIL REMOVAL IN ALL STREAM, RIVER, WETLAND OR OTHER WATER BODY CROSSINGS, REFER TO CONSTRUCTION SEQUENCE NOTES BELOW. TOPSOIL WILL BE SEGREGATED AT LOCATIONS THROUGHOUT THE PROJECT WHERE TOPSOIL EXISTS.

8A. RIGHT OF WAY CLEARING CONSISTING OF FELLING OF TREES AND GRUBBING MAY BE COMPLETED BEFORE THE E&S BMPS ARE INSTALLED ON AREAS WHERE SLOPES OF 3H:1V OR GREATER ARE NOT PRESENT. ONCE THE GRUBBING STARTS PERIMETER E&S BMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE PLAN DRAWINGS BY THE END OF THE DAY. IF HEAVY RAIN OCCURS DURING THE FELLING OF TREES AND GRUBBING PROCESS AND RUNOFF IS OBSERVED LEAVING THE RIGHT-OF-WAY, PERIMETER BMP'S MUST BE INSTALLED IMMEDIATELY AS OPPOSED TO THE END OF THE DAY. REGARDLESS OF SLOPE, EROSION CONTROL BLANKETS SHALL BE USED FOR ALL SEEDED AREAS WITHIN 100 FEET OF A HIGH QUALITY OR EXCEPTIONAL VALUE SURFACE WATER. FOR ALL SLOPES THAT ARE 3H:1V OR STEEPER OR WHERE POTENTIAL EXISTS FOR SEDIMENT POLLUTION TO RECEIVING WATERS, EROSION CONTROL BLANKETS SHALL BE USED FOR ALL SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER. IF SOCK IS DAMAGED DURING GRUBBING OR MULCHING SOCK WILL BE REPLACED. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION G OF THE APPROVED CHAPTER 102 PERMIT).

8B. GENERAL SITE CLEARING, AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OF PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLANS. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION F OF THE APPROVED CHAPTER 102 PERMIT).

9. TEMPORARY WATERBARS OR APPROVED INTERCEPTOR DYKES WILL BE INSTALLED ALONG THE ALIGNMENT PRIOR TO PIPE INSTALLATION AT THE END OF EACH WORK DAY. DURING THE PERIODS OF TIME WHERE PIPE TRENCH IS OPEN CONTRACTORS WILL PROVIDE POSITIVE CONTROL OF ALL STORM WATER ON SITE, TEMPORARY WATERBARS WILL BE CONSTRUCTED BY THE END THE WORK DAY, OR DURING EACH WORK DAY IF REQUIRED CONTRACTOR WILL INSTALL SILT FENCE TO CONTROL EROSION UNTIL 70% VEGETATION GROWTH HAS BEEN ACHIEVED.
10. MINIMIZE TOTAL AREA OF DISTURBANCE. MAINTAIN TEMPORARY SOIL STOCKPILES WITHIN EXISTING SOIL EROSION AND SEDIMENT CONTROLS. SHOULD EXCAVATION ENTER STREAMS, FOLLOW SPECIFIC DETAILS FOR THESE AREAS SHOWN ON THE DRAWINGS AND INCLUDE THE STEPS DETAILED IN THE SPECIFIC SECTIONS BELOW. PULLBACK AREAS FOR HDDS WILL BE CLEARED AND PREPARED AS NEEDED TO SUPPORT STAGING, WELDING AND TESTING OF THE HDD PIPE SECTIONS. AREAS NOT UTILIZED FOR CONSTRUCTION ACTIVITIES SHOULD BE AVOIDED TO MINIMIZE IMPACTS.
11. INSTALL PIPE AND TRENCH PLUGS IN ACCORDANCE WITH DETAILS ON PLAN SHEET ES-0.07. WHEN OPEN CUTTING DRIVEWAYS AND ACCESS ROADS, CONTRACTOR SHALL HAVE ROAD PLATES AVAILABLE TO MAINTAIN ACCESS FOR LANDOWNERS. THE LED-TRENCH PIPELINE WILL BE INSTALLED FIRST, FOLLOWED BY THE 16-INCH LINE. ANY TEMPORARY STABILIZATION REQUIRED BETWEEN THE TWO INSTALLATIONS WILL BE IMPLEMENTED IN ACCORDANCE WITH THIS E&S PLAN. BOTH PIPELINES WILL BE INSTALLED WITHIN THE SAME LIMIT OF DISTURBANCE AND IN THE SAME CONSTRUCTION PERIOD.
12. FOR OPEN-CUT AREAS, THE LENGTH OF TIME REQUIRED TO CLEAR AND GRADE THE AREA, EXCAVATE THE TRENCH, INSTALL THE PIPELINES, BACKFILL THE TRENCH AND BEGIN STABILIZATION OF DISTURBED AREAS WILL NOT EXCEED 30 CALENDAR DAYS FOR MOST INSTALLATIONS. LONGER TIME PERIODS MAY BE APPROVED ON A CASE-BY-CASE BASIS.
13. BACKFILL EXCAVATED AREA AND COVER WITH TOPSOIL (WHERE TOPSOIL WAS SEGREGATED).
14. BEFORE RESTORATION OF GRADE, THE SECOND

ALL PERMIT CONDTIONS SET □ORTH IN THE E&S PERMIT NO□ES□ □□□□□ □□□□□AND □ ATER O□STRUCTION AND ENCROACHMENT PERMIT E□□□6□ MUST □E □OLLO□ ED

E&S PERMIT PART C, OTHER REQUIREMENTS

I. PROHIBITED DISCHARGES

A. ALL DISCHARGES COVERED BY THIS PERMIT SHALL BE COMPOSED ENTIRELY OF STORMWATER. DISCHARGES OF SUBSTANCES OTHER THAN STORMWATER MUST BE IN COMPLIANCE, WHEN REQUIRED, WITH AN NPDES PERMIT (OTHER THAN THIS PERMIT) ISSUED FOR THE DISCHARGE. DISCHARGES OF SEWAGE OR INDUSTRIAL WASTE TO WATERS OF THE COMMONWEALTH OR A BMP IS NOT PERMITTED.

B. THE PERMITTEE OR CO-PERMITTEE(S) MAY NOT DISCHARGE FLOATING MATERIALS, OIL, GREASE, SCUM, FOAM, SHEEN, AND SUBSTANCES WHICH: PRODUCE ODOR, TASTE, OR TURBIDITY OR SETTLE TO FORM DEPOSITS IN CONCENTRATIONS OR AMOUNTS SUFFICIENT TO BE, OR CREATE A DANGER OF BEING, INIMICAL TO THE WATER USES TO BE PROTECTED OR HUMAN, ANIMAL, PLANT, OR AQUATIC LIFE.

II. EROSION AND SEDIMENT CONTROL (E&S) PLANS

A. THE PERMITTEE SHALL IMPLEMENT ITS APPROVED E&S PLAN, INCLUDING ALL BMPS CONTAINED THEREIN. THE E&S PLAN IS INCORPORATED INTO THIS PERMIT.

B. E&S PLANS REQUIRED UNDER THIS PERMIT ARE CONSIDERED REPORTS THAT SHALL BE AVAILABLE TO THE PUBLIC UNDER SECTION 607 OF THE CLEAN STREAMS LAW (35 P.S. § 691.607). THE OWNER OR OPERATOR OF A FACILITY WITH STORMWATER DISCHARGES COVERED BY THIS PERMIT SHALL MAKE E&S PLANS AVAILABLE TO THE PUBLIC UPON REQUEST. E&S PLANS MUST BE MADE AVAILABLE AT THE SITE OF THE CONSTRUCTION ACTIVITY AT ALL TIMES.

E. ALL MANUFACTURED BMPS, INCLUDING EROSION CONTROL MATTING AND WATER QUALITY DEVICES, SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

J. FOR ALL DISCHARGES FROM THE PROJECT SITE ASSOCIATED WITH EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE SHALL IMPLEMENT, MAINTAIN, REPAIR AND IF NECESSARY REPLACE BMPS TO MINIMIZE THE POTENTIAL FOR ACCELERATED EROSION AND SEDIMENTATION AND TO PROTECT, MAINTAIN, RECLAIM AND RESTORE WATER QUALITY AND EXISTING AND DESIGNATED USES.

III. POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLANS

A. THE PERMITTEE SHALL IMPLEMENT ITS APPROVED PCSM PLAN, INCLUDING ALL BMPS CONTAINED THEREIN. THE PCSM PLAN IS INCORPORATED INTO THIS PERMIT.

B. PCSM PLANS REQUIRED UNDER THIS PERMIT ARE CONSIDERED REPORTS THAT SHALL BE AVAILABLE TO THE PUBLIC UNDER SECTION 607 OF THE CLEAN STREAMS LAW (35 P.S. § 691.607). THE OWNER OR OPERATOR OF A FACILITY WITH STORMWATER DISCHARGES COVERED BY THIS PERMIT SHALL MAKE PCSM PLANS AVAILABLE TO THE PUBLIC UPON REQUEST. THE PCSM PLANS MUST BE MADE AVAILABLE AT THE SITE OF THE CONSTRUCTION ACTIVITY AT ALL TIMES.

D. THE PCSM PLAN MUST BE CONSISTENT WITH THE ASSUMPTIONS AND REQUIREMENTS OF ANY AVAILABLE WLAS FOR THE DISCHARGES AS SET FORTH IN ANY APPLICABLE TMDLS ESTABLISHED FOR THE RECEIVING WATERS.

E. THE PORTION OF A SITE RECLAMATION OR RESTORATION PLAN THAT IDENTIFIES PCSM BMPS TO MANAGE STORMWATER FROM PIPELINES OR OTHER SIMILAR UTILITY INFRASTRUCTURE MAY BE USED TO SATISFY THE PCSM REQUIREMENTS IF THE PCSM RECLAMATION, OR RESTORATION PLAN MEETS THE REQUIREMENTS OF 25 PA. CODE § 102.8(B), (C), (E), (F), (H), (I) AND (I), AND WHEN APPLICABLE, (M).

F. ALL MANUFACTURED BMPS, INCLUDING EROSION CONTROL MATTING AND WATER QUALITY DEVICES, SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

H. UPON REDUCTION, LOSS, OR FAILURE OF ANY PCSM BMP, THE PERMITTEE SHALL IMMEDIATELY TAKE MEASURES TO PREVENT POLLUTION TO WATERS OF THE COMMONWEALTH AND ADVERSE IMPACTS TO THE ENVIRONMENT. THE PERMITTEE SHALL IMMEDIATELY SUBMIT TO DEP FOR REVIEW AND APPROVAL A CORRECTIVE ACTION PLAN (CAP) AND, IF NECESSARY, A PERMIT MODIFICATION, WHICH SHALL INCLUDE A SCHEDULE FOR THE REPAIR AND/OR REPLACEMENT OF THE PCSM BMP. UPON DEP'S APPROVAL OF THE CAP, THE PERMITTEE SHALL IMPLEMENT THE CAP.

IV. PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLANS

A. IF TOXIC, HAZARDOUS, OR OTHER POLLUTING MATERIALS WILL BE ON SITE, THE PERMITTEE OR CO-PERMITTEE(S) MUST IMPLEMENT A PPC PLAN FOR USE WHILE THOSE MATERIALS ARE ON-SITE IN ACCORDANCE WITH 25 PA. CODE § 91.34 (RELATING TO ACTIVITIES UTILIZING POLLUTANTS). THE PPC PLAN SHALL IDENTIFY AREAS WHICH MAY INCLUDE, BUT ARE NOT LIMITED TO, WASTE MANAGEMENT AREAS, RAW MATERIAL STORAGE AREAS, FUEL STORAGE AREAS, TEMPORARY AND PERMANENT SPOILS STORAGE AREAS, MAINTENANCE AREAS, AND ANY OTHER AREAS THAT MAY HAVE THE POTENTIAL TO CAUSE NONCOMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS PERMIT DUE TO THE STORAGE, HANDLING, OR DISPOSAL OF ANY TOXIC OR HAZARDOUS SUBSTANCES SUCH AS OIL, GASOLINE, PESTICIDES, HERBICIDES, SOLVENTS, CONCRETE WASHWATERS, ETC. BMPS SHALL BE DEVELOPED AND IMPLEMENTED FOR EACH IDENTIFIED AREA.

B. THE PPC PLAN SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR REVIEW AT THE REQUEST OF DEP OR AN AUTHORIZED CONSERVATION DISTRICT.

VIII. PHASED PROJECTS

PRIOR TO THE COMMENCEMENT OF EARTH DISTURBANCE ACTIVITIES FOR SUBSEQUENT PHASES OF THE PROJECT, THE PERMITTEE OR CO-PERMITTEE SHALL SUBMIT AN E&S PLAN AND PCSM PLAN AND SUPPORTING INFORMATION FOR EACH ADDITIONAL PHASE OR PORTION OF THE PROJECT TO DEP OR AN AUTHORIZED CONSERVATION DISTRICT FOR APPROVAL. COVERAGE UNDER THIS PERMIT IS ONLY GRANTED FOR THOSE PHASES OR PORTIONS OF A PROJECT FOR WHICH AN E&S PLAN AND PCSM PLAN HAS BEEN SUBMITTED AND APPROVED BY DEP OR AN AUTHORIZED CONSERVATION DISTRICT,

IX. WETLAND PROTECTION

IF HYDRIC SOILS OR OTHER WETLAND FEATURES ARE PRESENT, A WETLAND DETERMINATION MUST BE CONDUCTED IN ACCORDANCE WITH DEP PROCEDURES. A COPY OF THE WETLAND DETERMINATION SHALL BE PROVIDED TO DEP OR AN AUTHORIZED CONSERVATION DISTRICT AS PART OF THE APPLICATION. ALL WETLANDS IDENTIFIED MUST BE INCLUDED ON THE E&S PLAN AND PCSM PLAN. SPECIAL PRECAUTIONS MUST BE TAKEN TO PROTECT WETLANDS AND OTHER WATER RESOURCES IDENTIFIED IN THE APPLICATION, PLANS, AND OTHER SUPPORTING DOCUMENTS.

X. INFILTRATION BMPS

A. WHERE INFILTRATION AND/OR RESTORATION BMPS ARE BEING UTILIZED, THE PERMITTEE AND CO-PERMITTEE MUST ENSURE THAT SOIL COMPACTION IS AVOIDED OR MINIMIZED IN THOSE AREAS. IF THE AREAS PLANNED FOR INFILTRATION AND/OR RESTORATION BMPS ARE COMPROMISED THROUGH COMPACTION OR OTHER MEANS, MEASURES SHALL BE TAKEN TO ENSURE THAT PROPER SOIL DE-COMPACTION OCCURS. THE PERMITTEE SHALL IMPLEMENT SUCH MEASURES IN ACCORDANCE WITH THE GUIDANCE ON SOIL RESTORATION IN THE PA STORMWATER BMP MANUAL (BMP 6.7.3, CHAPTER 6, PAGE 221). ADDITIONAL SOIL TESTING MUST BE PERFORMED TO VERIFY THAT THE BMPS WILL PERFORM AS PLANNED.

B. TO PROTECT THE EFFECTIVE INFILTRATION AREA(S) AT PCSM BMPS DURING CONSTRUCTION ACTIVITIES (INCLUDING EARTH DISTURBANCE AND CONVERSION OR INSTALLATION), THE INFILTRATION AREA(S) FOR A PCSM BMP SHALL BE PROTECTED BY ENTIRELY SURROUNDING THE INFILTRATION AREA WITH AN 18-INCH COMPOST FILTER SOCK. THIS IS ONLY NECESSARY IN THOSE AREAS WHERE SPECIFIC INFILTRATION BMPS ARE BEING UTILIZED. THE COMPOST FILTER SOCK SHALL REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE CONTRIBUTING DRAINAGE AREA HAS REACHED PERMANENT STABILIZATION (A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION) AND DEP OR AN AUTHORIZED CONSERVATION DISTRICT APPROVES THE REMOVAL OF THE COMPOST FILTER SOCK

XII. LONG-TERM OPERATION AND MAINTENANCE

A. THE PERMITTEE OR CO-PERMITTEE SHALL BE RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS UNLESS A DIFFERENT PERSON IS IDENTIFIED IN THE NOT AND THAT PERSON HAS AGREED TO LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS.

B. FOR ANY PROPERTY CONTAINING A PCSM BMP, THE PERMITTEE OR CO-PERMITTEE SHALL RECORD AN INSTRUMENT WITH THE RECORDER OF DEEDS WHICH WILL ASSURE DISCLOSURE OF THE PCSM BMP AND THE RELATED OBLIGATIONS IN THE ORDINARY COURSE OF A TITLE SEARCH OF THE SUBJECT PROPERTY. THE RECORDED INSTRUMENT MUST IDENTIFY THE PCSM BMP, PROVIDE FOR NECESSARY ACCESS RELATED TO LONG-TERM OPERATION AND MAINTENANCE FOR PCSM BMPS, AND PROVIDE NOTICE THAT THE RESPONSIBILITY FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS IS A COVENANT THAT RUNS WITH THE LAND THAT IS BINDING UPON AND ENFORCEABLE BY SUBSEQUENT GRANTEES, AND PROVIDE PROOF OF FILING WITH THE NOT UNDER 25 PA. CODE § 102.8(M)(2).

C. FOR COMMONWEALTH OWNED PROPERTY, A COVENANT THAT RUNS WITH THE LAND IS NOT REQUIRED UNTIL THE TRANSFER OF THE LAND CONTAINING A PCSM BMP OCCURS. UPON TRANSFER OF THE COMMONWEALTH-OWNED PROPERTY CONTAINING THE PCSM BMP, THE DEED MUST COMPLY WITH 25 PA. CODE § 102.8(M)(3). AN AGENCY OF THE FEDERAL GOVERNMENT SHALL NOT BE REQUIRED TO MAKE OR RECORD A DECLARATION OF COVENANTS ON ITS PROPERTY UNTIL TRANSFER OF THE PROPERTY TO A NON-FEDERAL OR NON-COMMONWEALTH ENTITY OR INDIVIDUAL. UPON TRANSFER OF THE COMMONWEALTH OWNED OR FEDERALLY OWNED PROPERTY CONTAINING THE PCSM BMP, THE DEED MUST COMPLY WITH 25 PA. CODE § 102.8(M)(3).

D. THE PERSON RESPONSIBLE FOR PERFORMING LONG-TERM OPERATION AND MAINTENANCE MAY ENTER INTO AN AGREEMENT WITH ANOTHER PERSON, INCLUDING A CONSERVATION DISTRICT, NONPROFIT ORGANIZATION, MUNICIPALITY, AUTHORITY, PRIVATE CORPORATION, OR OTHER PERSON, TO TRANSFER THE RESPONSIBILITY FOR PCSM BMPS OR TO PERFORM LONG-TERM OPERATION AND MAINTENANCE AND PROVIDE NOTICE THEREOF TO DEP.

E. A PERMITTEE OR CO-PERMITTEE THAT FAILS TO TRANSFER LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS OR OTHERWISE FAILS TO COMPLY WITH THIS REQUIREMENT, SHALL REMAIN JOINTLY AND SEVERALLY RESPONSIBLE WITH THE LANDOWNER FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS LOCATED ON THE PROPERTY.

F. UNLESS A LATER DATE IS APPROVED BY DEP IN WRITING, THE PERMITTEE SHALL RECORD AN INSTRUMENT AS REQUIRED UNDER 25 PA. CODE SUBSECTION 102.8(M)(2) AND PARAGRAPH XII.B WITHIN 45 DAYS FROM THE DATE OF ISSUANCE OF THIS PERMIT OR AUTHORIZATION. UNLESS DEP AUTHORIZES A DIFFERENT PROCEDURE, THE LONG-TERM OPERATION AND MAINTENANCE PLAN SHALL BE RECORDED ALONG WITH THE INSTRUMENT. UNLESS A LATER DATE IS APPROVED BY DEP IN WRITING, THE PERMITTEE SHALL PROVIDE THE CONSERVATION DISTRICT AND DEP WITH THE DATE AND PLACE OF RECORDING ALONG WITH A REFERENCE TO THE DOCKET, DEED BOOK OR OTHER RECORD, WITHIN 90 DAYS FROM THE DATE OF ISSUANCE OF THIS PERMIT OR AUTHORIZATION

G. UNLESS AN ALTERNATIVE PROCESS IS APPROVED BY DEP IN WRITING, UPON THE SALE OR OTHER TRANSFER OF ANY PARCEL, LOT, ROAD OR OTHER REAL PROPERTY INCLUDED WITHIN THE PERMIT BOUNDARY, THE PERMITTEE SHALL NOTIFY THE PURCHASER, GRANTEE, OR TRANSFEREE OF THE LONG-TERM PCSM BMP OPERATION AND MAINTENANCE REQUIREMENTS. THE PERMITTEE SHALL EXPRESSLY IDENTIFY THE PCSM BMPS ON EACH PROPERTY, THE SCHEDULE FOR INSPECTION AND REPORTING, THE PERSON OR ENTITY RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS AND HOW ACCESS TO THE BMPS WILL BE ACHIEVED AND SHALL OBTAIN APPROVAL FROM THE PURCHASER, GRANTEE OR TRANSFEREE. UNLESS A LATER DATE IS APPROVED BY DEP IN WRITING, THE PERMITTEE SHALL PROVIDE THE CONSERVATION DISTRICT AND DEP WITH NOTICE OF COMPLIANCE WITH THIS SECTION WITHIN 45 DAYS FROM THE DATE OF TRANSFER OF THE PROPERTY AND AT THE TIME THE PERMITTEE FILES A NOTICE OF TERMINATION.

XIII. PRIOR CONTAMINATION

THE PERMITTEE SHALL IMPLEMENT THE FOLLOWING PROCEDURES AT ANY LOCATION OF THE PROJECT SITE WHERE IT KNOWS OR HAS REASON TO BELIEVE THAT SOILS ARE OR MAY BE CONTAMINATED DUE TO PAST LAND USES OR UPON RECEIPT OF WRITTEN NOTIFICATION FROM DEP:

A. MINIMIZE DISTURBANCE -- LIMIT THE EXTENT AND DURATION OF EARTH DISTURBANCE ACTIVITIES, INCLUDING THE USE OF LESS INTRUSIVE EARTH DISTURBANCE TECHNIQUES/EQUIPMENT, AND AVOIDING AND MINIMIZING THE IMPACT OF ANCILLARY AREAS THAT ARE NOT NECESSARY FOR THE PROJECT.

B. INCORPORATE A CONTINGENCY PLAN AND ADDITIONAL SAFETY PROTOCOLS IN THE EVENT UNEXPECTED CONTAMINATION IS UNCOVERED. THESE PROTOCOLS SHALL BE ESTABLISHED IN THE PERMITTEE'S PPC PLAN. INCORPORATE APPROPRIATE DUST CONTROL AND SUPPRESSION PRACTICES AND PROCEDURES DURING DRY AND WINDY PERIODS.

C. IMPLEMENT IMMEDIATE STABILIZATION ON ALL CONTAMINATED AREAS OF THE PROJECT SITE INVOLVING EARTH DISTURBANCE. THIS MAY BE ACHIEVED USING MATS/BLANKETS/LININGS/MULCHING (INCLUDING COMPOST); TEMPORARY AND/OR PERMANENT SEEDING/VEGETATION; TARPING OR OTHER IMPERMEABLE/IMPERVIOUS COVER; OR TEMPORARY DAILY COVER.

D. IMPLEMENT AND MAINTAIN PERIMETER E&S BMPS INCLUDING BUT NOT LIMITED TO COMPOST FILTER BERMS, COMPOST FILTER SOCKS OR WEIGHTED SEDIMENT FILTER TUBES, AND/OR NON-ACRYLAMIDE FLOCCULANTS.

XIV. WATER SUPPLY NOTIFICATION

PRIOR TO BEGINNING ANY CONSTRUCTION OR EARTH DISTURBANCE ACTIVITIES, ALL PUBLIC WATER SUPPLIES OR OTHER USERS OF SURFACE WATERS WITHIN ONE (1) MILE DOWNSTREAM THAT MAY BE AFFECTED BY TURBIDITY INCREASES OR OTHER WATER QUALITY CHANGES CAUSED BY CONSTRUCTION OR EARTH DISTURBANCE ACTIVITIES SHALL BE NOTIFIED AT LEAST 72 HOURS PRIOR TO COMMENCING THE ACTIVITIES.

XV. ARCHAEOLOGICAL SPECIMENS

THE PERMITTEE SHALL NOT BEGIN WORK IN AREAS SUBJECT TO PHASE I OR PHASE II ARCHEOLOGICAL INVESTIGATIONS RECOMMENDED BY THE PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION (PHMC) UNTIL THE PERMITTEE SECURES THE NECESSARY CLEARANCES FOR THESE AREAS FROM PHMC. IN ADDITION, THE PERMITTEE AND ITS AGENTS SHALL VISUALLY INSPECT FOR ARCHAEOLOGICAL SPECIMENS, AS THE TERM IS DEFINED IN THE PENNSYLVANIA STATE HISTORY CODE (37 PA. C.S.A., SECTION 101 ET SEQ.), DURING EARTH DISTURBANCE ACTIVITIES, AND SHALL IMMEDIATELY CEASE EARTH DISTURBANCE ACTIVITIES UPON DISCOVERY OF ARCHAEOLOGICAL SPECIMENS. UPON DISCOVERY THE PERMITTEE SHALL IMMEDIATELY NOTIFY DEP AND PHMC (PHONE: (717) 783-8947).

XVI. DISCHARGES TO NON-SURFACE WATERS

THIS PERMIT AUTHORIZES PROPOSED DISCHARGES OF STORMWATER TO NON-SURFACE WATERS. DISCHARGES TO AREAS THAT ARE NOT SURFACE WATERS SHALL NOT CAUSE ACCELERATED EROSION OR STORMWATER DAMAGE TO DOWN SLOPE OR ADJACENT PROPERTIES. THESE AREAS THAT ARE NOT SURFACE WATERS SHALL BE MAINTAINED TO PREVENT EROSION FROM STORMWATER FLOWS.

XVII. RIPARIAN AREA REPLANTING

PRIOR TO SUBMISSION OF THE NOTICE OF TERMINATION, THE PERMITTEE SHALL REPLANT FORESTED RIPARIAN AREAS IN TEMPORARY RIGHT OF WAYS ALONG SURFACE WATERS. REPLANTING SHALL BE CONDUCTED FOR A MINIMUM DISTANCE OF FIFTY (50) FEET LANDWARD FROM THE TOP OF BOTH BANKS OF WARM WATER FISHERIES AND TROUT STOCKED FISHERIES; 100 FEET FROM COLD WATER FISHERIES; AND 150 FEET FROM HQ/EV STREAMS. THE DENSITY OF REPLANTED TREES SHALL BE SIMILAR TO THE DENSITY THAT EXISTED PRIOR TO THE PERMITTEE CONDUCTING CONSTRUCTION ACTIVITIES BUT SHALL PROVIDE NO LESS THAN 60% UNIFORM CANOPYCOVER UPON MATURATION AND SHALL BE APPROPRIATE TO THE GEOGRAPHIC LOCATION. MAINTENANCE AND INSPECTIONS SHALL ENSURE SURVIVAL AND GROWTH OF PLANTINGS AND PROTECTION FROM COMPETING PLANTS AND ANIMALS INCLUDING NOXIOUS WEEDS AND INVASIVE SPECIES OVER A 5-YEAR ESTABLISHMENT PERIOD TO ENSURE AND PROPER FUNCTIONING OF RIPARIAN FOREST BUFFERS, AND SHALL INCLUDE MEASURES TO REPAIR DAMAGE TO THE BUFFER FROM STORM EVENTS GREATER THAN THE 2-YEAR/24-HOUR STORM.

XVIII. HABITAT CONSERVATION PLANS AND THREATENED AND ENDANGERED SPECIES PROTECTION

A. THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE HABITAT CONSERVATION PLAN SUBMITTED AND APPROVED BY THE U.S. FISH AND WILDLIFE SERVICE (USFWS), PA GAME COMMISSION (PGC), PA FISH AND BOAT COMMISSION (PFBC) AND PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES (DCNR) TO PROTECT FEDERAL AND STATE LISTED SPECIES, THE PERMITTEE SHALL PROVIDE A COPY OF THE PLAN TO DEP PRIOR TO INITIATION OF ANY WORK UNDER THIS PERMIT.

B. THE PERMITTEE SHALL IMPLEMENT THE APPROVED HABITAT CONSERVATION PLAN IN ACCORDANCE WITH ALL PGC APPROVALS FOR THE ALLEGHENY WOODRAT (NEOTOMA MAGISTER). THIS INCLUDES NO BLASTING OR THE USE OF HERBICIDES ON THE PROJECT OR IN THE VICINITY OF THE PROJECT ON DCNR LANDS AS IDENTIFIED IN THE PGC CLEARANCE. THE PERMITTEE SHALL PROVIDE A COPY OF THE PLAN TO DEP PRIOR TO INITIATION OF ANY WORK UNDER THIS PERMIT.

C. THE PERMITTEE SHALL IMPLEMENT THE MIGRATORY BIRD CONSERVATION PLAN APPROVED BY THE USFWS. THE PERMITTEE SHALL PROVIDE A COPY OF THE PLAN TO DEP PRIOR TO INITIATION OF ANY WORK UNDER THIS PERMIT.

D. THE PERMITTEE SHALL IMPLEMENT ALL AVOIDANCE MEASURES IDENTIFIED BY THE JURISDICTIONAL RESOURCE AGENCIES FOR ANY THREATENED OR ENDANGERED SPECIES OR SPECIES OF SPECIAL CONCERN.

E. WHERE APPLICABLE, THE PERMITTEE SHALL IMPLEMENT THE AVOIDANCE MEASURES IDENTIFIED IN APPENDIX A OF THE DEPARTMENT'S PERMIT ISSUED UNDER CHAPTER 105 FOR ALL OPEN TRENCH WETLAND CROSSINGS IN BOG TURTLE (CLEMMYS MUHLENBERGII) COUNTIES IDENTIFIED BY THE USFWS AS OCCUPIED, POTENTIALLY OCCUPIED OR ADJACENT HABITATS, UNLESS OTHERWISE SPECIFIED BY THE USFWS.

F. THE PERMITTEE SHALL COMPLY WITH ALL PROTOCOLS SET FORTH BY THE USFWS FOR PROTECTION OF THE RUSTY PATCH BUMBLE BEE.

G. PRIOR TO CONDUCTING ANY FUTURE MAINTENANCE ACTIVITIES ON THE PIPELINE OR RIGHT OF WAY WHICH INVOLVES DISTURBANCE, THE PERMITTEE SHALL CONDUCT A THEN CURRENT PENNSYLVANIA NATURAL DIVERSITY INVENTORY SEARCH, SHALL OBTAIN CLEARANCE(S) FOR ANY SPECIES OR RESOURCE WHERE A POTENTIAL IMPACT IS IDENTIFIED, PROVIDE THE AVOIDANCE AND MITIGATION PLAN TO DEP PRIOR TO INITIATING SUCH MAINTENANCE WORK, AND SHALL IMPLEMENT AND ADHERE TO ALL AVOIDANCE MEASURES OUTLINED IN SUCH CLEARANCE(S).

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 044604-E 3/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
CHAPTER 102 PERMIT SPECIAL CONDITIONS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ALL PERMIT CONDTIONS SET □ORTH IN THE E&S PERMIT NO□ES□ □□□□□ □□□□□ AND □ ATER O□STRUCTION AND ENCROACHMENT PERMIT E□□□6□ MUST □E □OLLO□ ED

WATER OBSTRUCTION AND ENCROACHMENT PERMIT SPECIAL CONDITIONS

WATER SUPPLIES:

A. AT LEAST 72 HOURS IN ADVANCE OF BEGINNING ANY CONSTRUCTION ACTIVITIES, THE PERMITTEE SHALL NOTIFY ALL IDENTIFIED PUBLIC AND PRIVATE WATER SUPPLIES ALONG THE PROJECT'S CORRIDOR THAT MAY BE AFFECTED BY INCREASED TURBIDITY OR OTHER WATER QUALITY CHANGES CAUSED BY THE PERMITTEE'S CONSTRUCTION ACTIVITIES.

1. IF THE PROJECT RESULTS IN A POLLUTION EVENT WHICH MAY IMPACT ANY PUBLIC OR PRIVATE WATER SUPPLIES, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DEPARTMENT AND THE POTENTIALLY AFFECTED PUBLIC OR PRIVATE WATER SUPPLIES OF THE POLLUTION EVENT.

B. IN THE EVENT THE PERMITTEE'S WORK CAUSES ADVERSE IMPACTS TO A PUBLIC OR PRIVATE WATER SUPPLY SOURCE, THE PERMITTEE SHALL ALSO IMMEDIATELY NOTIFY THE DEPARTMENT AND IMPLEMENT A CONTINGENCY PLAN, TO THE SATISFACTION OF THE PUBLIC AND PRIVATE WATER SUPPLY OWNERS THAT ADDRESSES ALL ADVERSE IMPACTS IMPOSED ON THE PUBLIC AND PRIVATE WATER SUPPLY AS A RESULT OF THE POLLUTION EVENT, INCLUDING THE RESTORATION OR REPLACEMENT OF THE IMPACTED WATER SUPPLY.

C. AT LEAST 72 HOURS IN ADVANCE OF BEGINNING CONSTRUCTION ACTIVITIES, THE PERMITTEE SHALL NOTIFY ALL WATER USERS WITH DOWNSTREAM SURFACE WATER INTAKES WITHIN ONE MILE DOWNSTREAM, INCLUDING BUT NOT LIMITED TO, DRINKING WATER USERS, INDUSTRIAL AND COMMERCIAL USERS THAT MAY BE IMPACTED BY TURBIDITY OR WATER QUALITY CHANGES.

D. THE PERMITTEE SHALL NOTIFY SUCH DOWNSTREAM WATER USERS IMMEDIATELY OF ANY POLLUTION EVENT OR INCIDENT AT ITS SITE THAT MAY ENDANGER DOWNSTREAM USERS. THE PERMITTEE SHALL ALSO IMMEDIATELY IMPLEMENT ITS APPROVED CONTINGENCY PLAN TO PREVENT FURTHER ADVERSE IMPACTS AND REMEDIATE ALL ADVERSE IMPACTS AS A RESULT OF THE POLLUTION EVENT OR INCIDENT.

E. IF A PUBLIC OR PRIVATE DRINKING WATER SOURCE NOT PREVIOUSLY IDENTIFIED BY THE PERMITTEE IS DISCOVERED BY THE PERMITTEE DURING CONSTRUCTION, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DEPARTMENT OF THE IDENTIFIED WATER SOURCE AND SHALL NOTIFY THAT SOURCE OF THE PERMITTEE'S CONSTRUCTION ACTIVITIES.

PHMC GENERAL CONDITIONS:

F. THE PERMITTEE AND ITS AGENTS SHALL VISUALLY INSPECT FOR ARCHAEOLOGICAL ARTIFACTS AND SHALL IMMEDIATELY CEASE EARTH DISTURBANCE ACTIVITIES UPON DISCOVERY OF ARCHAEOLOGICAL ARTIFACTS.

G. IF ARCHAEOLOGICAL ARTIFACTS ARE DISCOVERED, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DEP REGIONAL OFFICE IN THE DEP REGION WHERE THE ARTIFACT IS FOUND AND SHALL CONCURRENTLY NOTIFY THE PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION (PHMC) AT P.O. BOX 1026, HARRISBURG, PA 17120-1026, TELEPHONE 717.783.8947.

H. AT ALL TIMES, THE PERMITTEE SHALL PROTECT HISTORIC, CULTURAL AND ARCHAEOLOGICAL SITES AS IDENTIFIED IN THE LATEST PUBLISHED VERSION OF THE PENNSYLVANIA INVENTORY OF HISTORICAL PLCES AND THE NATIONAL REGISTER OF HISTORICAL PLACES.

PIIMC AREAS SUBJECT TO PHASE I OR PHASE II SURVEYS:

I. THE PERMITTEE SHALL NOT BEGIN WORK IN AREAS SUBJECT TO PHASE I OR PHASE II ARCHEOLOGICAL INVESTIGATIONS RECOMMENDED BY THE PHMC UNTIL THE PERMITTEE SECURES THE NECESSARY CLEARANCES FOR THESE AREAS FROM PHMC.

SUBMERGED LANDS LICENSE AGREEMENTS:

J. THE PERMITTEE SHALL COMPLY WITH ALL TERMS AND CONDITIONS OF THE SUBMERGED LANDS LICENSE AGREEMENT ENTERED INTO BETWEEN THE DEPARTMENT AND THE PERMITTEE.

TEMPORARY ROAD CROSSINGS:

K. ALL TEMPORARY ROAD CROSSINGS OF STREAMS AND WETLANDS MUST MEET ALL OF THE FOLLOWING CONDITIONS:

1. THE PERMITTEE SHALL RESTORE AND STABILIZE ALL TEMPORARY CROSSING SITES, EXCEPT FORDS, WITHIN FIVE (5) DAYS AFTER TERMINATION OF ITS PERMITTED USE.
2. PERMITTEE SHALL NOT UTILIZE OR CONSTRUCT FORDS ON ANY STREAM OR WATERCOURSE WITHIN HIGH QUALITY (HQ) AND EXCEPTIONAL VALUE (EV) WATERSHEDS AS SPECIFIED IN 25 PA. CODE CHAPTER 93, OR IN WATERSHEDS TRIBUTARY TO DRINKING WATER INTAKES OR RESERVOIRS FOR PUBLIC WATER SUPPLY USERS, WHERE THE FORD IS WITHIN 2,000 FEET UPSTREAM OF SUCH INTAKE OR RESERVOIR.
3. THE PERMITTEE SHALL ADEQUATELY BLOCK AND STABILIZE ALL APPROACHES FOR FORDS USED AS TEMPORARY CROSSINGS WITHIN FIVE (5) DAYS AFTER TERMINATION OF THEIR PERMITTED USE IN ORDER TO PREVENT FUTURE USE.
4. THE PERMITTEE IS PROHIBITED FROM SKIDDING ACROSS FORDS.
5. WHERE A STREAMBED AT THE SITE OF A FORD DOES NOT HAVE A ROCK BOTTOM, A LAYER OF CLEAN ROCK OVER GEO-FABRIC MUST BE PLACED AND MAINTAINED. THIS LAYER OF CLEAN ROCK MUST NOT OBSTRUCT THE STREAM FLOW. IN ADDITION, THE FORD'S APPROACHES MUST: (1) BE MAINTAINED IN A FIRM AND STABLE CONDITION; AND (2) ENTER THE STREAM ON LESS THAN A 10% GRADE WITHIN 50 FEET OF THE STREAM WITH THE FLOW; AND (3) EXIT THE STREAM AGAINST THE FLOW ON THE SAME GRADE AND DISTANCE LIMITATION AS SPECIFIED FOR THE ENTRANCE. PERMITTEE SHALL ENSURE THAT ALL ROADS CROSS ALL WATERCOURSES AT A RIGHT ANGLE TO THE STREAM, UNLESS PERMITTEE OBTAINS SPECIFIC AND SEPARATE APPROVAL FROM THE DEPARTMENT.
6. PERMITTEE SHALL ENSURE THAT ALL CULVERTS PROVIDE A WATERWAY AREA SUFFICIENT TO ADEQUATELY DISCHARGE THE NORMAL FLOW OF THE WATERCOURSE OR STREAM, AND THAT CULVERTS ARE OF SUFFICIENT LENGTH TO EXTEND BEYOND THE TOE OF THE CLEAN ROCK FILL.
7. PERMITTEE SHALL ENSURE THAT CULVERTS ARE INSTALLED IN SUCH MANNER THAT OVERTOPPING OF THE ROADWAY WILL OCCUR WITHIN THE STREAM CHANNEL. THIS CAN BE ACCOMPLISHED BY PROVIDING A DEPRESSED ROADWAY EMBANKMENT.
8. PERMITTEE SHALL MINIMIZE EXCESSIVE FILL AND EXCAVATION OF STREAM BANKS BY UTILIZING CULVERTS WITH AS LARGE A DIAMETER AS POSSIBLE. THE MINIMUM DIAMETER SIZE OF A CULVERT TO BE USED IS NO LESS THAN 12 INCHES.
9. ROAD AND CAUSEWAY EMBANKMENTS SHALL ONLY CONSIST OF CLEAN ROCK MATERIAL TO PREVENT STREAM CHANNEL SEDIMENTATION DURING PLACEMENT, REMOVAL, AND PERIODS OF OVERTOPPING.
10. BRIDGES SHALL BE SINGLE SPAN FROM TOP OF BANK TO TOP OF BANK, AND MUST BE STRUCTURALLY STABLE.
11. APPROACH ROADS TO TEMPORARY ROAD CROSSINGS SHALL UTILIZE ORIGINAL GRADES. HOWEVER, CLEAN ROCK MATERIAL OR GRAVEL TO A DEPTH OF SIX INCHES ABOVE ORIGINAL GRADE CAN BE UTILIZED FOR APPROACHES, AS NECESSARY.
12. CAUSEWAYS SHALL NOT EXTEND STREAMWARD A DISTANCE GREATER THAN ONE-HALF THE WIDTH OF THE STREAM CHANNEL.

TEMPORARY ROAD CROSSINGS (CONTINUED):

13. TEMPORARY ROAD CROSSINGS SHALL BE KEPT OPEN AND FUNCTIONING AT ALL TIMES BY MAINTAINING THE CROSSINGS FREE OF DEBRIS AND OTHER OBSTRUCTIONS.
14. THE PERMITTEE SHALL PROMPTLY REPAIR ANY DAMAGE RESULTING FROM INCREASED BACKWATER CAUSED BY A TEMPORARY ROAD CROSSING. THE PERMITTEE SHALL REMOVE TEMPORARY ROAD CROSSINGS IN THE EVENT OF HIGH WATERS TO PREVENT INCREASED BACKWATER.
15. IF PERMITTEE CANNOT AVOID A WETLAND CROSSING, THE CROSSING IS PERMISSIBLE IF IT IS LOCATED AT THE NARROWEST PRACTICABLE POINT OF THE WETLAND.
16. ALL WETLANDS CROSSING SITES SHALL BE STABILIZED BY ANY APPROPRIATE MEANS, INCLUDING, BUT NOT LIMITED TO, USING REMOVABLE, TEMPORARY MATS, PADS OR OTHER SIMILAR DEVICES TO ENSURE MINIMIZATION OF IMPACT ON THE WETLANDS ECOLOGY.
17. TEMPORARY EMBANKMENTS FOR ROADS ACROSS WETLANDS SHALL BE INSTALLED TO MAINTAIN THE HYDROLOGY OF THE WETLAND.
18. POLLUTION OF ANY WATERWAY WITH HARMFUL CHEMICALS, FUELS, OILS, GREASES, BITUMINOUS MATERIAL, ACID, OR OTHER HARMFUL OR POLLUTING MATERIALS, IS PROHIBITED.
19. ACCESS ROADS SHOULD NOT APPROACH THE STREAM CHANNEL DIRECTLY DOWNSLOPE, BUT SHOULD TRAVERSE THE SLOPE OBLIQUELY TO PREVENT HIGH VELOCITY ROAD DRAINAGE FLOWS FROM DIRECTLY ENTERING THE STREAM CHANNEL ROAD DRAINAGE SHALL INCLUDE PROPER EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.
20. THE PERMITTEE SHALL REMOVE ALL OR ANY PORTION OF A TEMPORARY ROAD CROSSING UPON WRITTEN NOTIFICATION TO THE PERMITTEE FROM THE DEPARTMENT IN THE EVENT THE PROJECT IS CAUSING AN ADVERSE IMPACT ON PUBLIC HEALTH, SAFETY OR THE ENVIRONMENT OR IN ANY OTHER MANNER VIOLATES THE REQUIREMENTS OF THE PENNSYLVANIA CLEAN STREAMS LAW, 25 PA. CODE CHAPTER 105, OR BOOTH.
21. THE PERMITTEE SHALL BE RESPONSIBLE FOR DETERMINING AND DOCUMENTING WHICH METHOD OF CROSSING IS APPROPRIATE FOR EACH RESOURCE. THIS DOCUMENTATION SHALL BE PROVIDED TO THE DEPARTMENT WITH THE PRE- AND POST-CONSTRUCTION PHOTOGRAPHS. THE PERMITTEE SHALL SUBMIT THIS DOCUMENTATION TO THE RESPECTIVE DEP REGIONAL OFFICE WITHIN NINETY (90) DAYS AFTER COMPLETION OF WORK UNDER THE RESPECTIVE PERMIT.

SITE FIELD VERIFICATION, RESTORATION AND MONITORING:

L. PRIOR TO INSTALLATION OF PIPELINE CROSSINGS, THE PERMITTEE SHALL TAKE NEW PRE-CONSTRUCTION PHOTOGRAPHS OF THE NATURAL RESOURCES AT EACH OF THE CROSSINGS. THE PERMITTEE SHALL PREPARE AND MAINTAIN A RECORD OF PRE- AND POST- CONDITIONS OF EACH STREAM AND WETLAND CROSSING. THE PERMITTEE SHALL SUBMIT THIS DOCUMENTATION TO THE RESPECTIVE DEP REGIONAL OFFICE WITHIN NINETY (90) DAYS AFTER COMPLETION OF WORK UNDER THE RESPECTIVE PERMIT.

M. ALL WETLANDS WITHIN THE PROJECT AREA SHALL BE ACCURATELY FIELD-DELINEATED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES AND UP TO THE TIME THAT EARTH DISTURBANCE ACTIVITIES ARE COMPLETED AND THE SITE HAS BEEN STABILIZED. AN ACCEPTABLE METHOD OF FIELD-IDENTIFICATION OF WETLANDS INCLUDES BUT NOT LIMITED TO, THE USE OF AN ORANGE CONSTRUCTION SAFETY FENCE AND/OR FLAGS.

N. FOR A PERIOD OF UP TO 5 YEARS FOLLOWING CONSTRUCTION, THE PERMITTEE SHALL MONITOR FOR SECONDARY IMPACTS TO HYDROLOGY, I.E., THE LOSS OF HYDROLOGY, TO ALL WATERCOURSES WITH A DRAINAGE AREA OF LESS THAN 100 ACRES, INCLUDING THOSE WATERCOURSES THAT ORIGINATE WITHIN THE PROJECT ROW. REPORTS SHALL BE SUBMITTED TO DEP IN THE SPRING AND FALL FOR THE FIRST TWO (2) CALENDAR YEARS FOLLOWING CONSTRUCTION AND ANNUALLY FOR THREE (3) YEARS THEREAFTER.

1. THE MONITORING REPORTS SHALL CONTAIN INFORMATION DESCRIBING THE PRESENCE OR ABSENCE OF HYDROLOGY AT THE TIME OF INSPECTION, A NARRATIVE COMPARISON TO HYDROLOGY PRESENT IN THE WATERCOURSE DURING PRE-PERMITTING FIELD INVESTIGATION(S), AND PHOTOGRAPHS OF THE WATERCOURSE.
2. IF THE MONITORING IDENTIFIES A DIMINUTION OR COMPLETE LOSS OF HYDROLOGY, THE PERMITTEE SHALL EVALUATE WHETHER THE ACTIVITIES AUTHORIZED BY THIS PERMIT CAUSED THE LOSS OF HYDROLOGY AND SUBMIT THIS EVALUATION TO THE DEPARTMENT FOR REVIEW.
3. IF THE DEPARTMENT DETERMINES THAT THE ACTIVITIES AUTHORIZED BY THIS PERMIT ARE CONTRIBUTING TO THE LOSS OF HYDROLOGY, THE PERMITTEE SHALL PREPARE A WRITTEN PLAN TO CORRECT THE LOSS OF HYDROLOGY TO THE WATERCOURSE. THE PERMITTEE SHALL IMPLEMENT THE APPROVED PLAN WITHIN NINETY (90) AND SUBMIT THIS PLAN TO DEP FOR REVIEW AND APPROVAL. IF DEP IDENTIFIES ANY DEFICIENCIES WITH PERMITTEE'S PLAN, THEN THE PERMITTEE SHALL PROVIDE DEP A WRITTEN RESPONSE TO ADDRESS THE STATED DEFICIENCIES WITHIN 15 DAYS OF RECEIVING WRITTEN NOTICE OF DEP'S DEFICIENCIES, UNLESS DEP EXTENDS THAT TIMEFRAME IN WRITING.
4. THE PERMITTEE SHALL IMPLEMENT THE DEP-APPROVED PLAN WITHIN 90 DAYS OF RECEIVING WRITTEN APPROVAL FROM DEP, UNLESS DEP EXTENDS THAT TIMEFRAME IN WRITING.
5. IN THE EVENT THAT LOSS OF HYDROLOGY FROM ACTIVITIES CONDUCTED UNDER THIS PERMIT CANNOT BE RESTORED, THE PERMITTEE SHALL SUBMIT A MITIGATION PLAN TO DEP THAT SETS FORTH THE MANNER IN WHICH FULL LOSS OF HYDROLOGY AND ASSOCIATED WATER WILL BE COMPENSATED FOR. IF DEP IDENTIFIES ANY DEFICIENCIES WITH THE PERMITTEE'S MITIGATION PLAN, THEN THE PERMITTEE SHALL PROVIDE DEP A WRITTEN RESPONSE TO ADDRESS THE STATED DEFICIENCIES WITHIN 15 DAYS OF RECEIVING WRITTEN NOTICE OF DEP'S DEFICIENCIES, UNLESS DEP EXTENDS THAT TIMEFRAME IN WRITING. THE PERMITTEE SHALL IMPLEMENT THE DEP-APPROVED MITIGATION PLAN WITHIN 90 DAYS OF RECEIVING WRITTEN APPROVAL FROM DEP, UNLESS DEP EXTENDS THAT TIMEFRAME IN WRITING.

O. WETLAND EXCAVATION SHALL SEGREGATE THE SOIL HORIZONS AND REPLACE THE SOIL HORIZONS TO MATCH PRE-CONSTRUCTION CONDITIONS. FOR AREAS WHERE BORE PITS ARE PROPOSED IN OR ADJACENT TO WETLANDS, OR IF A RESTRICTIVE LAYER, INCLUDING BUT NOT LIMITED TO CLAY OR FRAGIPANS, IS ENCOUNTERED DURING THE TRENCH EXCAVATION, THE PERMITTEE SHALL HAVE A KNOWLEDGEABLE WETLANDS SCIENTIST ON THE ENVIRONMENTAL INSPECTION TEAM THAT SHALL OVERSEE BACKFILLING OF THE TRENCH AND INSTALLATION OF TRENCH PLUGS, IN ORDER TO MAINTAIN WETLAND HYDROLOGY.

P. TOPSOIL SHALL BE SEGREGATED FROM SUBSOIL IN ALL WETLAND AREAS.

Q. ALL DISTURBED AREAS ARE TO BE RESTORED, STABILIZED AND SHALL BE REPLANTED WITH INDIGENOUS PLANT SPECIES. EXCESS FILL FROM DISTURBED AREAS AND CONSTRUCTION ACTIVITIES SHALL BE LOCATED OUTSIDE OF THE FLOODWAY, FLOODPLAIN AND WETLANDS. THE PERMITTEE IS RESPONSIBLE FOR STABILIZING ANY EXCESS MATERIALS SPOILED ONSITE OR OFFSITE, WHETHER THE PERMITTEE OWNS THE SITE OR OTHERS OWN THE SITE.

R. ROCK RIPRAP SHALL BE USED IN THE STREAM BED ONLY WHERE A SHEAR STRESS ANALYSIS HAS DETERMINED THAT SCOUR PROTECTION IS NECESSARY TO ENSURE STABILITY OF THE RESOURCE.

S. A TRENCH IN WHICH THE PIPELINE WILL BE LAID SHALL BE BACKFILLED IN A MANNER THAT DOES NOT CREATE THE FORMATION OF A PERMANENT RIDGE IN A STREAMBED OR WETLAND.

T. RESTORED STREAMS SHALL USE A MINIMUM OF SIX (6) INCHES OF NATIVE STREAM BED MATERIAL. FOR STREAMS WHERE RIPRAP IS NECESSARY TO PREVENT SCOUR, THE RIPRAP SHALL BE DEPRESSED SUFFICIENTLY TO ALLOW SIX (6) INCHES OF NATIVE STREAM BED MATERIAL OVER THE RIPRAP.

SITE FIELD VERIFICATION, RESTORATION AND MONITORING (CONTINUED):

U. ALL PFO AND PSS WETLANDS WITHIN THE TEMPORARY ROW SHALL BE REPLANTED WITH WOODY SPECIES PRESENT IN THE WETLAND PRIOR TO THE PERMITTEE CONDUCTING CONSTRUCTION ACTIVITIES. THE PLANTINGS NEED NOT MIRROR PRE-CONSTRUCTION MATURITY.

V. FORESTED RIPARIAN AREAS IN THE TEMPORARY ROW ALONG WATERCOURSES SHALL BE REPLANTED WITH NATIVE TREE SPECIES FOR A MINIMUM DISTANCE OF FIFTY (50) FEET LANDWARD FROM THE TOP OF BOTH BANKS OF WARM WATER FISHERIES AND TROUT STOCKED FISHERIES, 100 FEET FROM COLD WATER FISHERIES, AND 150 FEET FROM HQ/EV STREAMS, IN A SIMILAR DENSITY AS THE TREES EXISTED PRIOR TO THE PERMITTEE CONDUCTING CONSTRUCTION ACTIVITIES. THE DENSITY OF REPLANTED TREES SHALL BE SIMILAR TO THE DENSITY THAT EXISTED PRIOR TO THE PERMITTEE CONDUCTING CONSTRUCTION ACTIVITIES BUT SHALL PROVIDE NO LESS THAN 60% UNIFORM CANOPY COVER UPON MATURATION AND SHALL BE APPROPRIATE TO THE GEOGRAPHIC LOCATION. MAINTENANCE AND INSPECTIONS SHALL ENSURE SURVIVAL AND GROWTH OF PLANTINGS AND PROTECTION FROM COMPETING PLANTS AND ANIMALS INCLUDING NOXIOUS WEEDS AND INVASIVE SPECIES OVER A 5-YEAR ESTABLISHMENT PERIOD TO ENSURE AND PROPER FUNCTIONING OF RIPARIAN FOREST BUFFERS, AND SHALL INCLUDE MEASURES TO REPAIR DAMAGE TO THE BUFFER FROM STORM EVENTS GREATER THAN THE 2-YEAR/24-HOUR STORM.

W. EACH STREAM CHANNEL SHALL BE RESTORED AND PROPERLY STABILIZED UPON COMPLETION OF THE ASSOCIATED STREAM CROSSING. WHERE RIPRAP IS PROPOSED, THE RIPRAP SHALL BE DEPRESSED AND COVERED WITH A MINIMUM OF 6-INCHES OF STREAMBED MATERIAL. THE RESTORED STREAMBED ELEVATION SHALL NOT EXCEED THE PRE-EXISTING STREAMBED ELEVATION.

X. THE PERMITTEE SHALL AVOID WETLAND IMPACTS, TO THE EXTENT PRACTICABLE, AND MINIMIZE ANY SUCH IMPACTS. THE PERMITTEE SHALL IMMEDIATELY RESTORE ALL DISTURBED WETLAND AREAS TO ORIGINAL CONTOURS, AND REPLANT WITH INDIGENOUS WETLAND VEGETATION IN ACCORDANCE WITH THEIR RESTORATION PLAN AS PROVIDED IN THEIR PERMIT APPLICATION. STREAMBANK AND WETLAND DISTURBANCES SHALL BE MINIMIZED AND STABILIZED WITH INDIGENOUS VEGETATION WITHIN TEN (10) CALENDAR DAYS OF FINAL EARTHMOVING TO PREVENT EROSION AND PROVIDE COVER, SHADING, AND FOOD SOURCE FOR AQUATIC LIFE. ANY TEMPORARY WETLAND CROSSINGS SHALL BE MADE BY LOW GROUND PRESSURE MACHINERY AND WETLAND MATS OR SIMILAR DEVICES. EXCESS FILL SHALL NOT BE DEPOSITED IN ANY WETLAND, WATERCOURSE, FLOODWAY, FLOODPLAIN, OR OTHER BODY OF WATER.

Y. FOR A PERIOD OF UP TO FIVE YEARS, THE PERMITTEE SHALL MONITOR THE STREAM AND WETLAND PLANTINGS. MONITORING REPORTS SHALL BE SUBMITTED TO THE RESPECTIVE DEP REGIONAL OFFICE IN THE SPRING (MAY15) AND FALL (NOVEMBER 15) FOR THE FIRST TWO (2) CALENDAR YEARS FOLLOWING CONSTRUCTION AND ANNUALLY (NOVEMBER 15) FOR FOUR (4) YEARS THEREAFTER.

1. THE MONITORING REPORTS SHALL CONTAIN INFORMATION DESCRIBING THE SUCCESS OF THE SITE AT THE TIME OF EACH INSPECTION, AN INVENTORY OF THE SURVIVING PLANT SPECIES AND PERCENT AREAL COVERAGE, PHOTOGRAPHS OF EACH SITE WITH PLANS SHOWING THE LOCATION AND ORIENTATION OF EACH OF THE PHOTOGRAPHS, AND A WRITTEN PLAN TO CORRECT ANY DEFICIENCIES IDENTIFIED DURING THE MONITORING PHASE.

Z. PERMITTEE SHALL ENSURE AT LEAST AN 85 PERCENT SURVIVAL RATE. ADDITIONAL PLANTINGS AND OR REPORTS IN SUBSEQUENT YEARS BEYOND THE INITIAL FIVE (5) YEARS MAY BE REQUIRED IF AN 85 PERCENT SURVIVABILITY OF PLANTED SPECIES IS NOT ACHIEVED.

AA. FOR A PERIOD OF AT LEAST THREE YEARS, THE PERMITTEE SHALL MONITOR ANY EXCEPTIONAL VALUE WETLANDS UNDER 25 PA. CODE §§ 105.17(1)0) AND 105.17(1)(i) THAT ARE DISTURBED, AS AUTHORIZED UNDER THIS PERMIT. MONITORING REPORTS SHALL BE SUBMITTED TO THE RESPECTIVE DEP REGIONAL OFFICE IN THE SPRING (MAY 15) AND FALL (NOVEMBER 15) FOR THE FIRST TWO (2) CALENDAR YEARS FOLLOWING CONSTRUCTION AND ONCE (NOVEMBER 15) IN THE THIRD YEAR. THE MONITORING REPORTS SHALL CONTAIN INFORMATION DESCRIBING THE WETLAND RESTORATION AND FUNCTION AND VALUES AT THE TIME OF INSPECTION, PHOTOGRAPHS OF THE WETLAND WITH PLANS SHOWING THE LOCATION AND ORIENTATION OF EACH PHOTOGRAPH, AND A WRITTEN PLAN TO CORRECT ANY DEFICIENCIES IDENTIFIED DURING THE MONITORING PHASE.

BB. STREAMBANK DISTURBANCE SHALL BE MINIMIZED AND STABILIZED WITH INDIGENOUS VEGETATION WITHIN 24 HOURS UPON COMPLETION OF FINAL EARTHMOVING TO PREVENT EROSION AND PROVIDE COVER, SHADING, AND FOOD SOURCE FOR AQUATIC LIFE.

WETLAND COMPENSATORY MITIGATION AND MONITORING:

CC. THE PERMITTEE SHALL CREATE PALUSTRINE FORESTED (PFO) WETLANDS IN ACCORDANCE WITH THEIR "PERMITTEE-RESPONSIBLE COMPENSATORY WETLAND MITIGATION PLAN" TO COMPENSATE FOR THE FUNCTION AND VALUE LOSS ASSOCIATED WITH PERMANENTLY CONVERTING 0.405 ACRES OF PFO WETLANDS TO PALUSTRINE EMERGENT (PEM) WETLANDS.

DD. THE PROPOSED COMPENSATORY WETLAND MITIGATION SITE IN CUMBERLAND COUNTY: THE PERMITTEE SHALL ONLY PLANT THE 0.58 ACRES IN THE SEASONALLY SATURATED AREAS IDENTIFIED IN THE COMPENSATORY WETLAND MITIGATION PLAN AND SHALL NOT PLANT IN THE AREAS IDENTIFIED AS SATURATED IN THE PRESENT CONDITION IN THE COMPENSATORY WETLAND MITIGATION PLAN.

EE. FOR AT LEAST FIVE (5) YEARS AFTER THE RESTORATION ACTIVITIES ARE COMPLETED, THE PERMITTEE SHALL MONITOR THE COMPENSATORY MITIGATION SITES, WETLAND RESTORATION SITES, STREAMS RESTORATION SITES AND FLOODWAY RESTORATION SITES. WITHIN SIXTY (60) DAYS OF COMPLETING CONSTRUCTION, THE PERMITTEE SHALL SUBMIT "AS-BUILT" DRAWINGS FOR THE FORESTED WETLAND CREATION PROJECT TO THE DEP. MONITORING REPORTS SHALL BE SUBMITTED TO THE RESPECTIVE DEP REGIONAL OFFICE WHERE THE MITIGATION PROJECT(S) IS(ARE) LOCATED AT A FREQUENCY OF EVERY SIX (6) MONTHS FOR THE FIRST TWO (2) YEARS AFTER MITIGATION SITE CONSTRUCTION AND ANNUALLY FOR THREE (3) YEARS THEREAFTER.

1. THE MONITORING REPORTS SHALL CONTAIN INFORMATION DESCRIBING THE SUCCESS OF THE SITE AT THE TIME OF INSPECTION, AN INVENTORY OF THE SURVIVING PLANT SPECIES AND PERCENT AERIAL COVERAGE, PHOTOGRAPHS OF EACH SITE WITH PLANS SHOWING THE LOCATION AND ORIENTATION OF EACH OF THE PHOTOGRAPHS, AND A WRITTEN PLAN TO CORRECT ANY DEFICIENCIES IDENTIFIED DURING THE MONITORING PHASE.
2. IF THE RESTORATION SITES AND COMPENSATOR), FOREST WETLAND ENHANCEMENT SITES HAVE NOT ACHIEVED DESIGN OBJECTIVES WITHIN THE MONITORING PERIOD, THE PENNITTEE WILL UNDERTAKE REMEDIAL WORK TO ASSURE ESTABLISHMENT OF FUNCTIONAL WETLAND HABITATS.

FF. RESTORED AND ENHANCED HABITATS SHALL BE CONSIDERED SUCCESSFUL WHEN THEY MEET THE DESIGN OBJECTIVES.

GG. WETLAND COMPENSATION CONSTRUCTION SHALL OCCUR PRIOR TO OR CONCURRENTLY WITH WETLAND IMPACTS REQUIRING COMPENSATION AS AUTHORIZED BY THIS PERMIT.

HH. COMPENSATORY WETLAND MITIGATION SHALL BE STARTED AND COMPLETED WITHIN ONE (1) GROWING SEASON FROM THE COMMENCEMENT OF THE ACTIVITIES AUTHORIZED BY THIS PERMIT. WITHIN THIRTY (30) DAYS OF COMPLETING THE PLANTING PLAN, THE PENNITTEE SHALL SUBMIT REVISED PLANS TO THE RESPECTIVE DEP REGIONAL OFFICE IF AS-BUILT CONDITIONS ARE SIGNIFICANTLY DIFFERENT FROM THE ORIGINAL APPROVED PLANS.

II. THE PERMITTEE SHALL PROVIDE COPIES OF THE RECORDED DEED RESTRICTIONS OR CONSERVATION EASEMENTS FOR THE COMPENSATORY WETLAND MITIGATION SITES WITHIN 60) DAYS AFTER PERMIT ISSUANCE. TIME-STAMPED COPIES OF THE INSTRUMENTS SHALL BE SENT TO THE RESPECTIVE DEP REGIONAL OFFICE.

HORIZONTAL DIRECTIONAL DRILLING:

JJ. THE PERMITTEE SHALL CONSTRUCT AND OPERATE THE HORIZONTAL DIRECTIONAL DRILLING (HDD) CROSSINGS AT WETLANDS, STREAMS AND FLOODWAYS IN ACCORDANCE WITH TABLES 2, 3, AND 4 OF THE JOINT PERMIT APPLICATION (SECTION F, ATTACHMENTS, ENVIRONMENTAL ASSESSMENT, ATTACHMENT 11, RESOURCE TABLES) IN A MANNER TO PREVENT A RELEASE OF DRILLING FLUID TO "REGULATED WATERS OF THIS COMMONWEALTH" (RWC). THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DEPARTMENT AT 866-8250208 IN THE EVENT OF AN INADVERTENT RETURN OCCURRING, AND IMMEDIATELY ACTIVATE AND IMPLEMENT THE PRE-PREPARED CONTROL PLANS (PPC PLANS) INCLUDING THE HDD INADVERTENT RETURN CONTINGENCY PLAN (IRCP), WATER SUPPLY AND KARST PPC PLANS TO PREVENT ANY IMPACTS TO RWC AND OTHER NATURAL RESOURCES.

KK. THE PERMITTEE SHALL TAKE MEASURES TO AVOID MINE VOIDS AND UTILITIES.

LL. THE PERMITTEE SHALL VISUALLY MONITOR THE GROUND SURFACE AND WITHIN RWC GENERALLY ALONG THE PATH OF THE HORIZONTAL DIRECTIONAL DRILLING WHILE DRILLING OPERATIONS ARE OCCURRING. THIS MONITORING SHALL INCLUDE WALKING, WADING AND USE OF A BOAT, AS NECESSARY TO EFFECTIVELY OBSERVE AND MONITOR FOR ANY RETURN TO THE SURFACE DURING ALL RWC CROSSINGS. IF LOSS OF CIRCULATION OF DRILLING FLUID OCCURS OR DRILLING FLUID PRESSURE IS LOST, THE PERMITTEE SHALL IMMEDIATELY INVESTIGATE THE DRILLING PATHWAY AND GENERAL SURROUNDING AREA FOR AN INADVERTENT RETURN. IF AN INADVERTENT RETURN IS DISCOVERED, THEN DRILLING SHALL IMMEDIATELY CEASE.

MM. INADVERTENT RETURNS THAT IMPACT OR DISCHARGE TO STREAMS, FLOODWAYS OR WETLANDS DURING THE HORIZONTAL DIRECTIONAL DRILLING OPERATIONS SHALL BE REMEDIATED IN COMPLIANCE WITH THE INADVERTENT RETURN CONTINGENCY PLAN. IF CLEANUP OPERATIONS DIFFER FROM THE SUBMITTED PLANS, PRIOR APPROVAL FROM THE RESPECTIVE DEP REGIONAL OFFICE WILL BE NECESSARY FOR ANY MODIFICATIONS TO THE INADVERTENT RETURN CONTINGENCY PLAN FOR ADDITIONAL MITIGATION.

NN. HDD ADDITIVES WHICH ARE CERTIFIED FOR CONFORMANCE WITH ANSI/NSF STANDARD 60 DRINKING WATER TREATMENT CHEMICALS - HEALTH EFFECTS) ARE DEEMED ACCEPTABLE TO DEP, WHEN USED IN THE MANNER INDICATED IN THE CERTIFICATION OF THE ADDITIVE. ALL CONDITIONS INCLUDED AS PART OF THE ADDITIVES CERTIFICATION SHOULD BE FOLLOWED. A CURRENT LISTING OF CERTIFIED DRILLING FLUIDS IS MAINTAINED BY NSF AT HTTP://WWW.NDF.ORG/CERTIFIED/PWSCHEMICALS/LISTINGS.ASP?PRODUCTFUNCTION=DRILLIN +FLUID& USE OF DRILLING ADDITIVES CERTIFIED FOR CONFORMANCE WITH ANSI/NSF STANDARD 60 DOES NOT RELIEVE OPERATORS FROM THE REQUIREMENT FOR OBTAINING THE NECESSARY PERMITS FOR DRILLING OPERATIONS. USE OF CERTIFIED ADDITIVES DOES NOT RELIEVE THE OPERATOR OF LIABILITY SHOULD AN INADVERTENT RETURN OR OTHER POLLUTION OF THE WATERS OF THE COMMONWEALTH OCCUR AS A RESULT OF DRILLING OPERATIONS.

HABITAT CONSERVATION PLANS AND THREATENED AND ENDANGERED SPECIES PROTECTION:

OO. THE PEIMITTEE SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE HABITAT CONSERVATION PLAN SUBMITTED AND APPROVED BY THE U.S. FISH AND WILDLIFE SERVICE (USFWS), PA GAME COMMISSION (PGC), PA FISH AND BOAT COMMISSION (PFBC) AND PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES (DCNR) TO PROTECT FEDERAL AND STATE LISTED SPECIES. PROVIDE A COPY OF THE PLAN TO THE DEPARTMENT PRIOR TO INITIATION OF ANY WORK UNDER THIS PERMIT.

PP. THE PERMITTEE SHALL IMPLEMENT THE APPROVED HABITAT CONSERVATION PLAN AND IN ACCORDANCE WITH ALL PA GAME COMMISSION APPROVALS FOR THE ALLEGHENY WOODRAT (NEOTOMA MAGISTER). THIS INCLUDES NO BLASTING OR THE USE OF HERBICIDE ON

TEMPORARY REVEGETATION

TEMPORARY GRASS COVER SHALL BE ESTABLISHED IN THE FOLLOWING AREAS:

1. UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY WHERE CESSATION OF EARTH DISTURBANCE ACTIVITIES IN NON-SPECIAL PROTECTION WATERSHEDS WILL EXCEED 4 DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION PENDING FUTURE EARTH DISTURBANCE ACTIVITIES. IN A SPECIAL PROTECTION WATERSHED TEMPORARY STABILIZATION SHALL BE IMMEDIATE.
2. WHERE SOIL STOCKPILES ARE TO BE EXPOSED FOR A PERIOD GREATER THAN FOUR (4) DAYS, THE STOCKPILE SHALL BE SEEDED.
3. WHERE VEGETATIVE FILTERS MUST BE ESTABLISHED BELOW FILTER BAGS, A MINIMUM DISTANCE OF 10 FT SHALL BE SEEDED DOWN SLOPE OF THE TRAP OUTLET.
4. SEED MIXTURE FOR TEMPORARY COVER SHALL CONSIST OF 100% ANNUAL RYEGRASS. SEED SHALL BE APPLIED AT THE RATE OF 40 LB/ACRE OR AS RECOMMENDED BY A LOCAL RECOGNIZED SEED SUPPLIER APPROVED BY THE OWNER'S REPRESENTATIVE. UNLESS EXPLICITLY RESTRICTED (E.G., WETLANDS) PRIOR TO SEEDING, APPLY 1 TON OF AGRICULTURAL GRADE LIMESTONE PER ACRE PLUS 10-10-10 FERTILIZER AT THE RATE OF 500 LB. PER ACRE AND WORK INTO SOIL.
5. TEMPORARY REVEGETATION CAN ALSO BE USED DURING UNFAVORABLE GROWING SEASON FOR PERMANENT MIXES. APPLY PERMANENT SEEDING DURING FIRST FAVORABLE GROWING SEASON.

MULCHING

THE PURPOSE OF MULCH IS TO REDUCE RUNOFF AND EROSION, PREVENT SURFACE COMPACTION OR CRUSTING, CONSERVE MOISTURE, AID IN ESTABLISHING PLANT COVER, AND CONTROL WEEDS. MULCH SHALL BE APPLIED ON ANY AREA SUBJECT TO EROSION, OR WHICH HAS UNFAVORABLE CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. THE PRACTICE MAY BE USED ALONE OR IN CONJUNCTION WITH OTHER STRUCTURAL AND VEGETATIVE CONSERVATION PRACTICES, SUCH AS WATERWAYS, PONDS, SEDIMENTATION TRAPS OR CRITICAL AREA PLANTING. ON SEDIMENT PRODUCING AREAS WHERE THE PERIOD OF EXPOSURE IS LESS THAN TWO (2) MONTHS, MULCH MATERIALS SHALL BE APPLIED ACCORDING TO THE FOLLOWING GUIDELINES:

1. STRAW MULCH SHALL BE APPLIED AT THE RATE OF THREE TONS PER ACRE. CHEMICALLY TREATED OR SALTED STRAW IS NOT ACCEPTABLE AS MULCH.
2. STRAW MULCH SHALL BE ANCHORED IMMEDIATELY AFTER APPLICATION BY AT LEAST ONE OF THE FOLLOWING METHODS.
   a. "CRIMPED" INTO THE SOIL USING TRACTOR DRAWN EQUIPMENT (STRAIGHT BLADED COULTER OR SIMILAR). THIS METHOD IS LIMITED TO SLOPES NO STEEPER THAN 3:1. MACHINERY SHOULD BE OPERATED ON THE CONTOUR. (CRIMPING OF HAY OR STRAW BY RUNNING IT OVER WITH TRACKED MACHINERY IS NOT RECOMMENDED)
   b. ASPHALT, EITHER EMULSIFIED OR CUT-BACK, CONTAINING NO SOLVENTS OR OTHER DILUTING AGENTS TOXIC TO PLANT OR ANIMAL LIFE, UNIFORMLY APPLIED AT THE RATE OF 31 GALLONS PER 1000 FT2.
   c. SYNTHETIC BINDERS (CHEMICAL BINDERS) MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THAT IT IS NON-TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.
   d. LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

MULCHED AREAS SHALL BE CHECKED PERIODICALLY AND AFTER EACH RUNOFF EVENT (E.G. RAIN, SNOWMELT, ETC.) FOR DAMAGE UNTIL THE DESIRED PURPOSE OF THE MULCHING IS ACHIEVED. DAMAGED PORTIONS OF THE MULCH OR TIE-DOWN MATERIAL SHALL BE REPAIRED UPON DISCOVERY.

PERMANENT REVEGETATION

SEEDING MIXTURES

FOLLOW WITH RECOMMENDED SEED MIXTURE TABLE AND NOTES, THEN PENNDOT FORMULA, THEN WETLAND, THEN APPLICATION GUIDANCE, THEN RATES, THEN NOTES.

LIMING RATES

MINIMUM 6 TONS PER ACRE AT 100% EFFECTIVE NEUTRALIZING VALUE (%ENV), UNLESS THE SOIL TEST DETERMINES THAT A LESSER AMOUNT IS NEEDED. TO DETERMINE THE ACTUAL AMOUNT OF REGULAR LIME TO APPLY, DIVIDE THE AMOUNT CALLED FOR BY THE SOIL TEST BY THE %ENV FOR THE PRODUCT USED. FOR EXAMPLE, IF 6 TONS PER ACRE IS NEEDED AND THE %ENV FOR THE LIME USED IS 88%, DIVIDE 6 BY 0.88 RESULTING IN 6.8 TONS NEEDING TO BE APPLIED.

FOR DOLOMITIC LIME, WHICH HAS A SIGNIFICANT AMOUNT OF MAGNESIUM IN IT, DIVIDE THE AMOUNT CALLED FOR BY THE SOIL TEST BY THE % CALCIUM CARBONATE EQUIVALENT (%CCE) LISTED FOR THE PRODUCT INSTEAD OF THE %ENV. THE %CCE MAY BE ABOVE 100% WHICH ACCOUNTS FOR THE FACT THAT MAGNESIUM HAS A GREATER EFFECT PER POUND THAN THE CALCIUM IN REGULAR LIME.

NOTE: WHEN A SOIL TEST REQUIRES MORE THAN 8,000 POUNDS OF LIME PER ACRE, THE LIME MUST BE MIXED INTO THE TOP 6 INCHES OF SOIL.

FERTILIZATION RATES

APPLY 10-20-20 AT 600 POUNDS/ACRE, IF TOP DRESSED OR 1,000 POUNDS/AC, IF INCORPORATED, UNLESS THE SOIL TEST DETERMINES THAT THE RATE CAN BE LESS THAN THESE MINIMUMS.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS

SOIL AMENDMENT	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YDS.	NOTES
PERMANENT SEEDING APPLICATION RATE				
AGRICULTURAL LIME	6 TONS	240 LBS.	2,480 LBS.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	210 LBS.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS

MULCH APPLICATION RATES

MULCH TABLE	APPLICATION RATE (MINIMUM) PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YDS.	NOTES
STRAW	3 TONS	140 LBS.	1,240 LBS.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	3 TONS	140 LBS.	1,240 LBS.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOODCHIPS	4 TO 6 TONS	185 TO 275 LBS.	1,650 TO 2,500 LBS.	MAY PREVENT GERMINATION OF GRASSES AND LEGUMES
HYDROMULCH	1 TON	47 LBS.	415 LBS.	SEE LIMITATIONS ABOVE

RECOMMENDED SEED MIXTURES

MIXTURE NO.	SPECIES	SEEDING RATES – PLS(1) MOST SITES	ADVERSE SITES
1 (2)	SPRING OATS (SPRING), OR 64 96	64	96
	ANNUAL RYEGRASS (SPRING OR FALL), OR	10	15
	WINTER WHEAT (FALL), OR	90	120
	WINTER RYE (FALL)	56	112
2 (3)	~~TALL FESCUE~~ BIG BLUESTEM, OR 75	60	75
	FINE FESCUE, OR 40	35	40
	KENTUCKY BLUEGRASS, PLUS 25 30	25	30
	REDTOP(4), OR	3	3
	PERENNIAL RYEGRASS	15	20
3	BIRDSFOOT TREFOIL, PLUS 6 10	6	10
	~~TALL FESCUE~~ BIG BLUESTEM,	30	35
4	BIRDSFOOT TREFOIL, PLUS	6	10
	~~REED CANARYGRASS~~ CANADA WILDRYE	10	15
5 (5)	BIG BLUESTEM, ~~PLUS~~	10	15
	~~TALL FESCUE~~ , OR	20	25
	PERENNIAL RYEGRASS	20	25
6 (5,6)	BIG BLUESTEM, PLUS	10	15
	ANNUAL RYEGRASS	20	25
7 (5)	BIRDSFOOT TREFOIL, PLUS	20	30
	BIG BLUESTEM, ~~PLUS~~	20	30
	~~TALL FESCUE~~	20	25
8	FLATPEA, PLUS	20	30
	~~TALL FESCUE~~ BIG BLUESTEM, , OR	20	30
	PERENNIAL RYEGRASS	20	25
9 (7)	~~SERECIA LESPEDEZA~~ ROUND-HEADED BUSH CLOVER, PLUS	10	20
	~~TALL FESCUE~~ BIG BLUESTEM, PLUS	20	25
	REDTOP(4)	3	3
10	~~TALL FESCUE~~ BIG BLUESTEM, PLUS	40	60
	FINE FESCUE	10	15
11	DEERTONGUE, PLUS	15	20
	BIRDSFOOT TREFOIL	6	10
12(8)	SWITCHGRASS, OR	15	20
	BIG BLUESTEM, PLUS	15	20
	BIRDSFOOT TREFOIL	6	10
13	ORCHARDGRASS, OR	20	30
	SMOOTH BROMEGRASS, PLUS	25	35
	BIRDSFOOT TREFOIL	6	10

NOTES:

1. PURE LIVE SEED (PLS) IS THE PRODUCT OF THE PERCENTAGE OF PURE SEED TIMES PERCENTAGE GERMINATION DIVIDED BY 100. FOR EXAMPLE, TO SECURE THE ACTUAL PLANTING RATE FOR SWITCHGRASS, DIVIDE 12 POUNDS PLS SHOWN ON THE SEED TAG. THUS, IF THE PLS CONTENT OF A GIVEN SEED LOT IS 35 PERCENT, DIVIDE 12 PLS BY 0.35 TO OBTAIN 34.3 POUNDS OF SEED REQUIRED TO PLANT ONE-ACRE. ALL MIXTURES IN THIS TABLE ARE SHOWN IN TERMS OF PLS.
2. IF HIGH-QUALITY SEED IS USED, FOR MOST SITES SEED SPRING OATS AT A RATE OF TWO BUSHELS PER ACRE, WINTER WHEAT AT 11.5 BUSHELS PER ACRE, AND WINTER RYE AT ONE BUSHEL PER ACRE. IF GERMINATION IS BELOW 90 PERCENT, INCREASE THESE SUGGESTED SEEDING RATES BY 0.5 BUSHEL PER ACRE.
3. THIS MIXTURE IS SUITABLE FOR FREQUENT MOWING. DO NOT CUT SHORTER THAN FOUR INCHES.
4. KEEP SEEDING RATE TO THAT RECOMMENDED IN TABLE. THESE SPECIES HAVE MANY SEEDS PER POUND AND ARE VERY COMPETITIVE. TO SEED SMALL QUANTITIES OF SMALL SEEDS SUCH AS WEEPING LOVEGRASS AND REDTOP, DILUTE WITH DRY SAWDUST, SAND, RICE HULLS, BUCKWHEAT HULLS, ETC.
5. USE FOR HIGHWAY SLOPES AND SIMILAR SITES WHERE THE DESIRED SPECIES AFTER ESTABLISHMENT IS BIG BLUESTEM.
6. USE ONLY IN EXTREME SOUTHEASTERN OR EXTREME SOUTHWESTERN PA. SERECIA LESPEDEZA IS NOT WELL ADAPTED TO MOST OF PA.
7. DO NOT MOW SHORTER THAN NINE TO 10 INCHES.
8. ONLY SEEDS OF NATIVE PLANTS TO BE USED.

PENN DOT FORMULA B

SEEDING RATE	3 LBS PER 1,000 SQ FT			
SPECIES	% BY WT.	PURITY %	MIN. % GERMINATION	MAX. % WEED SEED
KENTUCKY BLUEGRASS	50	98	80	0.20
PERENNIAL RYE	20	98	90	0.15
RED FESCUE	30	98	85	0.15

SEED MIX APPLICATION GUIDE

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED)		
WELL-DRAINED	1 PLUS	3, 5, 8, OR 12 (1)
VARIABLE DRAINAGE	1 PLUS	3 OR 7
SLOPES AND BANKS (MOWED)		
WELL-DRAINED	1 PLUS	2 OR 10
SLOPES AND BANKS (GRAZED/HAY)		
WELL-DRAINED	1 PLUS	2,3, OR 13
GULLIES AND ERODED AREAS	1 PLUS	3, 5, 7, OR 12 (1)
EROSION CONTROL FACILITIES (BMPS)		
SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS	1 PLUS	2, 3, OR 4
DRAINAGE DITCHES		
SHALLOW, LESS THAN THREE FEET DEEP	1 PLUS	2, 3, OR 4
DEEP, NOT MOWED	1 PLUS	5 OR 7
POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS		
MOWED AREAS	1 PLUS	2 OR 3
NON-MOWED AREAS	1 PLUS	5 OR 7
FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS	3 OR 13
HIGHWAYS (2)		
NON-MOWED AREAS		
WELL-DRAINED	1 PLUS	5, 7, 8, 9, OR 10
VARIABLE DRAINED	1 PLUS	3 OR 7
POORLY DRAINED	1 PLUS	3 OR 9
AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS	2, 3, OR 10
UTILITY ROW		
WELL-DRAINED	1 PLUS	5, 8, OR 12 (1)
VARIABLE DRAINED	1 PLUS	3 OR 7
WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS	2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES		
SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST)	1 PLUS	3, 4, 5, 7, 8, 9,11 (1) OR 12(1)
SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS	3 OR 13
	NONE	WETLAND SEED MIX
WETLAND	1 PLUS	SEE WETLAND SEED MIX
RESIDENTIAL/LAWN	1 PLUS	PENN DOT FORMULA B

NOTES:

1. FOR SEED MIXTURES 11 AND 12, ONLY USE SPRING OATS OR WEEPING LOVEGRASS (INCLUDED IN MIX) AS NURSE CROP.
2. CONTACT THE PA DEPARTMENT OF TRANSPORTATION DISTRICT ROADSIDE SPECIALIST FOR SPECIFIC SUGGESTIONS ON TREATMENT TECHNIQUES AND MANAGEMENT PRACTICES.
3. SEED TYPICAL WETLAND RESTORATION DETAIL ON PLAN SHEET ES-0.15 FOR ADDITIONAL NOTES, DETAIL, AND SPECIAL AREA RESTORATIONS.
4. DO NOT LIME OR FERTILIZE IN WETLAND.

PEM WETLAND SEED MIX

ERNST CONSERVATION SEED MIX NO. ERNMX-122 FACW MEADOW MIX

SEEDING RATE	20 LB PER ACRE, OR 1/2 LB PER 1,000 SQ FT	SEEDING RATE	20 LB PER ACRE, OR 1/2 LB PER 1,000 SQ FT
%	SPECIES LIST	%	SPECIES LIST
31%	FOX SEDGE (CAREX VULPINOIDEA)	1%	SWAMP MILKWEED (ASCLEPIAS INCARNATA)
20%	VIRGINIA WILDRYE (ELYMUS VIRGINICUS)	1%	NEW ENGLAND ASTER (ASTER NOVAE-ANGLIAE (SYMPHYOTRICHUM N.))
14%	LURID (SHALLOW) SEDGE (CAREX LURIDA)	1%	FLAT TOPPED WHITE ASTER (ASTER UMBELLATUS (DOELLINGERIA UMBELLATE))
5%	GREEN BULRUSH (SCIPUS ATROVIRENS)	0.5%	JOE PYE WEED (EUPATORIUM FISTULOSUM)
4%	BLUE VERVAIN (VERBENA HASTATE)	0.5%	BONESET (EUPATORIUM PERFOLIATUM)
3.5%	WOOD REEDGRASS (CINNA ARUNDINACEA)	0.5%	DITCH STONECROP (PENTHORUM SEDOIDES)
3%	SOFT RUSH (JUNCUS EFFUSES)	0.5%	NARROWLEAF BLUE EYED GRASS (SISYRINCHLUM ANGUSTIFOLIUM)
3%	BLUNT BROOM SEDGE (CAREX SCOPARIA)	0.5%	SEEDBOX (LUDWIGIA ALTERNIFOLIA)
3%	HOP SEDGE (CAREX LUPUTINA)	0.5%	GREAT BLUE LOBELIA (LOBELIA SIPHILITICA)
2%	SENSITIVE FERN (ONOCLEA SENSIBILIS)	0.5%	MUD PLANTAIN (WATER PLANTAIN) (ALISMA SUBCORDATUM (A. PLANTAGO-AQUATICA))
2%	OXEYE SUNFLOWER (HELIOPSIS HELIANTHOIDES)	0.5%	SQUARE STEMMED MONKEYFLOWER (MIMULUS RINGENS)
1%	RATTLESNAKE GRASS (GLYCERIA CANADENSIS)	0.4%	BLADDER (STAR) SEDGE (CAREX INTUMESCENS)
1%	WOOLGRASS (SCIRPUS CYPERINUS)	0.1%	SLENDER MOUNTAINMINT (PYCNANTHEMUM TENUIFOLIUM)
		TOTAL: 100%	

PLANTING SPECIFICATIONS FOR PFO OR PSS WETLAND RESTORATION AREAS (SEE ES-0.08 FOR RESTORATION DETAIL)

VEGETATION PLANTING TYPE	SIZE	SPECIES[A]		WETLAND STATUS[B]
SHRUB SPECIES	TWO TO THREE-FOOT WHIP	ALNUS SERRULATA	SMOOTH ALDER	OBL
		CORNUS AMONUM	SILKY DOGWOOD	FACW
		LINDERA BENZOIN	SPICEBUSH	FAC
		VIBURNUM DENTATUM	NORTHERN ARROW-WOOD	FAC
TREE SPECIES	CONTAINERIZED (1-INCH DBH)[C]	ACER RUBRUM	RED MAPLE	FAC
		BETULA ALLEGHANIENSIS	YELLOW BIRCH	FAC
		PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	FACW
		QUERCUS BICOLOR	SWAMP WHITE OAK	FACW
		SALIX NIGRA	BLACK WILLOW	OBL

NOTES:

A – IF LISTED SPECIES IS UNAVAILABLE DURING PLANTING, A COMPARABLE NATIVE SUBSTITUTE WILL BE USED.
B – USACE EASTERN MOUNTAINS AND PIEDMONT WETLAND STATUS TREES AND SHRUBS WILL BE PLANTED AT A DENSITY OF AT LEAST 400 PLANTS/TREES PER ACRE IN ACCORDANCE WITH USACE GUIDANCE.
C – DBH: DIAMETER AT BREAST HEIGHT.

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	TO SPECIFY NATIVE PLANTS IN THE SEED MIXTURES

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075404-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-0.04
SHEET 0.04 OF 99

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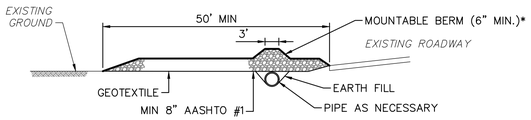
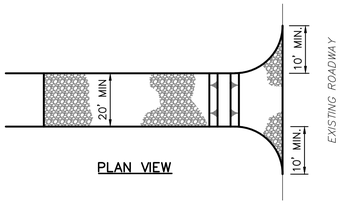


PROFILE



PLAN VIEW

* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE IF NEEDED.

NOTES:

REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.

RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.

MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTION CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THE PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

ROCK CONSTRUCTION ENTRANCE (1 / 0.05)
NOT TO SCALE

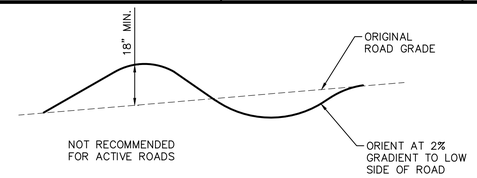
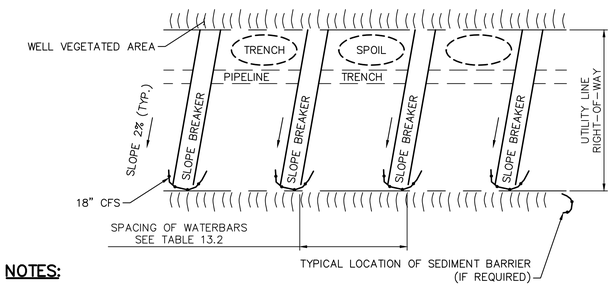


TABLE 13.2

MAXIMUM SPACING FOR PERMANENT WATERBARS ON A UTILITY LINE RIGHT-OF-WAY	
PERCENT SLOPE	SPACING (FT)
<5	250
5–15	150
15–30	100
>30	50



NOTES:

WATERBARS SHALL DISCHARGE TO A STABLE AREA.

WATERBARS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RUNOFF EVENT. DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION.

MAINTENANCE OF WATERBARS SHALL BE PROVIDED UNTIL ROADWAY, SKIDTRAIL, OR RIGHT-OF-WAY HAS ACHIEVED PERMANENT STABILIZATION.

WATERBARS ON RETIRED ROADWAYS, SKIDTRAILS, AND RIGHT-OF-WAYS SHALL BE LEFT IN PLACE AFTER PERMANENT STABILIZATION HAS BEEN ACHIEVED.

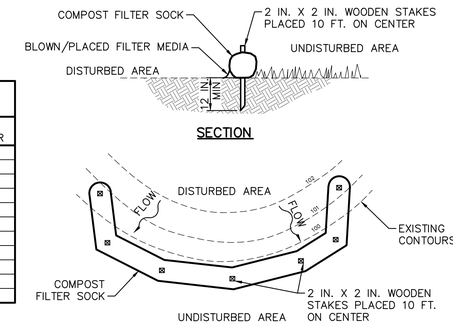
SEE TABLE 13.2 ABOVE FOR WATERBAR SPACING.

PERMANENT WATERBARS ARE REQUIRED AT ALL STREAM, RIVER, AND OTHER WATER-BODY CROSSINGS AS WELL AS UPSLOPE FROM ROADWAY AND RAILROAD CUT SLOPES.

SUMPS MAY BE ADDED AS NEEDED AT THE ENDS OF WATERBARS TO PROVIDE ADDITIONAL SEDIMENT REMOVAL PRIOR TO DISCHARGE THROUGH THE 18" COMPOST FILTER SOCK.

WATERBAR (2 / 0.05)
NOT TO SCALE

MAXIMUM SLOPE LENGTHS FOR COMPOST FILTER SOCK			
% SLOPE	12" DIAMETER	18" DIAMETER	24" DIAMETER
2 (OR LESS)	520	700	1000
5	250	340	500
10	150	250	300
15	100	200	250
20	70	140	200
25	50	100	140
30	45	70	100
35	40	60	90
40	35	45	60
45	30	40	50
50	20	30	40



NOTES:

SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE EPA DEP EROSION CONTROL MANUAL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXITING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES ½ THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

COMPOST FILTER SOCK SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

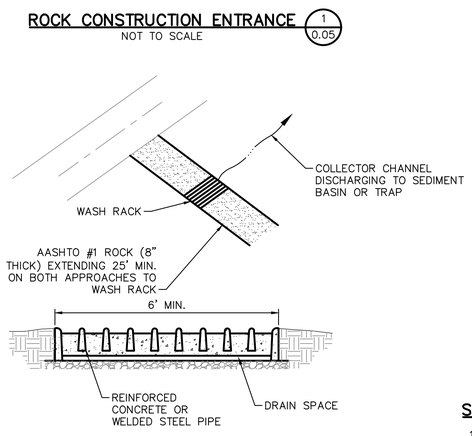
UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

TABLE 4.1

COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS					
MATERIAL TYPE	3 MIL HDPE	5 MIL HDPE	5 MIL HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STRENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMUM FUNCTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING	HDPE BIAXIAL NET				
	CONTINUOUSLY WOUND				
	FUSION-WELDED JUNCTURES				
	3/4" X 3/4" MAX. APERTURE SIZE				
OUTER FILTRATION MESH	COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)				
	3/16" MAX. APERTURE SIZE				
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

TABLE 4.2

COMPOST STANDARDS	
ORGANIC MATTER CONTENT	25%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
PH	5.5-8.5
MOISTURE CONTENT	30%-60%
PARTICLE SIZE	30%-50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 DS/M (MMHOS/XM) MAXIMUM



NOTES:

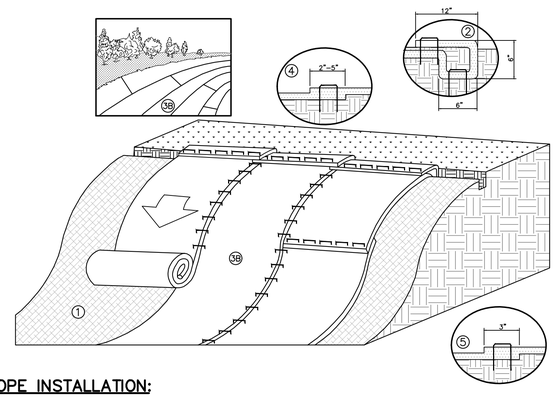
WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

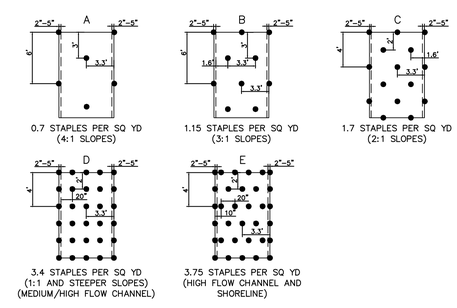
ROCK CONSTRUCTION ENTRANCE WITH WASH RACK (3 / 0.05)
NOT TO SCALE



SLOPE INSTALLATION:

1. PREPARE SOIL BEFORE INSTALLING RECPs, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECPs IN A 6 IN. DEEP X 6 IN. WIDE TRENCH WITH APPROXIMATELY 12 IN. OF RECPs EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE RECPs WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12 IN. APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12 IN. PORTION OF RECPs BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPs OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12 IN. APART ACROSS THE WIDTH OF THE RECPs.
3. ROLL THE RECPs (3A) DOWN OR (3B) HORIZONTALLY ACROSS THE SLOPE. RECPs WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPs MUST BE SECURELY FASTENED TO SOIL SURFACE BY REPLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL RECPs MUST BE STAPLED WITH AN APPROXIMATELY 2 IN. – 5 IN. OVERLAP DEPENDING ON THE RECP TYPE.
5. CONSECUTIVE RECP SPLICED DOWN THE SLOPE MUST BE END-OVER-END (SHINGLE STYLE) WITH AN APPROXIMATE 3 IN. OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12 IN. APART ACROSS ENTIRE RECPs WIDTH.

STAPLE PATTERN GUIDE



NOTES:

1. FOR SLOPES BETWEEN 3:1 AND 1:1, USE NORTH AMERICAN GREEN ERONET SC 150 OR OWNER APPROVED EQUAL MATERIAL/METHOD.
2. IN AREAS WHERE LIVESTOCK ARE KEPT, USE NORTH AMERICAN GREEN BIONET SC 150 BN OR OWNER APPROVED EQUAL MATERIAL/METHOD.
3. SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.
4. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE
5. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.
6. BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE PROJECT LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
7. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS,
8. BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

EROSION CONTROL BLANKET – SLOPE INSTALLATION (4 / 0.05)
NOT TO SCALE

COMPOST FILTER SOCK (5 / 0.05)
NOT TO SCALE

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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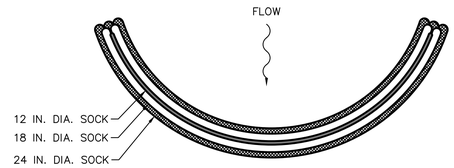
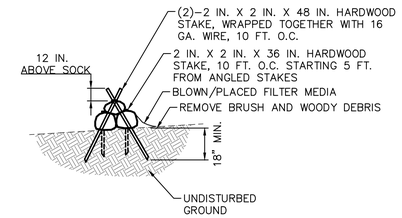


PLAN VIEW



STAKING VIEW

DESIGN NOTES:

1. COMPOST SEDIMENT TRAP SHALL BE SIZED TO PROVIDE 2000 CUBIC FEET OF STORAGE CAPACITY FOR EACH ACRE TRIBUTARY TO THE TRAP.
2. MINIMUM BASE WIDTH IS EQUAL TO THE HEIGHT.
3. SEDIMENT ACCUMULATION SHALL NOT EXCEED ⅓ THE TOTAL HEIGHT OF THE TRAP.
4. SOCKS SHALL BE OF LARGER DIAMETER AT THE BASE OF THE TRAP AND DECREASE IN DIAMETER FOR SUCCESSIVE LAYERS AS SHOWN ON THE PLAN VIEW.
5. ENDS OF THE TRAP SHALL BE A MINIMUM OF 1 FOOT HIGHER IN ELEVATION THAN THE MID–SECTION, WHICH SHALL BE LOCATED AT THE POINT OF DISCHARGE.

NOTES:

SOCK MATERIAL SHALL MEET THE STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

COMPOST SOCK SEDIMENT TRAPS SHALL NOT EXCEED THREE SOCKS IN HEIGHT AND SHALL BE STACKED IN PYRAMIDAL FORM AS SHOWN ABOVE. MINIMUM TRAP HEIGHT IS ONE 24" DIAMETER SOCK. ADDITIONAL STORAGE MAY BE PROVIDED BY MEANS OF AN EXCAVATED SUMP 12" DEEP EXTENDING 1 TO 3 FEET UPSLOPE OF THE SOCKS ALONG THE LOWER SIDE OF THE TRAP.

COMPOST SOCK SEDIMENT TRAPS SHALL PROVIDE 2,000 CUBIC FEET STORAGE CAPACITY WITH 12" FREEBOARD FOR EACH TRIBUTARY DRAINAGE ACRE. (SEE MANUFACTURER FOR ANTICIPATED SETTLEMENT.)

THE MAXIMUM TRIBUTARY DRAINAGE AREA IS 5.0 ACRES. SINCE COMPOST SOCKS ARE "FLOW–THROUGH," NO SPILLWAY IS REQUIRED.

COMPOST SOCK SEDIMENT TRAPS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. SEDIMENT SHALL BE REMOVED WHEN IT REACHES ⅓ THE HEIGHT OF THE SOCKS.

PHOTODEGRADABLE AND BIODEGRADABLE SOCKS SHALL NOT BE USED FOR MORE THAN 1 EYAR.

COMPOST SOCK SEDIMENT TRAP (6 / 0.06)
NOT TO SCALE

TETRA TECH
www.tetratech.com
661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921–7090 | F: (412) 921–4040

REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — ROBERT F. SIMCIK — 072364025-E

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES–0.06
SHEET 0.06 OF 99

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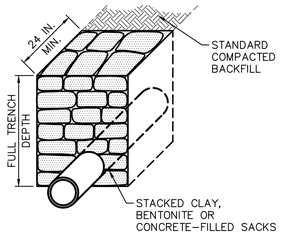
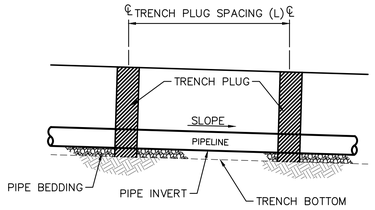


SECTION VIEW



ELEVATION

REQUIRED SPACING & MATERIALS FOR TRENCH PLUGS		
TRENCH SLOPE (%)	SPACING L (FT)	PLUG MATERIAL
<5	1,000	* CLAY, BENTONITE OR CONCRETE–FILLED SACKS
5–15	500	* CLAY, BENTONITE OR CONCRETE–FILLED SACKS
15–25	300	* CLAY, BENTONITE OR CONCRETE–FILLED SACKS
25–35	200	* CLAY, BENTONITE OR CONCRETE–FILLED SACKS
35–100	100	* CLAY, BENTONITE OR CONCRETE–FILLED SACKS
>100	50	CEMENT BAGS (WETTED) OR MORTARED STONE

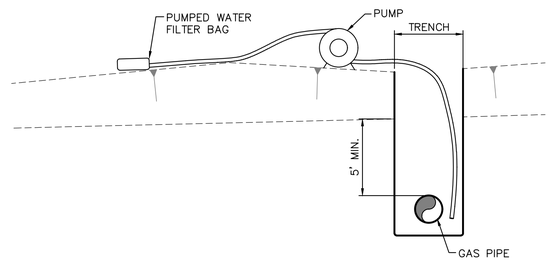
* TOP SOIL MAY NOT BE USED TO FILL SACKS

NOTES:

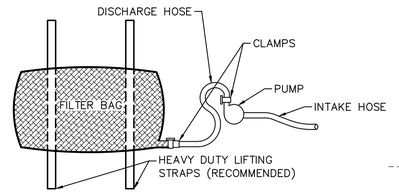
IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER WATERBODY CROSSINGS.

PLACE A MINIMUM OF ONE (1) TRENCH PLUG AT A MAXIMUM SPACING OF 100 FEET BETWEEN TRENCH PLUGS WITHIN A WETLAND. WETLAND CROSSINGS LESS THAN FIFTY (50) FEET DO NOT REQUIRE AN INTERNAL TRENCH PLUG. (IN ACCORDANCE WITH SPECIAL CONDITIONS PART, CONDITION FFF OF THE APPROVED CHAPTER 105 PERMIT)

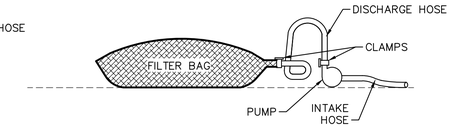
TRENCH PLUG INSTALLATION (10 / 0.07)
NOT TO SCALE



TRENCH DEWATERING DETAIL
NOT TO SCALE



PLAN VIEW



ELEVATION VIEW

NOTES:

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON–WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D–4884	60 LB/IN
GRAB TENSILE	ASTM D–4632	205 LB
PUNCTURE	ASTM D–4833	110 LB
MULLEN BURST	ASTM D–3786	350 PSI
UV RESISTANCE	ASTM D–4355	70%
AOS % RETAINED	ASTM D–3751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME ½ FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL–VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NO POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACE DON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5% FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON–ERODIBLE AND NON–POLLUTING MATERIAL MAY BE PLACE UNDER THE GAB TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

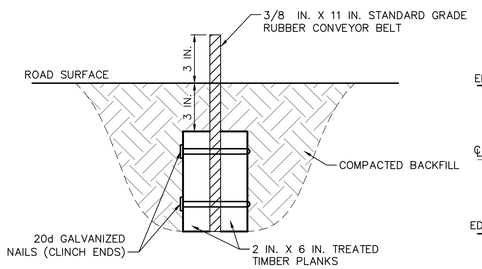
THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

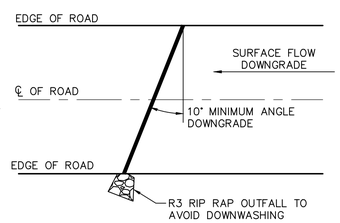
THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR ½ THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

WHERE COMPOST FILTER SOCK IS NECESSARY TO ELEVATE THE PUMPED WATER FILTER BAG TO AN ABACT E&S BMP, THE COMPOST FILTER SOCK SHALL BE PLACED TO SUFFICIENT LENGTH TO MANAGE ALL FLOW FROM THE PUMPED WATER FILTER BAG (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION II, CONDITION I OF THE APPROVED CHAPTER 102 PERMIT).

PUMPED WATER FILTER BAG (11 / 0.07)
NOT TO SCALE

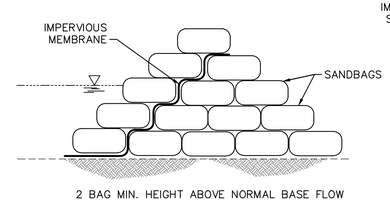




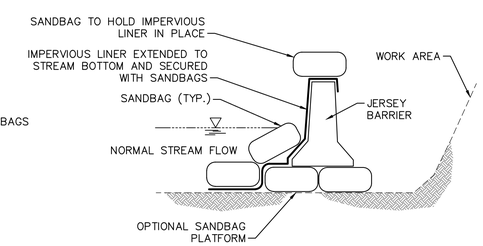
NOTE:
1. DEFLECTOR SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT.
2. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM DEFLECTOR WITHIN 24 HOURS OF INSPECTION.
3. BELT SHALL BE REPLACED WHEN WORN AND NO LONGER EFFECTIVE.
4. MAXIMUM SPACING OF DEFLECTORS SHALL BE AS SHOWN IN TABLE.

ROAD GRADE (PERCENT)	SPACING BETWEEN DIPS, CULVERTS,OR DEFLECTORS (FEET)
<2	300
3	235
4	200
5	180
6	165
7	155
8	150
9	145
10	140

WATER DEFLECTOR (12 / 0.07)
NOT TO SCALE



STACKED SANDBAGS OPTION



JERSEY BARRIER OPTION

NOTES:

CONSTRUCT DAMS WITH SAND BAGS, JERSEY BARRIERS OR SIMILAR MATERIAL WITH AN IMPERVIOUS LINER EXTENDED TO THE STREAM BOTTOM AND SECURED WITH SANDBAGS MAINTAINING AMBIENT DOWNSTREAM FLOW RATES.

SANDBAG OR DIVERSION DAM (13 / 0.07)
NOT TO SCALE

TETRA TECH
www.tetratech.com
661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921–7090 | F: (412) 921–4040

REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — ROBERT F. SIMCIK — 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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SHEET 0.07 OF 99

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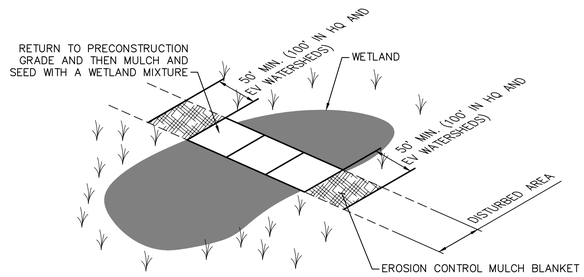
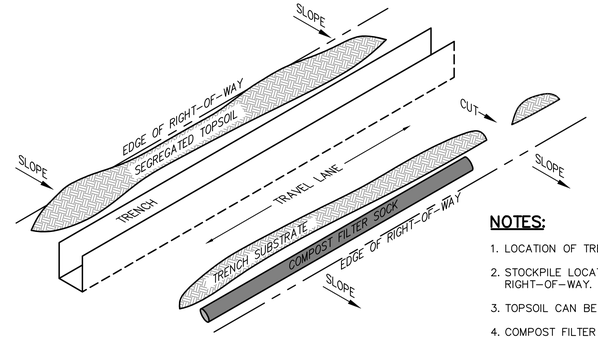


NOTES:

1. BACKFILL TRENCH; WERE SOILS WHERE SEGREGATED, REPLACE IN ORDER OF REMOVAL (CONSULT SPREAD HYDROGEOLOGIST PRIOR TO AND DURING BACKFILLING)
2. ONCE BACKFILLING IS COMPLETE, REMOVE TEMPORARY TIMBER MATTING AND ALL CONSTRUCTION DEBRIS AND RESTORE ORIGINAL GRADES AND HYDROLOGY.
3. RESTORATION ACTIVITIES SHALL BEGIN IMMEDIATELY AFTER BACKFILLING. TEMPORARILY REVEGETATE ALL IMPACTED WETLANDS IN ACCORDANCE WITH PLAN SHEET ES-0.05 TO ALLOW RAPID STABILIZATION AND DETER INVASIVE SPECIES.
4. PERMANENTLY REVEGETATE IMPACTED PEM WETLANDS IN ACCORDANCE WITH PLAN SHEET ES-0.05 THAT CALLS FOR ERNST CONSERVATION SEED MIX NO. ERNMX-122 FACW MEADOW MIX. PLANT DURING THE RECOMMENDED PLANTING SEASON.
5. TEMPORARY OR PERMANENT REVEGETATION IS NOT NECESSARY IN AREAS OF STANDING WATER.
6. NO SOIL AMENDMENTS, LIME, FERTILIZER, OR BINDING AGENTS ARE TO BE USED IN WETLAND AREAS.
7. PSS IMPACTED WETLAND AREAS WHERE NOTED ON PLAN SHEETS WILL BE PLANTED WITH SHRUB SPECIES IN ACCORDANCE WITH ES-0.04. PLANT DURING THE RECOMMENDED PLANTING SEASON.
8. PSS IMPACTED WETLAND AREAS WHERE THE ROOT SYSTEM WAS NOT REMOVED (E.G., MATTED OVER) DO NOT REQUIRE REPLANTING. PLANT DURING THE RECOMMENDED PLANTING SEASON.
9. PFO IMPACTED WETLANDS AREAS WHERE NOTED ON PLAN SHEETS FOR RESTORATION WILL BE PLANTED WITH THE TREE SPECIES IN ACCORDANCE WITH ES-0.04.
10. PSS AND PFO RESTORATION AREAS WILL BE PROTECTED WITH "NO-MOW" SIGNS.
11. REFER TO THE PROJECT'S IMPACT AVOIDANCE, MINIMIZATION, AND MITIGATION PROCEDURES FOR MORE SPECIFICS ON WETLAND RESTORATION IN GENERAL AND SPECIFICS REGARDING PSS AND PFO RESTORATION EFFORTS.

TYPICAL WETLAND RESTORATION

SCALE: NOT TO SCALE

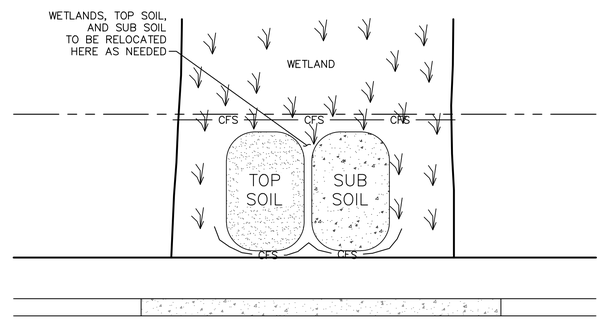


NOTES:

1. LOCATION OF TRENCH AND TRAVEL LANE WILL VARY BASED ON PROPOSED PIPE LOCATIONS.
2. STOCKPILE LOCATION PLACED UPSLOPE OF TRENCH TO DIVERT OFF-SITE DRAINAGE AWAY FROM RIGHT-OF-WAY.
3. TOPSOIL CAN BE PLACED WITH DITCH SPOIL IF PROPERLY SEGREGATED.
4. COMPOST FILTER SOCK TO BE INSTALLED PARALLEL TO EXISTING CONTOURS.
5. TOPSOIL TO BE REPLACED TO PRECONSTRUCTION DEPTH (TO BE FIELD VERIFIED).

RIGHT-OF-WAY DETAIL

NOT TO SCALE

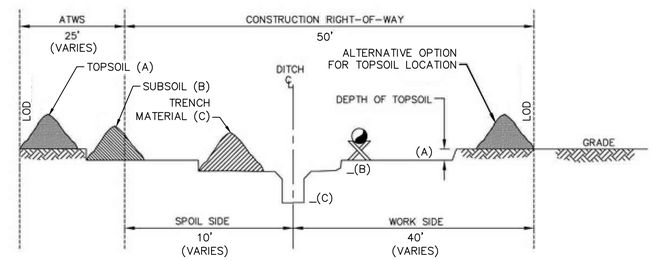


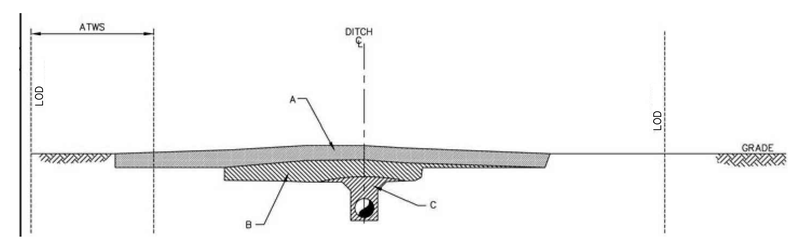
NOTES:

1. PROVIDE PHYSICAL SEPARATION BENEATH SPOIL PILES AND WETLAND SOIL TO ENSURE FULL REMOVAL AND TO MINIMIZE IMPACTS

SPOIL STOCKPILE CONTAINMENT – WETLANDS

NOT TO SCALE



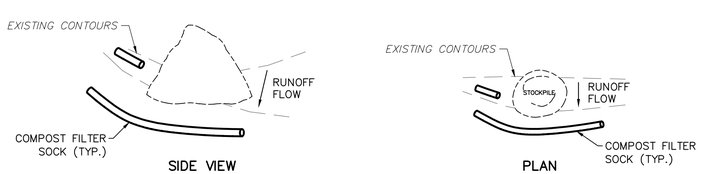


SPOIL STOCKPILE CONTAINMENT – TRIPLE DITCH

NOT TO SCALE

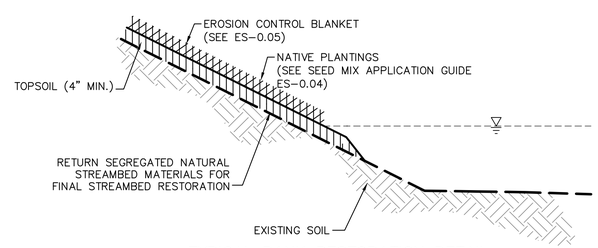
NOTES:

1. TRIPLE DITCH METHOD WILL BE USED TO SEGREGATE PROBLEM SOILS SUCH AS SALINE OR SODIC SOILS, IDENTIFIED STREAM CROSSINGS, AND/OR AS OTHERWISE DIRECTED.
2. ENSURE THE EXCAVATED SOILS ARE IN SEPARATE STOCKPILES WITH VISUAL SEPARATION OF AT LEAST 2' BETWEEN PILES.
3. EXCAVATED SOILS ARE TO BE PLACED BACK IN THE SEQUENCE IN WHICH WERE REMOVED.



SPOIL STOCKPILE CONTAINMENT – UPLANDS

NOT TO SCALE



TYPICAL BANK RESTORATION DETAIL

NOT TO SCALE

TETRA TECH
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661 ANDERSEN DRIVE – FOSTER PLAZA 7
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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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SHEET 0.08 OF 99

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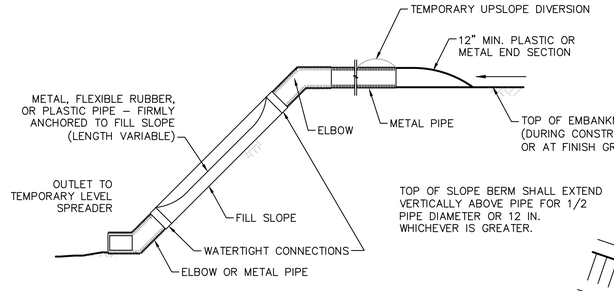
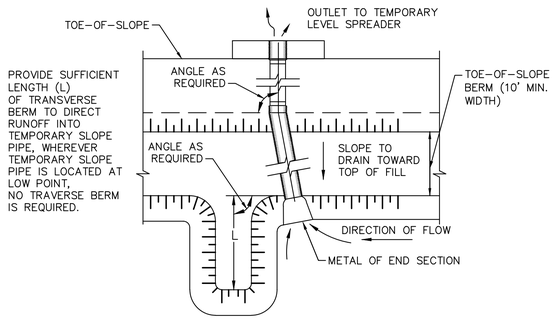




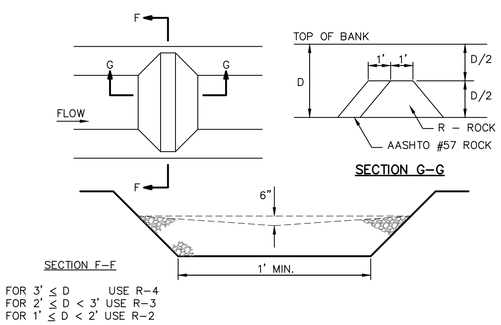
MINIMUM DIMENSIONS FOR TEMPORARY SLOPE PIPES		
DRAINAGE AREA (ACRES)	MINIMUM PIPE DIAMETER (IN.)	MINIMUM BERM HEIGHT (IN.)
<2	12	24
2–4	15	27
4–5	18	30

* TEMPORARY SLOPE PIPES SHOULD BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. ANY ACCUMULATED SEDIMENT SHOULD BE REMOVED FROM THE ENTRANCE. DAMAGED PIPE SHOULD BE REPAIRED OR REPLACED. NEEDED REPAIRS SHOULD BE INITIATED IMMEDIATELY AFTER THE INSPECTION.

NOTES:

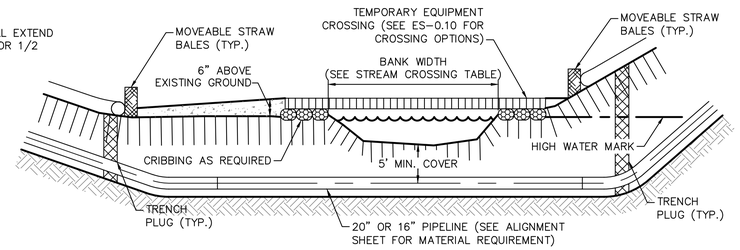
1. THE MAXIMUM DISTANCE BETWEEN ANCHOR STAKES SHALL BE 10 FEET.
2. TRANSVERSE BERM SHALL BE USED WHENEVER TEMPORARY SLOPE PIPE IS NOT LOCATED AT LOW POINT.
3. SLOPE PIPES SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE INLET IMMEDIATELY.
4. DAMAGED PIPE SECTIONS SHALL BE REPLACED WITHIN 24 HOURS. LEAKING CONNECTIONS SHALL BE REPAIRED IMMEDIATELY.

TEMPORARY SLOPE PIPE DETAIL
NOT TO SCALE

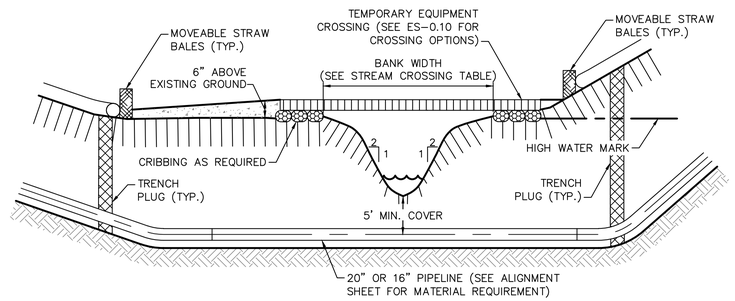


FOR 3' ≤ D USE R–4
FOR 2' ≤ D < 3' USE R–3
FOR 1' ≤ D < 2' USE R–2

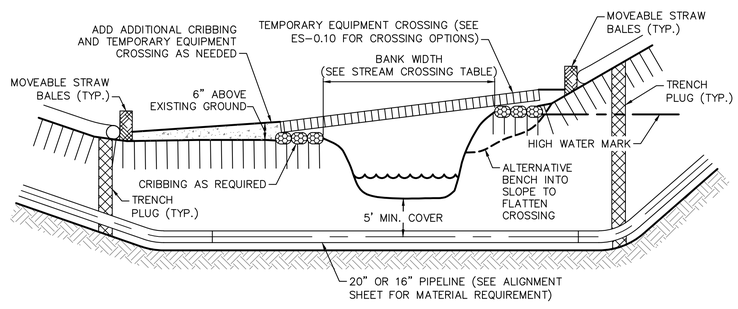
CHANNEL ROCK FILTER DETAIL
NOT TO SCALE



TYPICAL FLAT STREAM CROSSING



TYPICAL STEEP BANK STREAM CROSSING

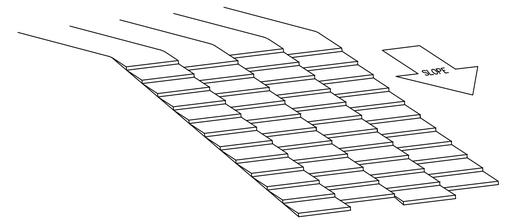


TYPICAL SLOPED STREAM CROSSING

NOTES:

1. SEE SITE SPECIFIC PLAN DRAWINGS FOR SITE SPECIFIC STREAM CROSSING DETAILS WHERE INDICATED.
2. STREAM CROSSING TECHNIQUE TO BE DETERMINED IN THE FIELD BY THE ENVIRONMENTAL INSPECTOR IN CONSULTATION WITH THE CONTRACTOR BASED UPON FIELD CONDITIONS.
3. SEE STREAM CROSSING TABLE FOR BANK WIDTHS.
4. SEE STEEP BANK STABILIZATION DETAIL WHEN BANK SLOPES ARE GREATER THAN 2H:1V.
5. SEE RIP–RAP BANK STABILIZATION DETAIL WHEN BANK SLOPE IS 2H:1V OR FLATTER.
6. SEE PLAN DRAWING FOR TRENCH PLUG LOCATIONS.

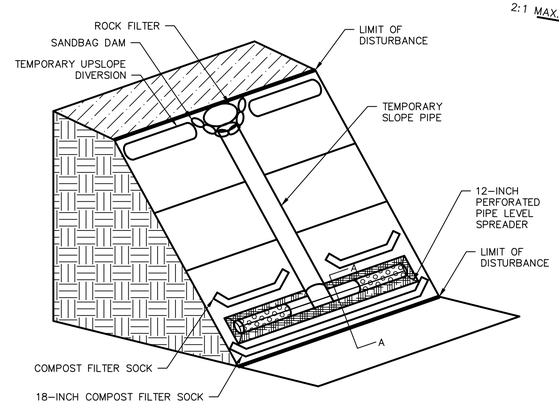
TYPICAL STREAM CROSSING DETAILS
NOT TO SCALE

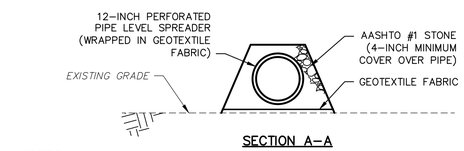


NOTES:

1. DOZER TREADS CREATE GROOVES PERPENDICULAR TO SLOPE.

SURFACE ROUGHENING DETAIL
NOT TO SCALE



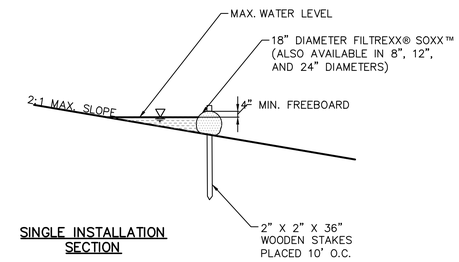


SECTION A–A

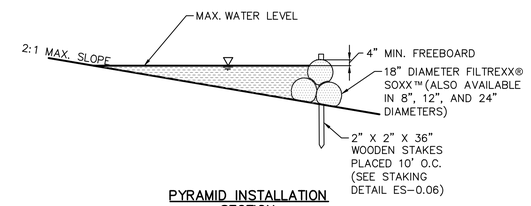
NOTES:

1. LEVEL SPREADER PIPES TO BE 12–INCH JM EAGLE EAGLE CORR PE PERFORATED PIPE (OR APPROVED EQUAL) AND SHALL BE CAPPED AT BOTH ENDS.
2. LEVEL SPREADER TO BE INSTALLED PARALLEL TO CONTOURS AT LEVEL ELEVATION.
3. PERFORATED PIPE TO BE UNDERLAIN AND WRAPPED WITH GEOTEXTILE FABRIC AND COVERED WITH AASHTO NO. 1 STONE. MINIMUM STONE COVER SHALL BE 4–INCHES OVER PERFORATED PIPE.
4. ALL LEVEL SPREADER STONE WILL BE REMOVED AND DISBTURBED AREA TO BE RESTORED IN ACCORDANCE WITH E&S PLAN.
5. LEVEL SPREADERS TO BE INSTALLED AT ALL TEMPORARY SLOPE PIPE DISCHARGES AT LOW POINTS OF DIVERSION BERM.
6. LEVEL SPREADERS TO BE INSPECTED WEEKLY OR AFTER MEASURABLE RAINFALL EVENT AND SHALL BE MAINTAINED IN GOOD CONDITION AT ALL TIMES.

TEMPORARY LEVEL SPREADER DETAIL
NOT TO SCALE

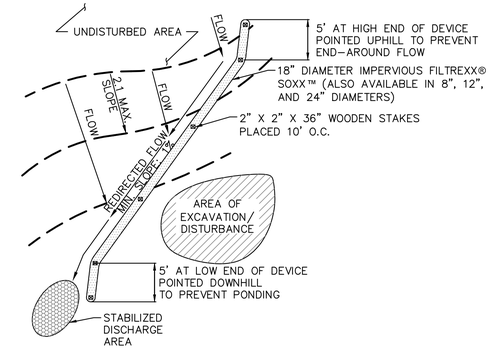


SINGLE INSTALLATION SECTION



PYRAMID INSTALLATION SECTION

FILTREXX® RUNOFF DIVERSION SECTIONS
NO SCALE



NOTES:

1. REMOVE SEDIMENT FROM THE UPSLOPE SIDE OF THE SOXX™ WHEN ACCUMULATION HAS REACHED ½ OF EFFECTIVE HEIGHT OF SOXX™.
2. SLOPES GREATER THAN 5% MAY REQUIRE ADDITIONAL STABILIZATION PRACTICES.
3. SOXX™ MAY BE SEEDED AT THE TIME OF INSTALLATION.
4. ALTERNATE COMPOST FILTER SOCK MAY BE SUBSTITUTED FOR FILTREXX® SOXX™ WITH PRIOR APPROVAL FROM THE ENGINEER.

TEMPORARY UPSLOPE DIVERSION BERM FOR FILTREXX® RUNOFF DIVERSION
NOT TO SCALE

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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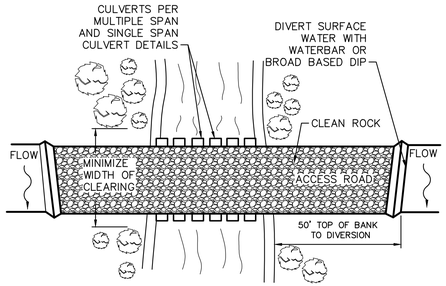
SHEET 0.09 OF 99



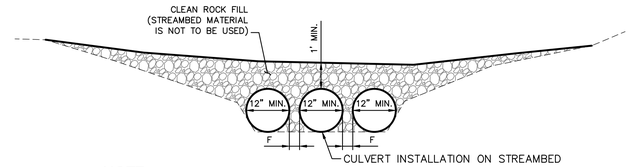
PLAN VIEW

NOTES:

1. WATERBARS AND BROAD-BASED DIPS SHALL DISCHARGE TO 18" CFS OR APPROVED SEDIMENT REMOVAL FACILITY.
2. CLEAN ROCK SHALL CONFORM TO CHAPTER 105 PERMITTING REQUIREMENTS.
3. FOLLOW PERMIT CONDITIONS REGARDING REMOVAL OF CROSSING.
4. ALTERNATIVELY, TIMBER MATS MAY BE USED TO FORM THE TRAVEL SURFACE.
5. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL (SEE PLAN VIEW). THE STABILIZED APPROACH MAY CONSIST OF GRAVEL (AASHTO #1 OR EQUAL) OR TIMBER MATS.
6. PIPES SHALL EXTEND BEYOND THE TOE OF THE CROSSING SUPPORT.
7. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.
8. FOLLOW TROUT STREAM RESTRICTIONS SHOWN ON PLAN SHEETS.

TEMPORARY CULVERT STREAM CROSSING

NOT TO SCALE

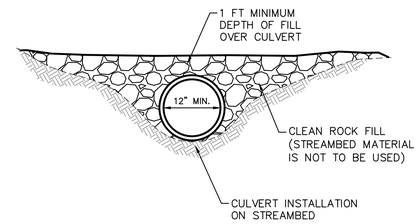


NOTE:

1. MULTIPLE PIPES AND MULTIPLE SPAN BRIDGES AND CULVERTS WHICH MAY TEND TO COLLECT DEBRIS, CONTRIBUTE TO THE FORMATION OF ICE JAMS AND INCREASE HEAD LOSSES SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. CROSSINGS OF LESS THAN 15 FEET SHALL BE BY ONE SPAN, EXCEPT WHERE CONDITIONS MAKE IT IMPRACTICAL TO AFFECT THE CROSSING WITHOUT MULTIPLE SPANS (SECTION 105.162).
2. REFER TO PADEP E&S MANUAL PAGES 39 AND 40 FOR DETAILS #3-13 (SINGLE SPAN CULVERT) AND #3-14 (MULTIPLE SPAN OUTLET) FOR ADDITIONAL INFORMATION.

MULTIPLE SPAN CULVERT

NOT TO SCALE



CROSS-SECTION VIEW

SINGLE SPAN CULVERT

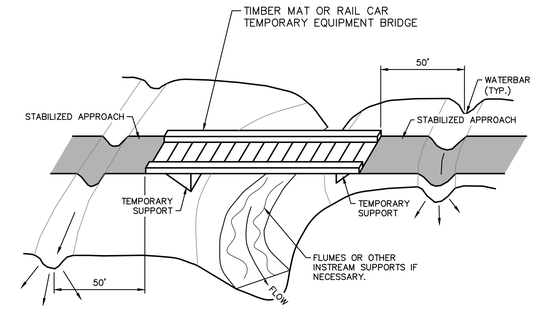
NOT TO SCALE

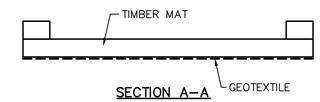
MAINTENANCE OF TEMPORARY EQUIPMENT CROSSING:

1. TEMPORARY STREAM CROSSING SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED REGULARLY AND PLACED IN SOIL STOCKPILES.
4. FLOW THROUGH SHALL BE INSPECTED DAILY AND IMPEDANCES REMOVED WITHIN 24 HOURS.
5. AS SOON AS TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND AREAS STABILIZED. TEMPORARY EQUIPMENT CROSSINGS SHALL REMAIN IN PLACE NO LONGER THAN 1 YEAR.

TEMPORARY EQUIPMENT CROSSING DETAILS (15 / 0.10)

NOT TO SCALE





SECTION A-A

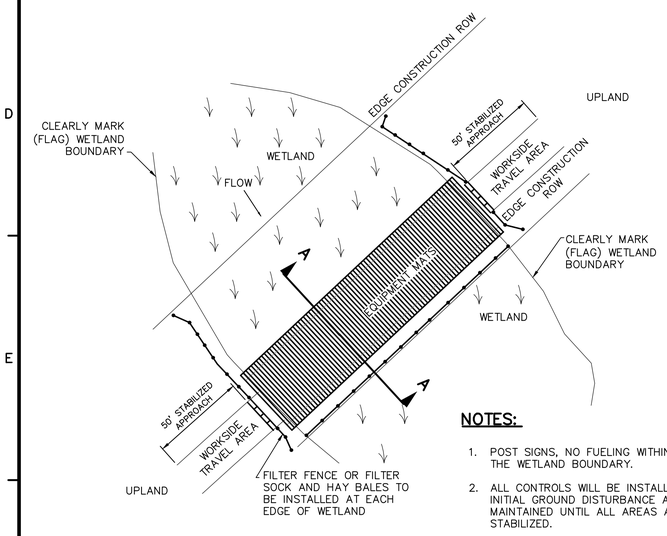
NOT TO SCALE

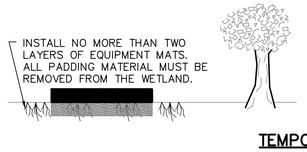
NOTES:

1. POST SIGNS; NO REFUELING WITHIN 100 FEET OF A STREAM.
2. APPROACHES TO CROSSINGS ARE NOT TO EXCEED 6" ABOVE ORIGINAL GRADE.
3. TIMBER MAT SPANS WITHOUT CENTER SUPPORT ARE LIMITED TO 15 FEET.
4. RAIL CAR SPANS WITHOUT CENTER SUPPORT ARE LIMITED TO 40 FEET.
5. GEOTEXTILE SHALL BE WOVEN WITH A MINIMUM GRAB TENSILE STRENGTH OF 200 POUNDS (MARV). ALTERNATES MUST BE APPROVED BY ENGINEER. WHERE SAFETY IS A CONCERN, GEOTEXTILE MAY BE REMOVED WITH PRIOR APPROVAL OF ENGINEER.
6. COMPOSITE MAT CAN BE SUBSTITUTED FOR TIMBER MATS.
7. CONSTRUCT AND MAINTAIN EQUIPMENT BRIDGES TO ALLOW UNRESTRICTED FLOW AND TO PREVENT SOIL FROM ENTERING THE WATERBODY.
8. WATERBARS AND BROAD-BASED DIPS SHALL DISCHARGE TO 18" CFS OR APPROVED SEDIMENT REMOVAL FACILITY.
9. FOLLOW PERMIT CONDITIONS REGARDING REMOVAL OF CROSSING.
10. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL (SEE PLAN VIEW). THE STABILIZED APPROACH MAY CONSIST OF GRAVEL (AASHTO #1 OR EQUAL) OR TIMBER MATS.
11. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.
12. FOLLOW TROUT STREAM RESTRICTIONS SHOWN ON PLAN SHEETS.
13. ACCUMULATED SEDIMENT ON TIMBER MAT OR EQUIPMENT BRIDGE WILL BE REMOVED BY HAND AND PLACED IN SOIL STOCKPILES.

TEMPORARY EQUIPMENT BRIDGE STREAM CROSSING DETAIL

NOT TO SCALE



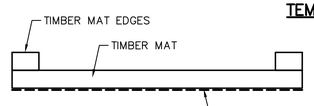


NOTES:

1. POST SIGNS, NO FUELING WITHIN 100' OF THE WETLAND BOUNDARY.
2. ALL CONTROLS WILL BE INSTALLED AFTER INITIAL GROUND DISTURBANCE AND MAINTAINED UNTIL ALL AREAS ARE STABILIZED.
3. LIMIT STUMP REMOVAL TO TRENCH LINE, UNLESS OTHER STUMPS CAUSE AN UNSAFE CONDITION.
4. RESTORE TO ORIGINAL CONTOUR AND DRAINAGE; RESTORE WETLAND MATERIAL.
5. RESTORE WETLAND IN ACCORDANCE WITH SHEET PLAN ES-0.08.

TEMPORARY TIMBER MAT WETLAND CROSSING (16 / 0.10)

NOT TO SCALE

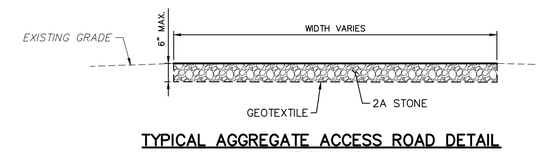


SECTION A-A

NOT TO SCALE

NOTE:

1. IF TIMBER MAT OR EQUIPMENT BRIDGE EDGES ARE NOT PROVIDED ON MAT TO CONTAIN SEDIMENT, INSTALL CFS IN SPECIAL PROTECTION WATERSHEDS OR SILT FENCE IN NON-SPECIAL PROTECTION WATERSHEDS TO PREVENT ANY SEDIMENT FROM THE EQUIPMENT CROSSING FROM ENTERING THE WETLAND.
2. GEOTEXTILE SHALL BE WOVEN WITH A MINIMUM GRAB TENSILE STRENGTH OF 200 POUNDS (MARV). ALTERNATES MUST BE APPROVED BY ENGINEER. WHERE SAFETY IS A CONCERN, GEOTEXTILE MAY BE REMOVED WITH PRIOR APPROVAL OF ENGINEER.
3. COMPOSITE MAT CAN BE SUBSTITUTED FOR TIMBER MATS.
4. ACCUMULATED SEDIMENT ON TIMBER MAT OR EQUIPMENT BRIDGE WILL BE REMOVED BY HAND AND PLACED IN SOIL STOCKPILES.



TYPICAL AGGREGATE ACCESS ROAD DETAIL

NOT TO SCALE

NOTES:

1. ENSURE RUNOFF FROM THE TRAVEL LANE SHALL BE DIVERTED OFF THE TRAVEL LANE INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE STABILIZED APPROACH.
2. GEOTEXTILE SHALL BE WOVEN WITH A MINIMUM GRAB TENSILE STRENGTH OF 200 POUNDS (MARV). ALTERNATES MUST BE APPROVED BY ENGINEER. WHERE SAFETY IS A CONCERN, GEOTEXTILE MAY BE REMOVED WITH PRIOR APPROVAL OF ENGINEER.

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075364-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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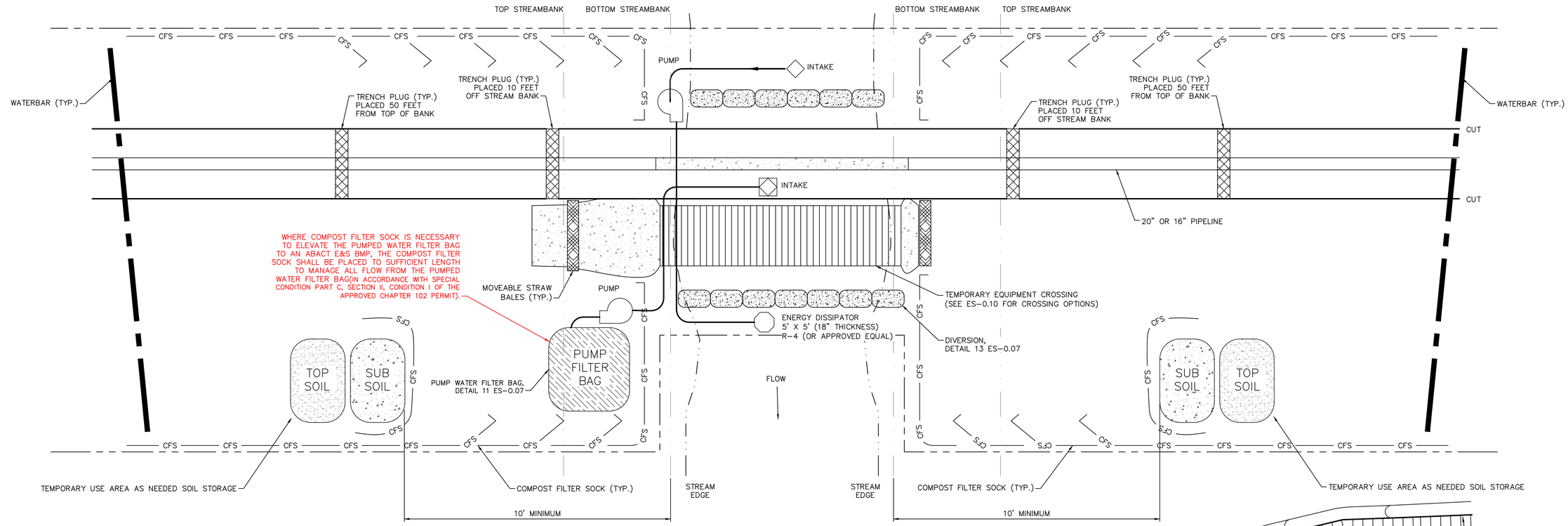
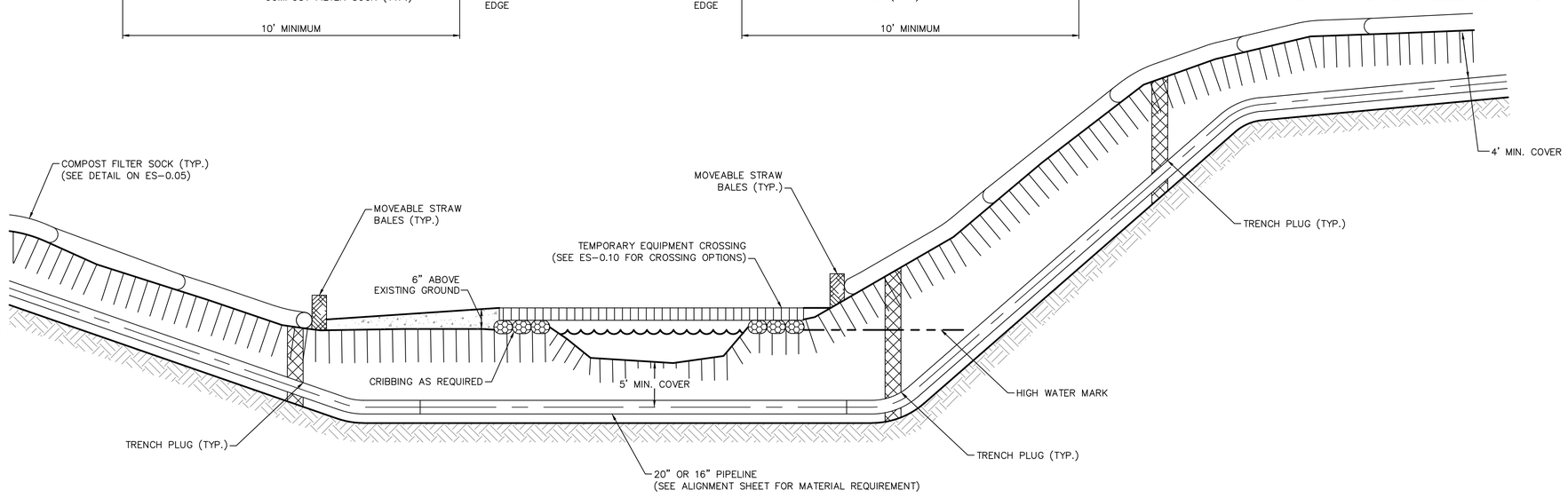
ES-0.10

SHEET 0.10 OF 99



NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-SPECIRIC STREAM CROSSING DRAWINGS.
2. CONSTRUCT WATERBODY CROSSINGS AS PERPENDICULAR TO THE AXIS OF THE WATERBODY CHANNEL AS ENGINEERING AND ROUTING CONDITIONS ALLOW.
3. SETUP PUMP AND HOSE AS SHOWN, OR USE OTHER PRACTICAL ALTERNATIVES. PUMP SHOULD HAVE TWICE THE PUMPING CAPACITY OF ANTICIPATED FLOW.
4. CONTRACTOR TO ENSURE A SUFFICIENT NUMBER OF ACTIVE AND BACKUP PUMPS TO MAINTAIN TWCE THE PUMPING CAPACITY OF ANTICIPATED FLOW ARE AVAILABLE AT THE SITE DURING THE INSTALLATION.
5. INSTALL UPSTREAM DAM, THEN DOWNSTREAM STREAM DAM. KEEP PUMP RUNNING TO MAINTAIN STREAM FLOW, DETAIL 13 ES-0.07.
6. BYPASS PUMP INTAKES SHALL BE SCREENED AND MAINTAINED A SUFFICIENT DISTANCE FROM THE STREAM BOTTOM TO PREVENT PUMPING OF CHANNEL BOTTOM MATERIALS AND AQUATIC LIFE.
7. AN ENERGY DISSIPATOR IS REQUIRED AT THE DISCHARGE OF THE BYPASS PUMPS.
8. WATERBARS ARE TO BE PLACED 50 FEET FROM TOP OF BANK EXCEPT AS NOTED ON SITE SPECIFIC PLAN DRAWINGS.
9. MARK THE TOP OF STREAMBANK WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF TOP OF STREAMBANK;
10. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAMBANK;
11. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP OF BANK PRIOR TO STREAM INSTALLATION WITH THE EXCEPTION OF THE TRAVEL LANE UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION;
12. CONSTRUCT DAMS WITH SAND BAGS, JERSEY BARRIERS OR SIMILAR MATERIAL WITH AN IMPERVIOUS LINER EXTENDED TO THE STREAM BOTTOM AND SECURED WITH SANDBAGS (SEE ES-0.07) MAINTAINING AMBIENT DOWNSTREAM FLOW RATES;
13. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION. EXCAVATION PORTION OF NATIVE STREAM BEDS COMPRISED OF ROCK, COBBLE, OR GRAVEL ARE TO BE STRIPPED AND SEGREGATED AND USED DURING STREAM RESTORATION.
14. REMOVE ALL CONSTRUCTION MATERIAL AND STRUCTURES FROM THE WATERBODY AFTER CONSTRUCTION;
15. RESTORE STREAM CHANNELS AND BOTTOMS TO THEIR PRECONSTRUCTION CONTOURS OR BETTER, AND STABILIZING THE STREAM CHANNEL PRIOR TO REESTABLISHING FLOW.
16. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE STREAM FLOODWAY PRIOR TO PERMANENTLY STABILIZING STREAM BANKS; AND,
17. ALL DISTURBED AREAS WITHIN 50 FEET OF TOP OF BANK AND 100 FEET IN SPECIAL PROTECTION WATERSHEDS SHOULD BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
18. KEEP LIME AND FERTILIZERS OUT OF STREAM.
19. TEMPORARY CROSSINGS WILL STAY IN PLACE FOR NO GREATER THAN ONE YEAR.



TYPICAL PIPELINE INSTALLATION STREAM CROSSING – PUMP BYPASS DETAIL

NOT TO SCALE

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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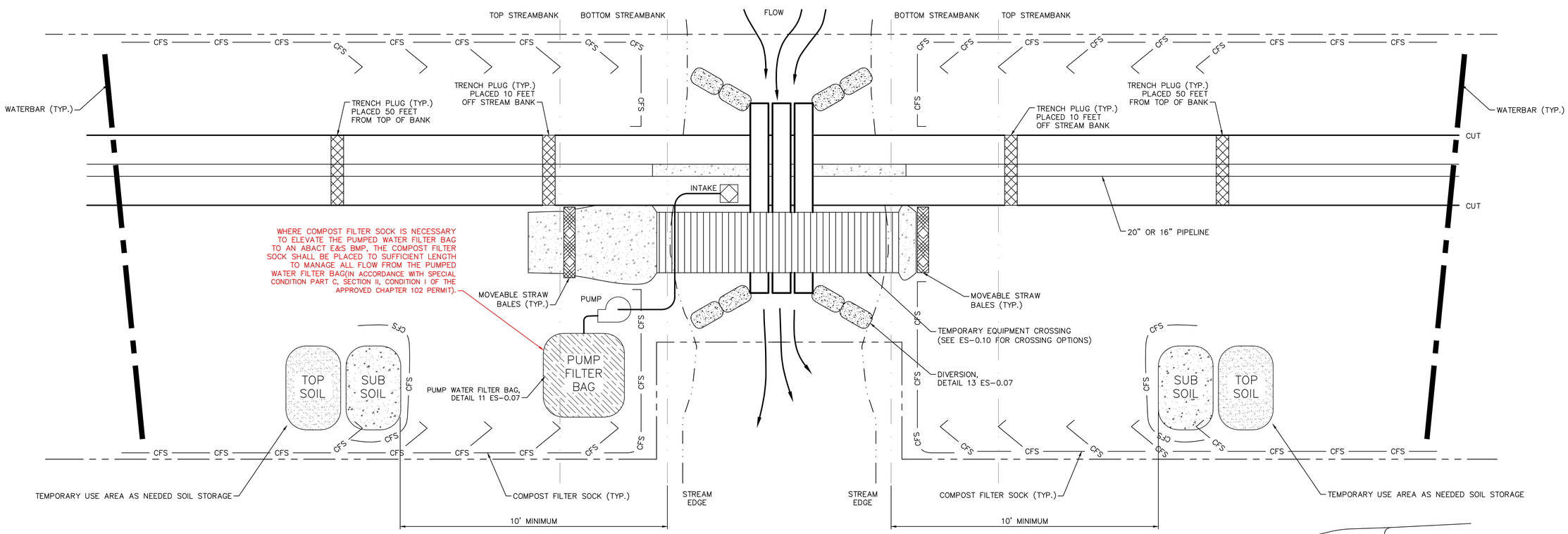
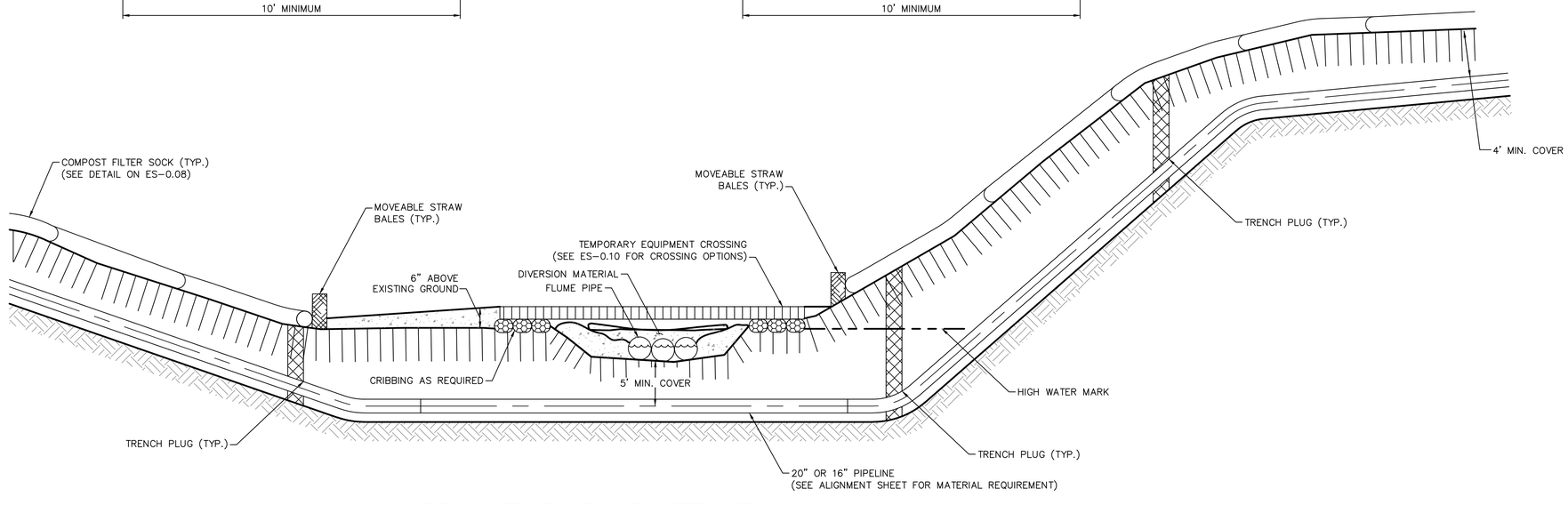


NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-SPECIFIC STREAM CORRING DRAWINGS.
2. THE FLUME SHOULD BE OF SUFFICIENT SIZE TO CONVEY NORMAL STREAM FLOW OVER THE OPEN TRENCH (MINIMUM SIZE OF 12 INCHES);
3. FLUME PIPE MUST BE ONE CONTINUOUS PIPE LONG ENOUGH TO ACCOUNT FOR THE POSSIBILITY OF THE TRENCH WIDENING UNEXPECTEDLY DURING THE EXCAVATION (DUE TO SLOUGHING);
4. FLUME SHALL BE INSTALLED PRIOR TO TRENCH EXCAVATION AT THAT LOCATION; AND,
5. AN EFFECTIVE SEAL MUST BE CREATED AROUND THE FLUME(S). ONCE IN PLACE, THE FLUMES ARE NOT REMOVED UNTIL THE PIPELINE HAS BEEN INSTALLED AND THE STREAMBED AND BANKS HAVE BEEN RESTORED.
6. WATERBARS ARE TO BE PLACED 50 FEET FROM TOP OF BANK EXCEPT AS NOTED ON SITE SPECIFIC PLAN DRAWINGS.
7. MARK THE TOP OF STREAMBANK WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF TOP OF STREAMBANK;
8. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAMBANK;
9. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP OF BANK PRIOR TO STREAM INSTALLATION WITH THE EXCEPTION OF THE TRAVEL LANE UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION;
10. CONSTRUCT DAMS WITH SAND BAGS, JERSEY BARRIERS OR SIMILAR MATERIAL WITH AN IMPERVIOUS LINER EXTENDED TO THE STREAM BOTTOM AND SECURED WITH SANDBAGS (SEE ES-0.07) MAINTAINING AMBIENT DOWNSTREAM FLOW RATES;
11. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION. EXCAVATION PORTION OF NATIVE STREAM BEDS COMPRISED OF ROCK, COBBLE, OR GRAVEL ARE TO BE STRIPPED AND SEGREGATED AND USED DURING STREAM RESTORATION.
12. REMOVE ALL CONSTRUCTION MATERIAL AND STRUCTURES FROM THE WATERBODY AFTER CONSTRUCTION;
13. RESTORE STREAM CHANNELS AND BOTTOMS TO THEIR PRECONSTRUCTION CONTOURS OR BETTER, AND STABILIZING THE STREAM CHANNEL PRIOR TO REESTABLISHING FLOW.
14. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE STREAM FLOODWAY PRIOR TO PERMANENTLY STABILIZING STREAM BANKS; AND,
15. ALL DISTURBED AREAS WITHIN 50 FEET OF TOP OF BANK AND 100 FEET IN SPECIAL PROTECTION WATERSHEDS SHOULD BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
16. KEEP LIME AND FERTILIZERS OUT OF STREAM.
17. TEMPORARY CROSSINGS WILL STAY IN PLACE FOR NO GREATER THAN ONE YEAR.



TYPICAL PIPELINE INSTALLATION STREAM CROSSING – DRY FLUME DETAIL

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 3/28/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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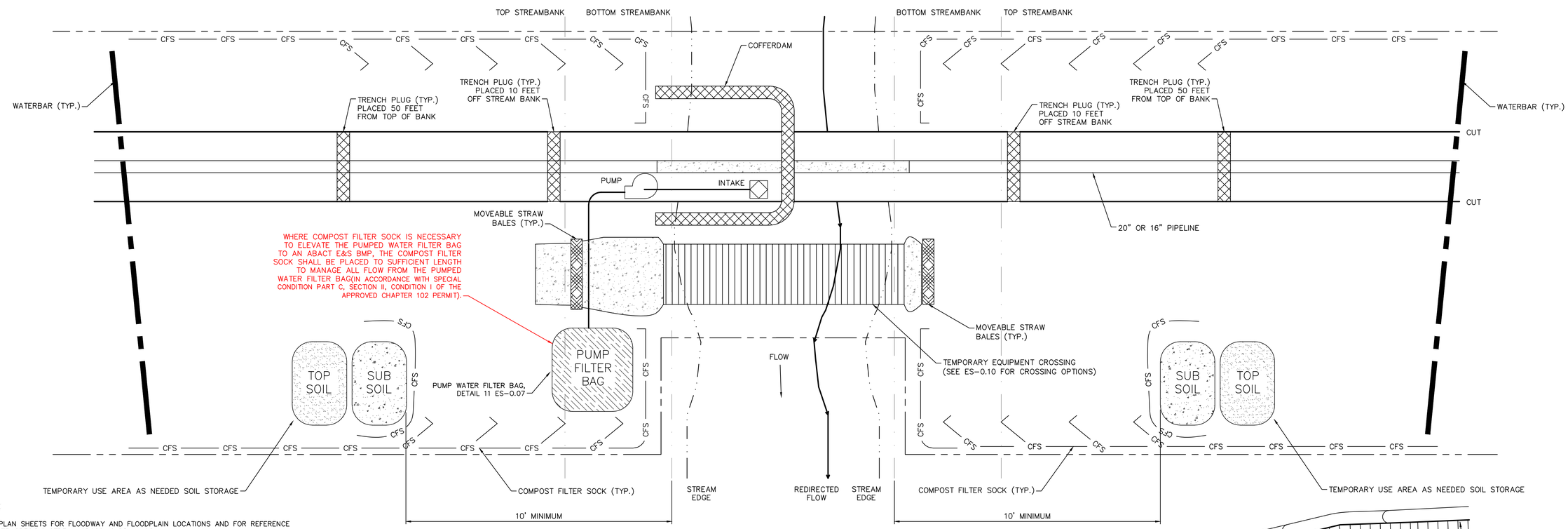

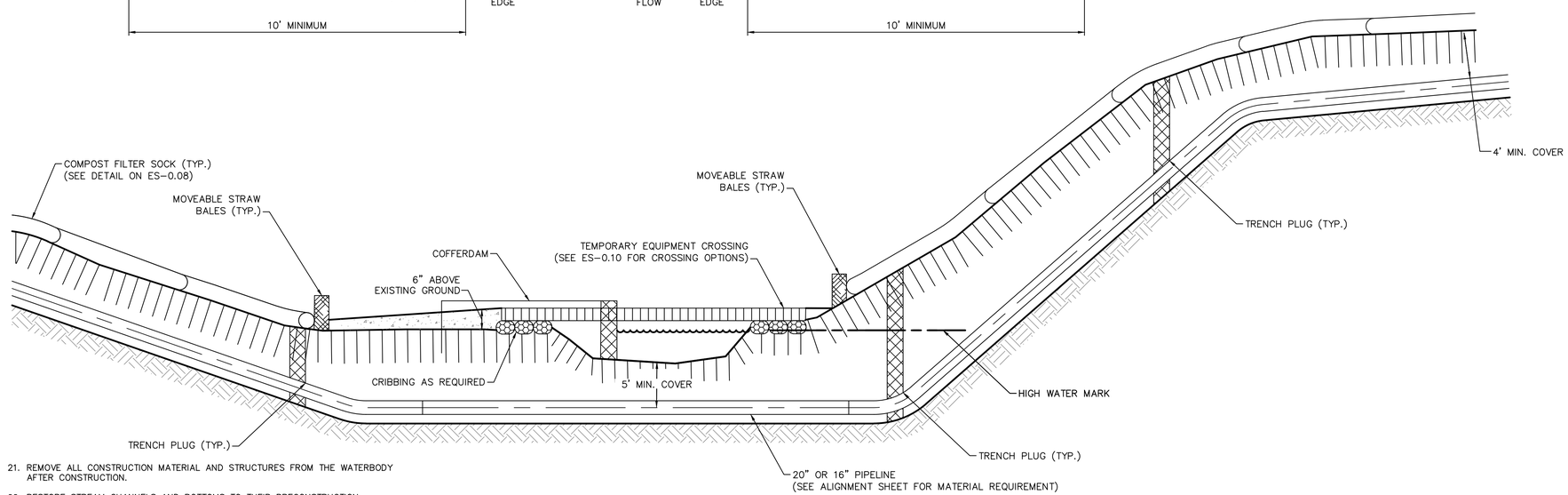

TYPICAL PIPELINE INSTALLATION STREAM CROSSING – COFFERDAM DETAIL

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NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-SPECIFIC STREAM CROSSING DRAWINGS.
2. MAINTAIN ADEQUATE IN-STREAM PASSAGE OF WATER (MIN 1/3 THE DISTANCE OF THE CROSSING) AT ALL TIMES TO CONVEY NORMAL STREAM FLOW WITHOUT CREATING ACCELERATED BANK EROSION;
3. PREPARE STREAM BED FOR CONSTRUCTION OF COFFERDAM BY REMOVING LARGE BOULDERS AND OTHER OBJECTS THAT MAY PREVENT AN ADEQUATE DAM SEAL;
4. DRAW DOWN WATER WITHIN COFFERDAM STRUCTURE AND PUMP INTO WATERBODY;
5. PREPARE SMALL TRENCH OR BERM AROUND INTERIOR OF COFFERDAM AND LOCATE SUMP AS DEPICTED FOR CONTINUOUS PUMPING OF ANY ADDITIONAL WATER INFILTRATION INTO COFFERDAM STRUCTURE SPACE AND TRENCH. CONTINUED PUMPING DURING CONSTRUCTION ACTIVITIES SHALL BE DIRECTED TO A DEWATERING STRUCTURE.
6. INSTALL TIMBER MATS ALONG CONSTRUCTION TRAVEL LANE, IF REQUIRED.
7. EXCAVATE THE PIPELINE TRENCH AS NECESSARY,
8. DEWATER TRENCH TO ENSURE THAT IT IS SUITABLE FOR WORKER ENTRANCE TO COMPLETE A TIE-IN WELD. SHOULD THE TRENCH FAIL AND PROVE TO BE UNSAFE FOR WORKERS, DISCUSS OPTIONS WITH AGENCIES.
9. INSTALL CROSSING PIPE AND SANDBAGS OR PREFABRICATED CONCRETE WALL ADJACENT TO THE WELD CAP WHICH WILL FORM A BARRIER TO PREVENT MOVEMENT OF RE-INSTALLED TRENCH SPOIL WHILE THE EAST SIDE OF THE CROSSING IS CONSTRUCTED.
10. RETURN TRENCH SPOIL TO TRENCH AND COVER PIPELINE. RESTORE RIVER BED WITH SEGREGATED RIVER BED SEDIMENT AND ROCK MATERIAL.
11. PUMP RIVER WATER INTO COFFERDAM STRUCTURE AND ALLOW ALL SEDIMENTATION TO SETTLE.
12. DISASSEMBLE COFFERDAM STRUCTURE;
13. RESTORE RIVER BANK PRECONSTRUCTION CONTOURS TO A STABLE ANGLE OF REPOSE.
14. REPEAT STEPS ON OPPOSITE SIDE OF WATERBODY.
15. WATERBARS ARE TO BE PLACED 50 FEET FROM TOP OF BANK EXCEPT AS NOTED ON SITE SPECIFIC PLAN DRAWINGS.
16. MARK THE TOP OF STREAMBANK WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF TOP OF STREAMBANK;
17. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAMBANK;
18. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP OF BANK PRIOR TO STREAM INSTALLATION WITH THE EXCEPTION OF THE TRAVEL LANE UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION;
19. CONSTRUCT DAMS WITH SAND BAGS, JERSEY BARRIERS OR SIMILAR MATERIAL WITH AN IMPERVIOUS LINER EXTENDED TO THE STREAM BOTTOM AND SECURED WITH SANDBAGS (SEE ES-0.07) MAINTAINING AMBIENT DOWNSTREAM FLOW RATES;
20. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION. EXCAVATION PORTION OF NATIVE STREAM BEDS COMPRISED OF ROCK, COBBLE, OR GRAVEL ARE TO BE STRIPPED AND SEGREGATED AND USED DURING STREAM RESTORATION.
21. REMOVE ALL CONSTRUCTION MATERIAL AND STRUCTURES FROM THE WATERBODY AFTER CONSTRUCTION.
22. RESTORE STREAM CHANNELS AND BOTTOMS TO THEIR PRECONSTRUCTION CONTOURS OR BETTER, AND STABILIZING THE STREAM CHANNEL PRIOR TO REESTABLISHING FLOW.
23. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE STREAM FLOODWAY PRIOR TO PERMANENTLY STABILIZING STREAM BANKS; AND,
24. ALL DISTURBED AREAS WITHIN 50 FEET OF TOP OF BANK AND 100 FEET IN SPECIAL PROTECTION WATERSHEDS SHOULD BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
25. KEEP LIME AND FERTILIZER OUT OF STREAM.
26. TEMPORARY CROSSINGS WILL STAY IN PLACE FOR NO GREATER THAN ONE YEAR.

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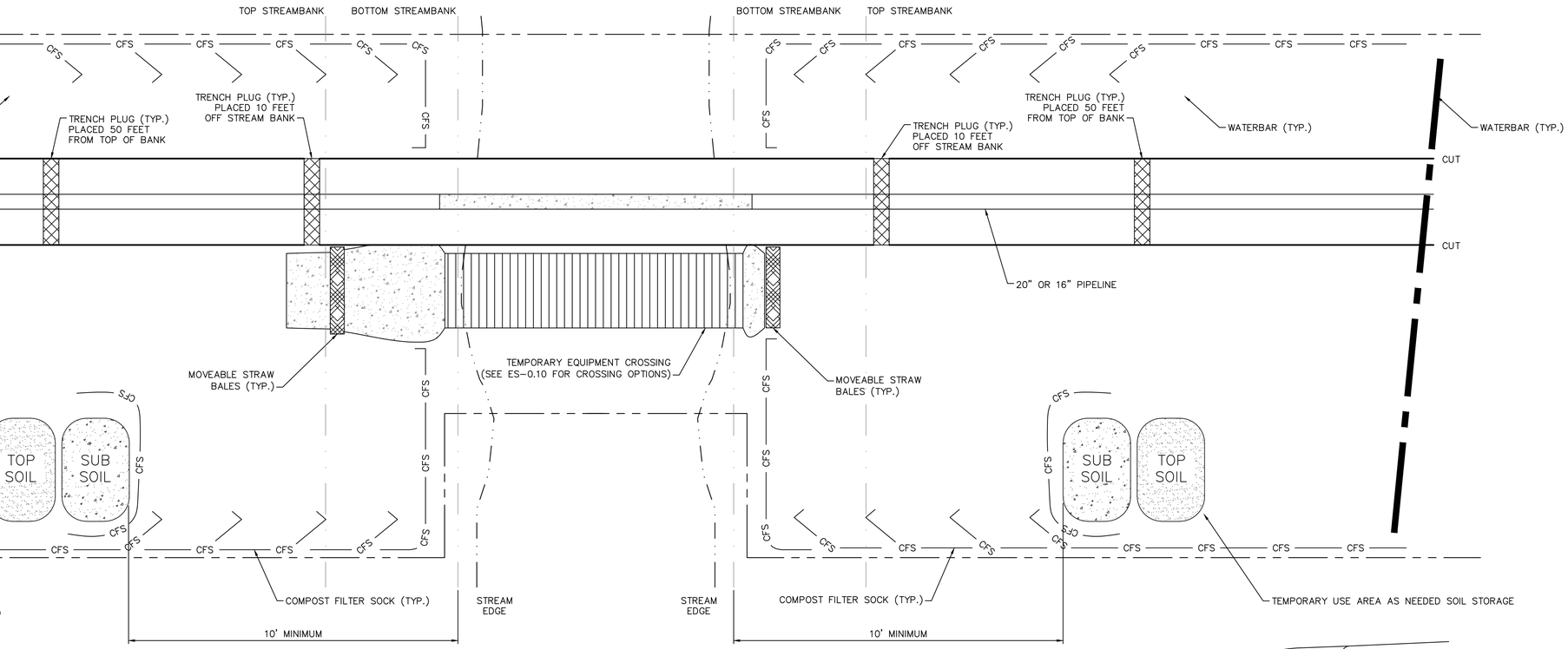
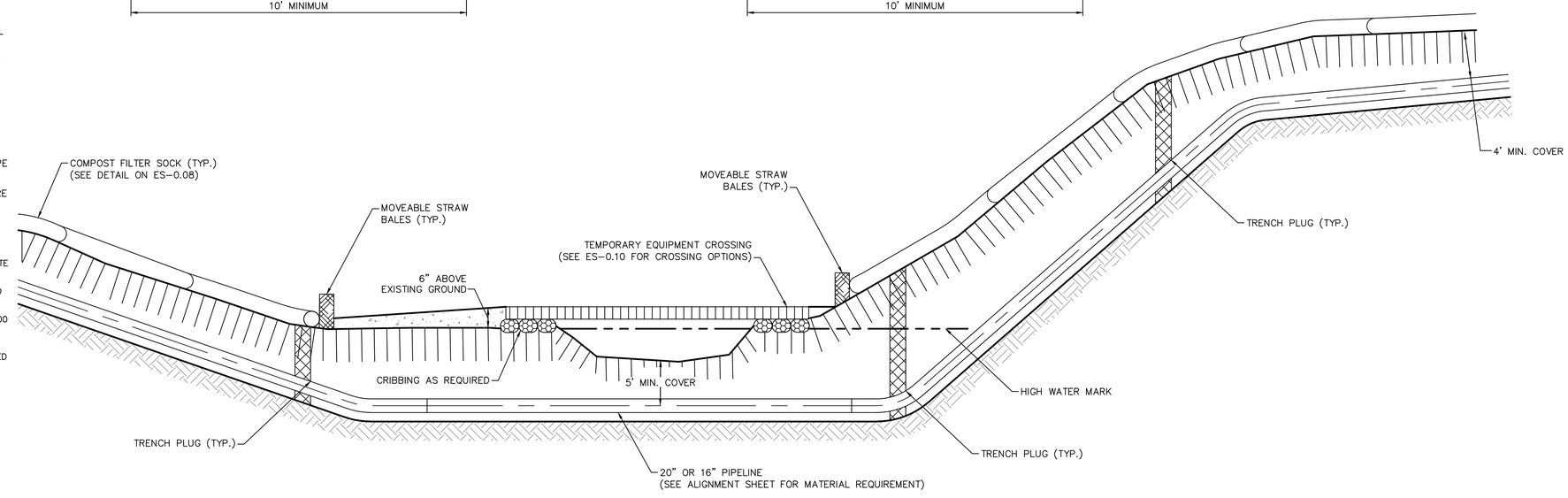


NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-SPECIRIC STREAM CROSSING DRAWINGS.
2. CROSSING OF WATERBODIES WHEN THEY ARE DRY AND NOT FLOWING MAY PROCEED WITHOUT USE OF THE DRY PUMP BYPASS OR A DRY FLUME PROVIDED THAT THE ENVIRONMENTAL INSPECTOR VERIFIES THAT WATER IS UNLIKELY TO FLOW BETWEEN INITIAL DISTURBANCE AND FINAL STABILIZATION OF THE FEATURE.
3. WORK ON THE CROSSING MUST BE CONTINUOUS AND THE CROSSING MUST BE ATTENDED AT ALL TIMES.
4. IN THE EVENT PERCEPTIBLE FLOW IS ANTICIPATED OR IF THE CREW IS NOT IN ATTENDANCE AT THE CROSSING ALL OF THE REQUIREMENTS FOR A PUMP BYPASS OR DRY FLUME MUST BE MET.
5. EQUIPMENT AND SUPPLIES TO IMPLEMENT DRY PUMP BYPASS OR DRY FLUME CROSSING WILL BE ON-SITE IF STREAM-FLOW OCCURS DURING IMPLEMENTATION.
6. OPEN CUT CROSSING METHOD IS ONLY PERMITTED DURING TIMES OF NO STREAM FLOW OR RUNOFF EXISTS. DO NOT EXCAVATE TRENCH IN STREAM UNTIL THE PIPE SEGMENT IS ASSEMBLED AND READY FOR LOWERING IN. TRENCH DEWATERING SHALL USE A FILTER BAG WHEREVER FEASIBLE, TO AVOID UNCONTROLLED DOWNSTREAM SEDIMENTATION. LIMIT LENGTH OF TIME TO COMPLETE AND RESTORE STREAM CROSSING TO THE MINIMUM PRACTICABLE, E.G., LESS THAN 24 HOURS. IF FLOW AND SUBSTRATE CONDITIONS ARE SUCH THAT USE OF THIS CROSSING METHOD WOULD RESULT IN SIGNIFICANT UNCONTROLLED SEDIMENT TRANSPORT TO DOWNSTREAM AREAS, CONSIDER USING A DRY PUMP BYPASS OR DRY FLUME METHOD INSTEAD OF OPEN CUT.
7. WATERBARS ARE TO BE PLACED 50 FEET FROM TOP OF BANK EXCEPT AS NOTED ON SITE SPECIFIC PLAN DRAWINGS.
8. MARK THE TOP OF STREAMBANK WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF TOP OF STREAMBANK;
9. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAMBANK;
10. GRUBBING SHALL NOT TAKE PLACE WITHIN 50 FEET OF TOP OF BANK PRIOR TO STREAM INSTALLATION WITH THE EXCEPTION OF THE TRAVEL LANE UNTIL ALL MATERIALS REQUIRED TO COMPLETE CROSSING ARE ON SITE AND PIPE IS READY FOR INSTALLATION;
11. CONSTRUCT DAMS WITH SAND BAGS, JERSEY BARRIERS OR SIMILAR MATERIAL WITH AN IMPERVIOUS LINER EXTENDED TO THE STREAM BOTTOM AND SECURED WITH SANDBAGS (SEE ES-0.07) MAINTAINING AMBIENT DOWNSTREAM FLOW RATES;
12. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION. EXCAVATION PORTION OF NATIVE STREAM BEDS COMPRISED OF ROCK, COBBLE, OR GRAVEL ARE TO BE STRIPPED AND SEGREGATED AND USED DURING STREAM RESTORATION.
13. REMOVE ALL CONSTRUCTION MATERIAL AND STRUCTURES FROM THE WATERBODY AFTER CONSTRUCTION;
14. RESTORE STREAM CHANNELS AND BOTTOMS TO THEIR PRECONSTRUCTION CONTOURS OR BETTER, AND STABILIZING THE STREAM CHANNEL PRIOR TO REESTABLISHING FLOW.
15. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED FROM THE STREAM FLOODWAY PRIOR TO PERMANENTLY STABILIZING STREAM BANKS; AND,
16. ALL DISTURBED AREAS WITHIN 50 FEET OF TOP OF BANK AND 100 FEET IN SPECIAL PROTECTION WATERSHEDS SHOULD BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE FOR MINOR STREAMS OR 48 HOURS OF INITIAL DISTURBANCE FOR MAJOR STREAMS UNLESS OTHERWISE AUTHORIZED. APPROPRIATE STREAM BANK PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
17. KEEP LIME AND FERTILIZER OUT OF STREAM.
18. TEMPORARY CROSSINGS WILL STAY IN PLACE FOR NO GREATER THAN ONE YEAR.



TYPICAL PIPELINE INSTALLATION STREAM CROSSING – DRY OPEN CUT DETAIL

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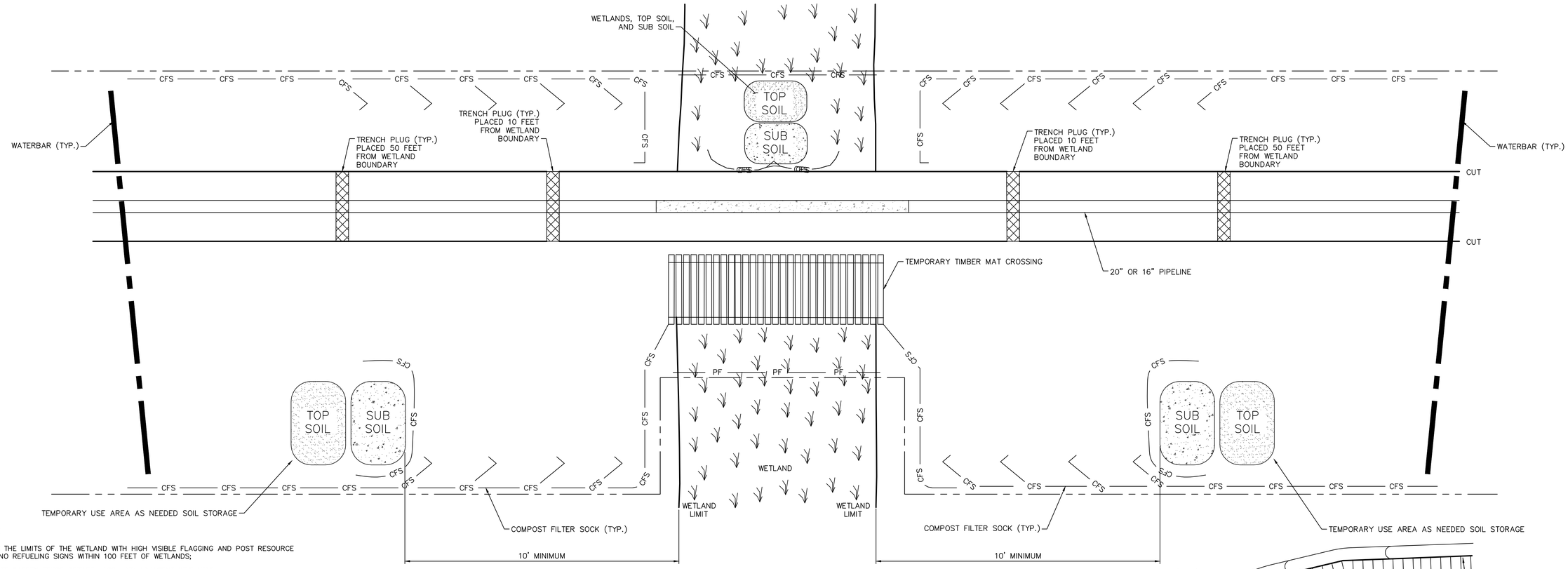
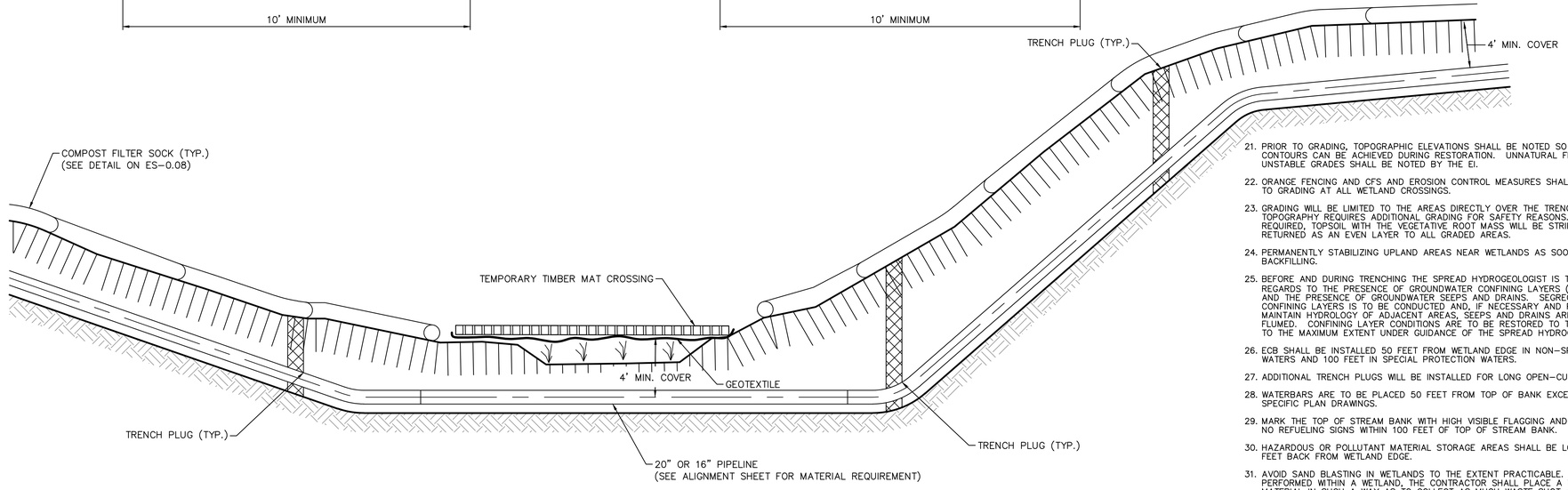


NOTES:

1. MARK THE LIMITS OF THE WETLAND WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF WETLANDS;
2. ORANGE SAFETY FENCE BETWEEN LOD AND ADJACENT WETLANDS.
3. STABILIZE WETLAND TRAVEL LANE APPROACH.
4. SEE SITE-SPECIFIC DETAILS WHEN NOTED ON E&S PLAN SHEETS.
5. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM THE WETLAND;
6. USE NO MORE THAN TWO LAYERS OF TIMBER RIPRAP TO STABILIZE THE CONSTRUCTION RIGHT-OF-WAY;
7. CUT VEGETATION OFF AT GROUND LEVEL LEAVING EXISTING ROOT SYSTEMS IN PLACE AND REMOVE IT FROM THE WETLAND FOR DISPOSAL;
8. LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCH LINE UNLESS SAFETY CONCERNS REQUIRE THE REMOVAL OF STUMPS FROM THE WORKING-SIDE OF THE CONSTRUCTION ROW;
9. SEGREGATE A MAXIMUM OF 12 INCHES OF TOPSOIL FROM THE AREA DISTURBED BY TRENCHING IN UNSATURATED WETLANDS.
10. INSTALL TEMPORARY TIMBER MATS ALONG TRAVEL LANE. EQUIPMENT WILL WORK FROM MATS;
11. ASSEMBLE PIPE IN UPLAND AREAS UNLESS WETLAND IS DRY ENOUGH TO ADEQUATELY SUPPORT SKIDS AND PIPE;
12. IF STREAMS ARE PRESENT IMPLEMENT DRY CROSSING METHODS.
13. RESTORATION ACTIVITIES WITHIN WETLANDS (SEE TYP WETLAND RESTORATION) SHALL BEGIN IMMEDIATELY AFTER BACKFILLING, WEATHER PERMITTING;
14. NO SOIL AMENDMENTS SUCH AS AGRICULTURAL LIME OR FERTILIZER WILL BE USED WITHIN THE WETLAND AREAS.
15. RESTORE WETLANDS TO THE ORIGINAL CONTOURS AND SURFACE FLOW.
16. BULLDOZERS WILL NOT BE USED FOR CLEARING. TREES AND BRUSH WILL BE CUT BY HAND AT GROUND LEVEL BY CHAIN SAWS OR LOW GROUND PRESSURE EQUIPMENT, OR WITH EQUIPMENT THAT DOES NOT CAUSE EXCESSIVE RUTTING OF TOPSOIL OR WITH EQUIPMENT SUPPORTED BY MATS (TIMBER MATS, HDPE COMPOSITE OR SIMILAR).
17. THE MINIMUM CLEARING NECESSARY TO SAFELY CONSTRUCT THE PIPELINE WILL BE DONE. MATS OR PADS MAY BE PLACED OVER TOP OF EXISTING VEGETATION, INCLUDING SHRUBS, WHERE POSSIBLE.
18. STUMPS WILL BE LEFT IN PLACE, EXCEPT ON THE TRENCH LINE OR UNLESS THE REMOVAL IS NECESSARY TO ENSURE WORKER SAFETY. STUMPS MAY BE GROUND TO A SUITABLE HEIGHT FOR SAFETY REASONS.
19. ALL CUT TIMBER AND BRUSH WILL BE REMOVED FROM WETLANDS. GRINDINGS WILL BE REMOVED AS MUCH AS PRACTICAL. DEBRIS AND STUMPS WILL NOT BE BURIED.
20. CONTRACTOR SHALL BE REQUIRED TO INSTALL COMPLETED MAT TRAVEL LANE FOR PIPELINE CONSTRUCTION DURING THE TIME CONTRACTOR'S CLEARING CREW 9DOES NOT MEAN TREE FELLING) IS PERFORMING ITS WORK.



TYPICAL PIPELINE INSTALLATION WETLAND CROSSING DETAIL

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21. PRIOR TO GRADING, TOPOGRAPHIC ELEVATIONS SHALL BE NOTED SO THAT ORIGINAL CONTOURS CAN BE ACHIEVED DURING RESTORATION. UNNATURAL FEATURES AND UNSTABLE GRADES SHALL BE NOTED BY THE EI.
22. ORANGE FENCING AND CFS AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO GRADING AT ALL WETLAND CROSSINGS.
23. GRADING WILL BE LIMITED TO THE AREAS DIRECTLY OVER THE TRENCHLINE, EXCEPT WHERE TOPOGRAPHY REQUIRES ADDITIONAL GRADING FOR SAFETY REASONS. WHEN GRADING IS REQUIRED, TOPSOIL WITH THE VEGETATIVE ROOT MASS WILL BE STRIPPED, SEGREGATED AND RETURNED AS AN EVEN LAYER TO ALL GRADED AREAS.
24. PERMANENTLY STABILIZING UPLAND AREAS NEAR WETLANDS AS SOON AS POSSIBLE AFTER BACKFILLING.
25. BEFORE AND DURING TRENCHING THE SPREAD HYDROGEOLOGIST IS TO BE CONSULTED IN REGARDS TO THE PRESENCE OF GROUNDWATER CONFINING LAYERS (I.E., CLAY, FRAGIPAN) AND THE PRESENCE OF GROUNDWATER SEEPS AND DRAINS. SEGREGATION OF THE CONFINING LAYERS IS TO BE CONDUCTED AND, IF NECESSARY AND PRACTICABLE TO MAINTAIN HYDROLOGY OF ADJACENT AREAS, SEEPS AND DRAINS ARE TO BE TEMPORARILY FLUMED. CONFINING LAYER CONDITIONS ARE TO BE RESTORED TO THE ORIGINAL CONDITION TO THE MAXIMUM EXTENT UNDER GUIDANCE OF THE SPREAD HYDROGEOLOGIST.
26. ECB SHALL BE INSTALLED 50 FEET FROM WETLAND EDGE IN NON-SPECIAL PROTECTION WATERS AND 100 FEET IN SPECIAL PROTECTION WATERS.
27. ADDITIONAL TRENCH PLUGS WILL BE INSTALLED FOR LONG OPEN-CUT WETLAND CROSSINGS.
28. WATERBARS ARE TO BE PLACED 50 FEET FROM TOP OF BANK EXCEPT AS NOTED ON SITE SPECIFIC PLAN DRAWINGS.
29. MARK THE TOP OF STREAM BANK WITH HIGH VISIBLE FLAGGING AND POST RESOURCE AND NO REFUELING SIGNS WITHIN 100 FEET OF TOP OF STREAM BANK.
30. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS SHALL BE LOCATED AT LEAST 100 FEET BACK FROM WETLAND EDGE.
31. AVOID SAND BLASTING IN WETLANDS TO THE EXTENT PRACTICABLE. IF SANDBLASTING IS PERFORMED WITHIN A WETLAND, THE CONTRACTOR SHALL PLACE A TARP OR SUITABLE MATERIAL IN SUCH A WAY AS TO COLLECT AS MUCH WASTE SHOT AS POSSIBLE AND DISPOSE OF THE COLLECTED WASTE. THE CONTRACTOR SHALL CLEAN UP ALL VISIBLE DEPOSITS OF WASTES AND DISPOSE OF THE WASTE AT AN APPROVED DISPOSAL FACILITY.
32. ANY EXCESS FILL MATERIAL MUST BE REMOVED AND NOT SPREAD WITHIN THE WETLAND.
33. PLACE A MINIMUM OF ONE (1) TRENCH PLUG AT A MAXIMUM SPACING OF 100 FEET BETWEEN TRENCH PLUGS WITHIN A WETLAND. WETLAND CROSSINGS LESS THAN FIFTY (50) FEET DO NOT REQUIRE AN INTERNAL TRENCH PLUG (IN ACCORDANCE WITH SPECIAL CONDITIONS UNDER SECTION "MISCELLANEOUS", CONDITION fff OF THE APPROVED CHAPTER 105 PERMIT).

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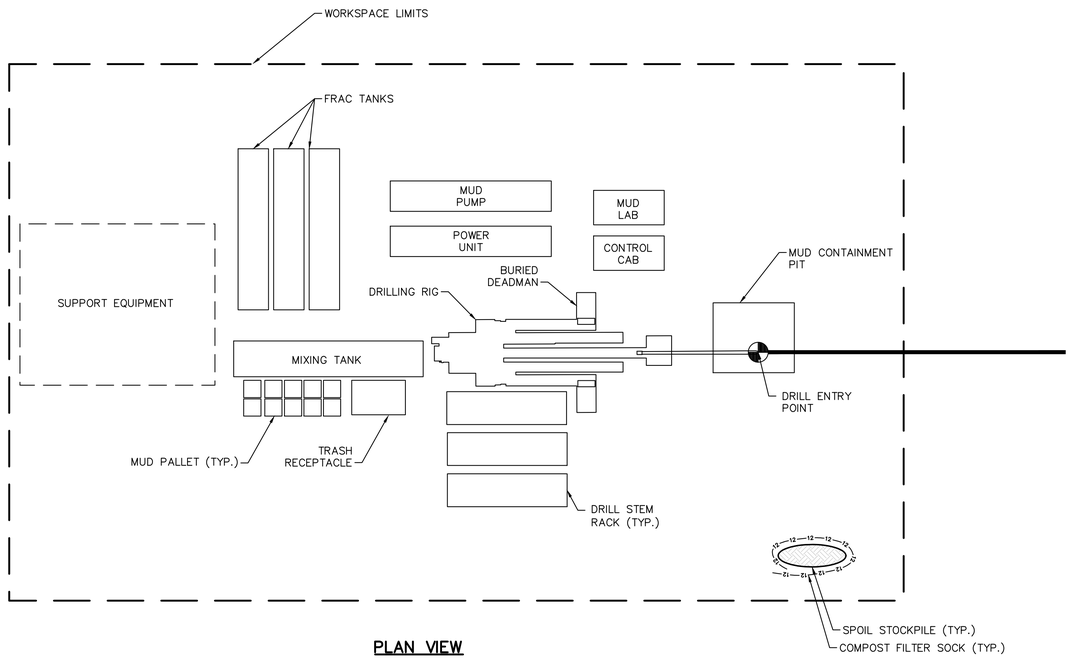

PLAN VIEW

ENTRY SIDE LAYOUT
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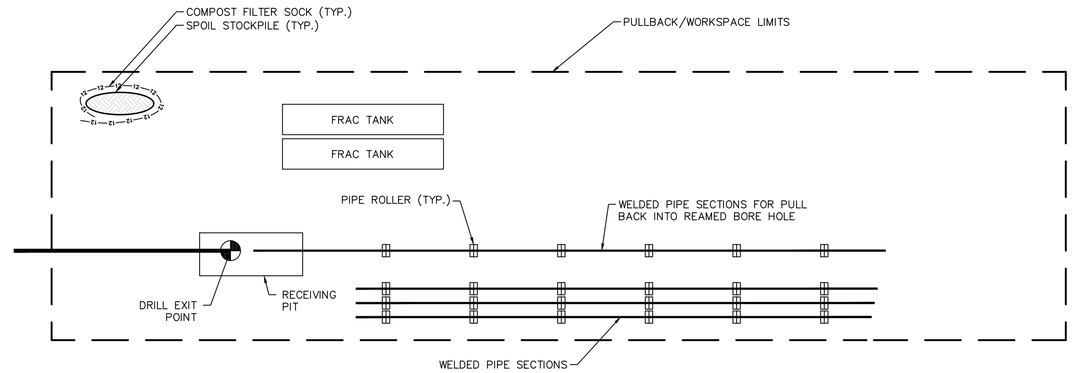

PLAN VIEW

EXIT SIDE LAYOUT
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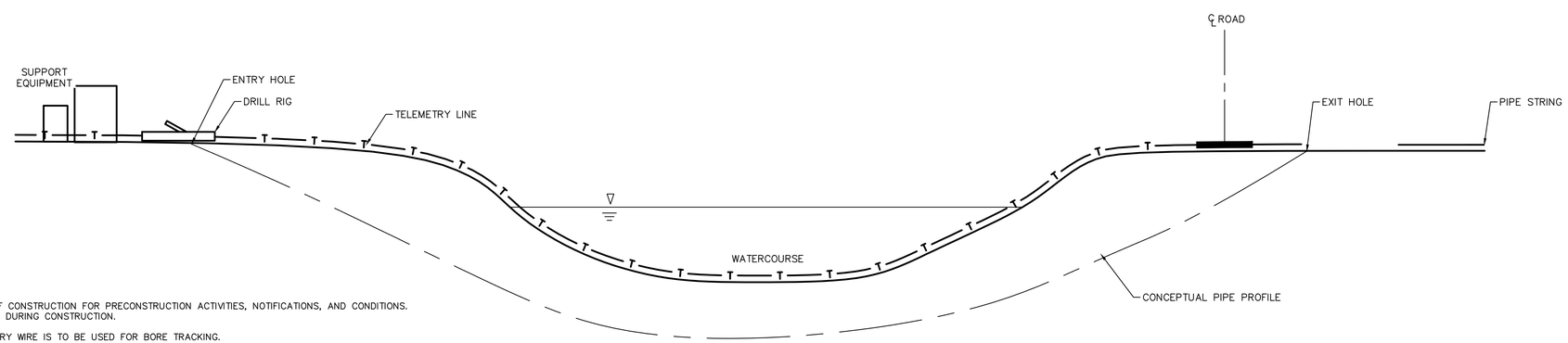

PROFILE VIEW

TYPICAL HDD BORE LAYOUT
NOT TO SCALE

NOTES:

1. REVIEW INADVERTENT RETURN AND PROJECT PPC PLANS AHEAD OF CONSTRUCTION FOR PRECONSTRUCTION ACTIVITIES, NOTIFICATIONS, AND CONDITIONS. MAKE ALL APPROPRIATE NOTIFICATIONS. IMPLEMENT THESE PLANS DURING CONSTRUCTION.
2. REVIEW HDD FOR WRITTEN ATON PLAN AND IMPLEMENT IF TELEMETRY WIRE IS TO BE USED FOR BORE TRACKING.
3. SEE SITE PLANS FOR E&S CONTROLS.
4. LAYOUT WILL VARY ACCORDING TO AVAILABLE WORK SPACE AND FIELD CONDITIONS.
5. GRADE AND TOPSOIL WORKSPACES WHERE NECESSARY TO MAKE WORKSPACE AVAILABLE FOR PARKING, STAGING, AND OTHER USES WHEN NOT BEING USED FOR BORING.
6. HDD BENEATH WETLAND AND WATERBODIES WHERE INDICATED ON E&S PLAN SHEETS. SEE SITE-SPECIFIC DRAWINGS IF NOTED TO BE AVAILABLE.
7. INSTALL TEMPORARY TIMBER WETLAND MATS IF WORKSPACES ARE IN WETLANDS.
8. TEMPORARY WATERBAR TO BE INSTALLED AFTER CLEARING AND PRIOR TO TEMPORARY GRADING IF NEEDED FOR HDD INSTALLATION.
9. PERMANENT WATERBAR TO BE INSTALLED AFTER CLEARING AND PRIOR TO TEMPORARY GRADING IF NEEDED FOR HDD INSTALLATION AND REINSTALLED ONCE FINAL GRADING ESTABLISHED.
10. TELEMETRY WIRE WILL BE STRUNG FROM ENTRY TO EXIT POINTS.
11. INSTALL COMPOST FILTER SOCKS/SILT FENCE ALONG THE DOWN GRADIENT PERIMETERS OF THE HDD BORE PIT.
12. EXCAVATION OF THE DRILL ENTRY AND EXIT LOCATIONS WILL BE NECESSARY TO CONTAIN DRILLING FLUIDS DURING ALL PHASES OF INSTALLATION. THESE FLUIDS AND CUTTINGS MUST BE DISPOSED OF IN AN APPROVED MANNER PERIODICALLY OR AT THE COMPLETE CROSSING INSTALLATION.
13. THE CROSSING LENGTH AND CROSS SECTIONAL GEOMETRY IS DEPENDENT UPON THE PIPELINE DESIGN PARAMETERS, THE OBSTACLE CROSSED, AND THE SUBSURFACE CONDITIONS.

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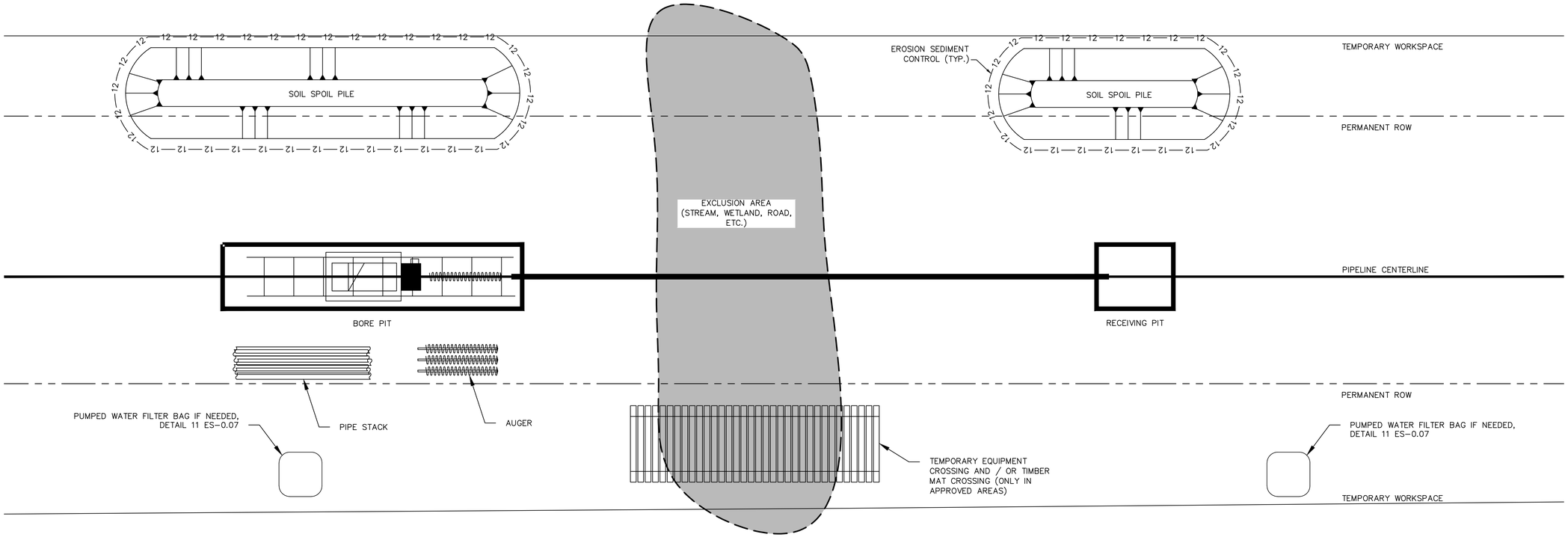
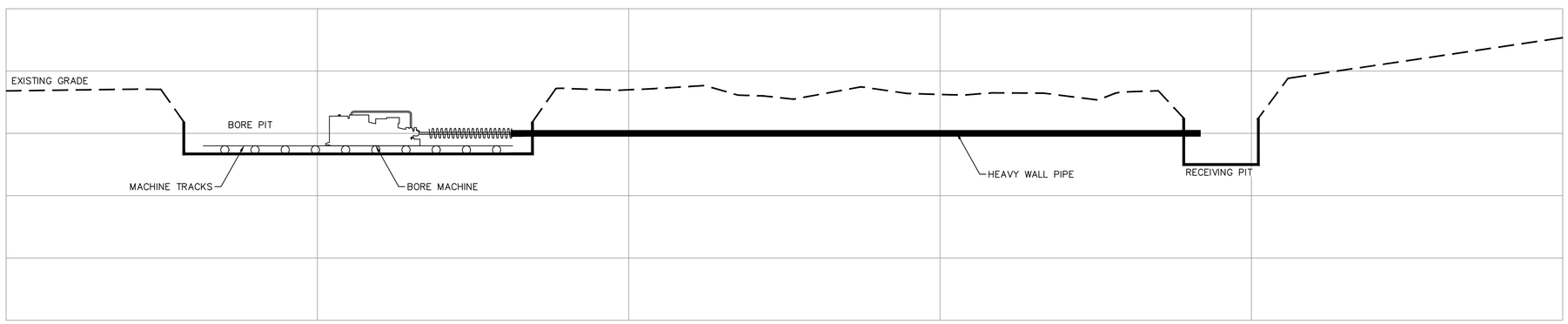


PLAN VIEW



PROFILE VIEW

TYPICAL CONVENTIONAL BORE CROSSING LAYOUT

NOT TO SCALE

NOTES:

1. LAYOUT WILL VARY ACCORDING TO AVAILABLE WORK SPACE AND FIELD CONDITIONS.
2. WORKSPACE AVAILABLE FOR PARKING, STAGING, AND OTHER USES WHEN NOT BEING USED FOR BORING.
2. INSTALL COMPOST FILTER SOCKS/SILT FENCE ALONG THE DOWN GRADIENT PERIMETERS OF THE BORE PITS. SEE SITE PLANS FOR E&S CONTROLS.
3. EXCAVATE BORE PITS IN ACCORDANCE WITH SITE-SPECIFIC PLANS AND SEGREGATE TOP SOIL IN ACCORDANCE WITH STANDARD E&SC PLAN NOTES. POSITION BORE PITS A MINIMUM OF 50 FEET FROM THE NEAREST TOP OF BANK, WHERE TECHNICALLY FEASIBLE.
4. THE CROSSING LENGTH IS DEPENDENT UPON THE OBSTACLE TO BE CROSSED, AND THE SURFACE AND SUBSURFACE CONDITIONS.

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 072364205-E

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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SHEET 0.17 OF 99

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DETAIL NOT REQUIRED IN CHESTER COUNTY

HYDROSTATIC TESTING WATER
DIRECT DISCHARGE DETAIL
NOT TO SCALE
17 / 0.19

DETAIL NOT REQUIRED IN CHESTER COUNTY

DISCHARGE STRUCTURES TO BE USED
FOR HYDROSTATIC TEST WATER
NOT TO SCALE
18 / 0.19

DETAIL NOT REQUIRED IN CHESTER COUNTY

CHESTER COUNTY HDD TESTING
DISCHARGE LOCATION INFORMATION
NOT TO SCALE
19 / 0.19

DETAIL NOT REQUIRED IN CHESTER COUNTY

CHESTER COUNTY MAINLINE TESTING
DISCHARGE LOCATION INFORMATION
NOT TO SCALE
20 / 0.19

HYDROSTATIC DISCHARGE DETAILS

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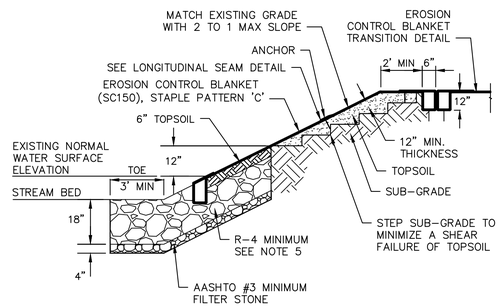
STREAMBANK STABILIZATION TABLE

SOUTHEAST REGION

COUNTY	STREAM	SPECIAL PROTECTION WATER	NORMAL DEPTH (ft)	SLOPE (ft/ft)	VELOCITY (ft/sec)	SHEAR STRESS (lb/sf)	SHEAR STRESS LESS THAN 0.25?	RIP RAP REQUIRED	IF "RIP RAP" REQ'D, SIZE (Table 6.6)	THICKNESS (IN) OF RIP RAP (Table 6.6)	FILTER STONE TYPE
Chester	S-H52	yes	0.82	0.046	5.01	2.35	no	yes	R-3 (1)	9	AASHTO #57
Chester	S-C73	yes	6.36	0.015	10.79	5.95	no	yes	R-5	27	AASHTO #3
Chester	S-B15	yes	1.64	0.069	8.97	7.06	no	yes	R-4	18	AASHTO #3
Chester	S-B18	yes	1.45	0.007	3.07	0.63	no	yes	R-3 (1)	9	AASHTO #57

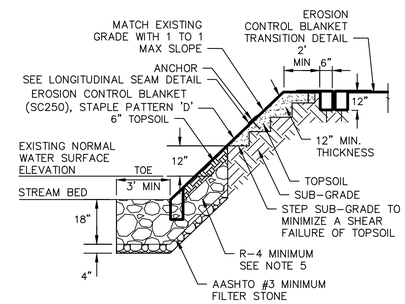
(1) R–4 IS MINIMUM RIPRAP SIZE TO BE USED. IF CALCULATIONS IDENTIFIED SMALLER STONE SIZE WILL BE INCREASED TO R–4



NOTES:

1. A SUITABLE WOVEN OR NON–WOVEN GEOTEXTILE UNDERLAYMENT MUST BE USED IN ACCORDANCE TO MANUFACTURER'S RECOMMENDATIONS.
2. REFER TO NORTH AMERICAN GREEN DETAILS.
3. MATTING WILL EXTEND FROM TOP OF BANK 50' PERPENDICULARLY AWAY FROM TOP OF BANK OR 100' IN HQ/EV WATERSHEDS.
4. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION.
5. WHERE NATURAL STONE IS REMOVED FROM THE STREAM CROSSING, NATURAL STONE SHALL BE INSTALLED AS TOP 6 INCHES OF RIPRAP.

RIP–RAP BANK STABILIZATION DETAIL
NOT TO SCALE



NOTES:

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2. REFER TO NORTH AMERICAN GREEN DETAILS.
3. MATTING WILL EXTEND FROM TOP OF BANK 50' PERPENDICULARLY AWAY FROM TOP OF BANK OR 100' IN HQ/EV WATERSHEDS.
4. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION.
5. WHERE NATURAL STONE IS REMOVED FROM THE STREAM CROSSING, NATURAL STONE SHALL BE INSTALLED AS TOP 6 INCHES OF RIPRAP.
6. FOR SLOPES GREATER THAN 1:1 REFER TO SITE SPECIFIC PLANS FOR APPROPRIATE CONTROLS.

STEEP BANK STABILIZATION DETAIL
NOT TO SCALE

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075304425-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

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SITE RESTORATION GENERAL NOTES:

1. TOPOGRAPHIC MAPPING AND FEATURES COMPILED FROM WWW.PASDA.PSU.EDU.
2. THE PROJECT TAKES PLACE WITHIN CHESTER COUNTY, PENNSYLVANIA.
3. TOWNSHIP BOUNDARIES TAKEN FROM WWW.PASDA.PSU.EDU.
4. 100-YEAR FEMA FLOODPLAINS TAKEN FROM WWW.PASDA.PSU.EDU.
5. SEE SHEET ES-0.02 FOR STREAM AND WETLAND CROSSING TABLE.
6. PIPELINE LOCATION AND RIGHT-OF-WAY FROM SUNOCO PIPELINE L.P.
7. USE COMPOST FILTER SOCK AS REQUIRED TO PREVENT RUNOFF FROM SPOIL AREA.
8. AT ALL STREAM CROSSINGS, RUNOFF MUST BE DIRECTED TO A SEDIMENT REMOVAL AREA (I.E. COMPOST FILTER SOCKS).
9. THE RIGHTS-OF-WAYS AND EASEMENTS SHOWN ON THIS PLAN ARE THE RESPONSIBILITY OF SUNOCO PIPELINE L.P. TO SECURE WITH THE INDIVIDUAL PROPERTY OWNER. THE RIGHTS-OF-WAY AND EASEMENTS SHOWN ON THIS PERMIT DRAWING REPRESENT THE BEST AVAILABLE PROPERTY INFORMATION AS PROVIDED TO TETRA TECH, INC. BY SUNOCO PIPELINE L.P. THE RIGHTS-OF-WAY AND EASEMENTS SHALL BE VERIFIED AND LOCATED IN THE FIELD BY SUNOCO PIPELINE L.P.
10. PAST AND PRESENT LAND USE CONSISTS OF AGRICULTURAL, FORESTED AND RESIDENTIAL AREAS. POST CONSTRUCTION LAND USE WILL BE A MAINTAINED, VEGETATED RIGHT-OF-WAY.
11. DRAWINGS REPRESENT THE FINAL PLAN FOR CONSTRUCTION.
12. THE EROSION & SEDIMENT CONTROL PLAN AND SITE RESTORATION PLAN, INSPECTION REPORTS, AND MONITORING REPORTS MUST BE AVAILABLE AT THE PROJECT SITE FOR REVIEW AND INSPECTION BY THE DEPARTMENT OR CONSERVATION DISTRICT.

CONSTRUCTION SEQUENCE FOR POST CONSTRUCTION STORMWATER MANAGEMENT CONTROLS:

A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. THE CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION IN ORDER TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR RESTORATION AND POST-CONSTRUCTION STORMWATER MANAGEMENT OF THE SITE. NECESSARY PARTS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. IT IS NOT INTENDED THAT THE DRAWINGS AND THIS REPORT SHOW DETAILED INFORMATION ON METHODS AND MATERIALS. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED IN THE FIELD.

A PRECONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY. THE PADEP OR APPLICABLE COUNTY CONSERVATION DISTRICT, CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, AND THE PLAN PREPARER MUST BE INVITED TO THIS MEETING AT LEAST SEVEN DAYS IN ADVANCE.

INFILTRATION BERM

1. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL BMPS AS PER THE PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL.
2. COMPLETE SITE GRADING AND STABILIZE WITHIN THE LIMIT OF DISTURBANCE EXCEPT WHERE THE INFILTRATION BERM WILL BE CONSTRUCTED; MAKE EVERY EFFORT TO MINIMIZE BERM FOOTPRINT AND NECESSARY ZONE OF DISTURBANCE (INCLUDING BOTH REMOVAL OF EXISTING VEGETATION AND DISTURBANCE OF SOIL) IN ORDER TO MAXIMIZE INFILTRATION.
3. LIGHTLY SCARIFY THE SOIL IN THE AREA OF THE PROPOSED BERM BEFORE DELIVERING SOIL TO SITE.
4. BRING IN FILL MATERIAL TO MAKE UP THE MAJOR PORTION OF THE BERM. SOIL SHOULD BE ADDED IN 8-INCH LIFTS AND COMPACTED PRIOR TO AND AFTER EACH CONSECUTIVE LIFT ACCORDING TO DESIGN SPECIFICATIONS. THE SLOPE AND SHAPE OF THE BERM SHOULD BE GRADED OUT AS SOIL IS ADDED.
5. PROTECT THE SURFACE PONDING AREA AT THE BASE OF THE BERM FROM COMPACTION. IF COMPACTION OF THIS AREA DOES OCCUR, SCARIFY SOIL TO A DEPTH OF AT LEAST 8-INCHES.
6. COMPLETE FINAL GRADING OF THE BERM AFTER THE TOP LAYER OF SOIL IS ADDED. TAMP SOIL DOWN LIGHTLY AND SMOOTH SIDES OF THE BERM. THE CREST AND BASE OF THE BERM SHOULD BE AT LEVEL GRADE.
7. PLANT BERM WITH TURF, MEADOW PLANTS, SHRUBS OR TREES, AS DESIRED.
8. MULCH PLANTED AND DISTURBED AREAS WITH COMPOST MULCH TO PREVENT EROSION WHILE PLANTS BECOME ESTABLISHED.

SITE RESTORATION SCHEDULE:

1. AGRICULTURAL LIME APPLICATION RATES WILL BE DETERMINED BY FIELD PH TESTING. TESTING WILL BE PERFORMED AT A RATE OF 1 TEST/ACRE (MIN). IN ABSENCE OF FIELD TESTING, APPLY AT 6 TONS/ACRE.
2. APPLY 10-20-20 FERTILIZER AT THE RATE OF 1,000 LB/ACRE, OR AT A RATE DETERMINED BY FIELD TESTING.
3. WORK IN LIME AND FERTILIZER TO A DEPTH OF 4 IN. USING SUITABLE EQUIPMENT.
4. SEED PER PERMANENT SEED MIXTURE.
5. STRAW MULCH SHALL BE APPLIED AT THE RATE OF THREE TONS PER ACRE. CHEMICALLY TREATED OR SALTED STRAW IS NOT ACCEPTABLE AS MULCH.

LONG TERM INSPECTIONS AND MAINTENANCE FOR SITE RESTORATION AND PCSM CONTROLS:

LONG TERM MAINTENANCE OF THE PROJECT WILL INCLUDE PERIODIC VISUAL INSPECTIONS FOR SUFFICIENT VEGETATIVE GROWTH AND COVER. INSUFFICIENT VEGETATIVE COVER IS DEFINED AS ANY AREA NOT ACHIEVING A UNIFORM 70% PERENNIAL VEGETATIVE COVER. BARE SPOTS AND AREAS WITH INSUFFICIENT VEGETATIVE COVER WILL BE RESEEDED AND MULCHED WITHIN 24 HOURS OF DISCOVERY. RESTORATION AREAS WILL BE INSPECTED FOR SIGNS OF EROSION, ESPECIALLY ON STEEP SLOPES. CORRECTIVE MEASURES WILL BE TAKEN, AS NEEDED. IF THERE IS EVIDENCE OF TRENCH SETTLING, THE AREA WILL BE REGRADED TO MAINTAIN PRE-CONSTRUCTION DRAINAGE PATTERNS, THEN MULCHED, AND SEEDED.

THE PROPOSED, PERMANENT ACCESS ROAD WHICH WILL REMAIN AS A PERMANENT GRAVEL DRIVE SHALL BE INSPECTED PERIODICALLY. AGGREGATE WILL BE APPLIED TO THE PERMANENT ACCESS ROAD AS NEEDED TO MAINTAIN AN ADEQUATE THICKNESS. THE INFILTRATION BERM SHALL BE INSPECTED REGULARLY TO ENSURE IT IS INFILTRATING PROPERLY AND NOT CLOGGED WITH SEDIMENT. VEGETATION OVER THE BERM SHALL BE MAINTAINED AS NECESSARY, WHICH MAY REQUIRE ANNUAL MULCHING. ROUTINELY REMOVE ACCUMULATED DEBRIS AND INVASIVE PLANTS AS NEEDED. INSPECT FOR SIGNS OF FLOW CHANNELIZATION AND RESTORE LEVEL GRADIENT IMMEDIATELY AFTER ANY DEFICIENCIES ARE OBSERVED. THE SOIL AMENDMENT AREAS WILL BE INSPECTED BIANNUALLY TO VERIFY THEIR EFFECTIVENESS. TRAFFIC WILL NOT BE PERMITTED TO DRIVE OFF OF THE AGGREGATE ACCESS ROADS AND INTO THE SOIL AMENDMENT AREAS. IF THE AREAS APPEAR TO BE COMPACTED OR INEFFECTIVE DURING AN INSPECTION, ADDITIONAL SOIL AND COMPOST WILL BE APPLIED.

A WRITTEN REPORT IS REQUIRED FOR EACH INSPECTION AND FOR EACH REPAIR OR MAINTENANCE ACTIVITY, AND THE REPORT SHOULD SPECIFY HOW TO ACCESS THE SITE. SUNOCO PIPELINE L.P. IS RESPONSIBLE FOR MAINTAINING THE RIGHT OF WAY UNDER THE PROVISIONS OF THIS PERMIT.

SITE RESTORATION:

FOLLOWING COMPLETION OF PIPELINE INSTALLATION AND TRENCH BACKFILLING, THE AREA SHALL BE RETURNED TO GENERAL PRECONSTRUCTION GRADES PRESENT PRIOR TO PIPELINE INSTALLATION IN ORDER TO MAINTAIN PRECONSTRUCTION DRAINAGE PATTERNS. GROUNDS DISTURBED BY ANY OF THE OPERATIONS NECESSARY TO COMPLETE THE WORK FOR THIS PROJECT ARE TO BE PERMANENTLY SEEDED, OR IF SPECIFIED, SODDED, UNLESS OCCUPIED BY STRUCTURES, PAVED, OR DESIGNATED AS A PERMANENT ACCESS ROAD. THE ENTIRE RIGHT-OF-WAY WILL BE RESTORED BACK TO A MEADOW CONDITION OR LAWN IN ACCORDANCE WITH THE PERMANENT REVEGETATION PLAN ON ES-0.04. A TEMPORARY CESSATION OF EARTH DISTURBANCE ACTIVITIES THAT LASTS FOUR DAYS OR LONGER REQUIRES TEMPORARY STABILIZATION. DISTURBED AREAS, WHICH ARE AT FINAL GRADE, SHALL BE SEEDED AND MULCHED IMMEDIATELY, WITH THE EXCEPTION OF THE PERMANENT ACCESS ROADS. IF SEEDING CANNOT BE COMPLETED IMMEDIATELY AFTER THE AREA REACHES FINAL GRADE DUE TO WEATHER CONDITIONS, THE DISTURBED AREA SHALL BE STABILIZED AND MULCHED WITH STRAW AT THE RATE OF THREE TONS PER ACRE. THIS STRAW SHALL BE ANCHORED USING A METHOD DESCRIBED UNDER MULCHING OF THIS NARRATIVE. TEMPORARY ACCESS ROADS WILL BE RESTORED TO A VEGETATED CONDITION FOLLOWING CONSTRUCTION. THE PROPOSED PERMANENT ACCESS ROADS WILL REMAIN IN PLACE FOLLOWING CONSTRUCTION. AN INFILTRATION BERM OR SOIL AMENDMENTS WILL BE SHOWN ON THE PLAN SHEETS TO ACCOUNT FOR THE INCREASE IN STORM WATER RUNOFF. AS A RESULT OF APPLYING SOIL AMENDMENT OR INFILTRATION BERM THE ENTIRE THE RIGHT OF WAY WILL BE RESTORED BACK TO A MEADOW OR LAWN CONDITION. THERE WILL BE NO INCREASE IN STORM WATER RUNOFF RATES OR VOLUMES.

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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075348-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
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CHESTER COUNTY CONSERVATION DISTRICT
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SHEET 0.20 OF 99

NOTES:

1. TOPOGRAPHIC MAPPING AND FEATURES COMPILED FROM WWW.PASDA.PSU.EDU.
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10. DRAWINGS REPRESENT THE FINAL PLAN FOR CONSTRUCTION.
11. ~~THE EROSION & SEDIMENT CONTROL PLAN AND SITE RESTORATION PLAN, INSPECTION REPORTS, AND MONITORING REPORTS MUST BE AVAILABLE FOR REVIEW AND INSPECTION BY THE DEPARTMENT OR CONSERVATION DISTRICT.~~ THE PCSM PLAN, INSPECTION REPORTS, AND MONITORING RECORDS SHALL BE MADE AVAILABLE AT THE PROJECT SITE FOR REVIEW AND INSPECTION BY DEP AND THE AUTHORIZED CONSERVATION DISTRICT. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION III, CONDITION J OF THE APPROVED CHAPTER 102 PERMIT).
12. ~~THE LICENSED PROFESSIONAL OR DESIGNEE SHALL BE PRESENT ON SITE FOR THE CONSTRUCTION OF THE INFILTRATION BERMS AND TRENCHES.~~ A LICENSED PROFESSIONAL OR THEIR DESIGNEE SHALL BE PRESENT ON-SITE AND BE RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN. THE LICENSED PROFESSIONAL WILL BE RESPONSIBLE TO PROVIDE A FINAL CERTIFICATION, PURSUANT TO 25 PA. CODE § 102.8(1) ALONG WITH THE REQUIRED NOT AND RECORD DRAWINGS, INDICATING THAT THE PROJECT SITE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED OR MODIFIED PCSM PLAN. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION III, CONDITION C OF THE APPROVED CHAPTER 102 PERMIT).
13. A RECORDED INSTRUMENT WILL BE RECORDED AT THE RECORDER OF DEEDS TO PROVIDE FOR NECESSARY ACCESS FOR LONG TERM OPERATION AND MAINTENANCE FOR PCSM BMP'S. THE DEED WILL PROVIDE NOTICE THAT THE RESPONSIBILITY FOR THE LONG TERM OPERATION AND MAINTENANCE OF THE PCSM BMP'S IS A COVENANT THAT RUNS WITH THE LAND AND IS BINDING AND ENFORCEABLE BY SUBSEQUENT GRANTEES.

SITE RESTORATION

FOLLOWING COMPLETION OF PIPELINE INSTALLATION AND TRENCH BACKFILLING, THE PIPELINE RIGHT OF WAY, ASSOCIATED WORKSPACES, AND TEMPORARY ACCESS ROADS SHALL BE RETURNED TO THE GENERAL GRADE PRESENT PRIOR TO PIPELINE INSTALLATION IN ORDER TO MAINTAIN PRECONSTRUCTION DRAINAGE PATTERNS. AFTER COMPLETION OF MAJOR CONSTRUCTION WORK, TOPSOIL THAT WAS STOCKPILED DURING CONSTRUCTION WILL BE PLACED ALONG THE ROW. GROUNDS DISTURBED BY ANY OF THE OPERATIONS NECESSARY TO COMPLETE THE WORK FOR THIS PROJECT ARE TO BE PERMANENTLY SEEDED, OR IF SPECIFIED, SODDED, UNLESS OCCUPIED BY STRUCTURES, PAVED OR DESIGNATED AS A PERMANENT ACCESS ROAD. DISTURBED AREAS, WHICH ARE AT FINAL GRADE, SHALL BE SEEDED AND MULCHED ONCE FINAL GRADES ARE ACHIEVED. THE PERMANENT SEED MIXTURE WILL RESTORE DISTURBED AREAS TO A MEADOW IN GOOD CONDITION OR BETTER. IF SEEDING CANNOT BE COMPLETED WITHIN A FOUR (4) DAY PERIOD DUE TO WEATHER CONDITIONS, THE DISTURBED AREA WILL BE MULCHED WITH STRAW AT THE RATE OF THREE (3) TONS PER ACRE. THIS STRAW WILL BE ANCHORED USING A METHOD OUTLINED ON DRAWING PCS-0.03.

SITE RESTORATION CONSTRUCTION SEQUENCE

A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. THE CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR SITE RESTORATION AND POST-CONSTRUCTION STORMWATER MANAGEMENT OF THE SITE. NECESSARY STEPS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. ~~THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON THE EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED IN THE FIELD. THE APPROPRIATE COUNTY CONSERVATION DISTRICT AND DEP SHALL BE CONTACTED AND MUST APPROVE ANY DEVIATION TO THE AUTHORIZED PLANS.~~ THE PERMITTEE SHALL IMPLEMENT PCSM BMPS AS DETAILED IN THE APPROVED PCSM PLAN. ANY CHANGES TO THE PCSM PLAN, INCLUDING THE INTRODUCTION OF ALTERNATE PCSM BMPS OR THE ELIMINATION OF ANY APPROVED PCSM BMPS, MUST BE APPROVED BY DEP PRIOR TO THE IMPLEMENTATION OF THESE CHANGES. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION III, CONDITION I OF THE APPROVED CHAPTER 102 PERMIT)
~~A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY. THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) OR APPLICABLE COUNTY CONSERVATION DISTRICT, CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, AND THE PLAN PREPARER MUST BE INVITED TO THIS MEETING AT LEAST 7 DAYS IN ADVANCE.~~FOR EARTH DISTURBANCE ACTIVITIES AUTHORIZED BY THIS PERMIT, AT LEAST ONE PRE-CONSTRUCTION MEETING IS REQUIRED. THE PERMITTEE SHALL CONTACT DEP TO SCHEDULE THE PRE-CONSTRUCTION MEETING AND PROVIDE AT LEAST SEVEN (7) DAYS' NOTICE OF THE PRE-CONSTRUCTION MEETING TO ALL INVITED ATTENDEES, UNLESS OTHERWISE APPROVED BY DEP IN WRITING. PERMITTEES, CO-PERMITTEES, OPERATORS, AND LICENSED PROFESSIONALS, OR DESIGNEES RESPONSIBLE FOR EARTH DISTURBANCE ACTIVITY, INCLUDING IMPLEMENTATION OF E&S, PCSM AND PPC PLANS, AND CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN, SHALL ATTEND THE PRE-CONSTRUCTION MEETING(S). PERMITTEES, CO-PERMITTEES, OPERATORS AND LICENSED PROFESSIONALS ARE RESPONSIBLE FOR ENSURING THAT ALL ACTIVITIES ON THE SITE COMPLY WITH THE REQUIREMENTS OF THE PERMIT. (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION VI OF THE APPROVED CHAPTER 102 PERMIT).

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. SURFACE ROUGHENING WILL BE UTILIZED TO ROUGH THE SOIL SURFACE WITH HORIZONTAL DEPRESSIONS FOR THE PURPOSE OF REDUCING RUNOFF VELOCITY, INCREASING INFILTRATION, AIDING THE ESTABLISHMENT OF VEGETATION, AND REDUCING EROSION. SURFACE ROUGHENING SHOULD BE APPLIED TO SLOPES 3H:1V OR STEEPER UNLESS A STABLE ROCK FACE IS PROVIDED OR IT CAN BE SHOWN THAT THERE IS NOT A POTENTIAL FOR SEDIMENT POLLUTION TO SURFACE WATERS. FOR ROUGHENED SURFACES WITHIN 50 FEET OF A SURFACE WATER, AND WHERE BLANKETING OF SEEDED AREAS IS PROPOSED AS THE MEANS TO ACHIEVING PERMANENT STABILIZATION, SPRAY-ON TYPE BLANKETS ARE RECOMMENDED. SURFACE ROUGHENING SHALL BE ACCOMPLISHED USING DOZERS AFFIXED WITH GROUSER TRACKED EQUIPMENT. DOZERS SHALL RUN UP AND DOWN THE SLOPES LEAVING HORIZONTAL GROOVES PERPENDICULAR TO THE SLOPE. DOZER BLADES SHALL BE RAISED AND NOT USED DURING SURFACE ROUGHENING. ~~WHERE COMPACTION DOES OCCUR, CONTRACTOR SHALL SCARIFIY THE SOIL OR PROVIDE ADDITIONAL ROUGHENING SUCH AS DEEP RIPPING OR CHISEL RIPPING TO RESTORE THE AREA TO A MINIMAL COMPACTED STATE. IN AREAS OF PROPOSED INFILTRATION, SOILS SHALL BE AMENDED TO 2' BELOW GRADE. SEE SOIL AMENDMENT AND RESTORATION CONSTRUCTION SEQUENCE BELOW.~~ IN ACCORDANCE WITH THE E&S AND SITE RESTORATION PLANS, MEASURES SHALL BE TAKEN TO ENSURE THAT PROPER SOIL DE-COMPACTION OCCURS FOR ALL AREAS OF SITE RESTORATION FOR THE PROJECT. THE PERMITTEE SHALL IMPLEMENT SUCH MEASURES IN ACCORDANCE WITH THE GUIDANCE ON SOIL RESTORATION IN THE PA STORMWATER BMP MANUAL (BMP 6.7.3, CHAPTER 6, PAGE 221). (IN ACCORDANCE WITH SPECIAL CONDITION PART C, SECTION III, CONDITION G OF THE APPROVED CHAPTER 102 PERMIT)
3. PLACE TOPSOIL FROM TOPSOIL STOCKPILES AS THE UPPER LAYER OF BACKFILL. TOPSOIL SHALL NOT BE PLACED WHEN THE SUBGRADE IS FROZEN OR WHEN IT IS EXCESSIVELY WET OR DRY AND SHALL NOT BE HANDLED WHEN IN A FROZEN OR MUDDY CONDITION.
4. REMOVE GRAVEL AND GEOTEXTILE FROM THE TEMPORARY ACCESS ROADS AND SCARIFY THE SOIL. REFER TO STEP 2 OF THIS SEQUENCE TO ADDRESS COMPACTION AT ACCESS ROADS. AFTER ADDRESSING COMPACTION CONCERNS, PLACE TOPSOIL THAT WAS STRIPPED PRIOR TO INSTALLATION OF THE ACCESS ROADS.
5. IMMEDIATELY SEED AND MULCH DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE ONCE FINAL GRADE IS ESTABLISHED AND TOPSOIL IS PLACED.
6. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70-PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED. REGRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

POST CONSTRUCTION STORMWATER MANAGEMENT CONSTRUCTION SEQUENCE

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. INSTALL POST CONSTRUCTION BMPS AFTER COMPLETION OF PIPELINE CONSTRUCTION:

INFILTRATION BERM

1. INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL BMPS AS PER THE PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL.
2. INSTALL ORANGE CONSTRUCTION FENCING AROUND THE PONDING AREA OF THE INFILTRATION BERM AS SHOWN ON THE PCSM PLAN DRAWINGS. COMPLETE SITE GRADING AND STABILIZE WITHIN THE LIMIT OF DISTURBANCE EXCEPT WHERE THE INFILTRATION BERM WILL BE CONSTRUCTED AND THE EXTENT OF THE PONDING AREA; MAKE EVERY EFFORT TO MINIMIZE BERM FOOTPRINT AND NECESSARY ZONE OF DISTURBANCE (INCLUDING BOTH REMOVAL OF EXISTING VEGETATION AND DISTURBANCE OF EMPTY SOIL) IN ORDER TO MAXIMIZE INFILTRATION. IF EQUIPMENT MUST TRAVEL THROUGH THE PONDING AREA, TIMBER MATTING SHALL BE PLACED TO MINIMIZE COMPACTION, AND EQUIPMENT TRAFFIC SHALL BE MINIMIZED.
3. LIGHTLY SCARIFY THE SOIL IN THE AREA OF THE PROPOSED BERM BEFORE DELIVERING SOIL TO SITE.
4. BRING IN FILL MATERIAL TO MAKE UP THE MAJOR PORTION OF THE BERM. SOIL SHOULD BE ADDED IN 8-INCH LIFTS AND COMPACTED AFTER EACH ADDITION ACCORDING TO DESIGN SPECIFICATIONS. THE SLOPE AND SHAPE OF THE BERM SHOULD BE GRADED OUT AS SOIL IS ADDED.
5. PROTECT THE SURFACE PONDING AREA AT THE BASE OF THE BERM FROM COMPACTION.
6. COMPLETE FINAL GRADING OF THE BERM AFTER THE TOP LAYER OF SOIL IS ADDED. TAMP SOIL DOWN LIGHTLY AND SMOOTH SIDES OF THE BERM. THE CREST AND BASE OF THE BERM SHOULD BE AT LEVEL GRADE.
7. PLANT BERM WITH TURF, MEADOW PLANTS, SHRUBS OR TREES, AS DESIRED.
8. MULCH PLANTED AND DISTURBED AREAS WITH COMPOST MULCH TO PREVENT EROSION WHILE PLANTS BECOME ESTABLISHED.

INFILTRATION TRENCH

1. INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.
2. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE.
3. PROTECT INFILTRATION TRENCH AREA FROM COMPACTION PRIOR TO INSTALLATION. INSTALL ORANGE CONSTRUCTION FENCE AROUND THE TRENCH AND, IF APPLICABLE, THE PONDING AREA OF THE DOWNSLOPE BERM.
4. IF POSSIBLE, INSTALL INFILTRATION TRENCH DURING LATER PHASES OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND/OR DAMAGE FROM CONSTRUCTION ACTIVITY. AFTER INSTALLATION, PREVENT SEDIMENT LADEN WATER FROM ENTERING INLETS AND PIPES. IF IT IS NOT POSSIBLE TO INSTALL THE INFILTRATION TRENCH DURING THE LATER PHASES OF CONSTRUCTION, PLACE COMPOST FILTER SOCK UPSLOPE OF THE TRENCH TO PREVENT SEDIMENT FROM REACHING AND CLOGGING THE TRENCH.
5. EXCAVATE INFILTRATION TRENCH BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE FREE FROM ROCKS AND DEBRIS. DO NOT COMPACT SUBGRADE. THE CONSTRUCTION EQUIPMENT SHALL REMAIN OUTSIDE OF THE INFILTRATION TRENCH WHILE EXCAVATING IT.
6. PLACE NONWOVEN GEOTEXTILE ALONG BOTTOM AND SIDES OF TRENCH. NONWOVEN GEOTEXTILE ROLLS SHOULD OVERLAP BY A MINIMUM OF 16 INCHES WITHIN THE TRENCH. FOLD BACK AND SECURE EXCESS GEOTEXTILE DURING STONE PLACEMENT.
7. INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, ETC.
8. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH. CARE SHALL BE TAKEN SO AS NOT TO COMPACT THE SUBGRADE.
9. INSTALL CONTINUOUSLY PERFORATED PIPE AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH. CARE SHALL BE TAKEN SO AS NOT TO COMPACT THE SUBGRADE.
10. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER INFILTRATION TRENCH, WITH MINIMUM OVERLAP OF 16- INCHES.
11. PLACE 6-INCH LIFT OF APPROVED TOPSOIL OVER INFILTRATION TRENCH, AS INDICATED ON PLANS.
12. SEED AND STABILIZE TOPSOIL.
13. ANY SEDIMENT THAT ENTERS INLETS DURING CONSTRUCTION IS TO BE REMOVED WITHIN 24 HOURS.
14. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
15. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
16. REMOVE EROSION SEDIMENT CONTROL MEASURES UPON ESTABLISHMENT OF A UNIFORM 70% VEGETATIVE COVER OVER THE DISTURBED AREA. RE-GRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

GEOWEB CONSTRUCTION SEQUENCE

1. GRADE SURFACE TO SUBGRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION. DO NOT COMPACT.
2. IF NEEDED, SCARIFY THE SOIL OR PROVIDE ADDITIONAL ROUGHENING SUCH AS DEEP RIPPING OR CHISEL RIPPING TO RESTORE THE AREA TO A MINIMAL COMPACTED STATE.
3. INSTALL GEOTEXTILE SEPARATION LAYER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. EXPAND GEOWEB TO REQUIRED DIMENSIONS AND ANCHOR EDGES WITH ATRA ANCHORS, IF NEEDED. JOIN ADJACENT SECTIONS WITH ATRA KEYS.
5. ANCHOR GEOWEB ON SLOPES GREATER THAT 5% WITH 24" ATRA ANCHORS PLACED ON A 3X8 CELL PATTERN.
6. MIX AND PLACE ENGINEERED INFILL MATERIAL (2/3 AASHTO #57 STONE AND 1/3 SCREENED TOPSOIL) INTO THE GEOWEB CELLS. INFILL MATERIAL SHALL BE FREE-FLOWING AND NOT FROZEN WHEN PLACED IN THE GEOWEB SECTIONS. LIMIT DROP HEIGHT TO 3 FEET TO AVOID DAMAGING OR DISPLACEMENT OF THE CELL WALL. SLIGHTLY OVERFILL THE CELLS AND LEVEL OFF MATERIAL ONCE SETTLEMENT IS NEGLIGIBLE. DO NOT COMPACT.
7. SEED AND MULCH FILLED SECTIONS IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE ONCE INFILL IS PLACED.
8. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70-PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED.

SOIL AMENDMENT AND RESTORATION

1. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF PIPE INSTALLATION.
2. IN THE DESIGNATED SOIL AMENDMENT AREA, TILL THE GROUND AND MIX IN THE COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST) TO A DEPTH OF 24 INCHES.
3. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
4. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.

SLOW RELEASE TRENCH

1. INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION.
2. GRADE SURFACE TO FINISHED GRADE ELEVATIONS AS SOON AS PRACTICABLE.
3. IF POSSIBLE, INSTALL SLOW RELEASE TRENCH DURING LATER PHASES OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND/OR DAMAGE FROM CONSTRUCTION ACTIVITY. AFTER INSTALLATION, PREVENT SEDIMENT LADEN WATER FROM ENTERING INLETS AND PIPES. IF IT IS NOT POSSIBLE TO INSTALL THE SLOW RELEASE TRENCH DURING THE LATER PHASES OF CONSTRUCTION, PLACE COMPOST FILTER SOCK UPSLOPE OF THE TRENCH TO PREVENT SEDIMENT FROM REACHING AND CLOGGING THE TRENCH.
4. EXCAVATE SLOW RELEASE TRENCH BOTTOM TO A UNIFORM, LEVEL SUBGRADE FREE FROM ROCKS AND DEBRIS.
5. INSTALL AN IMPERMEABLE LINER WITHIN THE SLOW RELEASE TRENCH. SECURE IMPERMEABLE LINER DURING STONE PLACEMENT WITH AN ANCHOR TRENCH.
6. INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, ETC.
7. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH.
8. INSTALL CONTINUOUSLY PERFORATED PIPE AND UNDERDRAIN OUTLET AS INDICATED ON PLANS. BACKFILL WITH UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 8-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS. LIGHT COMPACTION SHALL ENSURE THE AGGREGATE WON'T SETTLE BELOW THE INTENDED TOP ELEVATION OF THE TRENCH.
9. PLACE 6-INCH LIFT OF APPROVED TOPSOIL OVER SLOW RELEASE TRENCH, AS INDICATED ON PLANS.
10. SEED AND STABILIZE TOPSOIL.
11. ANY SEDIMENT THAT ENTERS INLETS DURING CONSTRUCTION IS TO BE REMOVED WITHIN 24 HOURS.
12. IMMEDIATELY SEED AND MULCH DISTURBED AREAS ONCE FINAL GRADE IS ESTABLISHED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE.
13. MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES UNTIL SITE WORK IS COMPLETE AND A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED.
14. REMOVE EROSION SEDIMENT CONTROL MEASURES UPON ESTABLISHMENT OF A UNIFORM 70% VEGETATIVE COVER OVER THE DISTURBED AREA. RE-GRADE AND REVEGETATE AREAS DISTURBED DURING THE REMOVAL OF THE EROSION AND SEDIMENT CONTROLS.

LEVEL SPREADER

1. THE UPHILL DEVELOPMENT SHALL BE STABILIZED BEFORE DIVERTING RUNOFF TO ANY DISPERSING FLOW TECHNIQUES.
2. ALL CONTRIBUTING STORMWATER ELEMENTS (INFILTRATION BERMS, INLETS, OUTLET CONTROL STRUCTURES, PIPES, ETC.) SHALL BE INSTALLED PRIOR TO INSTALLATION OF THE LEVEL SPREADER.
3. HDPE PIPE SHALL BE INSTALLED ALONG A CONTOUR UPHILL OF THE LEVEL SPREADER, WITH CARE TAKEN TO CONSTRUCT A SLIGHTLY SLOPED BOTTOM.
4. IF NECESSARY, INSTALL EROSION CONTROL MATTING ALONG THE LENGTH OF THE LEVEL SPREADER AND TO A DISTANCE DOWNHILL, AS SPECIFIED BY THE MANUFACTURER/SUPPLIER.
5. A BERM SHALL BE INSTALLED ALONG THE OUTLET OF THE HDPE PIPE TO ENSURE STORMWATER RUNOFF IS ROUTED TO THE LEVEL SPREADER.

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075248-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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LONG TERM INSPECTIONS AND MAINTENANCE FOR SITE RESTORATION AND PCSM CONTROLS:

LONG-TERM MAINTENANCE OF THE PIPELINE ROW WILL INCLUDE PERIODIC VISUAL INSPECTIONS FOR SUFFICIENT VEGETATIVE GROWTH AND COVER. INSUFFICIENT VEGETATIVE COVER IS DEFINED AS ANY AREA NOT ACHIEVING A UNIFORM 70-PERCENT PERENNIAL VEGETATIVE COVER. BARE SPOTS AND AREAS WITH INSUFFICIENT VEGETATIVE COVER WILL BE RESEEDED AND MULCHED WITHIN 24 HOURS OF DISCOVERY. THE RIGHT OF WAY WILL BE INSPECTED FOR SIGNS OF EROSION, ESPECIALLY ON STEEP SLOPES. CORRECTIVE MEASURES WILL BE TAKEN, AS NEEDED. IF THERE IS EVIDENCE OF TRENCH SETTLING, THE AREA WILL BE REGRADED TO MAINTAIN PRE-CONSTRUCTION DRAINAGE PATTERNS, MULCHED, AND SEEDED. A WRITTEN REPORT IS REQUIRED FOR EACH INSPECTION AND FOR EACH REPAIR OR MAINTENANCE ACTIVITY, AND THE REPORT SHOULD SPECIFY HOW TO ACCESS THE SITE. SPLP IS RESPONSIBLE FOR MAINTAINING THE ROW UNDER THE PROVISIONS OF THIS PERMIT.

PERMANENT PROPOSED ACCESS ROADS AND VALVE PADS WILL BE CONSTRUCTED AS PART OF THE PROJECT. THESE ACCESS ROADS WILL REMAIN AS A PERMANENT GRAVEL DRIVE AFTER CONSTRUCTION IS COMPLETE. THE ACCESS ROADS WILL BE INSPECTED PERIODICALLY, AND AGGREGATE WILL BE APPLIED TO THE PERMANENT ACCESS ROADS AS NEEDED TO MAINTAIN AN ADEQUATE THICKNESS.

INSPECTION AND MAINTENANCE PROCEDURES FOR PERMANENT POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES AND STORMWATER CONVEYANCE BMPS ARE SUMMARIZED BELOW. IF ANY POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES ARE CONSTRUCTED PRIOR TO STABILIZATION OF UPSLOPE CONTRIBUTORY DRAINAGE AREAS, INSPECTIONS SHALL OCCUR WEEKLY AND AFTER RUNOFF EVENTS UNTIL THE SURROUNDING AREA ACHIEVES STABILIZATION. SPECIFY WHERE WE HAVE TO DO POST-CONSTRUCTION INFILTRATION TESTING.

INFILTRATION BERM

- THE INFILTRATION BERM SHALL BE INSPECTED AT LEAST 4 TIMES PER YEAR TO ENSURE IT IS INFILTRATING PROPERLY AND NOT CLOGGED WITH SEDIMENT.
- MONITOR DRAWDOWN TIME AFTER THE FIRST MAJOR STORM EVENT. THE BERM SHALL DEWATER WITHIN A MAXIMUM OF 72 HOURS. IF THE BERM IS NOT INFILTRATING WITHIN THE SPECIFIED TIMEFRAME, AMEND THE SOILS WITHIN THE PONDING AREA OF THE BERM (SEE SOIL AMENDMENT DETAIL IN PLANS).
- VEGETATION OVER THE BERM SHALL BE MAINTAINED AS NECESSARY, WHICH MAY REQUIRE ANNUAL MULCHING. ROUTINELY REMOVE ACCUMULATED DEBRIS AND INVASIVE PLANTS AS NEEDED.
- INSPECT FOR SIGNS OF FLOW CHANNELIZATION AND RESTORE LEVEL GRADIENT IMMEDIATELY AFTER ANY DEFICIENCIES ARE OBSERVED.

INFILTRATION TRENCH

- CATCH BASINS AND INLETS FOR THE INFILTRATION TRENCH SHOULD BE INSPECTED AND CLEANED, AS NECESSARY, AT LEAST 4 TIMES PER YEAR.
- THE VEGETATION ALONG THE SURFACE OF THE INFILTRATION TRENCH SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
- VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON A VEGETATED INFILTRATION TRENCH, AND CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS.

SOIL AMENDMENT AND RESTORATION

- THE SOIL RESTORATION PROCESS MAY NEED TO BE REPEATED OVER TIME, DUE TO COMPACTION BY USE AND/OR SETTLING.
- SOIL AMENDMENT AREAS SHALL BE INSPECTED AT LEAST 4 TIMES PER YEAR FOR SIGNS OF COMPACTION. TO REMEDY COMPACTION, TILL THE SOIL TO A DEPTH OF 24 INCHES AND MIX IN COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST).

SLOW RELEASE TRENCH

- INLETS AND OUTLETS FOR THE SLOW RELEASE TRENCH SHOULD BE INSPECTED AND CLEANED, AS NECESSARY, AT LEAST 4 TIMES PER YEAR.
- THE VEGETATION ALONG THE SURFACE OF THE SLOW RELEASE TRENCH SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
- VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON A SLOW RELEASE TRENCH.

CHANNEL

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
  - O INSPECT AND CORRECT EROSIONS PROBLEMS, DAMAGE TO VEGETATION, AND SEDIMENT AND DEBRIS ACCUMULATION (ADDRESS WHEN > 3 INCHES AT ANY SPOT OR COVERING VEGETATION).
  - O FOR VEGETATED CHANNELS, INSPECT VEGETATION ON SIDE SLOPES FOR EROSION AND FORMATION OF RILLS OR GULLIES, CORRECT AS NEEDED.
  - O INSPECT FOR POOLS OF STANDING WATER, DEWATER AND DISCHARGE TO AN APPROVED LOCATION AND RESTORE TO DESIGN GRADE.
  - O FOR VEGETATED CHANNELS, MOW AND TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER SWALE OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION; DISPOSE OF CUTTINGS IN A LOCAL COMPOSTING FACILITY; MOW ONLY WHEN CHANNEL IS DRY TO AVOID RUTTING.
  - O INSPECT FOR LITTER; REMOVE PRIOR TO MOWING.
  - O INSPECT FOR UNIFORMITY IS CROSS-SECTION AND LONGITUDINAL SLOPE, CORRECT AS NEEDED.
  - O INSPECT CHANNEL INLET (CURB CUTS, PIPES, ETC.) AND OUTLET FOR SIGNS OF EROSION OR BLOCKAGE, CORRECT AS NEEDED.
  - O REPLACE ANY DISPLACED RIPRAP FOR RIPRAP LINED CHANNELS.

WATER DEFLECTOR

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WATER DEFLECTOR. THE RUBBER BELT SHALL BE REPLACED WHEN IT IS WORN AND NO LONGER EFFECTIVE.

LEVEL SPREADER

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- THE RECEIVING LAND SHALL BE IMMEDIATELY RESTORED TO DESIGN CONDITIONS AFTER ANY DISTURBANCE. VEGETATED AREAS SHALL BE SEEDED AND BLANKETED.
- IT IS CRITICAL THAT EVEN SHEET FLOW CONDITIONS ARE SUSTAINED THROUGHOUT THE LIFE OF THE LEVEL SPREADER, AS THEIR EFFECTIVENESS CAN DETERIORATE DUE TO LACK OF MAINTENANCE, INADEQUATE DESIGN/LOCATION, AND POOR VEGETATION COVER.
  - O THE AREA BELOW THE LEVEL SPREADER SHALL BE INSPECTED FOR CLOGGING, DENSITY OF VEGETATION, DAMAGE BY FOOT OR VEHICULAR TRAFFIC, EXCESSIVE ACCUMULATIONS, AND CHANNELIZATION. INSPECTIONS SHALL BE MADE ON A QUARTERLY BASIS FOR THE FIRST TWO YEARS FOLLOWING INSTALLATION, AND THEN ON A SEMIANNUAL BASIS THEREAFTER. INSPECTIONS SHALL ALSO BE MADE AFTER EVERY STORM EVENT GREATER THAN 1-INCH.
  - O SEDIMENT AND DEBRIS SHALL BE ROUTINELY REMOVED (BUT NEVER LESS THAN SEMIANNUALLY), OR UPON OBSERVATION, WHEN BUILDUP OCCURS IN THE CLEAN OUTS. REGRADING AND RESEEDING MAY BE NECESSARY IN THE AREAS BELOW THE LEVEL SPREADER. REGRADING MAY ALSO BE REQUIRED WHEN POOLS OF STANDING WATER ARE OBSERVED ALONG THE SLOPE. (IN NO CASE SHOULD STANDING WATER BE ALLOWED FOR LONGER THAN 72 HOURS).
  - O MAINTAINING A VIGOROUS VEGETATIVE COVER ON THE AREAS BELOW THE LEVEL SPREADER IS CRITICAL FOR MAXIMIZING POLLUTANT REMOVAL EFFICIENCY AND EROSION PREVENTION. IF VEGETATIVE COVER IS NOT FULLY ESTABLISHED WITHIN THE DESIGNATED TIME, IT MAY NEED TO BE REPLACED WITH AN ALTERNATIVE SPECIES. (IT IS STANDARD PRACTICE TO CONTRACTUALLY REQUIRE THE CONTRACTOR TO REPLACE DEAD VEGETATION.) UNWANTED OR INVASIVE GROWTH SHALL BE REMOVED ON AN ANNUAL BASIS. BIWEEKLY INSPECTIONS ARE RECOMMENDED FOR AT LEAST THE FIRST GROWING SEASON, OR UNTIL THE VEGETATION IS PERMANENTLY ESTABLISHED. ONCE THE VEGETATION IS ESTABLISHED, INSPECTIONS OF HEALTH, DIVERSITY, AND DENSITY SHALL BE PERFORMED AT LEAST TWICE A YEAR, DURING BOTH THE GROWING AND NON-GROWING SEASON. VEGETATIVE COVER SHALL BE SUSTAINED AT 85% AND REPLACED IF DAMAGE GREATER THAN 50% IS OBSERVED.

DIVERSION BERM

- INSPECTIONS TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (> 1 INCH RAINFALL DEPTH).
- MAINTAIN TURF GRASS AND OTHER VEGETATION BY MOWING AND RE-MULCHING.
- ROUTINELY REMOVE ACCUMULATED TRASH AND DEBRIS.
- REMOVE INVASIVE PLANTS AS NEEDED.
- INSPECT FOR SIGNS OF FLOW CHANNELIZATION; RESTORE LEVEL GRADIENT IMMEDIATELY AFTER DEFICIENCIES ARE OBSERVED.

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 075343-E 2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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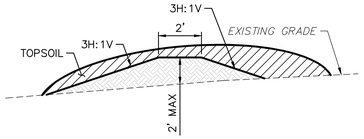
ES-0.22
SHEET 0.22 OF 99

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\17 – Chester\E&S\5958ES000.22.dwg PIT NICHOLE.NAJESKI 2/4/2017 4:37:48 PM

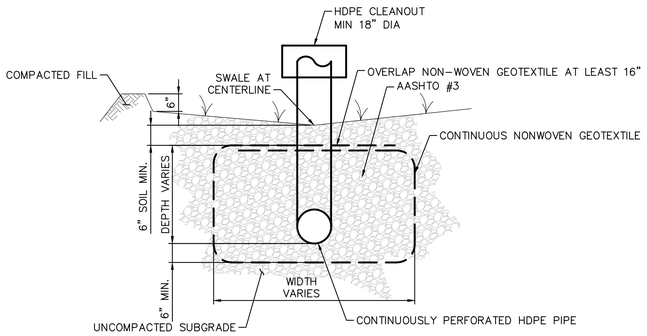


NOTES:

1. FILL WITH TOPSOIL TO ACHIEVE DESIRED SHAPE.

INFILTRATION BERM DETAIL

NOT TO SCALE

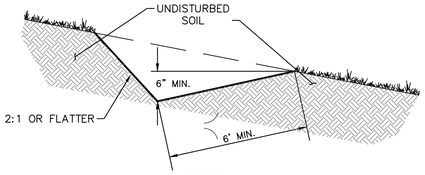


NOTES:

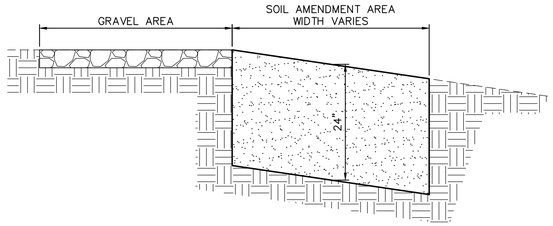
1. HEAT-SET OR HEAT-CALENDARED FIBERS ARE NOT PERMITTED.
2. ACCEPTABLE NON-WOVEN GEOTEXTILE TYPES INCLUDE MIRAFI 140N, AMOCO 4547, AND GEOTEX 451.

INFILTRATION TRENCH DETAIL

NOT TO SCALE



SECTION A–A

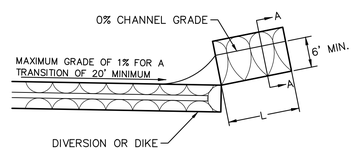


NOTES:

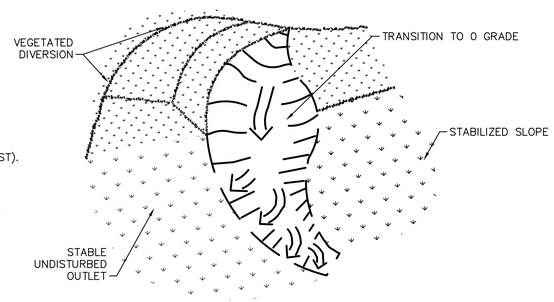
1. SOIL AMENDMENT MEDIA SHOULD CONSIST OF SOIL AND COMPOST AT A RATIO OF 2:1 (SOIL:COMPOST).
2. SOIL AMENDMENT SHOULD NOT BE USED ON SLOPES GREATER THAN 30%.
3. COMPOST CAN BE SUBSTITUTED WITH MULCH, MANURE, SAND.
4. NO VEHICULAR TRAFFIC WILL BE PERMITTED TO DRIVE IN UNPROTECTED SOIL AMENDMENT AREAS TO MINIMIZE THE POSSIBILITY OF COMPACTION
5. ALL CONSTRUCTION SHOULD BE COMPLETED AND STABILIZED BEFORE BEGINNING SOIL RESTORATION.
6. SOIL AMENDMENT TO BE INSTALLED BY TILLING.

SOIL AMENDMENT DETAIL

NOT TO SCALE



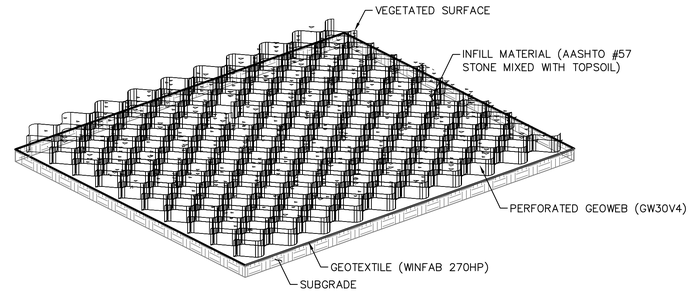
PLAN



ISOMETRIC VIEW – (NOT TO SCALE)

EARTHEN LEVEL SPREADER

NOT TO SCALE



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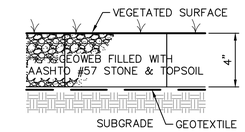


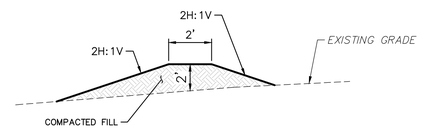
SECTION

NOTES:

1. PREPARE THE SUBGRADE AS SHOWN ON THE CONSTRUCTION DRAWINGS.
2. DO NOT COMPACT SUBGRADE.
3. PROVIDE WOVEN HIGH STRENGTH STABILIZATION GEOTEXTILE (WINFAB 270HP).
4. EXPAND THE GEOWEB SECTIONS INTO POSITION AND CONNECT THE END TO END AND INTERLEAF CONNECTIONS WITH ATRA KEYS.
5. GEOWEB CELL INFILL MATERIAL SHALL BE A MIX OF AASHTO #57 STONE AND SCREENED TOPSOIL IN AN APPROXIMATE RATIO OF 2/3 #57 AND 1/3 TOPSOIL.
6. PLACE THE SPECIFIED INFILL MATERIAL INTO CELLS AND TRACK UNTIL CELL IS FILLED AND SETTLEMENT OF INFILL IS NEGLIBILE.
7. ROUGH GRADE CONTOURS DEPICT THE TOP OF SUBGRADE IN AREAS WHERE GEOWEB IS TO BE INSTALLED.
8. TOP OF GEOWEB IS AT ELEVATION 4 INCHES ABOVE ROUGH GRADE SHOWN ON GRADING PLAN.
9. ON SLOPES GREATER THAN 5%, ANCHOR GEOWEB WITH 24" ATRA ANCHORS IN A 3x8 CELL PATTERN.

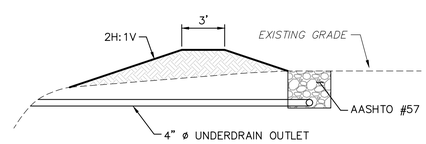
BLOCK VALVE GEOWEB DETAIL

NOT TO SCALE



DIVERSION BERM DETAIL

NOT TO SCALE



SLOW RELEASE TRENCH DETAIL

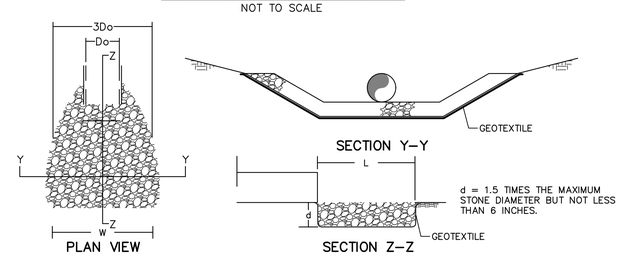
NOT TO SCALE

CHANNEL CROSS–SECTION

CHANNEL NO.	BOTTOM WIDTH B (FT)	DEPTH D (FT)	Z1 (FT)	Z2 (FT)	LINING*
A	4.0	2.0	2	2	NAG S150 ECB WITH CLASS C FINAL STABILIZATION
B	4.0	2.0	2	2	NAG P300 ECB WITH CLASS C FINAL STABILIZATION
C	4.0	2.0	2	2	NAG S150 ECB WITH CLASS C FINAL STABILIZATION
D	4.0	2.0	2	2	NAG S150 ECB WITH CLASS C FINAL STABILIZATION
E	6.0	2.0	2	2	NAG P300 ECB WITH CLASS C FINAL STABILIZATION
F	4.0	2.0	2	2	NAG S150 ECB WITH CLASS C FINAL STABILIZATION
G	2.0	2.0	2	2	NAG S150 ECB WITH CLASS C FINAL STABILIZATION

PERMANENT CHANNEL DETAIL

NOT TO SCALE



PLAN VIEW

SECTION Y–Y

SECTION Z–Z

OUTLET NO.	PIPE DIA Do (FT)	Q (CFS)	MINIMUM RIPRAP SIZE	MINIMUM L (FT)	MINIMUM W (FT)
RA–01	4.0	6.66	R–3	12.0	16.0
RA–02	4.0	19.77	R–3	14.0	18.0
RA–03	2.0	7.76	R–3	10.0	13.0
RA–04	2.0	48.43	R–5	26.0	32.0
RA–05	1.5	9.99	R–3	10.0	13.0
RA–06	1.5	10.34	R–3	10.0	13.0

RIPRAP APRONS AT PIPE OUTLETS WITH FLARED END SECTIONS

NOT TO SCALE

PCSM DETAILS

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT F. SIMCIK
ENGINEER
075364245-E
2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
NOTES & DETAILS

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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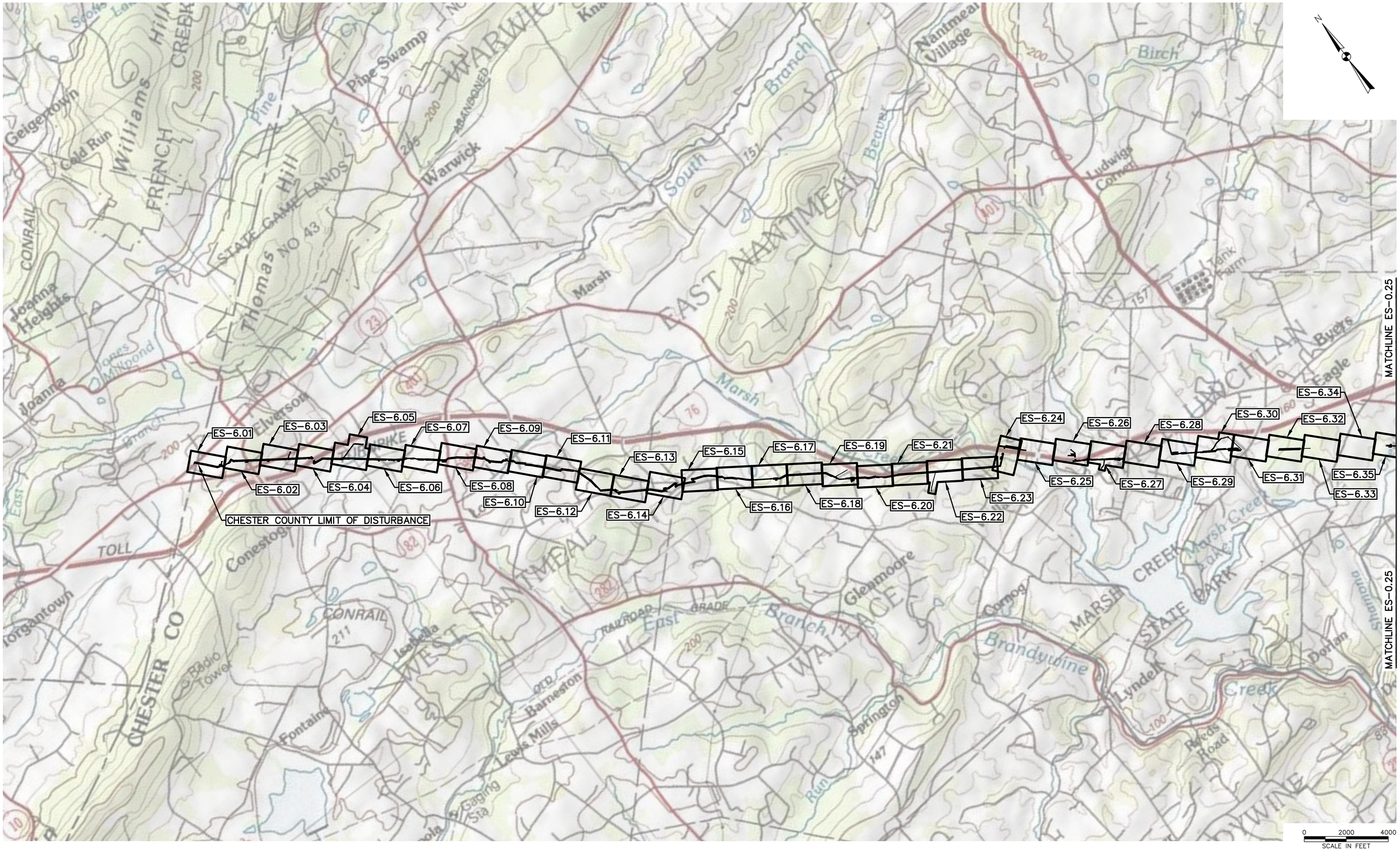
SHEET 0.23 OF 99



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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
ROBERT F. SIMCIK
2/6/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTRORATION PLAN
KEY PLAN (SHEET 1 OF 2)

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
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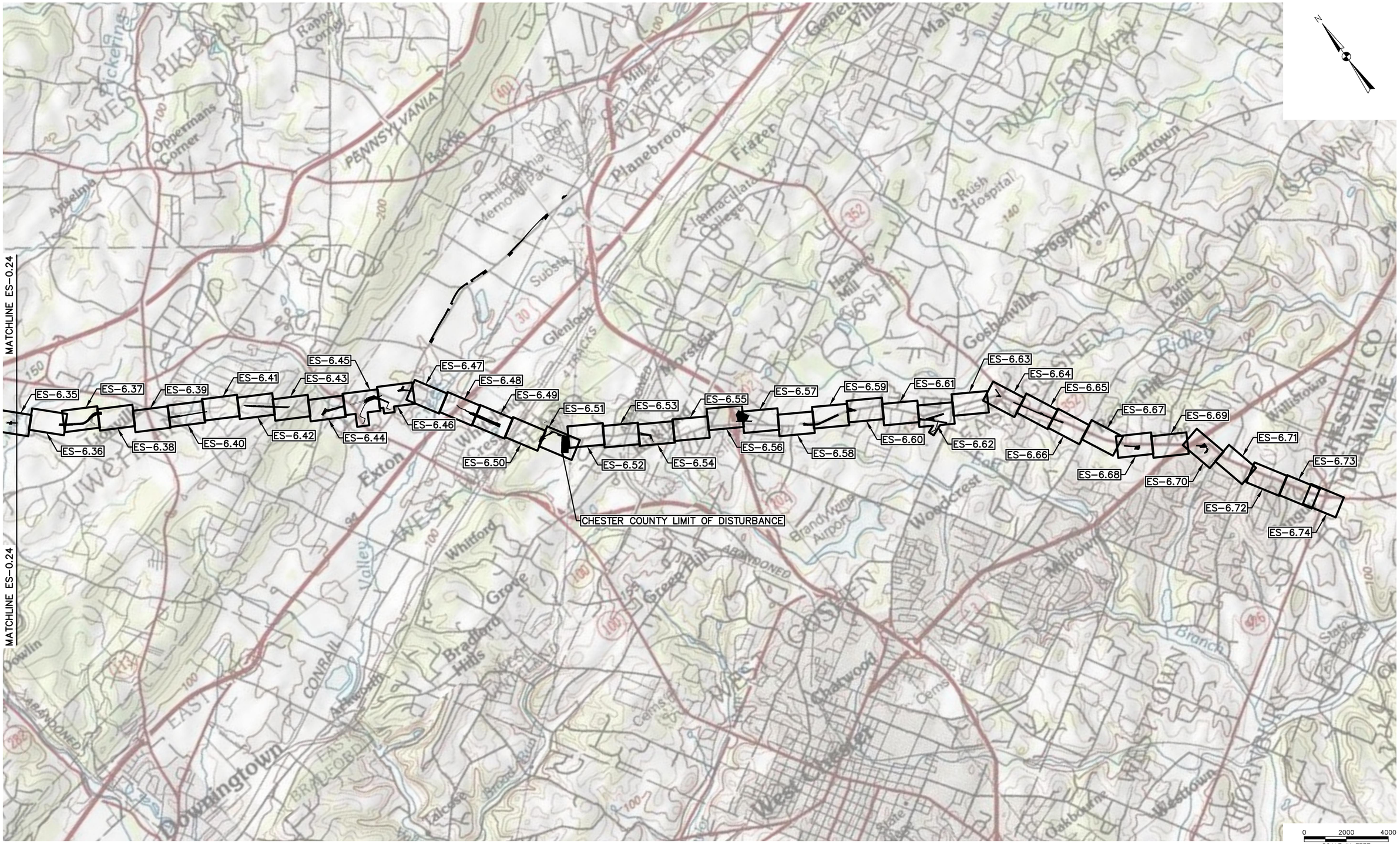

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
ROBERT F. SIMCIK

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTRORATION PLAN
KEY PLAN (SHEET 2 OF 2)

DATE:	2/6/17
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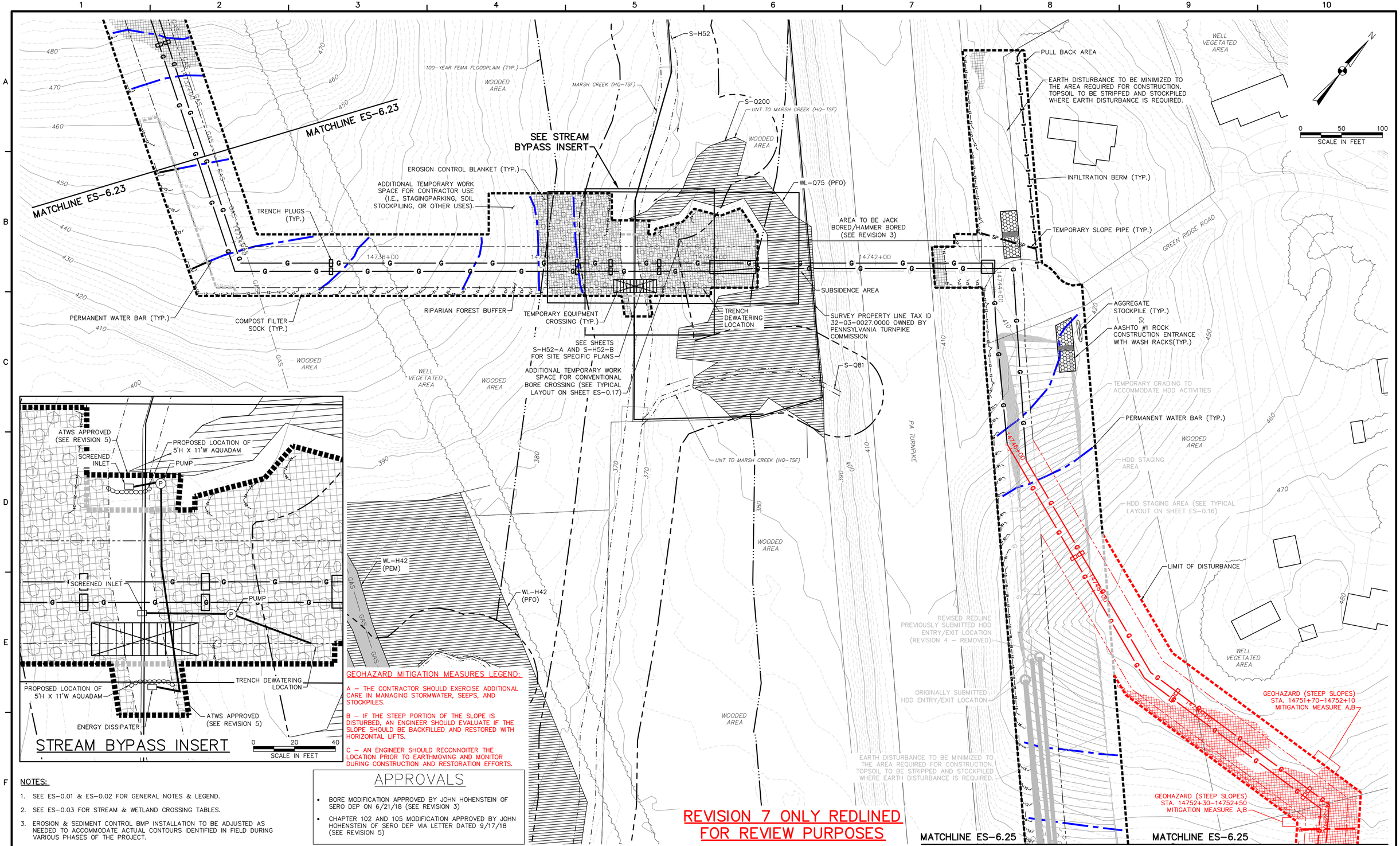

REVISION 7 ONLY REDLINED FOR REVIEW PURPOSES

GEOHAZARD MITIGATION MEASURES LEGEND:

A – THE CONTRACTOR SHOULD EXERCISE ADDITIONAL CARE IN MANAGING STORMWATER, SEEPS, AND STOCKPILES.

B – IF THE STEEP PORTION OF THE SLOPE IS DISTURBED, AN ENGINEER SHOULD EVALUATE IF THE SLOPE SHOULD BE BACKFILLED AND RESTORED WITH HORIZONTAL LIFTS.

C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

APPROVALS

- BORE MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP ON 6/21/18 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP VIA LETTER DATED 9/17/18 (SEE REVISION 5)

NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	3/5/18	BORE METHOD REVISION
4	RS	6/26/18	HDD AND CENTERLINE MODIFICATION
5	RS	8/3/18	ATWS ADDED FOR STREAM BYPASS INSERT
6	RS	12/17/18	PROPERTY LINE AND SUBSIDENCE ADDED
7	RS	3/12/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK NO. 044465-E 4/8/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 24 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
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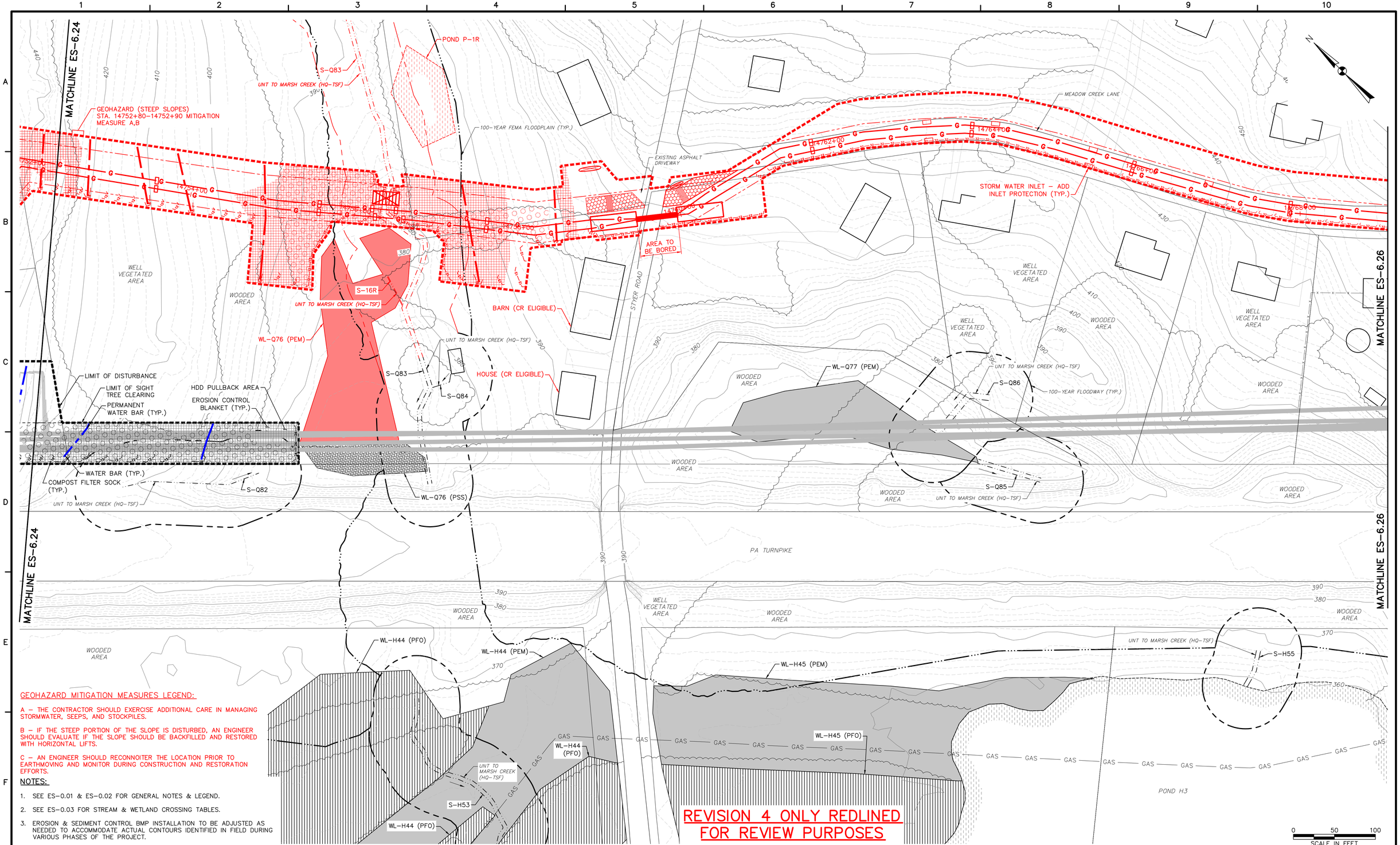

GEOHAZARD MITIGATION MEASURES LEGEND:

A – THE CONTRACTOR SHOULD EXERCISE ADDITIONAL CARE IN MANAGING STORMWATER, SEEPS, AND STOCKPILES.

B – IF THE STEEP PORTION OF THE SLOPE IS DISTURBED, AN ENGINEER SHOULD EVALUATE IF THE SLOPE SHOULD BE BACKFILLED AND RESTORED WITH HORIZONTAL LIFTS.

C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/26/18	HDD MODIFICATION
4	RS	3/12/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 044845-E 4/4/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 25 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
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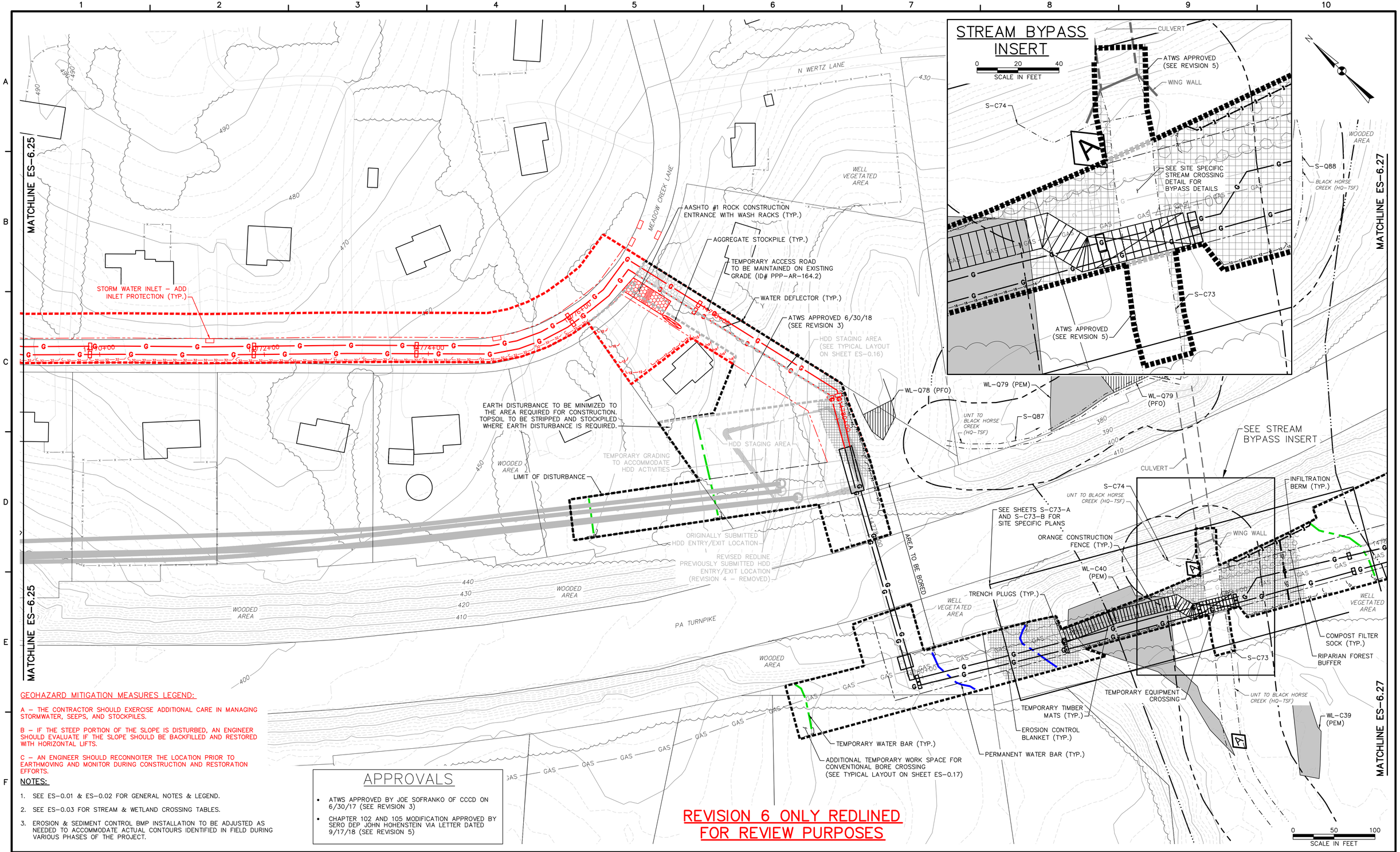

GEOHAZARD MITIGATION MEASURES LEGEND:

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1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

APPROVALS

- ATWS APPROVED BY JOE SOFRANKO OF CCCD ON 6/30/17 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY SERO DEP JOHN HOHENSTEIN VIA LETTER DATED 9/17/18 (SEE REVISION 5)

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/28/17	ATWS ADDED
4	RS	6/26/18	HDD MODIFICATION
5	RS	7/26/18	ATWS MODIFICATION AND STREAM BYPASS INSERT
6	RS	3/12/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 26 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
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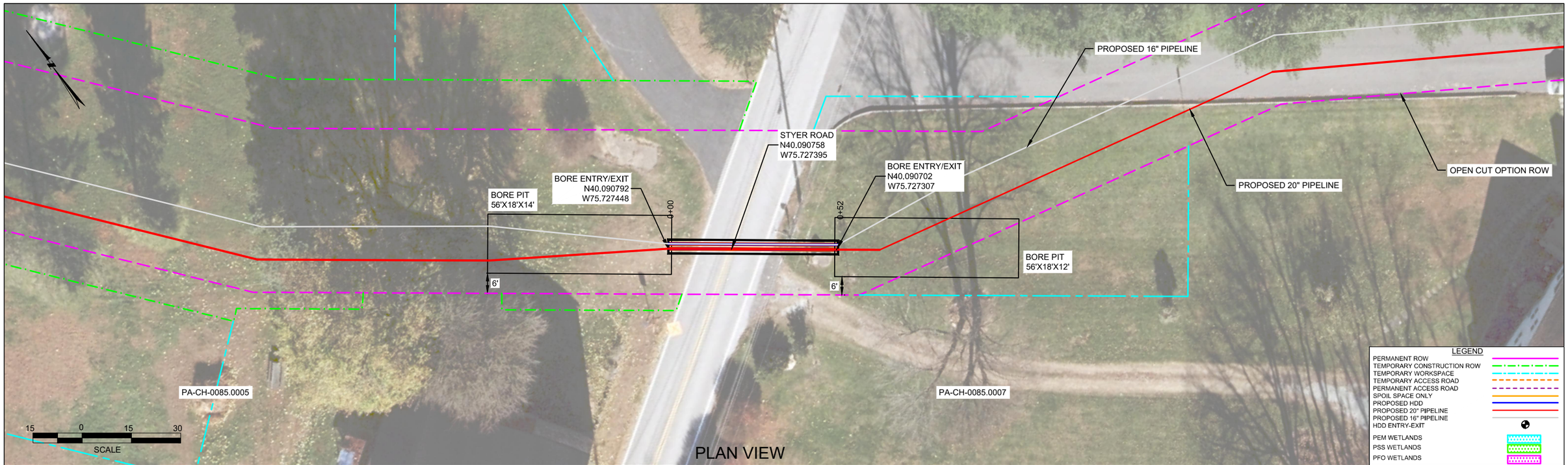
ATTACHMENT 3:

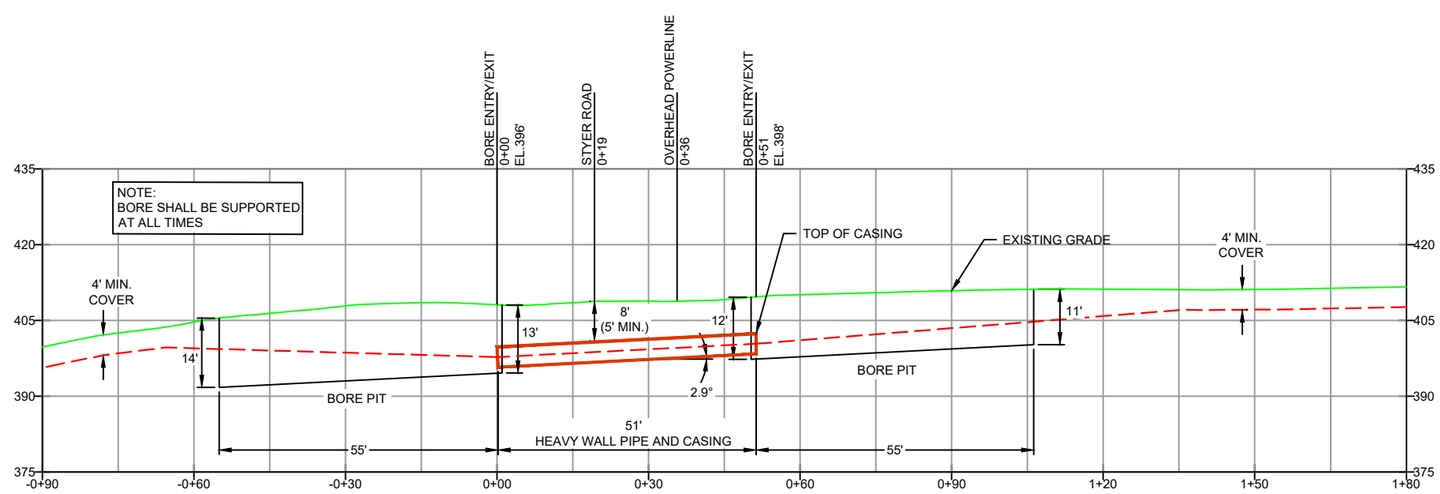
HDD Plans, Profiles and Auger Bore Drawings



PLAN VIEW

CHESTER COUNTY, PA - UPPER UWCHLAN TOWNSHIP

PROFILE VIEW



CONSTRUCTION NOTES

1. 20" AND 16" PIPE WILL BE BUNDLED TOGETHER AND INSTALLED INTO 48" x 0.750" W.T. x X-52 CASING USING AUGER BORE METHOD.
2. HORIZONTAL PIPE LENGTH (L) = 51'
   PIPE LENGTH (S) = 51'
3. 20" WELDED STEEL PIPE: 20" OD x 0.456" WT, X-65, API-5L, PSL2, ERW, BFW, DRL COATING 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCRETE R95)
4. 16" WELDED STEEL PIPE: 16" OD x 0.438" WT, X-70, API-5L, PSL2, ERW, BFW, DRL COATING 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCRETE R95)
5. 20" DESIGN PRESSURE: 1480 PSIG
6. 16" DESIGN PRESSURE: 2100 PSIG
7. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
8. THE COATING ON THE CARRIER PIPE SHALL BE INSPECTED IMMEDIATELY PRIOR TO ITS INSTALLATION AND ALL DAMAGED COATING SHALL BE REPAIRED IN ACCORDANCE WITH SUNOCO'S PIPELINE COATING SPECIFICATIONS.
9. INSTALL CATHODIC PROTECTION TEST LEADS AS SPECIFIED ON THE ALIGNMENT SHEETS OR SUNOCO CORROSION TECHNICIAN.
10. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
11. WELDED JOINTS INSIDE R.O.W. SHALL BE 100% X-RAYED.
12. CONTRACTOR WILL MAINTAIN A MINIMUM 4' OF COVER TO THE TOP OF PIPE USING FIELD BENDS.
13. CONTRACTOR WILL MAINTAIN A MINIMUM 24" OF COVER FROM ALL EXISTING UTILITIES.
14. CONTRACTOR WILL MAINTAIN A MINIMUM 5' OF COVER FROM BOTTOM OF STREAMS.
15. CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
16. IN ADDITION TO THE SITE-SPECIFIC INFORMATION PROVIDED IN THIS DRAWING, GENERAL REQUIREMENTS INCLUDED IN ALIGNMENT SHEETS, PERMITS AND APPROVAL FROM FEDERAL, STATE AND LOCAL AGENCIES ALSO APPLY.
17. SUNOCO PIPELINE, L.P.'S HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN CONTINGENCY PLAN WILL BE IMPLEMENTED AT ALL TIMES.
18. SUNOCO PIPELINE, L.P.'S EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED AT ALL TIMES.

NOTES

1. ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
2. STATIONING IS BASED ON HORIZONTAL DISTANCES.
3. ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP ARE NOT RESPONSIBLE FOR LOCATION OF FOREIGN UTILITIES SHOWN IN PLOT PLAN OR PROFILE. THE INFORMATION SHOWN HEREON IS FURNISHED WITHOUT LIABILITY ON THE PART OF ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP, FOR ANY DAMAGES RESULTING FROM ERRORS OR OMISSIONS THEREIN.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING

DWG NO		DWG NO	DESCRIPTION
ES-6.25	TO	ES-6.25	EROSION & SEDIMENT PLAN
SHEET 15	TO	SHEET 15	AERIAL SITE PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
0	ISSUED FOR CONSTRUCTION	MRS	0312/19	RMB	0312/19	AMC	0312/19

Sunoco Logistics Partners L.P.

TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

AUGER BORE (CASED)
STYER ROAD
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=30'

DWG. NO.: PA-CH-0085.0007-RD

ATTACHMENT 4:

Design Calculations and Construction Details

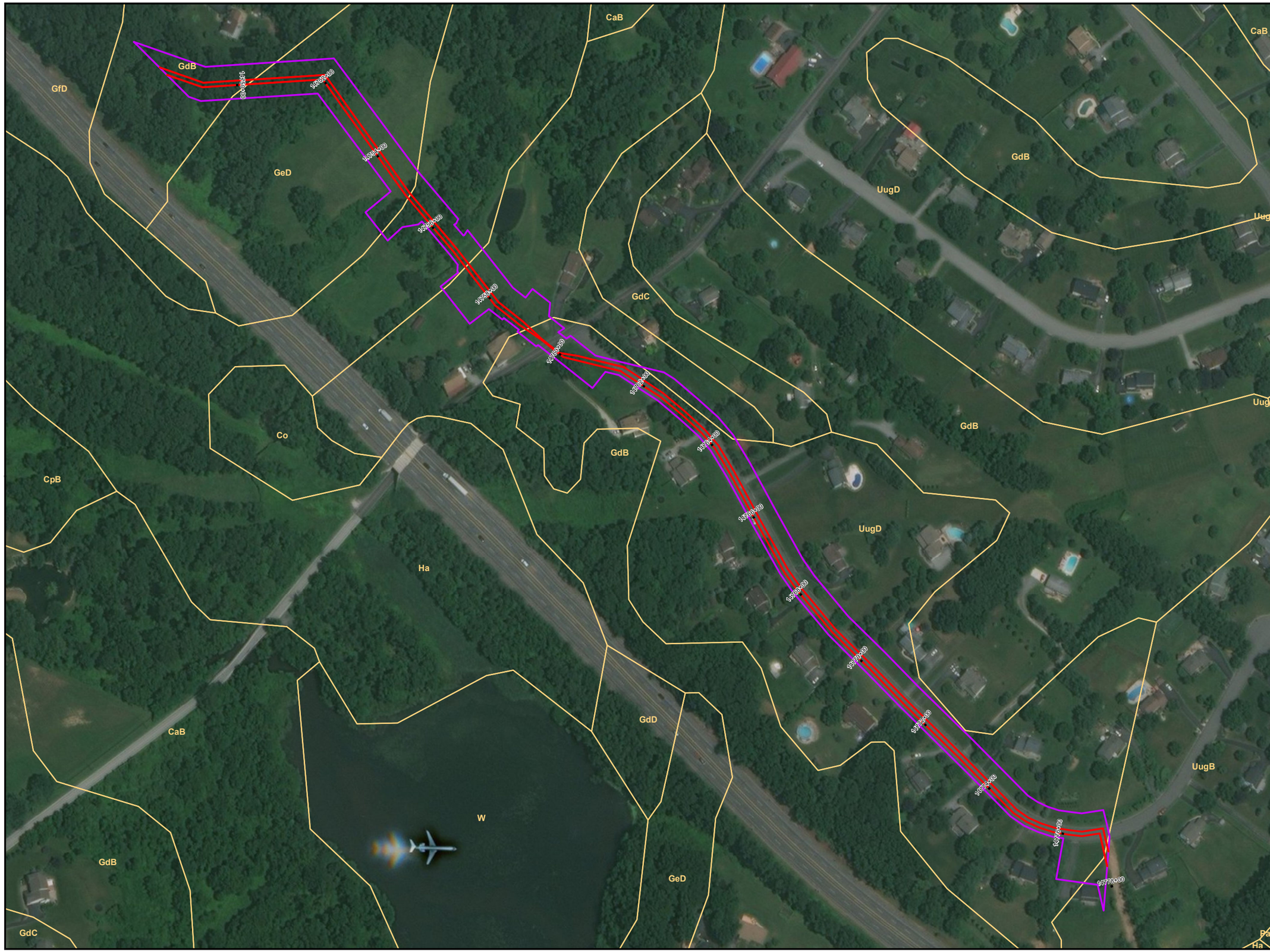
Compost Filter Sock Table				
Begin Sta.	End Sta.	Upstream Slope, (ft/ft)	Slope Length Above Measure, ft	Compost Filter Sock Size, in
14749+00 R	14752+00 R	0.17	284	32
14752+20 R	14752+70 R	0.24	58	12
14754+00 L	14754+80 L	0.16	57	12
14755+95 R	14756+20 R	0.08	151	12
14756+50 R	14757+40 R	0.09	88	12
14757+75 R	14758+10 R	0.11	87	12
14758+65 L	14758+65 L	0.17	182	24
14758+65 R	14759+40 R	0.12	154	18
14759+80 R	14760+95 R	0.12	78	12
14762+00 R	14776+60 R	0.07	500	32
14776+90 R	14777+90 R	0.09	129	12

ATTACHMENT 5:

Limiting Soil Characteristics Table, Soil Descriptions,

Soil and Geological Maps, KARST Plan

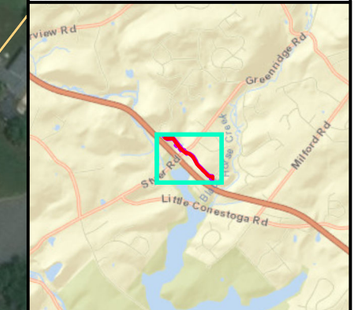
Soils Maps



Legend

- Stationing
- Major Modification
- Alignment Centerline
- Natural Resources Conservation Service (NRCS) Soils & Code

Sheet Identifier



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Feet: 0 100 200

Meters: 0 30.48 60.96

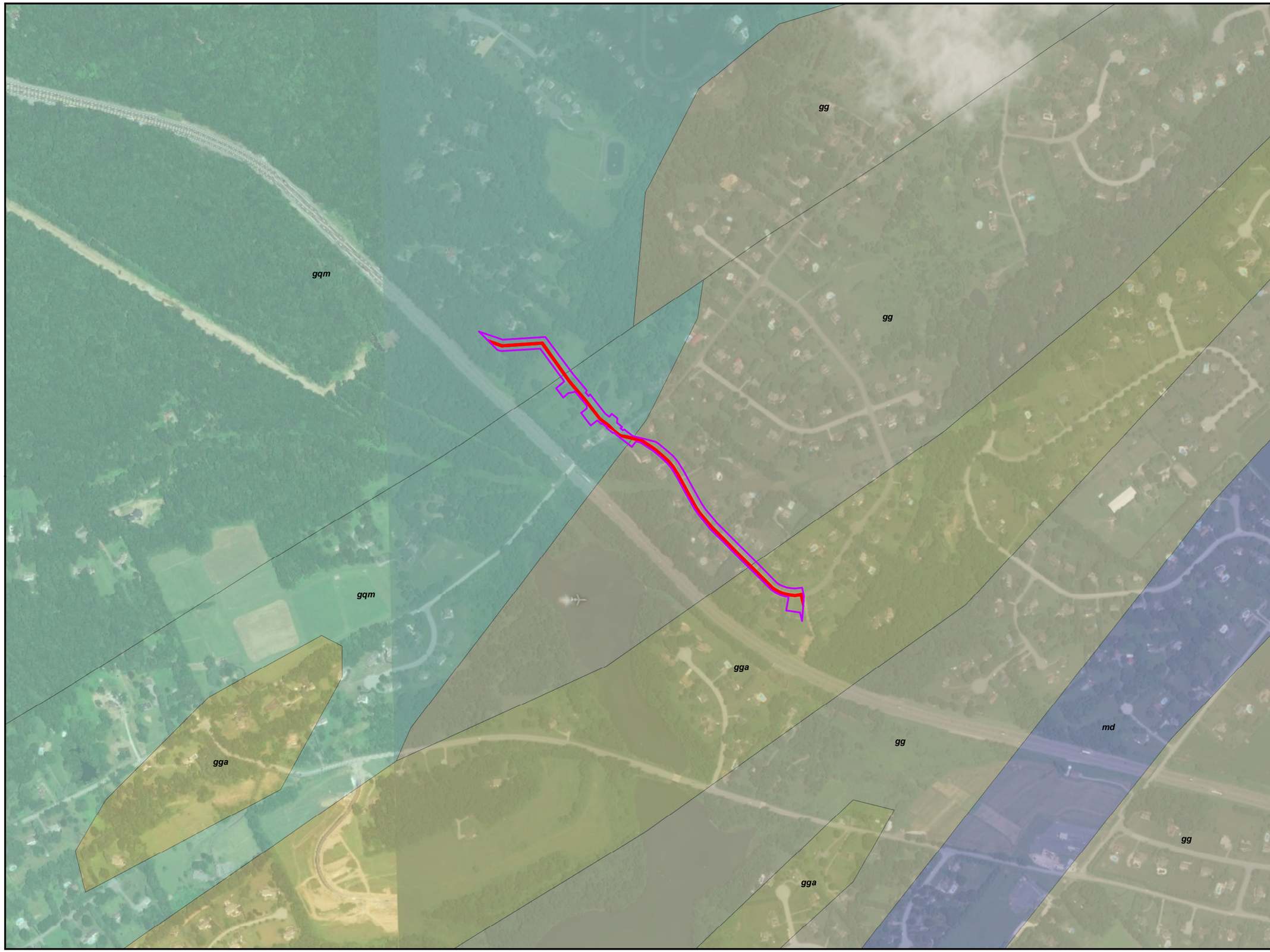
NRCS SOILS MAP
ATTATCHMENT 5
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY, PA

TETRA TECH

Notes:
Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP ESC\GP\PENNPIPELINE_SOUTHEAST_SOILS_ESCGP_OPT3_20190820.MXD 08/24/19 TT

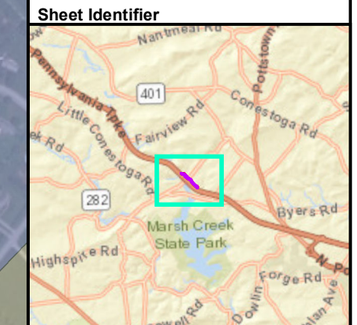
Formations Maps



Legend

- Major Modification
- Alignment Centerline
- Graphitic felsic gneiss (gg)
- Banded mafic gneiss (gga)
- Graphitic felsic gneiss (gqm)
- Metadiabase (md)

Sheet Identifier



N

0 300 600 Feet

0 91.5 183 Meters

GEOLOGIC UNIT MAP
ATTACHMENT 5
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

Notes:
Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2013 ESRI and its data suppliers).

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ATTACHMENT 12:

Geohazard Evaluation

TETRA TECH

MEMO

To:	Rob Simcik, Tetra Tech
Cc:	Megan Carson, Tetra Tech
From:	Bill Smith, PE, Tetra Tech
Date:	2/25/2019
Subject:	**PPP Turnpike 280 Reroute Major Modification - Desktop Geohazard Evaluation**

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
WILLIAM C. SMITH
ENGINEER
038102E

2/25/19

Tetra Tech performed a desktop geotechnical review of the proposed Turnpike 280 reroute using publicly available information to identify areas of potential concern along the proposed alignment and access roads with respect to potential geologic hazards. References included the following:

- PASDA, LiDAR topography, 2006 (UTM NAD83 Zone 17 Feet).
- PASDA, Karst features, PADCNR, 2007.
- PADCNR Scans of USGS Landslide Inventory Maps for PA. PADCNR 8/29/2017.
- NCRS Soil Survey for Chester County, PA, Web Soil Survey.
- Chester County Multi-Jurisdictional Hazard Mitigation Plan, 2015. Chester County Department of Emergency Services, October 2015.
- PADEP (2018) https://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Arsenic-in-Drinking-Water.aspx
- PADEP (2016) Technology Enhanced Naturally Occurring Radioactive Materials (TENORM) Study Report
- http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=5815&DocName=01%20PENNSYLVANIA%20DEPARTMENT%20OF%20ENVIRONMENTAL%20PROTECTION%20TENORM%20STUDY%20REPORT%20REV%201.PDF%20
- US Geological Survey (2006). Arsenic in Coal. Fact Sheet 2005-3152
- US Geological Survey (2013). Arsenic Concentrations, Related Environmental Factors, and the Predicted Probability of Elevated Arsenic in Groundwater in Pennsylvania. Scientific Investigations Report 2012-5257.

Figure 1 depicts the pipeline right-of-way and the 600' study corridor for the geohazard evaluation. This figure shows documented and suspected landslides, steep slopes, karst features, and soils that are prone to slipping.

A separate coal and mining review was conducted and is included as Attachment A.

Tetra Tech, Inc.
661 Andersen Drive, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

USGS Landslide Inventory Review

The Major Modification alignment does not intersect any areas of old landslides or active or recently active landslides as designated by USGS. The Chester County Multi-Jurisdictional Hazard Mitigation Plan indicates that landslides in Chester County are unlikely given its topography.

Topographic Review for Recent Landslides

Recent PASDA LiDAR topography was reviewed for evidence of suspected landslides or earthflow. The Major Modification alignment does not intersect any suspected landslides based on topographic review.

Steep Slopes

Steep slopes (greater than 2 horizontal to 1 vertical) were evaluated along the pipeline alignment. Steep slopes along the pipeline alignment are located in the following approximate areas:

- Station 14751+70 to 14752+10,
- Station 14752+30 to 14752+50, and
- Station 14752+80 to 14752+90.

Soil Type Review

The soil types were assessed to ascertain which types intersected the pipeline and access roads. Each soil type and the corresponding Soil Slippage Potential, as designated by NCRS, are listed below. The soil slippage potential is the hazard that a mass of soil will slip when vegetation is removed, soil water is at or near saturation, and other normal practices are applied.

Soils along the Turnpike 280 Major Modification include:

Soil Symbol	Map Unit Name	Slippage Rating
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	NR
GeD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	NR
Ha	Hatboro silt loam	NR
UugB	Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes	NR
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	NR

NR = No Rating

Soil types are overlaid on the alignment on Figure 1. There are no soils that have a high soil slippage rating along the pipeline LOD.

Karst/Sinkhole Formations

There are no PA DCNR karst features in the major modification alignment.

Coal and Mining Review

The coal and mining review is provided in Attachment A and summarized here.

There are no coal seams or coal bearing units in Chester County. Research of available published information indicates no deep, underground or surface mining has occurred or is permitted along the modification route

In the Piedmont physiographic province, dark shales, sulfide mineralized areas, fractured rocks and rocks with little calcareous material have the potential to produce acidic discharges; however, according to PGS (2005), Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss are not noted as acid-producing.

If coal or black shales are encountered during excavation for the project, the potential impact from acid producing minerals is expected to be minimal due to the shallow excavation and most of these shallow areas would not contain pollution-forming minerals as the material is expected to be highly weathered. BMPs will be used to mitigate potential impacts from encountering acid-producing rock formations.

Radiation

Most soils and rocks contain low-levels of naturally occurring radioactive material (NORM). This material can be concentrated through physical or chemical processing resulting in technologically enhanced NORM called TENORM. Examples of TENORM containing materials include fire brick, water and wastewater treatment residuals, coal ash and decorative polished rock commonly used in building or home construction. The three primary naturally radioactive elements are potassium, thorium, and uranium. Both potassium and thorium are typically found in insoluble minerals and unlikely to present any issues. Uranium is common in marine, organic-rich, black shales, which are the primary radioactive mineral bearing formations, but sometimes occurs in non-marine, organic-rich, black shales.

Formations designated by the PADEP that pose a high radioactive risk include the Antes Formation (Utica), Mandata Formation, Marcellus Formation, Burket Member of the Harrell Formation, and Lockatong Formation. None of these formations are found near the surface in southwestern Pennsylvania or the project area, and this project will not involve Marcellus/Utica drill cuttings or flowback fluids.

Arsenic

Arsenic occurs naturally in trace amounts in soil, water, rocks, including coal (within the pyrite and organic portions), and can be in mine drainage. While coal and associated trace mineral Arsenic, is prevalent throughout southwest Pennsylvania and the project area, the project is not crossing any known mining waste areas which may have elevated levels of arsenic.

Mitigation Plan

The following areas of the Turnpike 280 Major Modification are at an increased risk of soil slippage or sliding from a geologic hazard.

Station	Potential Geologic Hazard	Mitigation Measures
14751+70 to 14752+10	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles.

		If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.
Station 14752+30 to 14752+50	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles. If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.
Station 14752+80 to 14752+90	Steep slopes	The contractor should exercise additional care in managing stormwater, seeps, and stockpiles. If the steep portion of the slope is disturbed, an engineer should evaluate if the slope should be backfilled and restored with horizontal lifts.

Conclusions/Recommendations

Based on this desktop geohazard evaluation, the Turnpike 280 Major Modification does not intersect any known or suspected landslide areas but does intersects several areas of steep slopes that constitute potential geohazards, and mitigation measures may be warranted. Suggested mitigation measures are outlined above to focus inspection efforts and call attention to several areas requiring special attention by inspectors and engineers during construction and restoration to enable prevention and early detection of a problem if one develops.

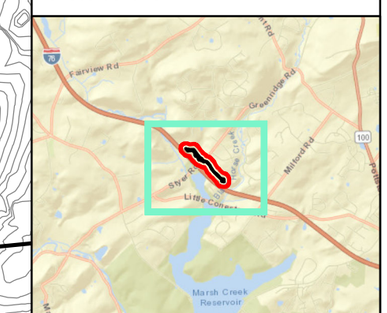
*** End ***

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\TURNPIKE_280_GEOHAZARD.MXD 04/01/19 PD

Legend

- PA State Road
- PA Local Road
- 16in Centerline
- 20in Centerline
- DCNR Karst Feature
- Limit of Disturbance
- 300ft Buffer
- Soil Boundary
- Active or Recently Active Landslide, USGS
- Old Landslide, USGS
- Suspected Landslide Area, Topographic Review
- Slope>3:1
- 0+00 2' Contour
- Pipe Station

Sheet Identifier



Feet: 0 250 500

Meters: 0 76.2 152.4

FIGURE 1
GEOHAZARD EVALUATION
PENNSYLVANIA PIPELINE PROJECT
TURNPIKE 280 MAJOR MODIFICATION
SUNOCO LOGISTICS, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

PASDA LIDAR TOPOGRAPHY, 2006
(UTM NAD83 ZONE 17 FEET).

Attachment A

Coal and Mining Review

PPP Turnpike 280 Major Modification

April 1, 2019

Sunoco Pipeline L.P.
535 Fritztown Road
Sinking Spring, PA 19608

Subject: Pennsylvania Pipeline Project- 280 Major Modification
Acid-Forming Formations, Coal, and Mining Review
Chester County, Pennsylvania

Tetra Tech, Inc. (Tetra Tech) has prepared this review for Sunoco Pipeline L.P. (SPLP) to evaluate the coal and mining along the proposed HDD 280 Major Modification Project located in Upper Uwchlan Township, Chester County, Pennsylvania.

The purpose of this modification for a change in the route and installation method for the 16-inch and 20-inch diameter pipeline previously permitted as a Horizontal Directional Drill (HDD) to an open cut and conventional bore installation. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration.

Site Description
The project area crosses the Piedmont Upland Section of the Piedmont Province. Bedrock underlying the modification project area consists of Precambrian, Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss. Gneiss is a medium to coarse grained metamorphic rock and commonly consists of quartz, orthoclase, hornblende, biotite, and graphite.

Coal and Mining Conditions
There are no coal seams or coal bearing units in Chester County, refer to attached DCNR Map 11, Distribution of Pennsylvania Coals. Research of available published information indicates no deep, underground or surface mining has occurred or is permitted for the modification route (eMap).

Evaluation of Potential of Encountering Acid-Producing Formations
In the Piedmont physiographic province, some sulfide mineralization material has the potential to produce acidic discharges, particularly in the Pickering Gneiss (PGS, 2005). Acidic discharges are the result of down-dip drainage of ground water that has intersected and reacted with the sulfide-bearing minerals. However, acidic drainage may not always occur within those units.

If coal or black shales are encountered during excavation for the project, the potential impact from acid producing minerals is expected to be minimal due to the shallow excavation for the pipeline trench (less than 7 feet). It is our opinion that most of these shallow areas would not contain pollution-forming minerals as the material is expected to be highly weathered and the majority of the pollution-forming minerals leached from the material due to years of weathering cycles. The low risk of acid drainage from shallow weathered material is also noted in PADEP's *How to Avoid and Handle Acid-Producing Rock Formations Encountered during Well Site Development*.

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Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

No coal-bearing rocks or AMD discharges are noted within the project area on eMAP. According to PGS (2005), the Graphitic felsic gneiss, Graphitic gneiss, and Banded mafic gneiss are not noted as acid-producing.

Measures to Prevent or Mitigate Acidic Discharges

If the trench excavation encounters an acidic discharge, changes to the volume or chemistry are not anticipated. The trenching would not increase or decrease the volume of acidic discharges because the volume is controlled by precipitation and hydro-geologic parameters. The chemistry of acidic discharges is not anticipated to change due to the shallow excavation into weathered material.

Several measures will be implemented to reduce the potential and mitigate for pollution from trench excavation activities that encounter coal, black shale, or acidic discharges. These measures are as follows:

- When coal, black shale, or other acid-forming material is encountered during the excavation, the excavated material will be covered with tarps, mats, or blankets. Water is to be directed away from the temporary stockpiled material and the trench until the material is returned to the trench.
- If water accumulates in the trench within the areas of excavated acid-forming material, use a field pH meter to test the pH of the water. If the pH is between 6.0 to 9.0 standard units, inclusive, pump water that accumulates in the trench through a filter bag and slowly discharge to a well vegetated area. If the water pH is not within 6.0 to 9.0 range, collect the water and transfer to an approved treatment facility.
- Backfill the trench with the removed material and conduct alkaline addition by following PADEP's *How to Avoid and Handle Acid-Producing Rock Formations Encountered during Well Site Development*. Fact Sheet 5600-FS-DEP4284.
- Additional trench plugs may be needed to limit water encountering the coal material along the sides of the trench. Trench plugs to seal off the acid-forming material should consist of clay.
- Perform immediate stabilization of the pipe ROW after installation of the pipe by returning the area to original topographic grade.
- Prepare the disturbed area for permanent seeding with the use of lime and fertilizer. It is recommended to test the soil in areas of past surface/strip mines, or where coal or black shale are near the surface to determine the optimum liming rate. In the absence of testing, apply at 6 tons/acre. Limestone is applied to neutralize the acidity in soil. Blending of soils is recommended to mix potentially acidic materials with materials that have buffering capacity.
- Immediately mulch and seed all disturbed areas with the temporary and/or permanent seed mixture. PADEP and Penn State University have identified seed mixes that are more suited to acidic conditions and should be applied when acid-forming materials are near the surface.
- Monitor the areas until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established.
- If acid-forming material is to be hauled offsite, waste materials are to be disposed of at an approved DEP waste site (permitted coal refuse area or landfill).

TETRA TECH

Closing

If you have any questions or comments, please feel free to contact me at 412-921-8051 or heather.trexler@tetratech.com.

Sincerely,

Heather Trexler

Heather Trexler, P.G.
Project Manager, Energy and Natural Resources Department

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
HEATHER ANNE TREXLER
GEOLOGIST
PG004798

Enclosures

References

Pennsylvania Department of Conservation and Natural Resources. 2019. Pennsylvania Geologic Data Exploration (PaGEODE) http://www.gis.dcnr.state.pa.us/geology/index.html

Pennsylvania Department of Environmental Protection. 2019. eMapPA http://www.depgis.state.pa.us/emappa/

Pennsylvania Department of Environmental Protection (PADEP). 2014. How to avoid and handle acid-producing rock formations encountered during well site development. Fact Sheet 5600-FS-DEP4284

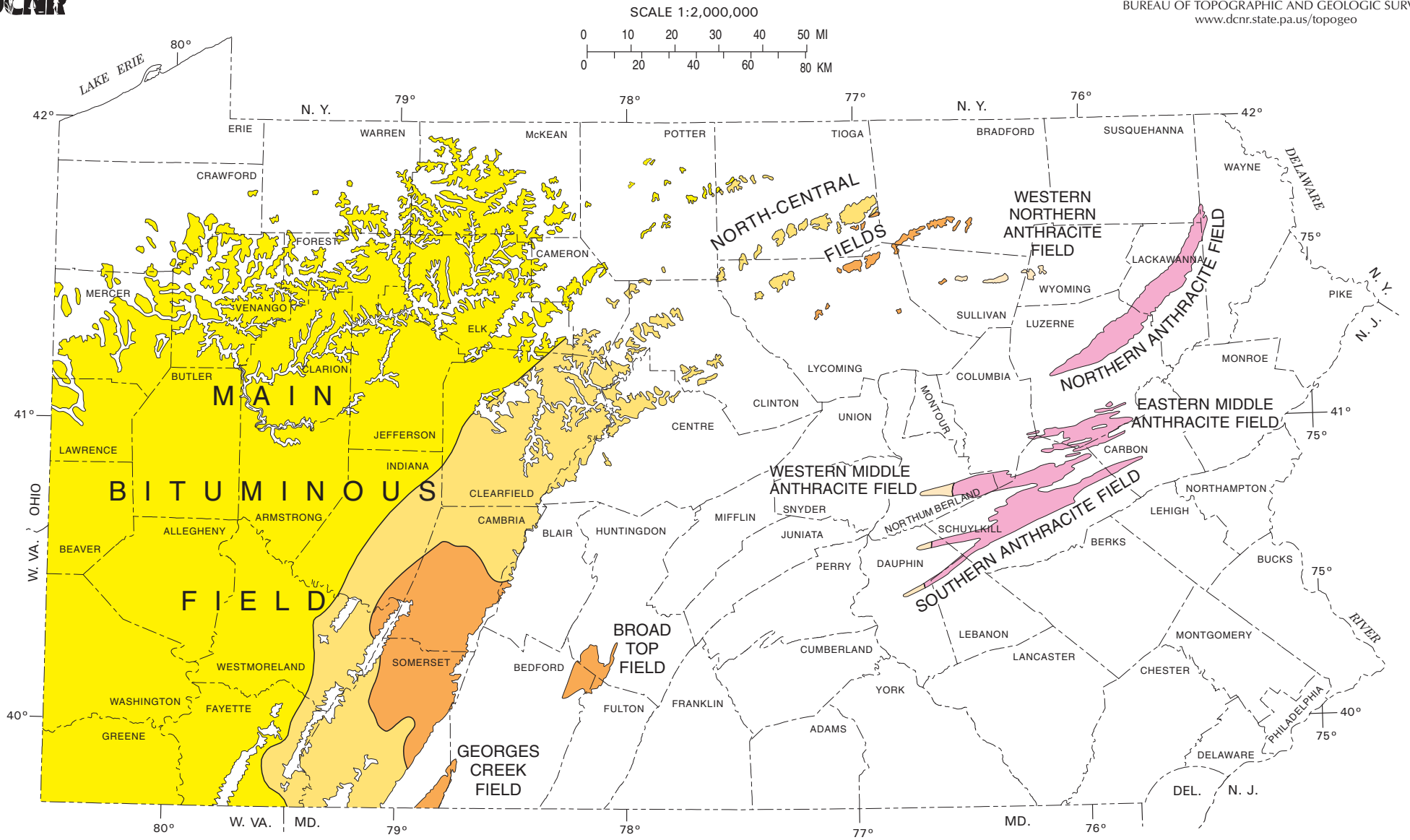
Pennsylvania Geologic Society (PGS). 2005. Geologic units containing potentially significant acid-producing sulfide minerals. Pennsylvania Geological Survey. 4th Ser. Open-File Report OFMI 05-01.1.

Figures

MAP 11

DISTRIBUTION OF PENNSYLVANIA COALS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

BITUMINOUS FIELDS

- High-volatile bituminous coal
- Medium-volatile bituminous coal
- Low-volatile bituminous coal

ANTHRACITE FIELDS

- Semi-anthracite
- Anthracite

Prepared by Bureau of Topographic and Geologic Survey.
Third Edition, Revised, 2000; Third Printing, 2008.

2200–MP–DCNR0855
Printed on Recycled Paper

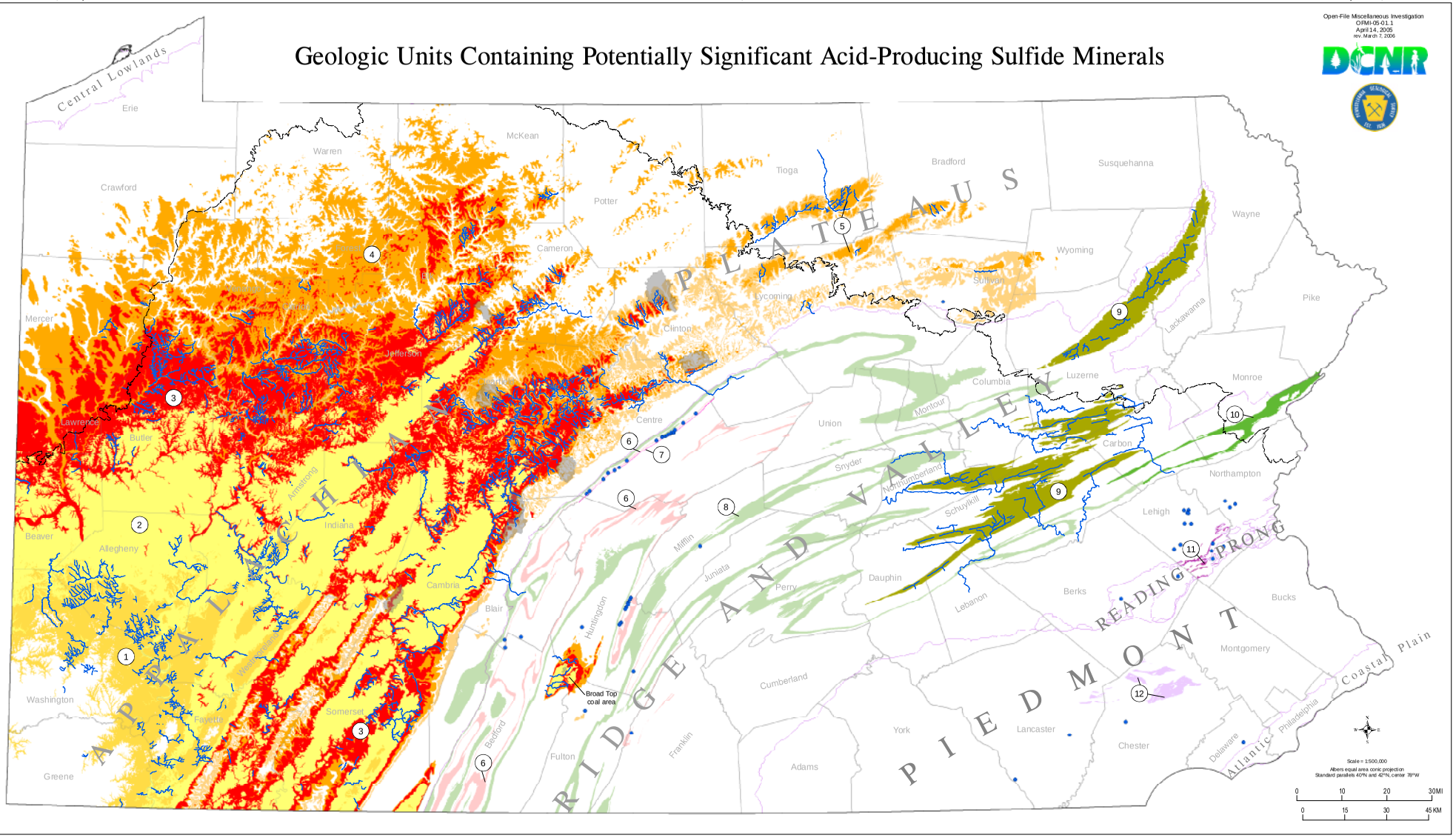
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Michael DiBerardinis, Secretary

COMMONWEALTH OF PENNSYLVANIA
Edward G. Rendell, Governor

BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
Jay B. Parrish, Director

Open-File Miscellaneous Investigation
OFMI-05-01.1
April 14, 2005
rev. March 7, 2006

Geologic Units Containing Potentially Significant Acid-Producing Sulfide Minerals



EXPLANATION

Map Compilation Notes

Original map scale is 1:500,000. The map is not intended to be used for detailed or site-specific analyses, nor is it intended to be used at any scale finer than 1:250,000 (for example, use at 1:24,000 or 1:100,00 scales is inappropriate).

Map rock formation color does not imply "risk" or potential of acid drainage, but only represents different geologic units.

Bedrock geology units are based on the digital compilation by Miles and Whitfield, 2001.

Map Layers

Point locations of potentially significant sulfide mineralization based on published and unpublished information, Pennsylvania Geological Survey (PaGS).

Late Wisconsinan glacial border (PaGS, 1995).

Preliminary landform subdivisions of Pennsylvania (PaGS, 1998).

Streams impaired by abandoned mine drainage from 1998 to 2004 with problems listed as including pH and/or metals, Pennsylvania Department of Environmental Protection, 2004.

Areas declared by Pennsylvania Department of Environmental Protection to be unsuitable for mining due to potential AD.

Appalachian Plateaus

(1) Monongahela Group and Waynesburg Formation. Includes known problematic coals such as the Pittsburgh and Waynesburg coals (and underclays), and the Sewickley coals, which can also have acidic drainage.

(2) Conemaugh Group. Includes the Casselman and Glenshaw Formations, and the Conemaugh Formation of the Broadtop coal region in northeastern Bedford and southern Huntingdon Counties. Although typically not as problematic as other coal-bearing units, the Conemaugh can produce acid drainage.

(3) Allegheny Formation. Includes problematic coals such as the Clarion, Lower Kittanning, and Middle Kittanning coals. Fewer problems occur with the Upper Kittanning and Freeport coals.

(4) Pottsville Formation, in western Pennsylvania, and Pottsville and Allegheny Formations, undivided, in north-central Pennsylvania. Especially east and southeast of the plateau along the Allegheny Front; includes the Mercer coals, which can be problematic. Calcareous minerals are rare in the Pottsville.

(5) Burgoon Formation, in north-central Pennsylvania and along the Allegheny Front.

Ridge and Valley

(6) The Tuscarora Formation in Huntingdon, Bedford, Blair, and Centre Counties, and in the Metal Township area, Franklin County.

Ridge and Valley

(7) The Bald Eagle Formation along Bald Eagle ridge in Centre County.

(8) The top of Ridgeley Formation through base of Marcellus Formation (including the Onondaga Formation). Map units shown are the Ridgeley member of the Old Port Formation, Onondaga Formation, Onondaga and Old Port Formations, undivided, and the Hamilton Group, but only the top of the Ridgeley and the base of the Marcellus are targets.

(9) The anthracite coal fields in eastern Pennsylvania (includes the Pottsville and Llewellyn Formations).

(10) In the Carbon and Monroe Counties area, the top of Palmerton Sandstone through base of Marcellus Formation, Carbon County. Map units include Buttermilk Falls Limestone through Esopus Formation, undivided, and the Marcellus Formation, but only the top of Palmerton Sandstone and the base of Marcellus Formation are targets.

Piedmont and Reading Prong

(11) The base of Hardyston Formation in Lehigh County. All of the Hardyston Formation in Lehigh County is shown.

(12) The Pickering Gneiss. Map unit is the graphitic felsic gneiss.

Potential Acidic Rock Units in Pennsylvania

Typical geologic weathering of undisturbed rock is a slow process involving the natural stability of minerals on the Earth's surface. In most cases in Pennsylvania, acidic drainage involves iron sulfide minerals such as pyrite and its exposure to air to create iron oxides and acidic water. Naturally occurring acute acid drainage is uncommon in Pennsylvania. In every significant case, it is the exposure of iron sulfides to air by dropping the water table or *excavating rock*, the lack of any inherent buffering capability, and the flow of water through the rocks that create acidic drainage.

The chemistry of acid drainage (AD) is understood, and prediction of AD is possible through a combination of several methods. Experience and understanding of specific geologic formations and combinations of geologic units on a regional and local scale are used to assess the potential for acidic drainage. Quantitative onsite prediction of acidic drainage has become possible through the geochemical analysis of the rocks. Calculations of acid-base balance based on neutralization potential and potential acidity can be used to quantitatively predict whether disturbance of a site will cause AD. Such calculations in conjunction with site history and experience, along with judgments with regard to geology and site hydrology, allow accurate predictions to be made.

Although specific geologic units are known to possibly cause problems, numerous factors influence the outcome of mining or excavation of the rock unit. The presence of buffering substances (mainly calcareous minerals) is a chief factor in preventing the development of AD. The occurrence of calcareous minerals is related to the rock type and the depositional environment of rocks at the site. Calcareous minerals can prevent the occurrence of AD in rocks that contain acid-forming minerals. In addition, the kinetics of the reaction may not allow AD to be seen for years.

Coal-bearing rocks of Pennsylvania have been a particular source of AD. However, all coal units and associated formations are not equal sources. Some geologic units are typically AD free; others are commonly sources of AD. Some units will produce AD depending on the overburden composition at the site.

In the Appalachian plateaus of western Pennsylvania, the extent of knowledge is typically based on the mining of coal. Less is known about units that have not traditionally been mined. For specific information about coal mine prediction of these mainly coal containing units, see the report *Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania* (Brady and others, 1998). The source of acidity (iron sulfides) is typically depositional, although structural features may have enhanced the occurence of sulfides.

The abundance and distribution of sulfides in the Appalachian plateaus are often related to depositional environment, whereas the sulfides in the Ridge and Valley physiographic province have been more affected by Alleghanian structural features (faults, fractures, lineaments, etc.) and fluid movement. To the southeast in the Piedmont, structural complexities and metamorphism combine to defy simple explanation of the occurrence of sulfide mineralization. Where sulfides are not areally large or discontinuous, scattered point occurrences of sulfide mineralization are shown on the map.

This map indicates formations that may have acid-forming minerals, primarily pyrite. Although this map is useful for general planning and preliminary site studies, it does not substitute for site-specific subsurface investigations of the rock units that will be disturbed through excavation, mining, or drilling. The occurrence of AD depends on numerous factors, including rock type, mineralogy, geochemistry, geologic structure (e.g., fractures, joints, and faults), changing the water table, surface and sub-surface hydrology, extent of geologic weathering, and depositional environments.

In addition, the extent of Wisconsinan glaciation is indicated on the map. The Wisconsinan glaciation may have removed weathered (oxidized) rocks. Thus the "inert" oxidized zone that typically blankets most rocks in Pennsylvania may be thin or absent in glaciated areas. The effect of older glacial episodes on the oxidized bedrock is not well understood.

The map indicates geologic units and points that may have the potential to generate AD. It of course does not guarantee that AD will occur or conversely, that AD cannot occur in other areas and formations not shown on this map. The occurrence of AD, therefore, is not restricted to the areas delineated on the map.

Site-specific assessment of AD potential is the only reliable way to predict it. Pre-site investigation data is often available from previous studies, including college theses, consultant reports, geologic survey reports, aerial photographs, existing geophysical surveys, and the like. There is, however, no substitute for site specific information including interviews with local residents, geologic logs of borings, analysis of site geochemistry (water and rock), and other sources of information.

General guidelines on recognizing potential acid-producing rock in Pennsylvania

The presence of sulfide-bearing rock formations and isolated occurrences of sulfide deposits in Pennsylvania depends on a wide variety of factors including the rock's depositional and structural history, its mineralogy and geochemistry, and present surface and subsurface hydrologic and geochemical environment.

The common iron-sulfide minerals pyrite (FeS_2) and less common pyrrhotite (FeS) and marcasite (FeS_2) are the dominant sources of acidity. However, specific buffering minerals can offset their presence, and the groundwater and surface water setting can control the development of AD.

Appalachian Plateaus

(1) (2) (3) (4) (5)

In the Appalachian Plateaus physiographic province, the source of acidity (iron sulfides) is typically depositional, although structural features such as faults and lineaments may enhance the occurrence of sulfides or flow of groundwater. Sulfide minerals are associated with coal-bearing rocks, some underclays, and black shales.

Every coal-bearing unit in western Pennsylvania has some potential for AD. Potentially acid-producing rocks include underclays beneath coals, the coal beds themselves, or rocks of the coal overburden. Black shales may contain significant quantities of iron sulfides. The overburden of coals associated with marine or fresh water units are less likely to yield AD than marginal marine (brackish) units due to the association of limestones and other calcareous units with marine and freshwater environments.

Some geologic units may contain only moderate levels of pyrite, but lack buffering calcareous minerals. Sandstones in the Allegheny and Pottsville Formations and the Burgoon Sandstone fall into this category.

A history of AMD, presence of black shales, rocks with low amounts of calcareous minerals, or rocks with pyritic minerals are those that should be especially considered as having the potential to produce AD. However, an unmined area with no acidic drainage does not necessarily mean that there is not a possibility of AD when rocks are excavated or the water table drops and exposes acidic rocks.

Ridge and Valley

(6) (7) (8) (9) (10)

Dark shales, sulfide mineralized areas, fractured rocks, and rocks with little calcareous material are zones that should be considered as having the potential to produce AD in the Ridge and Valley physiographic province. This could include formations with thin dark shale layers that are not listed on the map (for example, the Mifflintown Formation in central Pennsylvania).

Dark shales commonly hold primary sulfide minerals derived from its specific depositional environment. The Tuscarora Formation, a sandstone, is the host of some secondary mineralization based on its proximity to a source of sulfide minerals, insignificant calcareous material, and its tendency to fracture. Mobile sulfide-bearing solutions amassed in secondary spaces of the rock based on complex factors such as intersecting fractures and source fluid movement. Similar conditions may occur in carbonate rocks, but because of their dominant calcareous composition, they pose no known threat of AD.

Concentrated sulfide mineralization may be evident on the surface in the form of oxidized pyrite, leaving behind various iron oxide minerals as gossan. Newly excavated material beneath a gossan cap should be monitored for its ability to produce AD. The presence of sulfide minerals is typically apparent because of their production of iron oxide minerals. However, the potential of AD by rocks such as black shales that can have disseminated microscopic pyrite may be evident only through geochemical analysis.

Anthracite Region

(9)

The Anthracite Region is part of the Ridge and Valley physiographic province. Acid problems can occur when pyritic coal associated rocks are disturbed. The chemistry of the rock between the coals is poorly understood, but the presence of acid mine drainage from more than a century of mining indicates that the potential for acid drainage exists and caution should be exercised when excavating material.

Piedmont and Reading Prong

(11) (12)

Some sulfide mineralization is associated with the Pickering Gneiss and other formations. However, lithologic and structural complexity and regional metamorphism combine to make prediction of sulfide mineralization difficult. It is unlikely that all mineralization has been discovered. Scattered point occurrences of sulfide mineralization attest to the wide distribution of such mineralized areas.

As noted previously, site-specific assessment of AD potential is the only reliable way to predict it.

References

Brady, K., Smith, M. W., and Schueck, J. (editors), 1998, Coal mine drainage prediction and pollution prevention in Pennsylvania, Pennsylvania Department of Environmental Protection, 375 p., URL link: [http://www.dep.state.pa.us/dep/deputate/minres/districts/CMDP/main.htm].

Miles, C. E., and Whitfield, T. G., compilers, 2001, Bedrock geology of Pennsylvania: Pennsylvania Geological Survey, 4th ser., dataset, scale 1:250,000, URL link: [http://www.dcnr.state.pa.us/topogeo/map1/bedmap.aspx].

Pennsylvania Geological Survey, 1995, Late Wisconsinan glacial border 1:100,000, URL link: [http://www.pasda.psu.edu/summary.cgi/dcnr/pags/pags_glacier1k.xml].

Pennsylvania Geological Survey, 1998, Preliminary landform subdivisions of Pennsylvania, URL link: [http://www.pasda.psu.edu/documents.cgi/dcnr/pags/pags_landform98.xml].

Acknowledgements

Information compiled from published and unpublished information. Major contributions to this map are from:

S. Berkheiser, S. Reese, and R. Smith (retired) of the Pennsylvania Geological Survey; and D. Bisko, K. Brady, M. Gardner, M. Hill, K. Laslow, M. McCommons, M. Smith, and J. Tarantino of the Pennsylvania Department of Environmental Protection.

4. ACT 14 NOTIFICATIONS AND RECEIPTS

TETRA TECH

PITT-04-19-007

April 3, 2019

Project Number 212C-PB-00037

Chester County
313 West Market Street, Suite 6202
West Chester, Pennsylvania 19380

Reference: Sunoco Pipeline, L.P. (SPLP)
Pennsylvania Pipeline Project
Major Modification- HDD 280

To Whom It May Concern:

This municipal notice, under the requirements of Acts 14, 67, 68, and 127, is to inform you that our client, Sunoco Pipeline, L.P. (SPLP), is applying for coverage under the Erosion and Sediment Control General Permit (ESCGP-3) for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities and for coverage under Chapter 105 Joint Permit for Water Obstruction and Encroachment.

Project Name: Pennsylvania Pipeline Project
Major Modification-HDD 280

Applicant Name: Sunoco Pipeline, L.P.
525 Fritztown Road
Sinking Spring, PA 19608

Project Description: This modification is being requested for a for a change in route and installation method for the 16- and 20-inch diameter pipelines from a Horizontal Directional Drill (HDD) to an open cut installation across Stream S-Q83 (Unnamed tributary to Marsh Creek) and a conventional bore under Styer Road. In addition, the requested reroute will cross the floodways of streams S-Q83, S-16r, and S-Q84. Stream S-Q83 will be crossed in accordance with one of the approved open-trench excavation methods for installation of the pipeline across waterbodies. The reroute avoids crossing through Marsh Creek State Park, Wetlands WL-Q76 and WL-Q77, and Stream S-Q86.

Site Location: The Major Modification is located in Upper Uwchlan Township, Chester County.

Enclosed is a copy of the Notice of Intent (NOI) application for an ESCGP-3, General Information Form (GIF) for the Wetlands and Waterways permit application, and Location map of the proposed major modification route. Please submit any comments concerning this project within 30 days from date of receipt of this letter to:

Pennsylvania Department of Environmental Protection (PA DEP)
2 East Main Street
Norristown, PA 19401
Phone: (484) 250-5900

Tetra Tech
661 Andersen Drive, Suite 200, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

Should you have questions regarding this correspondence, please do not hesitate to contact me at 412.921.8163 or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

Robert F. Simcik, P.E.
E&S Task Manager

RFS/clm

Enclosure: Site Location Maps; Notice of Intent; GIF

cc: File 212C-PB-00037

April 4,2019

Dear Customer:

The following is the proof-of-delivery for tracking number **774875722943**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	M.RYAN	**Delivery location:**	313 WEST MARKET STREET WEST CHESTER, PA 19380
Service type:	FedEx Priority Overnight	**Delivery date:**	Apr 4, 2019 10:23
Special Handling:	Deliver Weekday Adult Signature Required		

Shipping Information:

Tracking number:	774875722943	**Ship date:**	Apr 3, 2019
		Weight:	0.5 lbs/0.2 kg

Recipient:
Commissioners
Chester County
313 West Market Street
Suite 6202
WEST CHESTER, PA 19380 US

Shipper:
ADMIN OFFICE
Tetra Tech, Inc.
Foster Plaza Building 7
661 Andersen Drive
Pittsburgh, PA 15220 US

Reference 212IC-BF-00037.500
Purchase order number: Simcik/Morris

Thank you for choosing FedEx.

PITT-04-19-006

April 3, 2019

Project Number 212C-PB-00037

Upper Uwchlan Township
140 Pottstown Pike
Chester Springs, Pennsylvania 19425

Reference: Sunoco Pipeline, L.P. (SPLP)
Pennsylvania Pipeline Project
Major Modification- HDD 280

To Whom It May Concern:

This municipal notice, under the requirements of Acts 14, 67, 68, and 127, is to inform you that our client, Sunoco Pipeline, L.P. (SPLP), is applying for coverage under the Erosion and Sediment Control General Permit (ESCGP-3) for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing or Treatment Operations or Transmission Facilities and for coverage under Chapter 105 Joint Permit for Water Obstruction and Encroachment.

Project Name: Pennsylvania Pipeline Project
Major Modification-HDD 280

Applicant Name: Sunoco Pipeline, L.P.
525 Fritztown Road
Sinking Spring, PA 19608

Project Description: This modification is being requested for a for a change in route and installation method for the 16- and 20-inch diameter pipelines from a Horizontal Directional Drill (HDD) to an open cut installation across Stream S-Q83 (Unnamed tributary to Marsh Creek) and a conventional bore under Styer Road. In addition, the requested reroute will cross the floodways of streams S-Q83, S-16r, and S-Q84. Stream S-Q83 will be crossed in accordance with one of the approved open-trench excavation methods for installation of the pipeline across waterbodies. The reroute avoids crossing through Marsh Creek State Park, Wetlands WL-Q76 and WL-Q77, and Stream S-Q86.

Site Location: The Major Modification is located in Upper Uwchlan Township, Chester County.

Enclosed is a copy of the Notice of Intent (NOI) application for an ESCGP-3, General Information Form (GIF) for the Wetlands and Waterways permit application, and Location map of the proposed major modification route. Please submit any comments concerning this project within 30 days from date of receipt of this letter to:

Pennsylvania Department of Environmental Protection (PA DEP)
2 East Main Street
Norristown, PA 19401
Phone: (484) 250-5900

Tetra Tech
661 Andersen Drive, Suite 200, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

Should you have questions regarding this correspondence, please do not hesitate to contact me at 412.921.8163 or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

Robert F. Simcik, P.E.
E&S Task Manager

RFS/clm

Enclosure: Site Location Maps; Notice of Intent; GIF

cc: File 212C-PB-00037

April 15,2019

Dear Customer:

The following is the proof-of-delivery for tracking number **774875779162**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	A.GASPARY	**Delivery location:**	140 POTTSTOWN PIKE CHESTER SPRINGS, PA 19425
Service type:	FedEx Priority Overnight	**Delivery date:**	Apr 4, 2019 09:49
Special Handling:	Deliver Weekday Adult Signature Required		

Shipping Information:

Tracking number:	774875779162	**Ship date:**	Apr 3, 2019
		Weight:	0.5 lbs/0.2 kg

Recipient:
TO WHOM IT MAY CONCERN
UPPER UWCHLAN TOWNSHIP
140 POTTSTOWN PIKE
CHESTER SPRINGS, PA 19425 US

Shipper:
ADMIN OFFICE
Tetra Tech, Inc.
Foster Plaza Building 7
661 Andersen Drive, Suite 200
Pittsburgh, PA 15220 US

Reference 212IC-BF-00037.500
Purchase order number: SIMCIK/MORRIS

Thank you for choosing FedEx.

5. ACT 167 VERIFICATION REPORT

ACT 167 STORMWATER CONSISTENCY VERIFICATION REPORT

SUNOCO PENNSYLVANIA PIPELINE PROJECT

CHESTER COUNTY, PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT F. SIMCIK
ENGINEER
PE-058435-E

3/28/18

ACT 167 STORMWATER CONSISTENCY VERIFICATION REPORT FOR CHESTER COUNTY

1.0 INTRODUCTION

Tetra Tech, Inc. (Tt) has prepared this Act 167 Stormwater Consistency Verification Report. The report verifies consistency between the provisions of the Chester Countywide Act 167 Stormwater Management Plan and the Pennsylvania Pipeline Project. The 280 HDD Major Modification is located within Upper Chichester Township. The pipeline will traverse through ten townships in Chester County: East Goshen, East Nantmeal, East Whiteland, Elverson, Upper Uwchlan, Uwchlan, Wallace, West Goshen, West Nantmeal, West Whiteland, and Westtown Townships. The County of Chester developed the Countywide Act 167 Stormwater Management Plan, which was adopted in July 2013. Elverson, West Nantmeal, Wallace, East Nantmeal, Upper Uwchlan, Uwchlan, West Whiteland, East Whiteland, East Goshen, West Goshen, and Westtown Townships have all adopted the Chester Countywide Act 167 Stormwater Management Plan. Parts of Elverson and West Nantmeal Townships lie within the Conestoga Creek Watershed Act 167 Plan area, and parts of West Whiteland, West Goshen, East Goshen, and Westtown Townships lie within the Chester Creek Watershed Act 167 Plan area. The Chester Countywide Act 167 Stormwater Management Plan supersedes and replaces the individual Watershed Act 167 Plans; however, certain provisions of those watershed plans still apply.

2.0 PROJECT DESCRIPTION

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project that would expand existing pipeline systems to provide natural gas liquid (NGL). The project involves the installation of approximately two parallel pipelines within a 306.8-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in Delaware County, PA with the purpose of interconnecting with existing SPLP Mariner East pipelines. A 20-inch diameter pipeline would be installed within the ROW from Houston to Marcus Hook (306.8 miles) and a second, 16-inch diameter pipeline, will also be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, PA to the Marcus Hook facility, paralleling the initial line for approximately 255.8 miles. The majority of the new ROW will be co-located adjacent to existing utility corridors, including approximately 230 miles of pipeline that will be co-located in the existing SPLP Mariner East pipeline system. The 20-inch pipeline will be installed first, followed by the 16-inch line. Any temporary stabilization required will be implemented in accordance with this Erosion and Sediment (E&S) Plan. Both pipelines will be installed within the same limit of disturbance (LOD) and in the same construction period. Construction activities will involve the installation of access roads, block valve pads, tree removal, clearing and grubbing within the right of way, trenching, pipe installation, and site restoration. The total LOD will be 180 acres in Chester County.

The HDD 280 Major Modification consists of a change in the route and installation method for the 16 and 20-inch diameter pipeline previously permitted as Horizontal Directional Drill (HDD) 280. The permit request is to convert the installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The change in methodology is to minimize impacts to Waters of the Commonwealth and avoid future expansions of PA Turnpike 76. The requested reroute will cross the floodways of streams S-Q83, S-16r, and S-Q84. Stream S-Q83 will be crossed in accordance with one of the approved open-trench excavation methods for installation of the pipeline across waterbodies. The reroute includes an additional 4.86 acres of LOD.

Fifty feet will be maintained as permanent ROW. In addition, temporary use areas or extra workspaces will be required at some stream and road/railroad crossings; these will typically expand the construction ROW by 25 feet where needed. Construction activities will involve the installation of 3 permanent access roads, 3 temporary access roads, 3 block valve pads, tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration.

In Chester County, Pennsylvania, the Pennsylvania Pipeline Project traverses 23.6 linear miles through the municipalities of East Goshen, East Nantmeal, East Whiteland, Elverson, Upper Uwchlan, Uwchlan, Wallace, West Goshen, West Nantmeal, West Whiteland, and Westtown and spans the Downingtown, Elverson, Pottstown, Wagontown, Malvern, West Chester, and Media USGS Quadrangles. A USGS location map showing the proposed alignment can be found in Attachment 1 of the E&S report. Past and present land use of the project area and surrounding area is agricultural and forested land. Future land use will be a maintained vegetated natural gas pipeline ROW and agricultural land.

The project area surface water runoff drains to surface waters and unnamed tributaries (UNTs) designated as high quality (HQ), trout stock fisheries (TSF), warm water fisheries (WWF), and cold water fisheries (CWF) under PA Code 25 Chapter 93 including UNT to Conestoga River (WWF), South Branch French Creek (HQ-TSF), UNT to South Branch French Creek (HQ-TSF), UNT to Marsh Creek (HQ-TSF), Marsh Creek (HQ-TSF), Black Horse Creek (HQ-TSF), UNT to Black Horse Creek (HQ-TSF), Shamona Creek (HQ-TSF), UNT to Shamona Creek (HQ-TSF), UNT to Upper East Branch Brandywine Creek (HQ-TSF), UNT to Valley Creek (CWF), Valley Creek (CWF), East Branch Chester Creek (TSF), UNT to Ridley Creek (HQ-TSF), and UNT to Chester Creek (TSF). The 280 HDD Major Modification area surface water runoff drains to UNT to Marsh Creek (HQ-TSF).

The E&S plan contains Antidegradation Best Available Combination of Technologies (ABACT) best management practices (BMPs) to maintain the designated use of the receiving waters. The basic BMPs that are anticipated to be employed during the construction activities include:

- Minimizing disturbances to site areas, especially those currently covered with pavement or vegetation.
- Minimizing the time that soil is exposed.
- Preventing the runoff from flowing across disturbed areas (divert the flow to vegetated areas).
- Stabilizing disturbed soils as soon as possible.
- Slowing down the runoff flowing across the site.
- Removing sediment from surface water runoff before it leaves the site.

3.0 SITE RESTORATION

Following completion of pipeline installation and trench backfilling, the pipeline right of way, associated workspaces, and temporary access roads shall be returned to the general grade present prior to pipeline installation in order to maintain preconstruction drainage patterns. After completion of major construction work, topsoil that was stockpiled during construction will be placed along the ROW. Grounds disturbed by any of the operations necessary to complete the work for this project are to be permanently seeded, or if specified, sodded, unless occupied by structures, paved or designated as a permanent access road. Disturbed areas, which are at final grade, shall be seeded and mulched as soon as practical. The permanent seed mixture will restore disturbed areas to a meadow in good condition or better. As a result of restoring the right of way, workspaces, and temporary access roads to a meadow condition, there will be no increase in stormwater runoff rates or volume attributed to those areas.

The Major Modification LOD will maintain pre-construction drainage pattern and be restored to meadow in good condition or better. Within Chester County, all disturbed areas within the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored to a meadow in good condition or better. The pre-construction drainage patterns surrounding the project will be maintained for the areas of the project within the township. As a result of restoring the pipeline right of way, additional temporary workspaces, and temporary access roads to a meadow condition and maintaining pre-construction drainage patterns in accordance with 25 Pa Code § 102.8(n), there will be no increase in stormwater runoff rate or volume attributed to these locations, and a quantitative stormwater analysis is not required for the pipeline ROW. Where an existing lawn condition exists and the property owner specifies, the area will be restored to a lawn condition instead of meadow.

4.0 STORMWATER MANAGEMENT

The construction and restoration practices for the proposed Major Modification have been designed to meet the provisions of the County-Wide Act 167 Stormwater Management Plan for Chester County, Pennsylvania, as well as PADEP Chapter 102 regulations. In general, the pre-construction drainage patterns surrounding the project will be maintained, and all disturbed areas within the pipeline ROW will be restored to a meadow in good condition, with the exception of proposed permanent features, existing permanent features within the right of way, and lawn in residential areas where the landowner has required that lawn cover be reestablished. As a result of restoring the ROW to a meadow condition or lawn, the project will not result in increased stormwater runoff rate or volume for the pipeline corridor.

The Chester County land use ordinance requires that all existing conditions be evaluated as meadow. This project is not in compliance with the requirements of evaluating existing conditions as meadow. Instead, existing conditions were evaluated as is, per PADEP Chapter 102 regulations. The project is not in compliance with the requirements of the Chester County Act 167 ordinance for the areas which do not have permanent facilities proposed. The increase in runoff that would result in the calculations from assuming a meadow to lawn conversion in residential areas has not been detained. An actual increase in runoff rate and volume will not be realized in these areas, however, because the existing and proposed conditions are both lawn cover. The restoration of the ROW to lawn in some residential areas prevents the ability to meet the requirements of the criteria outlined in the Chester County Act 167 plan due to landowner constraints. Approximately 25 percent of the project's limit of disturbance was determined to be existing residential lawn areas that have the potential to be restored to lawn.

The PCSM plan and narrative for the project comply with 25 Pa. Code § 102.8 to preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving stream while minimizing any increase in stormwater runoff and volume, impervious areas, land clearing, and grading. The project also protects the existing drainage features and vegetation to the maximum extent possible. The project is in compliance with Section 13 of Chester County's Act 167 Plan because the maximum rate of stormwater runoff is no greater after development than prior to development activities. In addition, the quantity, velocity and direction of resulting stormwater runoff has been managed in a manner which otherwise adequately protects health and property from possible injury.

5.0 ACT 167 COMPLIANCE

For the proposed major modification, the pre-construction drainage patterns surrounding the project will be maintained, the LOD will be minimized to the extent practicable, and all disturbed areas will be restored to a meadow in good condition. Stormwater management best management practices will be used to ensure that the post-development runoff volume and post-development peak discharge rates do not increase. The channel protection standards have been achieved by eliminating the increase in the post-development runoff volume. The water quality standards have been met by minimizing disturbance, maintaining trees and woodlands where possible, maintaining pre-construction drainage patterns to the extent practicable, minimizing soil disturbance and replacing topsoil. By following the requirements of PADEP's 25 Pa Code § 102.8(n) and Chester County's approved Act 167 Stormwater Management Plan, the Sunoco Pipeline project meets the criteria for Chester County.

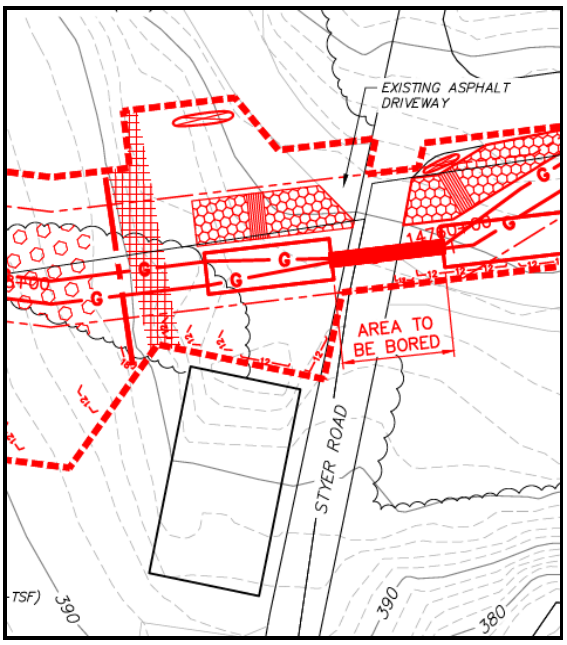
6. PHMC/PNDI Coordination

Cultural Resources/PA SHPO Consultation

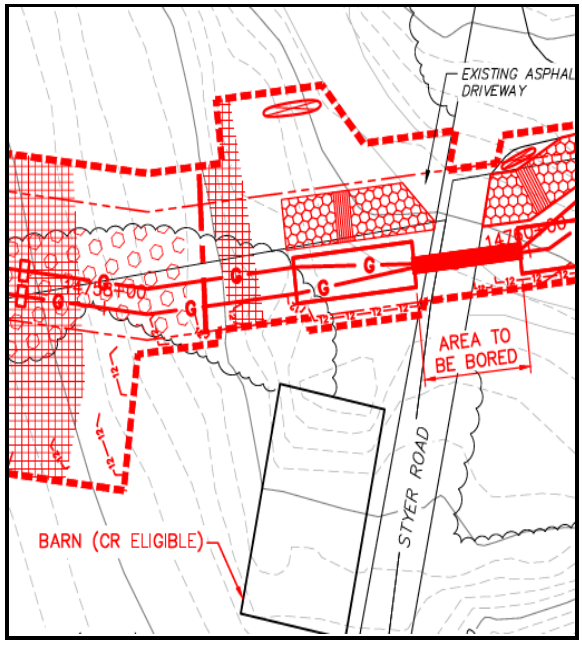
The Tetra Tech Cultural Resources Group has reviewed the proposed PA Turnpike 76/280 Reroute (S3-0280-16; PA-CH-0088.0000-RD-16) modification and has determined the revised construction plans may impact cultural resources or archaeological sites listed in or eligible for listing in the NRHP. Approximately 22 percent of the required workspace/Limit of Disturbance (LOD) or Area of Potential Effect (APE) has been previously surveyed for cultural resources with negative results. However, the remaining 78 percent (approximately 2,783 feet of proposed alignment) will require survey. Tetra Tech has started the field survey and anticipates it will be completed by the end of next week (April 12, 2019). Once complete, the survey results will be documented in accordance with state guidelines and forwarded to the SHPO for review and comment via the online Cultural Resources Geographic Information System (CRGIS).

Additionally, a previously identified historic property (Key No. 065764) has been identified and is crossed by the proposed LOD. The NRHP-eligible Krauser Farm is located at 195 Styler Road and includes a 1750s farmhouse, an associated stone barn, springhouse, and chicken coop. SPLP reduced the LOD within the vicinity of the stone barn to avoid potential impacts (see below). Current plans include a 40 to 50-foot buffer around the barn and eliminates any tree clearing in the immediate vicinity. The proposed mitigation plan also includes the installation of orange safety fencing along the boundary of the LOD during construction activities. Tetra Tech will forward the proposed mitigation plan to SHPO for review and will comply with any SHPO recommended mitigation measures.

Before LOD reduction:



After LOD reduction:



1. PROJECT INFORMATION

Project Name: **S3-0280-Meadow Creek Rd.**
Date of Review: **2/20/2019 02:03:06 PM**
Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**
Project Area: **4.23 acres**
County(s): **Chester**
Township/Municipality(s): **UPPER UWCHLAN**
ZIP Code: **19343**
Quadrangle Name(s): **DOWNINGTOWN**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Marsh Creek**
Decimal Degrees: **40.092064, -75.728738**
Degrees Minutes Seconds: **40° 5' 31.4287" N, 75° 43' 43.4567" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

S3-0280-Meadow Creek Rd.

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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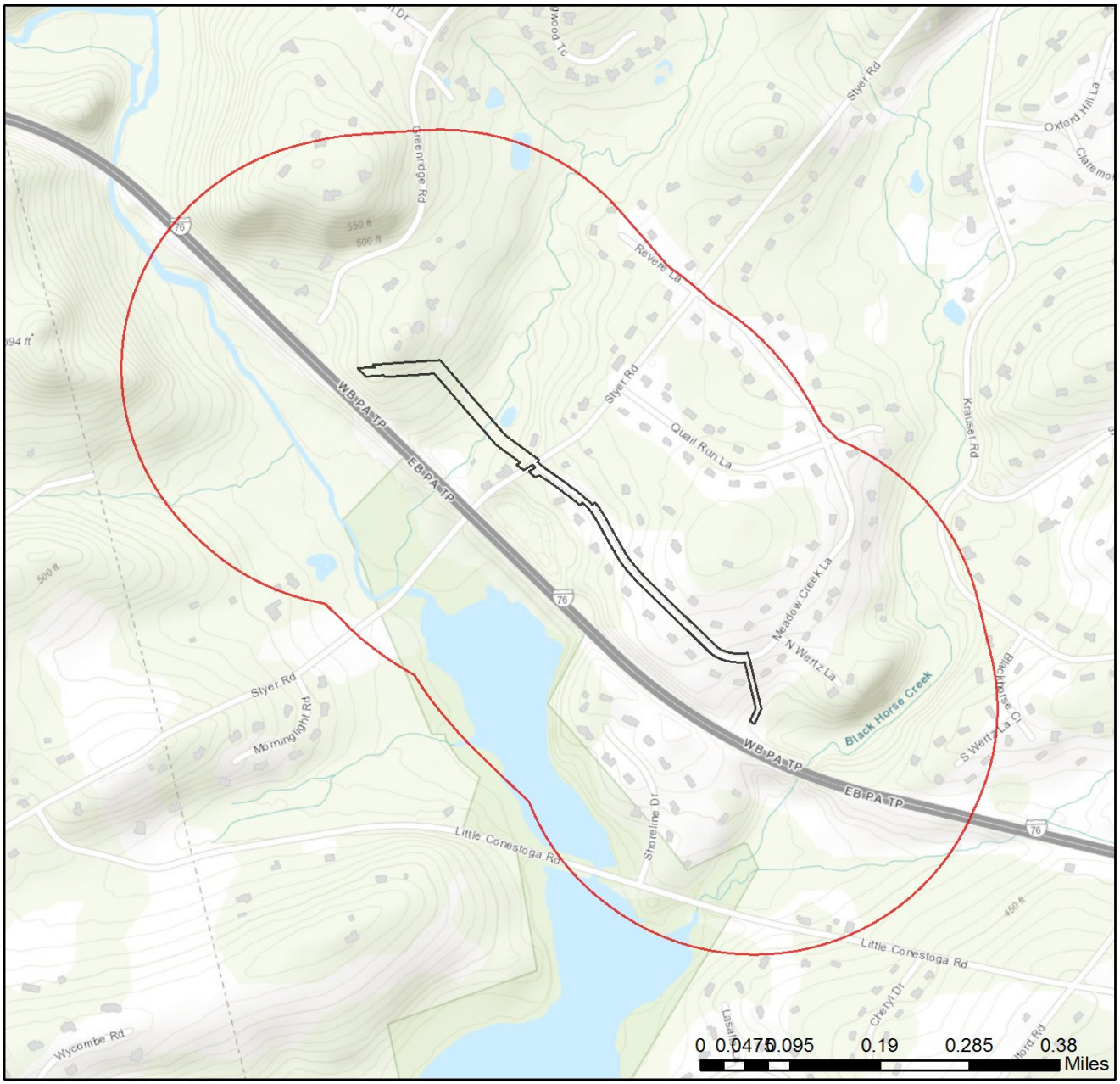
S3-0280-Meadow Creek Rd.



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RESPONSE TO QUESTION(S) ASKED

Q1: Will this project or any project-related activities require any in-stream work, or a permanent or temporary crossing of a waterway (stream, river, creek, tributary)?
Your answer is: Yes

Q2: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

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Q5: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats?
Your answer is: Yes

Q6: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Kevin Berend
Company/Business Name: Tetra Tech
Address: 301 Elliott St.
City, State, Zip: Buffalo NY 14203
Phone: (716) 849-9419 Fax: (716) 849-9420
Email: kevin.berend@tetratech.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

2/22/19
date

Additional Agency Coordination

Division of Environmental Services
Natural Gas Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

March 26, 2019

IN REPLY REFER TO
SIR# 50864

Tetra Tech
Pat Green
301 Ellicott Street
Buffalo, New York 14203

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 677023_1
S3-0280 Meadow Creek Road
CHESTER County: Upper Uwchlan Township

Dear Pat Green:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission (PFBC) jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the PNDI database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Eastern Redbelly Turtle (*Pseudemys rubriventris*, Threatened)

Based on the review of this information and the proximity of the project to known element occurrences of the species of concern listed above, potential habitat could be present within the proposed disturbance area. Therefore, additional evaluations are necessary to confirm whether or not the project site contains habitat and to determine the potential for adverse impacts to this species. We request completion of a **habitat assessment** to characterize and determine if potential habitat exists within the vicinity of the proposed project area and **pond (P-1R)**.

A qualified biologist, who possesses the necessary Scientific Collector's Permit issued by the PFBC, must conduct this habitat assessment. A list of biologists recognized as qualified by the PFBC to perform this assessment is enclosed.

As noted in your submittal, the Project was previously investigated and referenced in a letter from PFBC dated October 26, 2015 (Attachment C-2). A review of this letter and the subject report, "Habitat

Assessment Report – Eastern Redbelly Turtle – Pennsylvania Pipeline – Section 3 – Chester and Delaware Counties, Pennsylvania, Dated September 4, 2015, revealed Aquatic Habitat supporting the species (Figure 2d. from report). Additionally it appears the new route occurs outside of the 200-ft Study Area, therefore pond (P-1R) was likely not previously investigated for potential habitat. **If P-1R was previously investigated, please submit supporting documents to show negative results.**

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Greg Lech at 610-847-8772 and refer to the SIR # 50864. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Greg Lech
Natural Gas Section

GPL/dn

1. PROJECT INFORMATION

Project Name: **S3-0280-Meadow Creek Rd.**
Date of Review: **2/20/2019 02:03:06 PM**
Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**
Project Area: **4.23 acres**
County(s): **Chester**
Township/Municipality(s): **UPPER UWCHLAN**
ZIP Code: **19343**
Quadrangle Name(s): **DOWNINGTOWN**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Marsh Creek**
Decimal Degrees: **40.092064, -75.728738**
Degrees Minutes Seconds: **40° 5' 31.4287" N, 75° 43' 43.4567" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

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S3-0280-Meadow Creek Rd.

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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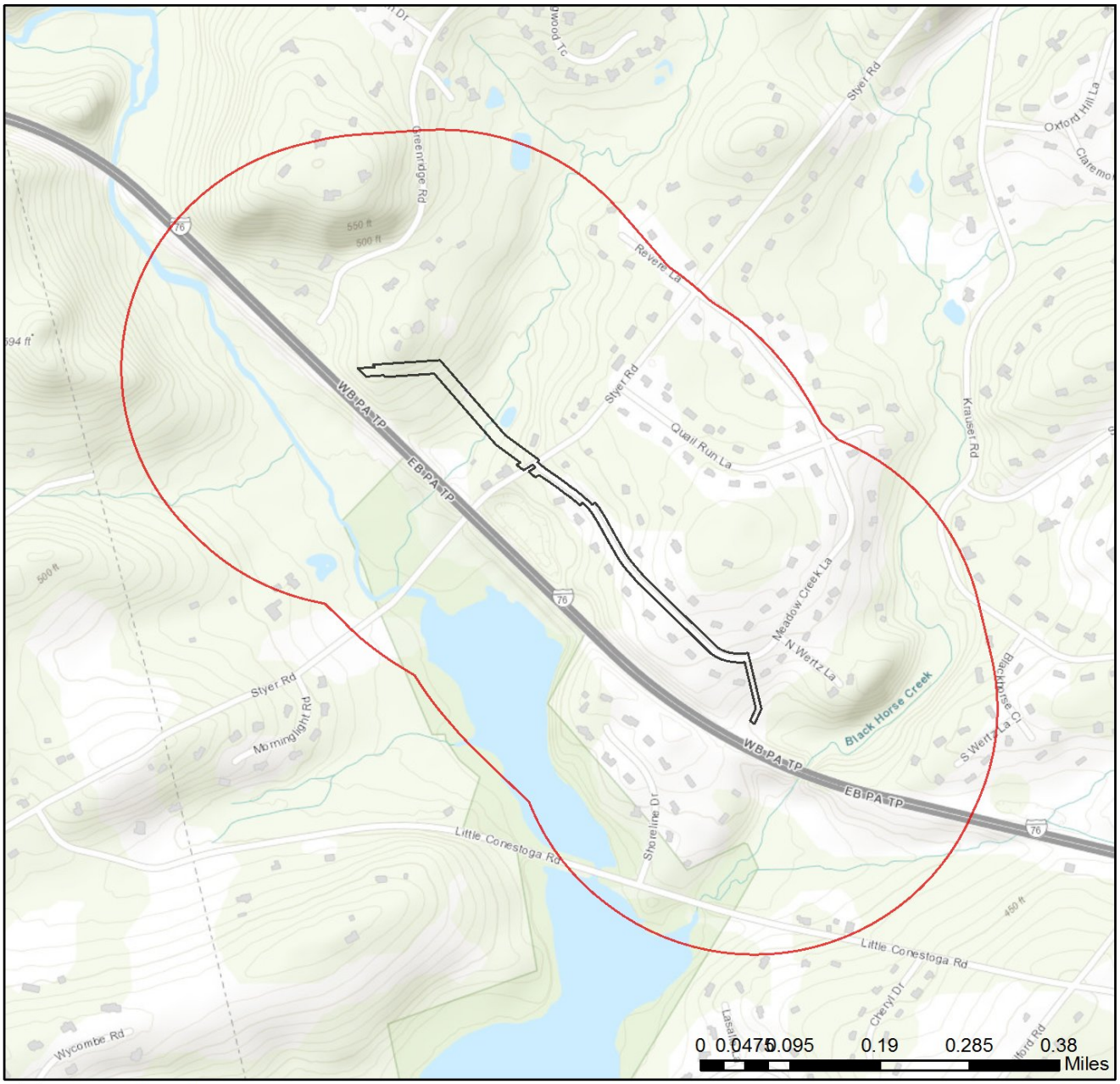
S3-0280-Meadow Creek Rd.



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RESPONSE TO QUESTION(S) ASKED

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Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service

RESPONSE:

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For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

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PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Kevin Berend
Company/Business Name: Tetra Tech
Address: 301 Elliott St.
City, State, Zip: Buffalo NY 14203
Phone: (716) 849-9419 Fax: (716) 849-9420
Email: kevin.berend@tetratech.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

2/22/19
date

February 26, 2019

Pennsylvania Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Drive
Bellefonte, PA 16823

RE: Additional Coordination on PNDI File Number 677023
Mariner East II: Pennsylvania Pipeline Project
Modification to Installation Method and Reroute
Chester County, Pennsylvania

To Whom It May Concern:

On behalf of Sunoco Pipeline, L.P. (SPLP), Tetra Tech, Inc. (Tetra Tech) is submitting supplemental materials in response to a Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review (receipt number 677023) for the SPLP Pennsylvania Pipeline Project (Project). The PNDI indicated no impact anticipated from the Pennsylvania (PA) Game Commission and the PA Department of Conservation and Natural Resources (PADCNR), however, the PA Fish and Boat Commission (PAFBC) and the U.S. Fish and Wildlife Service (USFWS) required further coordination and information to evaluate the potential impact of the Project on protected resources. PAFBC identified an unnamed sensitive species and USFWS did not identify any specific species in the PNDI receipt. A copy of PNDI receipt 677023 is provided in Attachment A.

SPLP is requesting a major Chapter 105 permit modification from the Pennsylvania Department of Environmental Protection (PADEP) for a change in the installation method and route for the 20-inch and the 16-inch diameter pipelines in Upper Uwchlan Township, Chester County. This area was previously reviewed for protected species as a Horizontal Directional Drill (HDD). This permit modification is to convert the planned HDD to conventional open trench construction for most of the route, and supplement with conventional auger bores as feasible and as necessary under Styer Road and Meadow Creek Lane. Attachment B provides the revised PADEP Chapter 105 Aerial Site Plan sheets depicting the location and proposed route of the modification.

Based on the location of the proposed modification and previous coordination with both PAFBC and USFWS, Tetra Tech assumes the PAFBC sensitive species is the eastern redbelly turtle (*Pseudemys rubriventris*) and/or the eastern bog turtle (*Clemmys muhlenbergii*) and the USFWS concern in the area is also the bog turtle. PAFBC previously reviewed the Project under Species Impact Review (SIR) number 41856, deferred the review of the bog turtle to USFWS in a letter dated January 27, 2014, and provided a clearance letter for the eastern redbelly turtle on October 26, 2015. USFWS previously reviewed the Project as part of USFWS Project number 2014-0200 and provided a clearance letter for the bog turtle in a letter dated September 15, 2016. These letters are provided in Attachment C.

Project Description and Minimization Efforts

The new installation method and route will involve both the 20-inch and 16-inch pipeline crossing stream S-Q83. No wetlands will be crossed by the reroute. Stream S-Q83 will be crossed via an open trench method for both pipelines with the appropriate dam and pump bypass installed to convey stream flow across the workspace and outlet downstream within the permitted limit-of-disturbance (LOD), such that work will be conducted in a dry stream channel. After the stream bypass is in place, the trench will be excavated, and the pipe will be installed. To efficiently complete all construction activities and minimize resource

Tetra Tech, Inc.
301 Ellicott Street, Buffalo, New York 14203
Tel 716.849.9419 Fax 716.849.9420 tetratech.com

impacts for the 20-inch pipe, SPLP is proposing a 50-foot-wide LOD across stream S-Q83. Measures to minimize and/or eliminate any scour of the streambank such as using geotextile at the outlet pump or flume will be used. Most stream crossings happen within 12-24 hours, sometimes exceeding that timeframe due to presence of rock or the size of the stream.

Timber mats and bridges will be placed within the travel lane where the stream is crossed to avoid soil compaction, allow for trench excavation, segregation of the stream substrate material, and stockpiling of excavated materials in adjacent upland areas. Once the pipes and appropriate trench plugs are installed, the trench will be backfilled, and restored per the approved Erosion and Sediment Control Plans approved by PADEP, including returning the area to pre-existing elevations and hydrology, and revegetated.

Appropriate Best Management Practices (BMPs) for Erosion and Sediment Control, including processes and control devices (e.g. silt fence, filter sock) will be used to avoid any sediment leaving the workspace areas. The revised Erosion and Sediment Control Plan of the proposed open cut crossing is provided as Attachment D.

Project Information Provided
The PNDI receipt generated for this request is provided in Attachment A, and the location and extents of the Project site and scope of the proposed change to be reviewed is provided in the revised Chapter 105 aerial site plan in Attachment B. Relevant excerpts of previous PAFBC and USFWS correspondence for the Project is provided in Attachment C, and the proposed Erosion and Sediment Control design is provided in Attachment D.

SPLP appreciates your timely review of this request for the PAFBC's clearance to change the installation method of the Project in this area. PADEP requires SPLP coordinate with PAFBC to support the modification to SPLP's received PADEP Chapter 105 Water Encroachment and Obstruction permit and U.S. Army Corps of Engineers Section 404 permit. Please contact me by telephone at 716-541-9217 or by e-mail at pat.green@tetratech.com with any questions you may have.

Sincerely,

Tetra Tech, Inc.

Pat Green
Ecological Services Manager

Enclosures: Attachments

cc:
M. Gordon, SPLP
M. Styles, SPLP
B. Schaeffer, Tetra Tech
R. Dingle, Tetra Tech

Attachment A

PNDI Receipt

1. PROJECT INFORMATION

Project Name: **S3-0280-Meadow Creek Rd.**
Date of Review: **2/20/2019 02:03:06 PM**
Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**
Project Area: **4.23 acres**
County(s): **Chester**
Township/Municipality(s): **UPPER UWCHLAN**
ZIP Code: **19343**
Quadrangle Name(s): **DOWNINGTOWN**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Marsh Creek**
Decimal Degrees: **40.092064, -75.728738**
Degrees Minutes Seconds: **40° 5' 31.4287" N, 75° 43' 43.4567" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

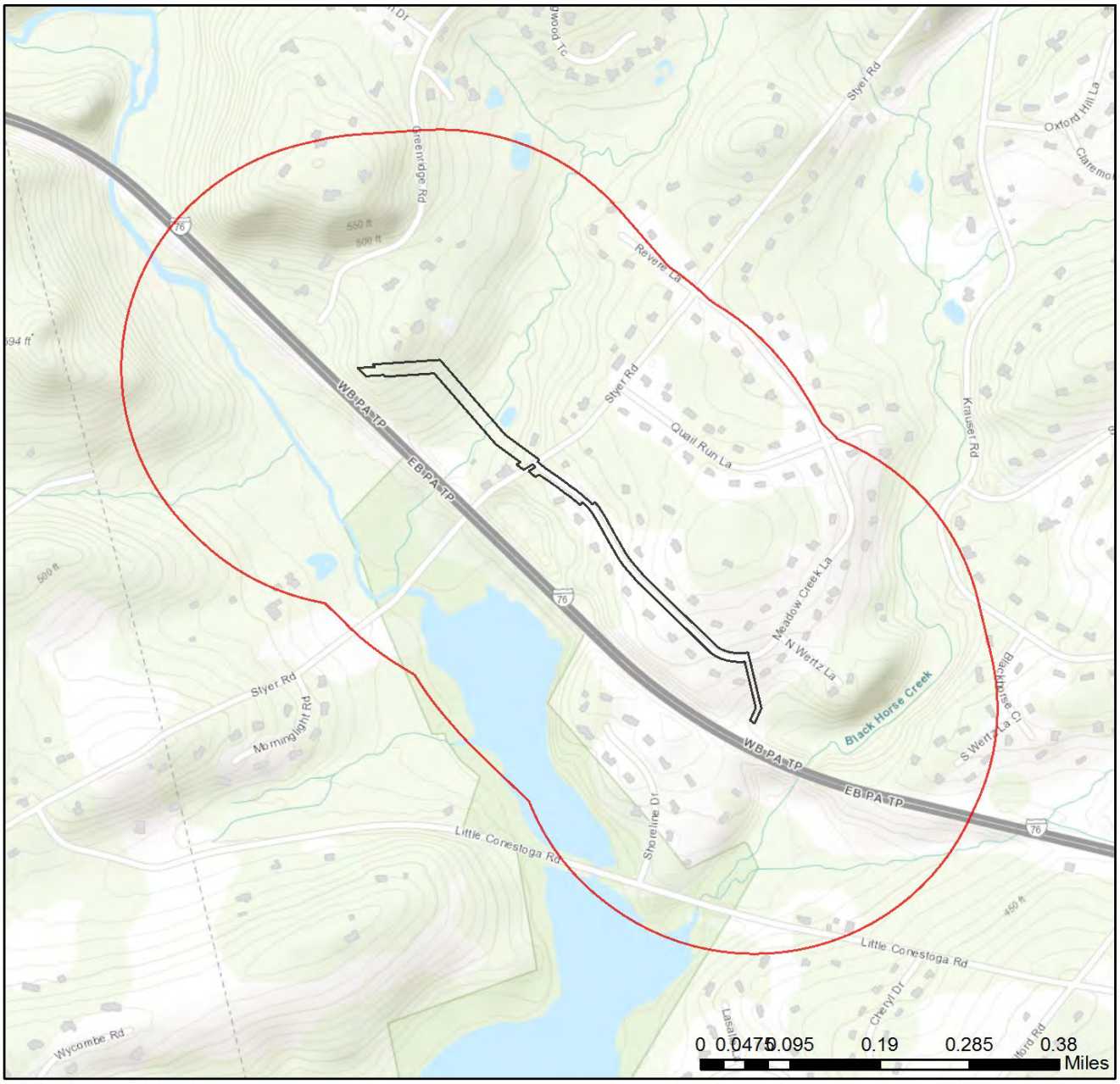
S3-0280-Meadow Creek Rd.

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

S3-0280-Meadow Creek Rd.



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

RESPONSE TO QUESTION(S) ASKED

Q1: Will this project or any project-related activities require any in-stream work, or a permanent or temporary crossing of a waterway (stream, river, creek, tributary)?
Your answer is: Yes

Q2: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

Q3: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

Q4: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q5: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats?
Your answer is: Yes

Q6: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Kevin Berend
Company/Business Name: Tetra Tech
Address: 301 Elliott St.
City, State, Zip: Buffalo NY 14203
Phone: (716) 849-9419 Fax: (716) 849-9420
Email: kevin.berend@tetratech.com

8. CERTIFICATION

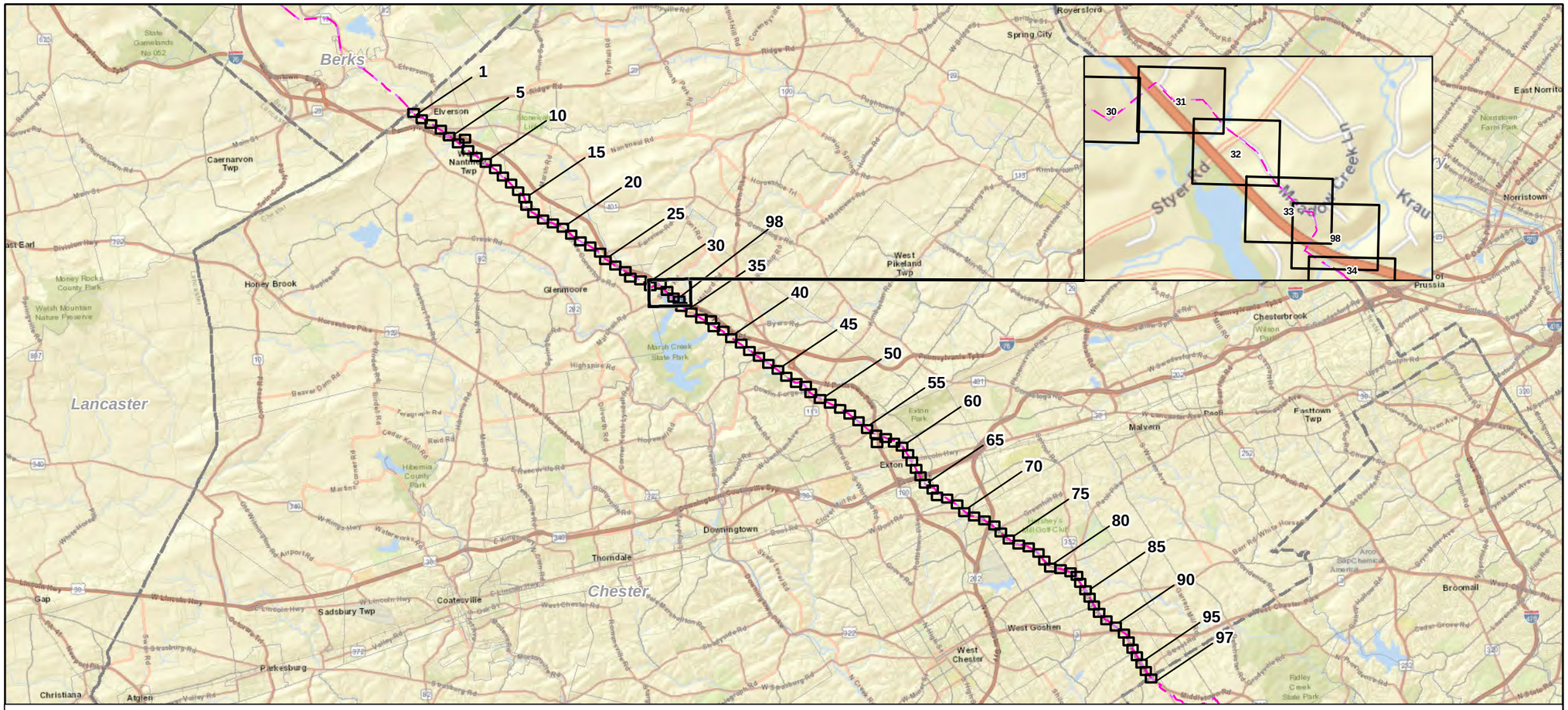
I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

2/22/19
date

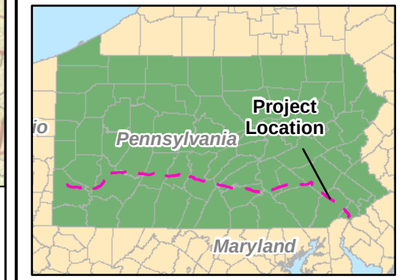
Attachment B

Revised PADEP Chapter 105 Site Plan Sheets



Legend

- Sheet Boundary
- PPP 1
- PPP 2
- Roads
- County Boundary
- Municipal Boundary



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1 inch = 15,000 feet

Mapset Legend

- Sheet Boundary
- Site Specific Drawing
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 2, Bore
- PPP 2, HDD
- Pullback String
- Bore Pits
- Existing Block Valve
- New Block Valve
- Block Valve Setting LOD
- Permanent Easement (no surface disturbance)
- Permanent ROW
- Temporary ROW
- ATWS
- Permanent Access Road
- Temporary Access Road
- ROW - Travel LOD (Travel Lane)
- ROW - Travel and Clearing LOD (Clearing LOD)
- Station LOD
- Hay Bale Discharge (See E&S Plan, Att 12)
- Direct Discharge (See E&S Plan, Att 12)
- Water Source (See E&S Plan, Att 12)
- ME1 12" Pipeline
- 12" ME1 Permanent ROW
- 8" Centerline
- 8" Pipeline Maintenance Corridor
- Existing Buried Cable
- Existing Electric Line
- Existing Fiberoptic Cable
- Existing Gas Line
- Existing Phone Line
- Existing Sanitary Sewer
- Existing Septic System
- Existing Storm Sewer
- Existing TV Line
- Existing Utility (unknown)
- Existing Water Line
- Stream Photo
- PEM Photo
- PFO Photo
- PSS Photo
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Ch. 105 Floodway
- Ch. 106 Floodplain Fringe
- PEM Extension
- PFO Extension
- PSS Extension
- PEM Wetland
- PFO Wetland
- PSS Wetland
- Pond
- Municipal Boundary
- Parcels
- Contours
- Roads

Site Plan Sheet Key for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 1 of 1

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI ArcGIS Online, Roads from NRCS Geospatial Data Giveaway, 100-Year Floodplain from FEMA National Flood Hazard Layer, downloaded 8/2013.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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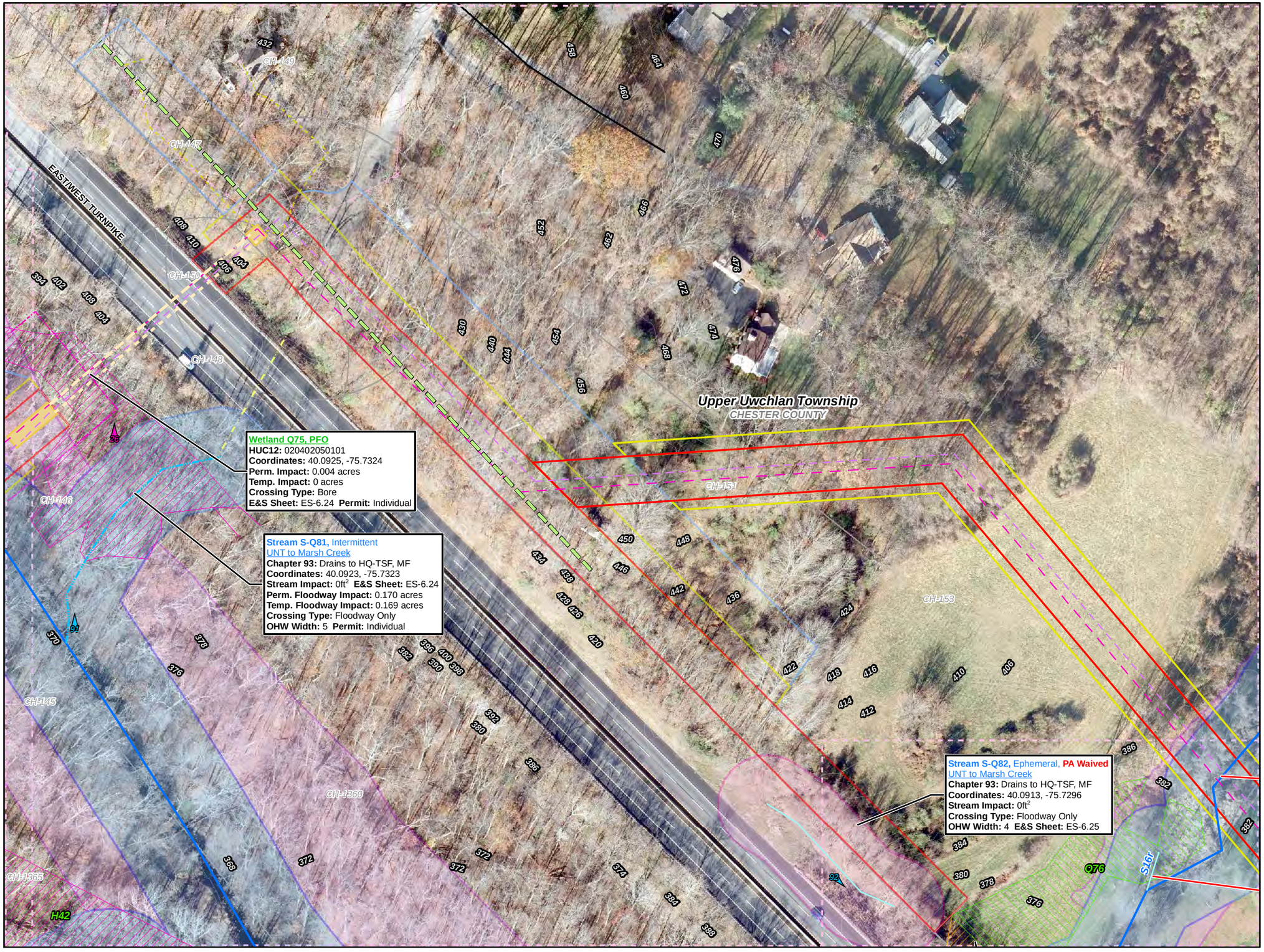
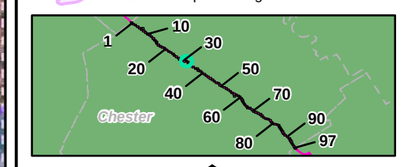


Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, FlexBor
- Pullback String
- Permanent Easement (no surface disturbance)
- Permanent ROW
- Temporary ROW
- ATWS
- Permanent Access Road
- Temporary Access Road
- ROW-Travel LOD
- ROW-Travel and Clearing LOD
- Existing Block Valve
- New Block Valve
- Block Valve Setting LOD
- Station LOD
- Bore Pits
- PEM Wetland
- PFO Wetland
- PSS Wetland
- Pond
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



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0 25 50 100 150 200

1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 31 of 98

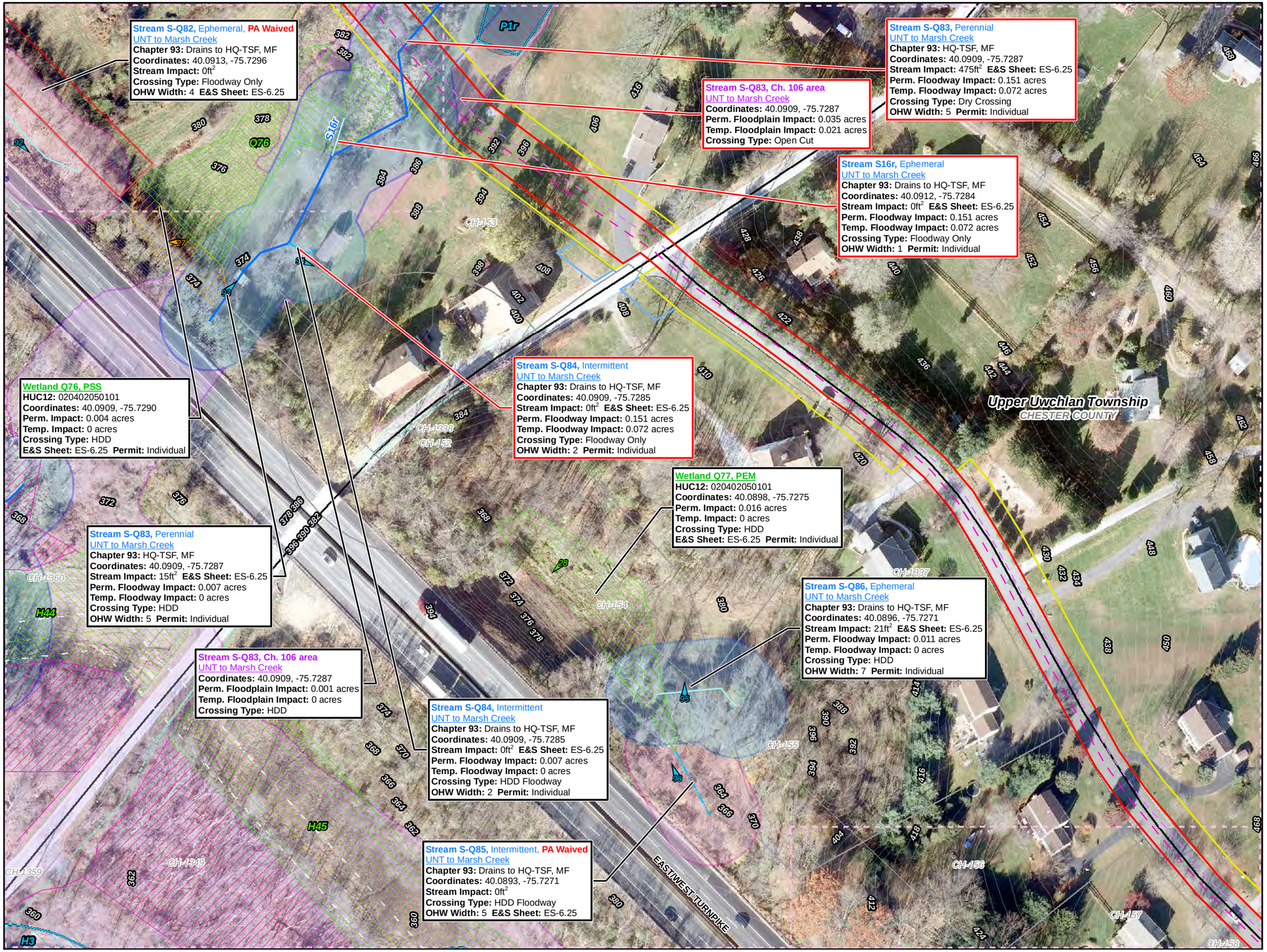
Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

P:\GIS\Projects\112\C5958-PPP\MXD\Permits\CountyPermits\ChesterCountySitePlan_Rev5



Legend

- Sheet Boundary
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- PPP 1, HDD
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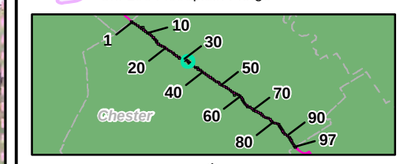
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



N

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1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 32 of 98

Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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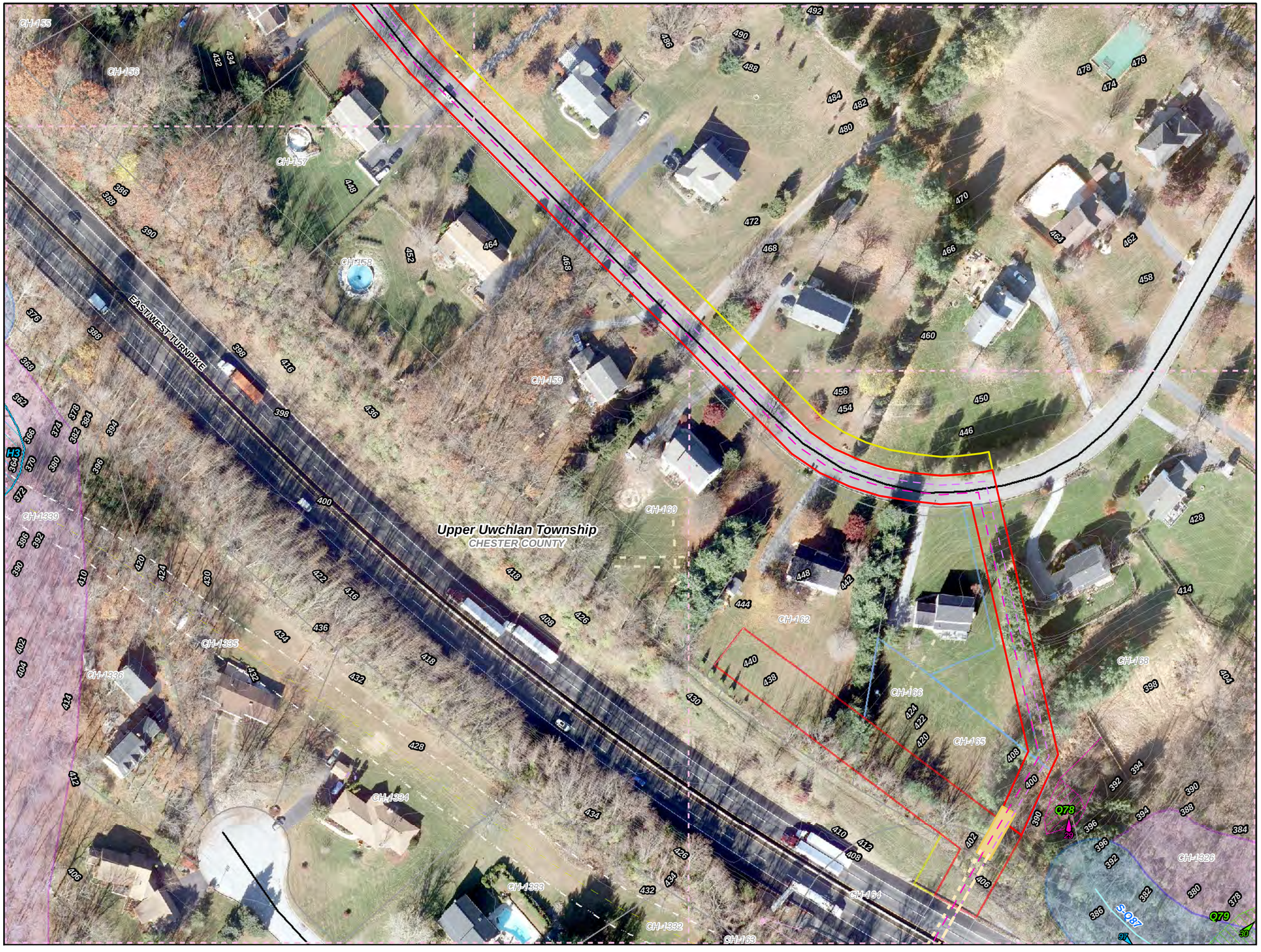

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
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- PSS Wetland
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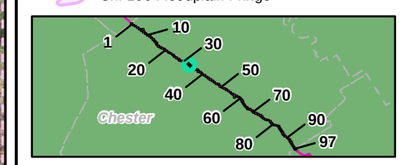
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



N

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1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 33 of 98

Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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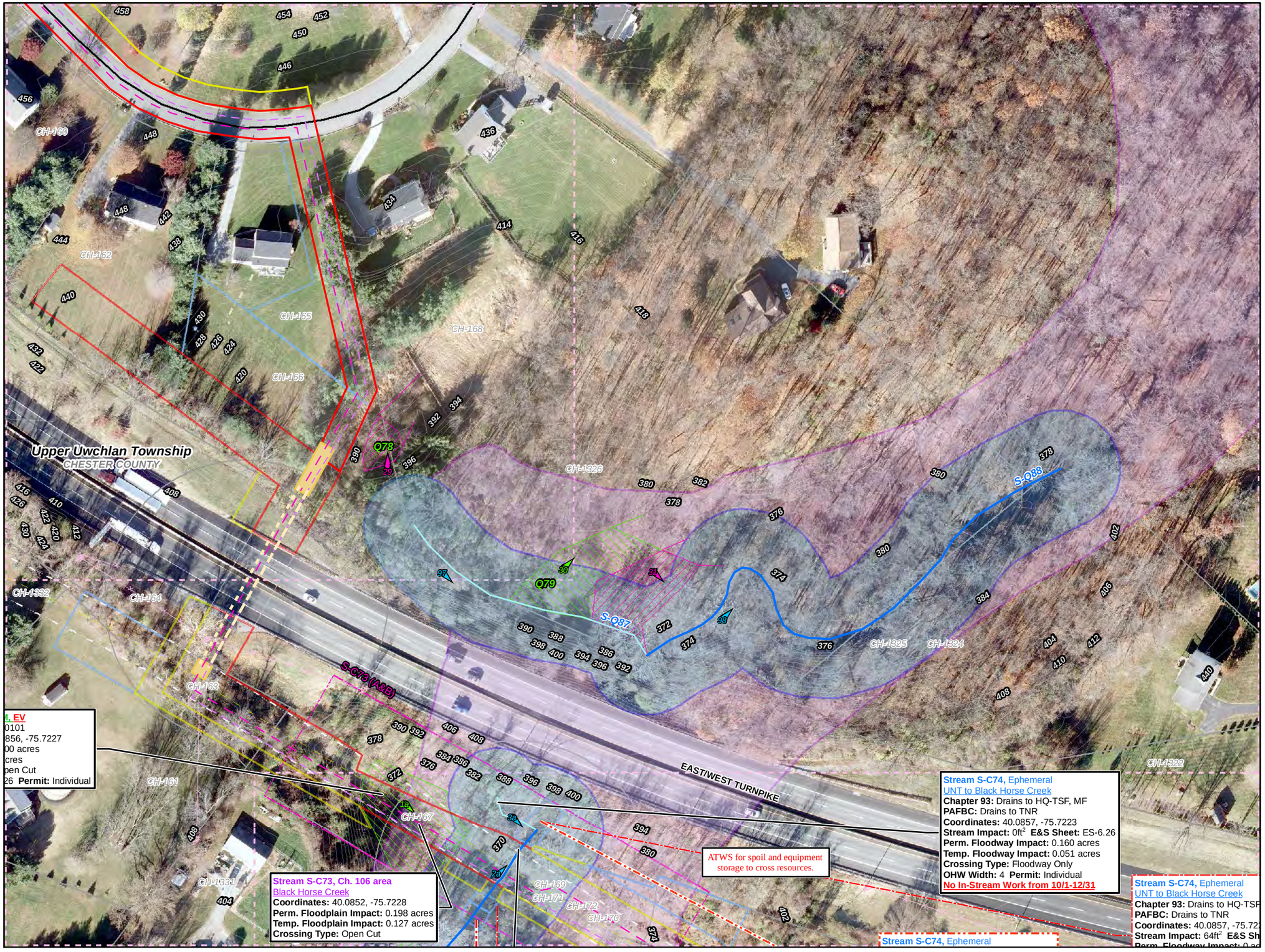

Legend

- Sheet Boundary
- PPP 1
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- PPP 1, HDD
- PPP 1, FlexBor
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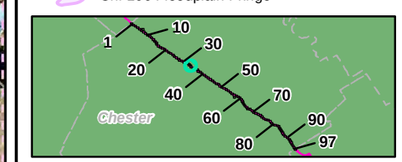

N

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1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 98 of 98

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

P:\GIS\Projects\112\C5938-PPP\MXD\Permits\ChesterCountySitePlan_Rev5

Attachment C-1

PAFBC Defer Bog Turtle Review to USFWS

Division of Environmental Services
Natural Gas Section
450 Robinson Lane
Bellefonte, PA 16823

January 27, 2014

IN REPLY REFER TO
SIR# 41856

TETRA TECH
Preston Smith
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No.
Sunoco Mariner East 2 Pipeline
ALLEGHENY County: - BERKS County: - BLAIR County: - CAMBRIA County: - CHESTER County: - CUMBERLAND County: - DAUPHIN County: - DELAWARE County: - HUNTINGDON County: - INDIANA County: - JUNIATA County: - LANCASTER County: - LEBANON County: - PERRY County: - WASHINGTON County: - WESTMORELAND County: - YORK County:

Dear Preston Smith:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Timber Rattlesnake (*Crotalus horridus*, PA Candidate)

Timber rattlesnakes occur in the forested, mountainous regions of the Commonwealth. They prefer forested areas to forage for small mammals (e.g., mice and chipmunks) and southerly-facing slopes for hibernating and other thermoregulatory activities. The timber rattlesnake is threatened by habitat loss/alteration, wanton killing, and poaching.

Based on the review of this information and the proximity of the project to known critical habitat of the Timber Rattlesnake, we recommend completion of a **habitat assessment** to determine presence/absence of potential habitat at the proposed project areas:

County	Potential Conflict	Western End of Habitat Assessment		Eastern End of Habitat Assessment		Comment
		Latitude	Longitude	Latitude	Longitude	
Cambria	Timber Rattlesnake	40.423856	-78.918485	40.419370	-78.884942	Laurel Ridge South Exposure
Blair	Timber Rattlesnake	40.465277	-78.489083	40.464433	-78.444829	West of Altoona
Huntingdon	Timber Rattlesnake	40.348146	-77.953475	40.337198	-77.912710	Jacks Mountain, SGL 71
Huntingdon	Timber Rattlesnake	40.329852	-77.820093	40.312663	-77.745830	Blacklog Mountain, Shade Mountain
Perry	Timber Rattlesnake	40.289980	-77.635604	40.284410	-77.612818	Conococheague Mountain, Tuscarora State Forest
Perry	Timber Rattlesnake	40.266702	-77.508005	40.262470	-77.491688	Bowers Mountain, Tuscarora State Forest
Cumberland	Timber Rattlesnake	40.256799	-77.469902	40.251875	-77.448899	Blue Mountain
Cumberland	Timber Rattlesnake	40.246850	-77.428032	40.245663	-77.385058	Wildcat Ridge, Tuscarora State Forest

We have included a list of qualified surveyors and habitat assessment protocol for your convenience. This list is not an exhaustive list of qualified rattlesnake surveyors in Pennsylvania as there may be qualified surveyors who have not asked to be placed on this list. It is not mandatory that you use someone on this list.

Freshwater Mussels

The following rare freshwater mussel species are known from the vicinity of the project area:

County	Potential Conflict	Latitude	Longitude	Water Name
Huntingdon	Yellow Lampmussel (*Lampsilis cariosa*)	40.342806	-77.853210	Aughwick Creek
Huntingdon	Rainbow Mussel (*Villosa iris*)	40.342806	-77.853210	Aughwick Creek
Juniata	Rainbow Mussel (*Villosa iris*)	40.301386	-77.696168	Tuscarora Creek
Cumberland	Rainbow Mussel (*Villosa iris*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Elktoe (*Alasmidonta marginata*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Triangle Floater (*Alasmidonta undulata*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Yellow Lampmussel (*Lampsilis cariosa*)	40.239506	-77.176329	Conodoguinet Creek

Freshwater mussels are the most imperiled taxonomic group in North America. Nearly 20% of the species historically known to occur in the Commonwealth are now extirpated (locally extinct). Additionally 60% of Pennsylvania's remaining species are of conservation concern. We are concerned about direct and indirect (i.e., runoff) effects that the proposed project may have on the species of concern. The freshwater mussel species known from the project area are especially vulnerable to physical (dredging, rip-rap, etc.) and chemical (pH, dissolved oxygen, temperature, heavy metals and organic contaminants) changes to their aquatic environment. Therefore, **we recommend using directional boring** rather than open cutting for the Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek crossings. Open cutting will most likely adversely impact the species of concern. Work should be conducted from the bank (e.g., no in-stream disturbance). Likewise, no erosion or sediment should be allowed to enter into the river (e.g., strict erosion and sedimentation control measures need to be employed).

Provided that directional boring methodology is used, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the mussel species of special concern. The **applicant should implement the following contingencies to prevent impacts to water quality from drilling/boring operations:**

• Have a designated environmental inspector on site for the duration of the entire crossing operation
• Stop the bore/drill immediately if anyone on site observes an Inadvertent Return.
• Have a Vac Truck on site or on call (within three hours) to begin clean-up of the release in the stream channel to prevent downstream migration of drilling fluids
• Notify PFBC Bureau of Law Enforcement Regional Office within 24 hours http://fishandboat.com/dir_regions.htm (NC 814-359-5250; NE 570-477-5717; NW 814-337-0444; SW 814-445-8974)

Additionally, any release of sediment to the stream should be reason to initiate contact with the PFBC Bureau of Law Enforcement to address these issues. Any unauthorized disturbance, unpermitted discharge, or release of sediment(s) that is determined to be a pollution event (generally described http://www.fish.state.pa.us/fishpub/summary/reporting.html) per the Pennsylvania Fish and Boat Code will be subject to the appropriate legal enforcement action.

If, however, the work will necessitate any direct (e.g. equipment intrusion) or indirect impacts (e.g. runoff) to Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek, a mussel survey & relocation should be conducted to avoid potential impacts to these rare mussel species. It is recommended that a qualified malacologist complete a mussel survey to identify any mussel species present and determine their abundance. Additionally, if mussels are encountered it is recommended that the mussels in the area of direct impact be relocated to suitable habitat outside of the disturbance area.

A list of qualified malacologists and a Pennsylvania Fish & Boat Commission approved mussel survey protocol is enclosed for your convenience when arranging for a mussel survey. Prior to conducting a survey, qualified malacologist should submit a proposed survey and relocation plan to this office. Upon completion of the mussel survey and relocation, please send a copy of the final report to this office for further evaluation.

Fish

The following rare or protected fish species are known from the vicinity of the project area:

County	Potential Conflict	Latitude	Longitude	Water Name
Washington / Allegheny	Ghost Shiner (*Notropis buchanani*, PA Endangered)	40.230011	-79.971321	Monongahela River
Cambria	Brook Stickleback (*Culaea inconstans*, PA Candidate)	40.449661	-78.605685	Little Conemaugh River

The fish species known from the project area are especially vulnerable to physical (dredging, substrate modification, etc.) and chemical (turbidity, pH, dissolved oxygen, temperature, heavy metals and organic contaminants) changes to their aquatic environment. Although the mobile adults of these protected fish species may be capable of moving from the project area, their spawning grounds (including eggs, fry, and immature fish) are vulnerable to burial, crushing by equipment, and siltation from in-stream construction projects. We are concerned about potential impacts to the fish, eggs and the hatching fry from any instream work.

Provided that directional boring is used for the Monongahela River and Little Conemaugh River crossings, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the fish species of special concern.

If, however, the Monongahela River work will necessitate any direct impacts such as instream work or open cut stream crossings, we will need more information to allow for a more thorough evaluation of potential adverse impacts from the proposed project. Items such as a detailed narrative accurately describing the crossing including possible instream work, sequence of activities, basic site plans and map, aerial maps of the general area, project alternatives, acreage to be impacted, general habitat descriptions or onsite color photographs (keyed to a site map) would expedite our review process. Pending the review of this information a survey for the species of concern may be warranted.

If, however, the Little Conemaugh River work will necessitate any direct impacts such as instream work or open cut stream crossings, we request that all in-stream activity be avoided from April 1 to June 15 in order to avoid adverse impacts during the spawning season for the Brook Stickleback. Likewise, all work should be done during low flow periods, and strict erosion and sedimentation control measures need to be employed. Provided that these recommendations are followed, as well as best management practices and an approved erosion and sedimentation control plan is maintained, then we do not anticipate the proposed activity to have any significant adverse impacts to the fish species of special concern.

Eastern Redbelly Turtle (*Pseudemys rubriventris*, PA Threatened)

The eastern redbelly turtle is one of Pennsylvania's largest native aquatic turtles. This turtle species is known to inhabit relatively large, deep streams, rivers, ponds, lakes, and marshes with permanent water and ample basking sites. Redbelly turtles are restricted to the southcentral and southeastern regions of the Commonwealth. The existence of this turtle species is threatened by habitat destruction, poor water quality and competition with aggressive non-native turtle species that share its range and habitat (e.g. red-eared slider).

If large, deep streams, rivers, ponds, lakes and wetlands with permanent water or the area within 300ft of these water features in Chester and Delaware counties are to be disturbed from the

project activity, we request completion of a habitat assessment to determine presence/absence of potential redbelly turtle habitat and/or nesting habitat at the proposed project area.

A qualified biologist, who possesses the necessary Scientific Collector's Permit issued by the Pennsylvania Fish and Boat Commission, must conduct this habitat/nesting habitat assessment. A list of biologists recognized as qualified by the Pennsylvania Fish and Boat Commission to perform redbelly turtle surveys is enclosed. Following completion of the assessment, a report of the qualified redbelly turtle biologist's observations and conclusions must be submitted to this office for further review and consultation.

However, if permanent water wetlands, vernal pools, or water bodies or the area within 300ft of these water features in Chester and Delaware counties are not to be disturbed in any way by the proposed activity, and provided that best management practices are employed and strict erosion and sedimentation measures are maintained, I do not foresee any adverse impacts to the Eastern Redbelly Turtle from the proposed project.

Bog Turtle (*Glyptemys muhlenbergii*, PA Endangered, Federal Threatened)

In an effort to streamline our threatened and endangered species environmental review process, reduce the redundancy in project reviews and ease our staff workload, the Pennsylvania Fish and Boat Commission has delegated coordination/consultation of joint state/federally listed species impact reviews to the PA Field Office of the U.S. Fish and Wildlife Service (USFWS). Please send your project materials *if you have not already done so* to them at: **U.S. Fish and Wildlife Service, Endangered Species Section, 315 South Allen St, Suite 322, State College, PA 16801-4851.**

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gary Smith at 814-279-3080 and refer to the SIR # 41856. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Heather Smiles

Heather A. Smiles, Chief
Natural Gas Section

HAS/GAS/dn

Attachment C-2

PAFBC Redbellied Turtle Clearance

Division of Environmental Services
Natural Gas Section
450 Robinson Lane
Bellefonte, PA 16823

October 26, 2015

IN REPLY REFER TO
SIR# 41856

TETRA TECH
Preston Smith
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No.
Sunoco Mariner East 2 Pipeline
ALLEGHENY County: - BERKS County: - BLAIR County: - CAMBRIA County: - CHESTER County: - CUMBERLAND County: - DAUPHIN County: - DELAWARE County: - HUNTINGDON County: - INDIANA County: - JUNIATA County: - LANCASTER County: - LEBANON County: - PERRY County: - WASHINGTON County: - WESTMORELAND County: - YORK County:

Dear Preston Smith:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Freshwater Mussels

Rare freshwater mussel species are known from the vicinity of the project area in Aughwick Creek (Rainbow Mussel & Yellow Lampmussel), Tuscarora Creek (Rainbow Mussel), and Conodoguinet Creek (Elktoe, Rainbow Mussel, Triangle Floater, Yellow Lampmussel). Your October 9, 2015 letter stated that Sunoco plans to drill/bore Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek and implement our contingency recommendations for drilling/boring operations as listed in our January 27, 2014 letter. Provided that drilling/boring is conducted on these three streams and our recommendations are followed, as well as best management practices and an approved strict erosion and sedimentation control plan is maintained, then we do not anticipate the proposed activity to have any significant adverse impacts to the freshwater mussel species of special concern.

Fish

Rare or protected fish species are known from the vicinity of the project area in the Monongahela River (Ghost Shiner) and Little Conemaugh River (Brook Stickleback). Your October 9, 2015 letter stated that Sunoco plans to drill/bore the Monongahela River and Little Conemaugh River. Provided that directional boring is used for the Monongahela River and Little Conemaugh River crossings, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the fish species of special concern.

Eastern redbelly turtle (*Pseudemys rubriventris*, PA threatened)

Per our request, an Eastern Redbelly Turtle habitat assessment survey was conducted by a qualified biologist and the habitat assessment report was provided to us. Based on the report, 34 properties were deemed as suitable RBT habitat (aquatic or nesting) within or adjacent to the pipeline ROW. Of the 34 properties that were suitable RBT habitat, only 2 areas identified as suitable nesting habitat and 1 area identified as suitable aquatic habitat would be disturbed by the construction of the project. All other suitable habitat areas would be outside the limit of disturbance or would be crossed via drilling/boring.

Based on our review of the habitat assessment report, the project site contains accessible potential redbelly turtle nesting habitat that would be disturbed by the construction of the project at the following locations: areas near Pond A4 (Habitat Assessment Report Attachment 4, Figure 2b) and Wetland I2 (Habitat Assessment Report Attachment 4, Figure 2i). The following measures will be necessary at areas near Pond A4 and Wetland I2 in order to avoid impacts to redbelly turtles during the construction of this project:

1) A silt fence barrier should be placed at the edge of the proposed area of disturbance, in between the waterway and the work area, to prevent turtles from accessing active work zones in the segments that were determined to be potential habitat. This fence should be installed during the inactive period of the redbelly turtle (October 15-April 15) so that active turtles or their nests do not get trapped in the work zone.

2) Any turtle found on site should be relocated to the nearest aquatic habitat. Additionally, the PFBC must be contacted within 48 hours of the find.

We are concerned that eastern redbelly turtles could be using the project area at Stream H52 near Wetland Q75 (Habitat Assessment Report Attachment 4, Figure 2d) for overwintering (brumation). Any dewatering or disturbance to the sediments during the brumation of the turtles could cause harm or even death to turtles that are in a dormant state and unable to move away. Therefore, we recommend that no construction be conducted in the water at Stream H52 near Wetland Q75 during the overwintering period of the redbelly turtle (October 15 through April 15). Any instream **construction activities should take place between April 15 and October 15 at Stream H52 near Wetland Q75 in order to allow turtles to avoid the project area while they are active.** Any turtles found within the staging area of the project should be safely moved outside the work zone in appropriate habitat.

Provided that the potential nesting habitat areas can be fenced and overwintering season can be avoided as recommended, best management practices are followed, and an approved strict erosion and sedimentation control plan is maintained, then I do not anticipate the proposed activity to have any significant adverse impacts to the eastern redbelly turtle.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not

necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gary Smith at 814-279-3080 and refer to the SIR # 41856. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Heather A. Smiles, Chief
Natural Gas Section

HAS/GAS/dn

Attachment C-3

USFWS Bog Turtle Clearance

RECEIVED
SEP 20 2016
BY:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

September 15, 2016

Brad Schaeffer
Tetra Tech
301 Ellicott Street
Buffalo, NY 14203

RE: USFWS Project #2014-0200

Dear Mr. Schaeffer:

Thank you for your letter dated August 19, 2016, which provided the Fish and Wildlife Service (Service) with additional information regarding Sunoco Pipeline, L.P., proposed Pennsylvania Pipeline (formerly part of the Sunoco Mariner East 2 Pipeline) project located in Washington, Allegheny, Westmoreland, Indiana, Cambria, Blair, Huntington, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, Berks, Chester, and Delaware counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species and the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended) to ensure the protection of migratory bird species.

The project involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to Sunoco Pipeline, L.P.'s (SPLP), Twin Oaks facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. As initially described, a 20-inch diameter pipeline would be installed within the ROW from Houston, PA to the Twin Oaks facility (306 miles) and a second, up to 20-inch diameter pipeline, is proposed to be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Twin Oaks facility, paralleling the initial line for approximately 255 miles.

Federally listed species

Bog Turtle

The project area is within the range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. The species inhabits shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy.

To determine the potential effects of the proposed project on bog turtles and their habitat, Stan Boder, James Drasher, Kevin Keat, Jason Tesauro, Ben Berra, Andy Brookens, and Logan Zugay conducted Phase 1 bog turtle habitat assessments on all wetlands within 300 feet of the project's proposed limit of disturbance (LOD). According to their reports, 430 wetlands extend to within 300 feet of the proposed LOD within the range of the bog turtle. Following the methods described under "Bog Turtle Habitat Survey" (Phase 1 survey) of the Guidelines for Bog Turtle Surveys (revised April 2006), the surveyors determined that 334 of the subject wetlands do not have the combination of soils, vegetation, and hydrology typical of habitat occupied by bog turtles. We agree with their habitat determination for those wetlands.

Species presence surveys (Phase II surveys) were initiated at 99 wetlands determined by the surveyors to have the combination of habitat characteristics typical of areas occupied by bog turtles. Based on survey results and known bog turtle occurrences, Tetra Tech reported that there are four wetlands within the LOD and four wetlands within 300 feet of the LOD that are occupied by bog turtles (Table 1.).

Table 1. Occupied wetlands the will be directly or indirectly affected by the action.

Wetlands	BT Occupancy	Location
A54	Occupied	Within LOD
A55	Occupied	Within LOD
AM2	Occupied	Within LOD
AM3	Occupied	Within 300 feet
C6	Occupied	Within LOD
C7	Occupied	Within 300 feet
C8	Occupied	Within 300 feet
C44	Occupied	Within 300 feet

To avoid adverse effects to the known bog turtle populations in wetlands A54 and A55 the applicant has proposed the following measures:

1. Drill under Wetlands A54 and A55 using horizontal directional drilling (HDD). The pilot hole for the HDD will be completed during the bog turtle active season (April 1 through October 31), but the subsequent low pressure reaming of the hole may occur during the bog turtle inactive season (November 1 through March 31);
   a. Prior to performing any construction work in wetlands, streams, or uplands within 300 feet of the potential bog turtle habitat, all areas of expected disturbance must be surveyed by a qualified surveyor for the presence of bog turtles immediately prior to construction commencement.
   b. Prior to the survey, herbaceous vegetation should be cut to a height of 4 to 6 inches using a hand-held trimmer/weed-cutter, and then carefully raked away from the area to be searched. A qualified bog turtle surveyor should be present when this vegetation clearing occurs.
   c. Immediately following the survey, silt-fencing should be placed between the wetland and the proposed construction zone while the bog turtle surveyor is present to ensure that the fencing is properly installed in the correct location. The silt-fencing should be removed immediately following construction.

2. Ensure the HDD will be in bedrock prior to drilling beneath the wetlands by utilizing the information provide in geotechnical reports;
3. Implement Service-approved Inadvertent Return Contingency Plan;
4. Install a series of piezometers to monitor groundwater conditions before, during, and after the HDD following a Service-approved monitoring plan.
5. Implement its bog turtle radio-telemetry study protocol (see Appendix A)
6. Implement a Service-approved vibration monitoring plan along the alignment and within the wetlands if HDD activities extend into the bog turtle dormant season.
7. Post-construction routine pipeline operation and maintenance protective measures:
   a. "No Mowing" signs will be placed along the boundary of Wetlands A54 and A55 to prevent disturbance during post-construction right-of-way (ROW) maintenance activities;
   b. Additional signs will be placed at the edge of Zone 2 (300 feet from the wetland edge) to demarcate the limit of herbicide application within the ROW;
   c. Only hand clearing will occur in Zone 2 and will be conducted between October 1 and March 31.

During an April 6, 2016, field view, Service-biologist Brian Scofield, acknowledged the marginal, but suitable, habitat conditions of Wetland AM2 and recommended a time-of-year restriction or pre-construction survey. The same recommendation was given for Wetlands AM3, C7, C8, and C44 because of their proximity to known bog turtle populations. Therefore, the applicant has proposed that either construction will take place between November 1 and March 31, when bog turtles are hibernating, or a pre-construction survey will be performed if construction occurs between April 1 and October 31, during which time bog turtles are active. If construction takes place during the active season the following measures will be followed.

1. Prior to performing any construction work in wetlands, streams, or uplands within 300 feet of the potential bog turtle habitat, all areas of expected disturbance must be surveyed by a qualified surveyor for the presence of bog turtles immediately prior to construction commencement.
2. Prior to the survey, herbaceous vegetation should be cut to a height of 4 to 6 inches using a hand-held trimmer/weed-cutter, and then carefully raked away from the area to be searched. A qualified bog turtle surveyor should be present when this vegetation clearing occurs.
3. Immediately following the survey, silt-fencing should be placed between the wetland and the proposed construction zone while the bog turtle surveyor is present to ensure that the fencing is properly installed in the correct location. The silt-fencing should be removed immediately following construction.
4. If any bog turtles are located during these searches, the Service and Pennsylvania Fish and Boat Commission (PFBC) should be contacted immediately, and construction should not proceed until further consultation occurs. Survey results should be submitted to the Service and PFBC.

To avoid the risk of take to the known bog turtle population in Wetland C6 the applicant has proposed the use of a dry-bore to go under the wetland and avoid surface impacts. Because dry-bore technology does not utilize pressurized fluid to bore, there is no risk of an inadvertent

return; therefore, the applicant has proposed the same minimization measures as Wetlands AM2, AM3, C7, C8, and C44.

With the implementation of the avoidance and conservation measures listed above and in the applicant's April 2016 Bog Turtle Conservation Plan, we anticipate that the effects of this project to bog turtles will be insignificant or discountable. If you are unable to implement all proposed avoidance measures or project plans change, further consultation with the Service will be required, pursuant to the Endangered Species Act.

Indiana bat

The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Mist-net surveys were conducted within the appropriate survey windows between May 15, 2014, and August 4, 2015, for Indiana bats. Surveys were carried out only where suitable habitat existed and where those areas occurred outside of already assumed occupied habitats (swarming areas).

According to the April 2016 survey report, surveys were conducted at 294 survey blocks within the project area, in accordance with the Fish and Wildlife Service's 2014 and 2015 Indiana bat summer survey guidelines, which are designed to detect the presence of Indiana bat maternity colonies. During these surveys, no Indiana bats were captured. Additionally, 12 portals were analyzed as potential hibernacula. Harp traps and acoustic surveys were performed, but did not yield any Indiana bat captures or calls. Therefore, based on these survey results, we conclude (1) there is no higher population density of Indiana bat activity that would be typical of a maternity colony, and (2) it is unlikely that the studied mine portals support Indiana bats.

Portions of the project area are within two known Indiana bat hibernacula swarming areas. Swarming areas are habitat surrounding known hibernation sites that the bats depend on for spring staging and fall swarming (the periods following emergence from hibernation and prior to reentering hibernation, respectively). These swarming areas are also used by some male bats, and nonreproductive females through the warmer seasons. As such, Sunoco Pipeline, L.P., has submitted an Indiana Bat Conservation Plan. The proposed project will affect approximately 258 acres of forest habitat in the vicinity of the Hartman Mine Indiana bat swarming area. To avoid adverse effects on Indiana bats, Sunoco Pipeline, L.P, has agreed to implement the measures outlined in their April 2016 Indiana Bat Conservation Plan for the subject pipeline project. This includes a commitment to cut trees between November 15 and March 31 in the Indiana bat swarming area. The Conservation Plan also details specific measures that will be implemented to avoid indirect effects of the cumulative forested habitat loss on Indiana bats, including the contribution of $1,002,819 into the Indiana Bat Conservation Fund that will be used for permanent conservation of Indiana bat habitat.

The project information and our analysis include a portion of the pipeline project that traverses through Raystown Lake Recreation Area, which is located in Hartman Mine Indiana Bat Swarming Area. Sunoco Pipeline, L.P. has committed to removing these trees between November 15 and March 31 during a time when bats are assumed to be hibernating to avoid the risk of directly killing roosting bats.

Additionally, a small segment of the pipeline will traverse a portion of the Layton Fire Clay Mine Indiana bat swarming area. There is limited tree clearing proposed here (approximately 0.62 acres), due to this portion of the line being collocated with an existing right-of-way. To avoid the risk of directly killing or injuring Indiana bats, Sunoco Pipeline L.P., has agreed to implement tree clearing in this swarming area between November 15 and March 31.

The Service has reviewed the Conservation Plan and found it to address the recommended avoidance and conservation measures outlined in our guidance. Therefore, with the implementation of these measures: (1) time of year restrictions on tree clearing to avoid the risk of direct take of Indiana bats, (2) the results of the mist-net and hibernacula surveys that failed to locate maternity colonies or new hibernation sites, and (3) use of the Indiana Bat Conservation Fund to offset indirect effects to bats that may result from aggregate forest habitat loss of swarming habitat, we conclude that effects of the project on the Indiana bat are insignificant or discountable.

Northern long-eared bat

The proposed project is located within the range of the federally threatened northern long-eared bat (*Myotis septentrionalis*). On February 16, 2016, the final rule that tailors protections for the northern long-eared bat under the Endangered Species Act became effective (81 FR 1900; see: http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/FRnlebFinal4dRule14Jan2016.pdf).

Mist-net surveys were conducted within the appropriate survey windows between May 15, 2014 and August 4, 2015, for northern long-eared bats.

According to the April 2016 survey report, surveys were conducted at 294 survey blocks within the project area, in accordance with the Fish and Wildlife Service's 2014 and 2015 Indiana bat summer survey guidelines. During the 2014 surveys, 30 northern long-eared bats were captured and 13 were radio-tracked. Two more northern long-eared bats were captured and radio-tracked in 2015 surveys. Additionally, 12 portals were analyzed as potential hibernacula. Harp trapping and acoustic surveys were performed at the portals, but did not yield any northern long-eared bat captures or calls.

Although several northern long-eared bat roost trees were documented close to the LOD, only one roost tree was identified within 150 feet of project disturbance. In accordance with the final 4(d) rule, removal of this roost tree will not occur between June 1 and July 31. Additionally, your project is not located within 0.25 mile of a known northern long-eared bat hibernaculum. Therefore, following the June 1 –July 31 time of year restriction on roost tree clearing, any incidental take that might result from tree removal is not prohibited, and no further consultation regarding this species is necessary. More information on the northern long-eared bat and the 4(d) rule can be found here: http://www.fws.gov/midwest/endangered/mammals/nleb/

Northeastern bulrush

The project is within the known range of the northeastern bulrush (*Scirpus ancistrochaetus*), a federally listed, endangered plant. Surveys were conducted for this species in 2014 and 2015. 231 potential northeastern bulrush habitat areas were identified. These 231 habitat areas revealed

two previously undocumented northeastern bulrush populations. The Blair County population is located approximately 340 feet from the edge of the proposed LOD and is not hydrologically connected to Wetland L70, which is located in the ROW.

The Cambria County population is located within the LOD, approximately 75 feet from a proposed access road. To minimize and avoid impacts to this population, Sunoco Pipeline, L.P., proposes to install the pipeline under this wetland system via HDD. While we support this method of crossing to reduce vernal pool and wetland impacts, best management practices need to be employed to minimize potential harm to listed species. The pipeline will be approximately 50 feet below the surface. The entry point will be about 150 feet from the population and the exit point will be about 1,534 feet southeast of the population. The HDD length will be approximately 1,684 feet.

Despite best intentions, drilling fluids can still be released to the surface. Damage to the wetlands, its hydrology, flora or fauna can occur from equipment used to clean up the drilling fluid material. Therefore, all precautions to prevent an inadvertent release (IR) should be implemented, including examining the subsurface soil and bedrock material to determine geotechnical limitations or IR probability, and designing a drill path to minimize drill pressure and entry angles. As a means to minimize impacts should an IR occur, you provided an HDD Inadvertent Release Contingency Plan. In addition to the instructions in this Plan, please add the USFWS phone number (provided below) as an agency to be contacted should an IR occur, and inform the HDD contractor about the sensitive nature of the drill at this location.

With the aforementioned buffers in place and a successful HDD, this project is not likely to adversely affect these northeastern bulrush populations.

Assessment of Risks to Migratory Birds

The Service received Sunoco's draft Migratory Bird Conservation Plan on July 15, 2016, and provided comments on the plan during our August 10, 2016, meeting. The Service is awaiting Sunoco's final Migratory Bird Conservation Plan.

The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the FWS recognizes that some birds may be taken during activities such as pipeline construction even if all reasonable measures to avoid take are implemented. The FWS's Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

Please contact Pamela Shellenberger or Brian Scofield of this office at (814) 234 4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

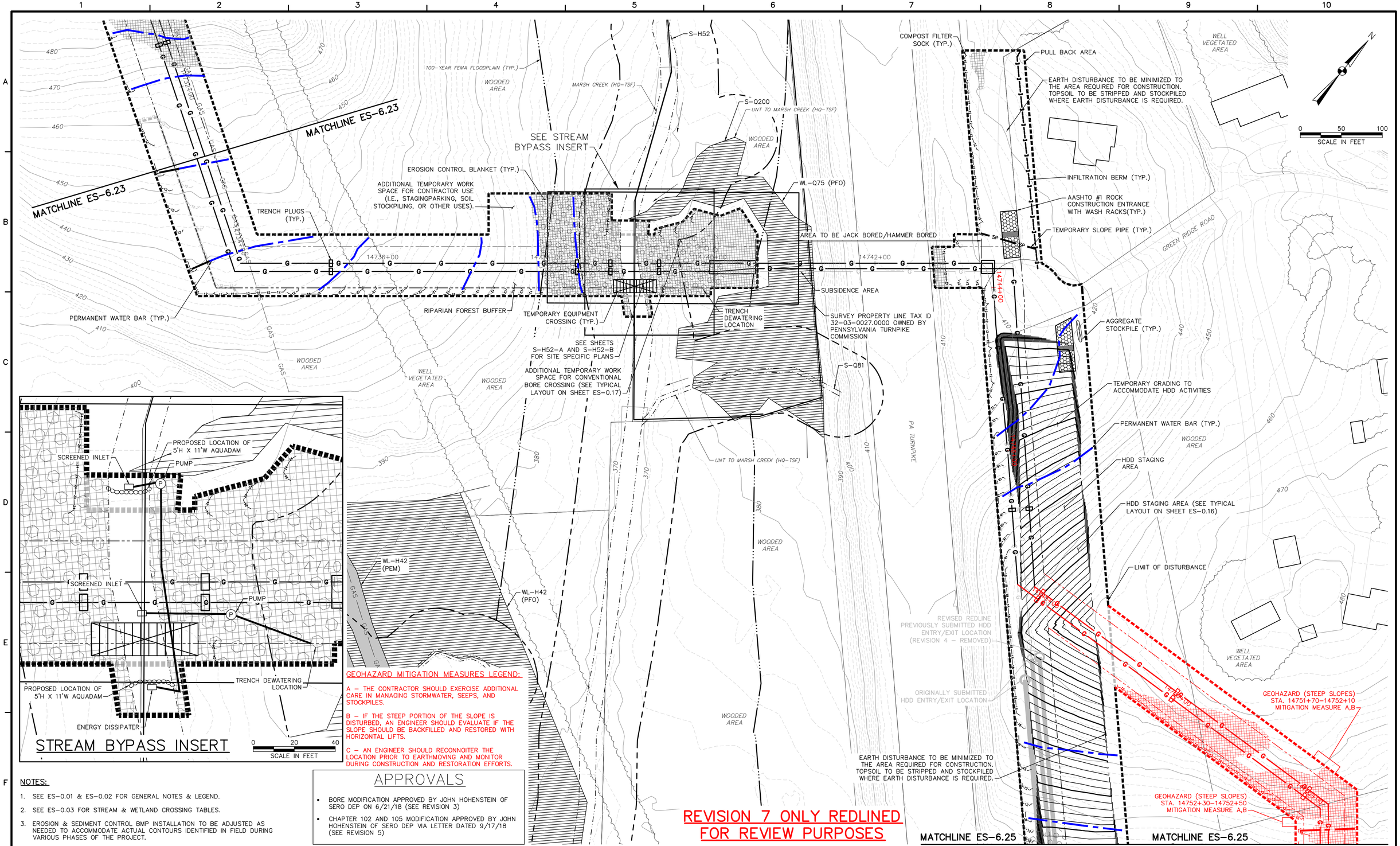
for Lora Z. Lattanzi
Field Office Supervisor

Enclosure

cc:
Corps – W. Chandler
DEP – A. McDonald

Attachment D

Revised Erosion and Sediment Control Plan Sheets



GEOHAZARD MITIGATION MEASURES LEGEND:

A – THE CONTRACTOR SHOULD EXERCISE ADDITIONAL CARE IN MANAGING STORMWATER, SEEPS, AND STOCKPILES.

B – IF THE STEEP PORTION OF THE SLOPE IS DISTURBED, AN ENGINEER SHOULD EVALUATE IF THE SLOPE SHOULD BE BACKFILLED AND RESTORED WITH HORIZONTAL LIFTS.

C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

APPROVALS

- BORE MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP ON 6/21/18 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP VIA LETTER DATED 9/17/18 (SEE REVISION 5)

NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

REVISION 7 ONLY REDLINED FOR REVIEW PURPOSES

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661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	3/5/18	BORE METHOD REVISION
4	RS	6/26/18	HDD AND CENTERLINE MODIFICATION
5	RS	8/3/18	ATWS ADDED FOR STREAM BYPASS INSERT
6	RS	12/17/18	PROPERTY LINE AND SUBSIDENCE ADDED
7	RS	2/10/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 24 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-6.24
SHEET 6.24 OF 99

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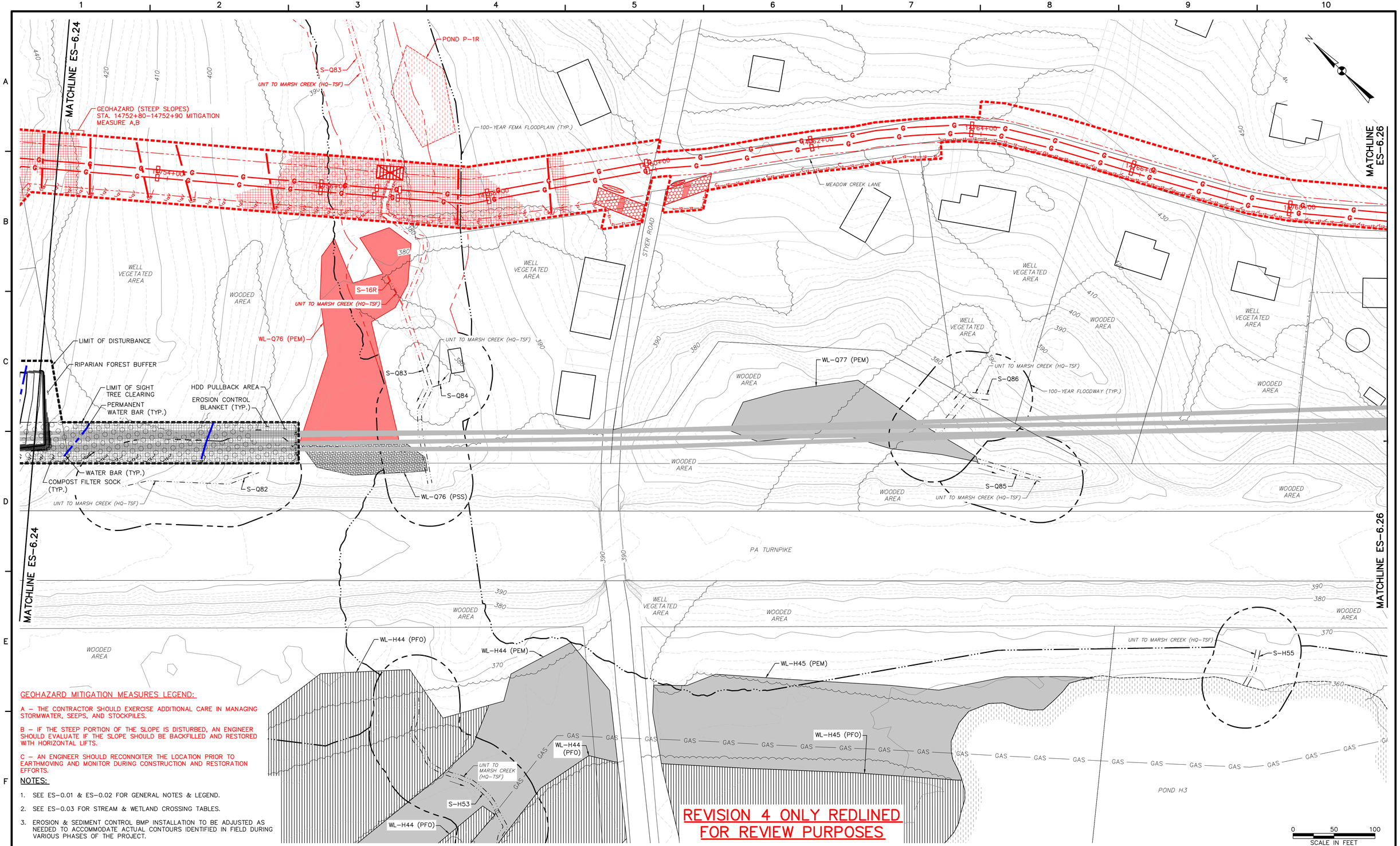

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C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 25 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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SHEET 6.25 OF 99

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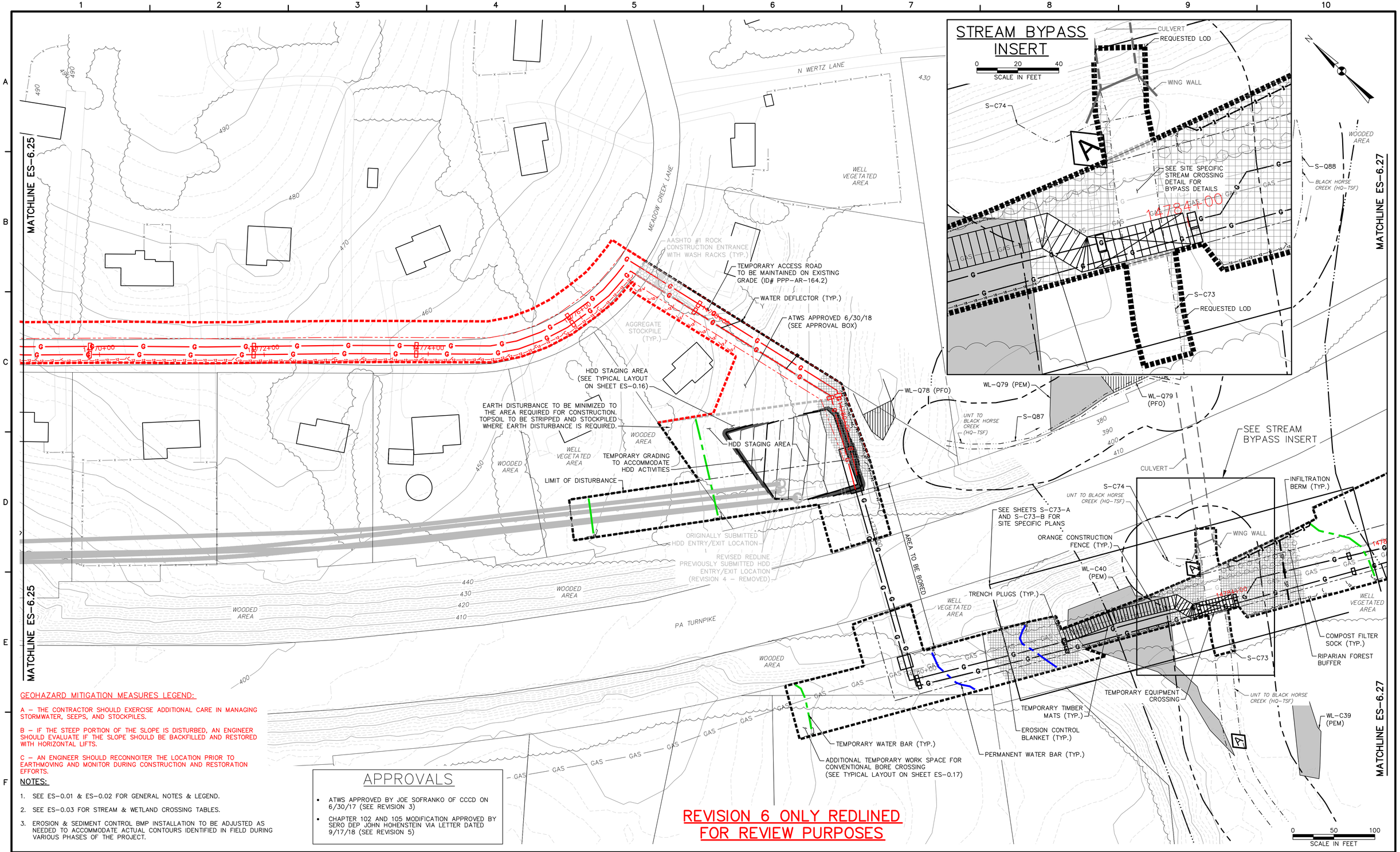

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2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

APPROVALS

- ATWS APPROVED BY JOE SOFRANKO OF CCCD ON 6/30/17 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY SERO DEP JOHN HOHENSTEIN VIA LETTER DATED 9/17/18 (SEE REVISION 5)

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4	RS	6/26/18	HDD MODIFICATION
5	RS	7/26/18	ATWS MODIFICATION AND STREAM BYPASS INSERT
6	RS	2/10/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 075843-E 2/11/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 26 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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SHEET 6.26 OF 99

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February 27, 2019

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Road; Suite 101
State College, PA 16801

RE: Additional Coordination on PNDI File Number 677023
Mariner East II: Pennsylvania Pipeline Project
Modification to Installation Method and Reroute
Chester County, Pennsylvania

To Whom It May Concern:

On behalf of Sunoco Pipeline, L.P. (SPLP), Tetra Tech, Inc. (Tetra Tech) is submitting supplemental materials in response to a Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review (receipt number 677023) for the SPLP Pennsylvania Pipeline Project (Project). The PNDI indicated no impact anticipated from the Pennsylvania (PA) Game Commission and the PA Department of Conservation and Natural Resources (PADCNR), however, the PA Fish and Boat Commission (PAFBC) and the U.S. Fish and Wildlife Service (USFWS) required further coordination and information to evaluate the potential impact of the Project on protected resources. PAFBC identified an unnamed sensitive species and USFWS did not identify any specific species in the PNDI receipt. A copy of PNDI receipt 677023 is provided in Attachment A.

SPLP is requesting a major Chapter 105 permit modification from the Pennsylvania Department of Environmental Protection (PADEP) for a change in the installation method and route for the 20-inch and the 16-inch diameter pipelines in Upper Uwchlan Township, Chester County. This area was previously reviewed for protected species as a Horizontal Directional Drill (HDD). This permit modification is to convert the planned HDD to conventional open trench construction for most of the route, and supplement with conventional auger bores as feasible and as necessary under Styer Road and Meadow Creek Lane. Attachment B provides the revised PADEP Chapter 105 Aerial Site Plan sheets depicting the location and proposed route of the modification.

Based on the location of the proposed modification and previous coordination with both PAFBC and USFWS, Tetra Tech assumes the PAFBC sensitive species is the eastern redbelly turtle (*Pseudemys rubriventris*) and/or the eastern bog turtle (*Clemmys muhlenbergii*) and the USFWS concern in the area is also the bog turtle. PAFBC previously reviewed the Project under Species Impact Review (SIR) number 41856, deferred the review of the bog turtle to USFWS in a letter dated January 27, 2014, and provided a clearance letter for the eastern redbelly turtle on October 26, 2015. USFWS previously reviewed the Project as part of USFWS Project number 2014-0200 and provided a clearance letter for the bog turtle in a letter dated September 15, 2016. These letters are provided in Attachment C.

Project Description and Minimization Efforts

The new installation method and route will involve both the 20-inch and 16-inch pipeline crossing stream S-Q83. No wetlands will be crossed by the reroute. Stream S-Q83 will be crossed via an open trench method for both pipelines with the appropriate dam and pump bypass installed to convey stream flow across the workspace and outlet downstream within the permitted limit-of-disturbance (LOD), such that work will be conducted in a dry stream channel. After the stream bypass is in place, the trench will be excavated, and the pipe will be installed. To efficiently complete all construction activities and minimize resource impacts for the 20-inch pipe, SPLP is proposing a 50-foot-wide LOD across stream S-Q83. Measures to

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301 Ellicott Street, Buffalo, New York 14203
Tel 716.849.9419 Fax 716.849.9420 tetratech.com

minimize and/or eliminate any scour of the streambank such as using geotextile at the outlet pump or flume will be used. Most stream crossings happen within 12-24 hours, sometimes exceeding that timeframe due to presence of rock or the size of the stream.

Timber mats and bridges will be placed within the travel lane where the stream is crossed to avoid soil compaction, allow for trench excavation, segregation of the stream substrate material, and stockpiling of excavated materials in adjacent upland areas. Once the pipes and appropriate trench plugs are installed, the trench will be backfilled, and restored per the approved Erosion and Sediment Control Plans approved by PADEP, including returning the area to pre-existing elevations and hydrology, and revegetated.

Appropriate Best Management Practices (BMPs) for Erosion and Sediment Control, including processes and control devices (e.g. silt fence, filter sock) will be used to avoid any sediment leaving the workspace areas. The revised Erosion and Sediment Control Plan of the proposed open cut crossing is provided as Attachment D.

Project Information Provided
The PNDI receipt generated for this request is provided in Attachment A, and the location and extents of the Project site and scope of the proposed change to be reviewed is provided in the revised Chapter 105 aerial site plan in Attachment B. Relevant excerpts of previous PAFBC and USFWS correspondence for the Project is provided in Attachment C, and the proposed Erosion and Sediment Control design is provided in Attachment D.

SPLP appreciates your timely review of this request for the USFWS's clearance to change the installation method of the Project in this area. PADEP requires SPLP coordinate with USFWS to support the modification to SPLP's received PADEP Chapter 105 Water Encroachment and Obstruction permit and U.S. Army Corps of Engineers Section 404 permit. Please contact me by telephone at 716-541-9217 or by e-mail at pat.green@tetratech.com with any questions you may have.

Sincerely,

Tetra Tech, Inc.

Pat Green
Ecological Services Manager

Enclosures: Attachments

cc:

M. Gordon, SPLP
M. Styles, SPLP
B. Schaeffer, Tetra Tech
R. Dingle, Tetra Tech

Attachment A

PNDI Receipt

1. PROJECT INFORMATION

Project Name: **S3-0280-Meadow Creek Rd.**
Date of Review: **2/20/2019 02:03:06 PM**
Project Category: **Energy Storage, Production, and Transfer, Energy Transfer, Pipeline (e.g., gas, oil) -- NEW (construction of new line in a new location)**
Project Area: **4.23 acres**
County(s): **Chester**
Township/Municipality(s): **UPPER UWCHLAN**
ZIP Code: **19343**
Quadrangle Name(s): **DOWNINGTOWN**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Marsh Creek**
Decimal Degrees: **40.092064, -75.728738**
Degrees Minutes Seconds: **40° 5' 31.4287" N, 75° 43' 43.4567" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

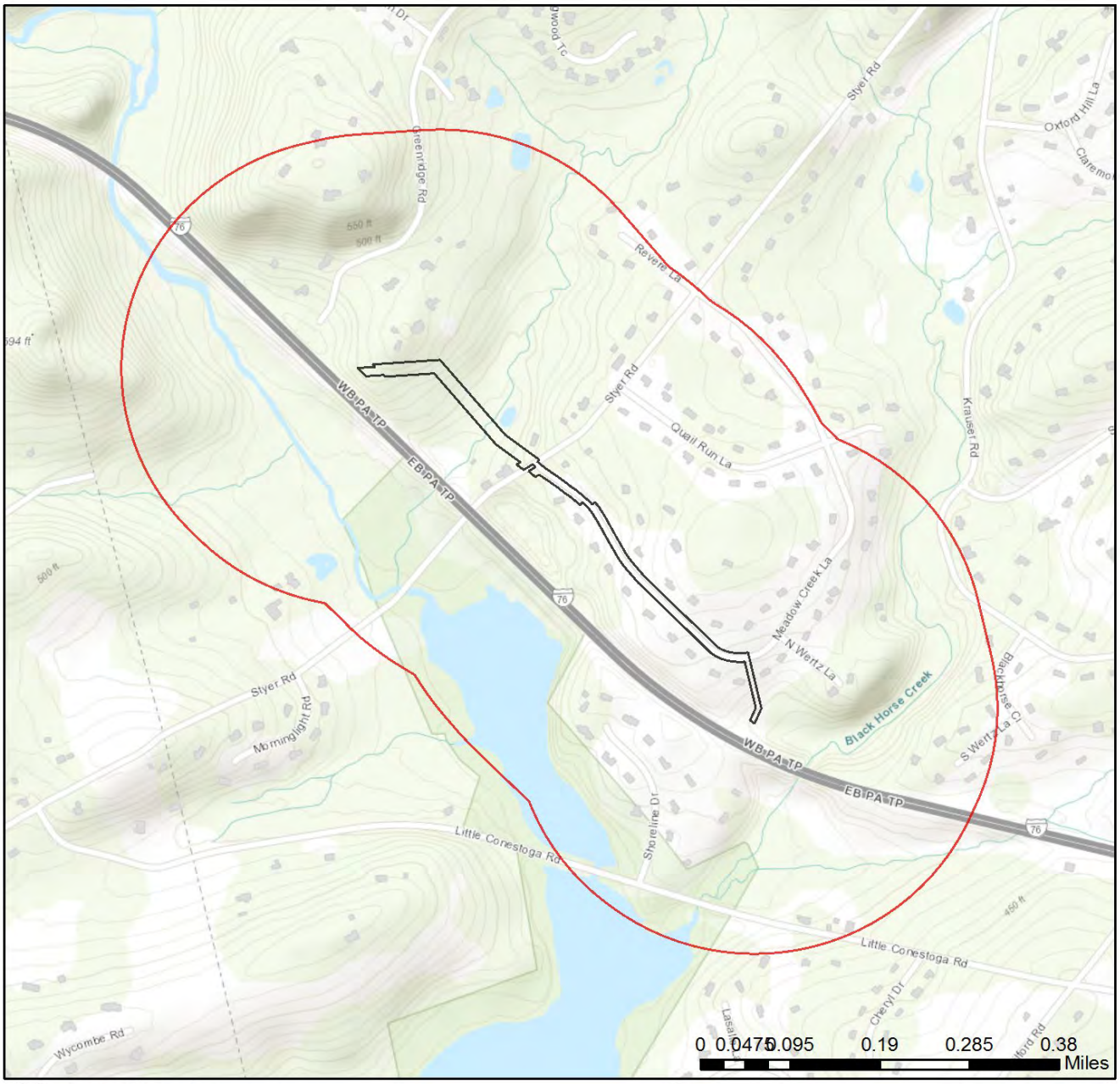
S3-0280-Meadow Creek Rd.

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

S3-0280-Meadow Creek Rd.



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

RESPONSE TO QUESTION(S) ASKED

Q1: Will this project or any project-related activities require any in-stream work, or a permanent or temporary crossing of a waterway (stream, river, creek, tributary)?
Your answer is: Yes

Q2: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

Q3: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)

Q4: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q5: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats?
Your answer is: Yes

Q6: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Sensitive Species**		Threatened

U.S. Fish and Wildlife Service

RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Kevin Berend
Company/Business Name: Tetra Tech
Address: 301 Elliott St.
City, State, Zip: Buffalo NY 14203
Phone: (716) 849-9419 Fax: (716) 849-9420
Email: kevin.berend@tetratech.com

8. CERTIFICATION

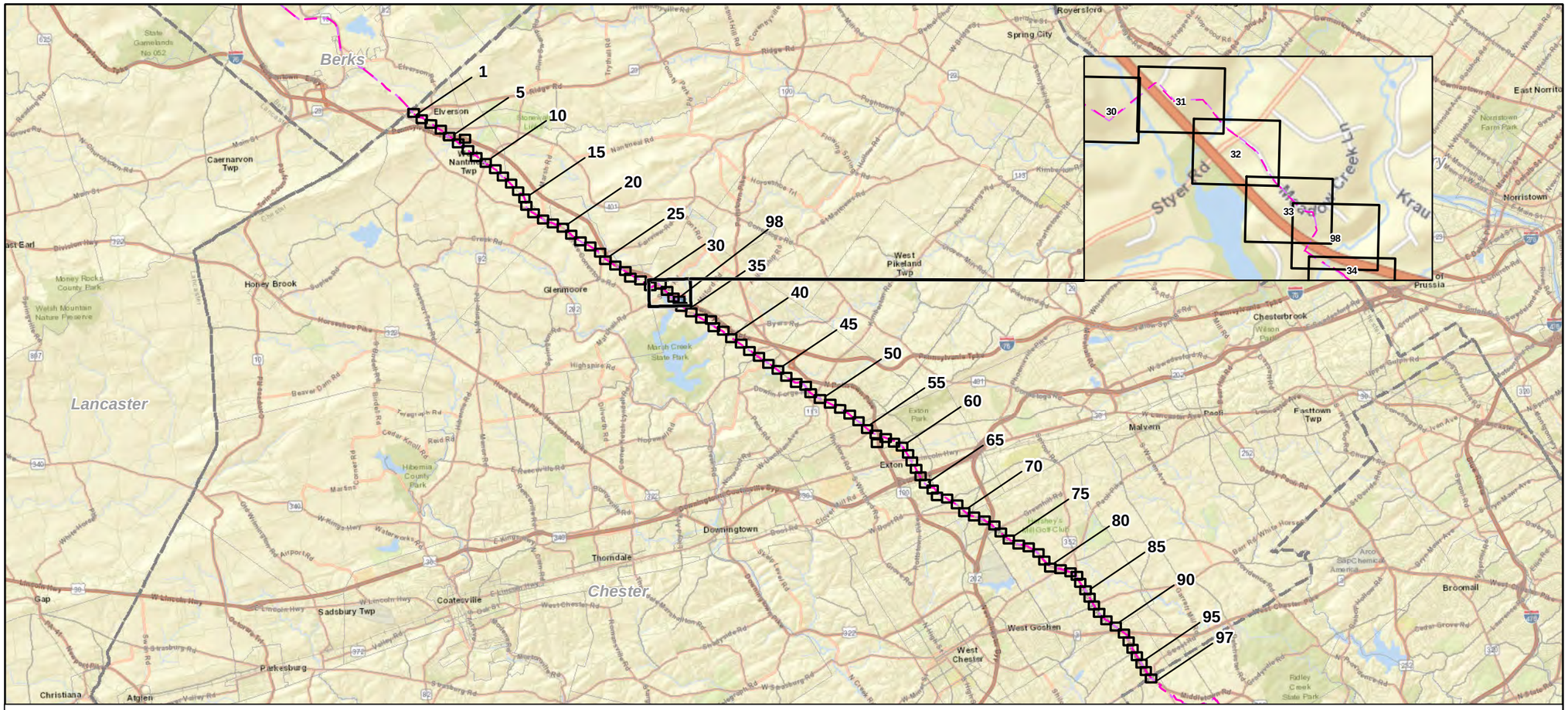
I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

2/22/19
date

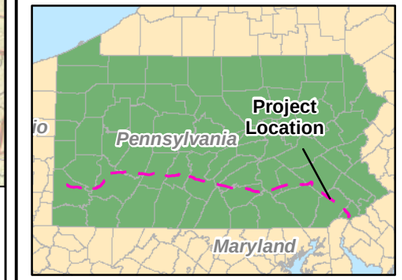
Attachment B

Revised PADEP Chapter 105 Site Plan Sheets



Legend

- Sheet Boundary
- PPP 1
- PPP 2
- Roads
- County Boundary
- Municipal Boundary



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1 inch = 15,000 feet

Mapset Legend

- Sheet Boundary
- Site Specific Drawing
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 2, Bore
- PPP 2, HDD
- Pullback String
- Bore Pits
- Existing Block Valve
- New Block Valve
- Block Valve Setting LOD
- Permanent Easement (no surface disturbance)
- Permanent ROW
- Temporary ROW
- ATWS
- Permanent Access Road
- Temporary Access Road
- ROW - Travel LOD (Travel Lane)
- ROW - Travel and Clearing LOD (Clearing LOD)
- Station LOD
- Hay Bale Discharge (See E&S Plan, Att 12)
- Direct Discharge (See E&S Plan, Att 12)
- Water Source (See E&S Plan, Att 12)
- ME1 12" Pipeline
- 12" ME1 Permanent ROW
- 8" Centerline
- 8" Pipeline Maintenance Corridor
- Existing Buried Cable
- Existing Electric Line
- Existing Fiberoptic Cable
- Existing Gas Line
- Existing Phone Line
- Existing Sanitary Sewer
- Existing Septic System
- Existing Storm Sewer
- Existing TV Line
- Existing Utility (unknown)
- Existing Water Line
- Stream Photo
- PEM Photo
- PFO Photo
- PSS Photo
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Ch. 105 Floodway
- Ch. 106 Floodplain Fringe
- PEM Extension
- PFO Extension
- PSS Extension
- PEM Wetland
- PFO Wetland
- PSS Wetland
- Pond
- Municipal Boundary
- Parcels
- Contours
- Roads

Site Plan Sheet Key for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 1 of 1

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI ArcGIS Online, Roads from NRCS Geospatial Data Giveaway, 100-Year Floodplain from FEMA National Flood Hazard Layer, downloaded 8/2013.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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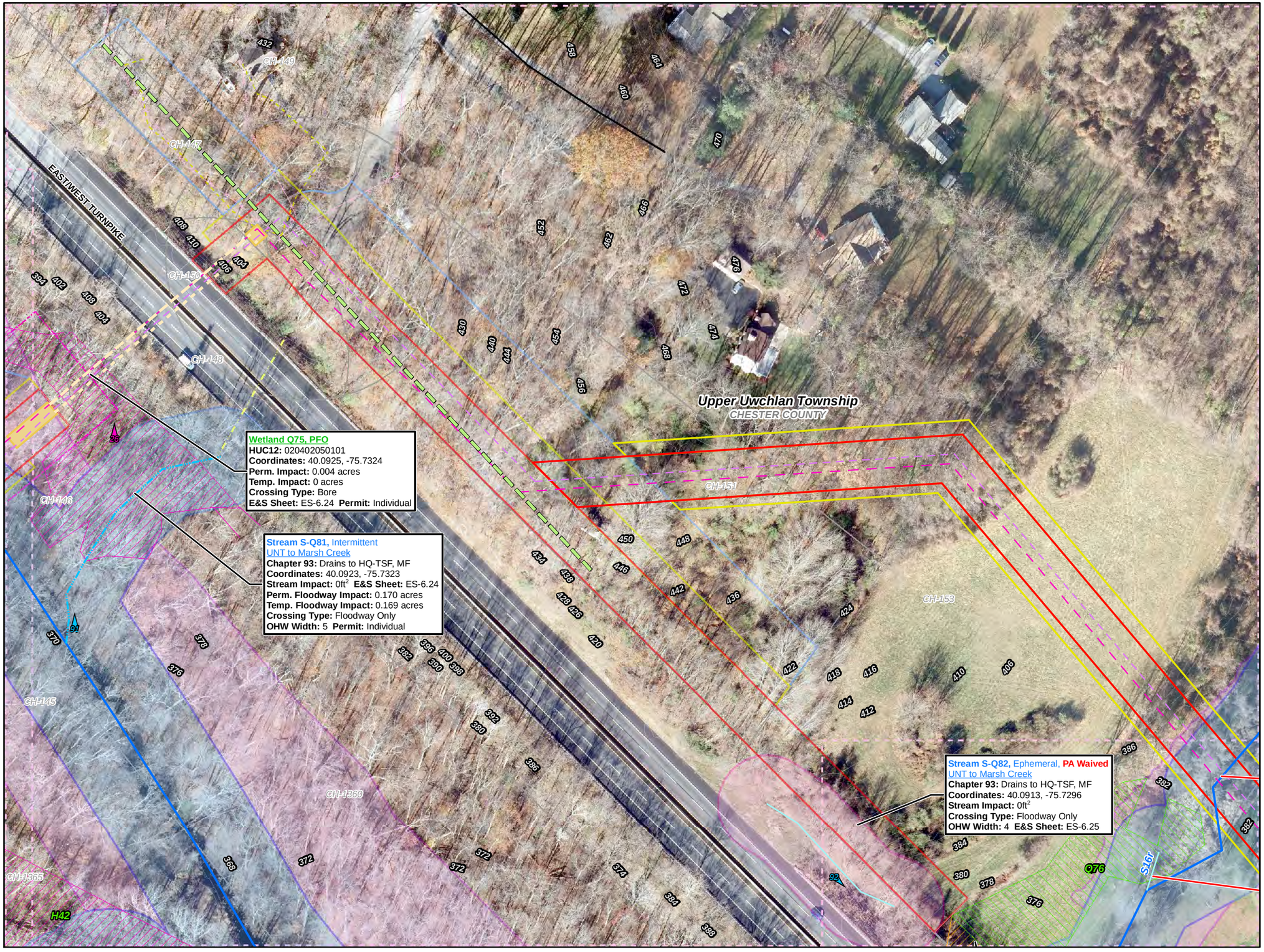

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, FlexBor
- Pullback String
- Permanent Easement (no surface disturbance)
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- ATWS
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- ROW-Travel and Clearing LOD
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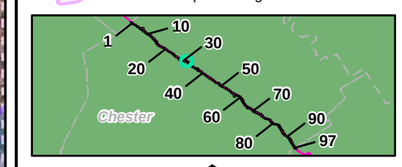
- Block Valve Setting LOD
- Station LOD
- Bore Pits
- PEM Wetland
- PFO Wetland
- PSS Wetland
- Pond
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



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1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 31 of 98

Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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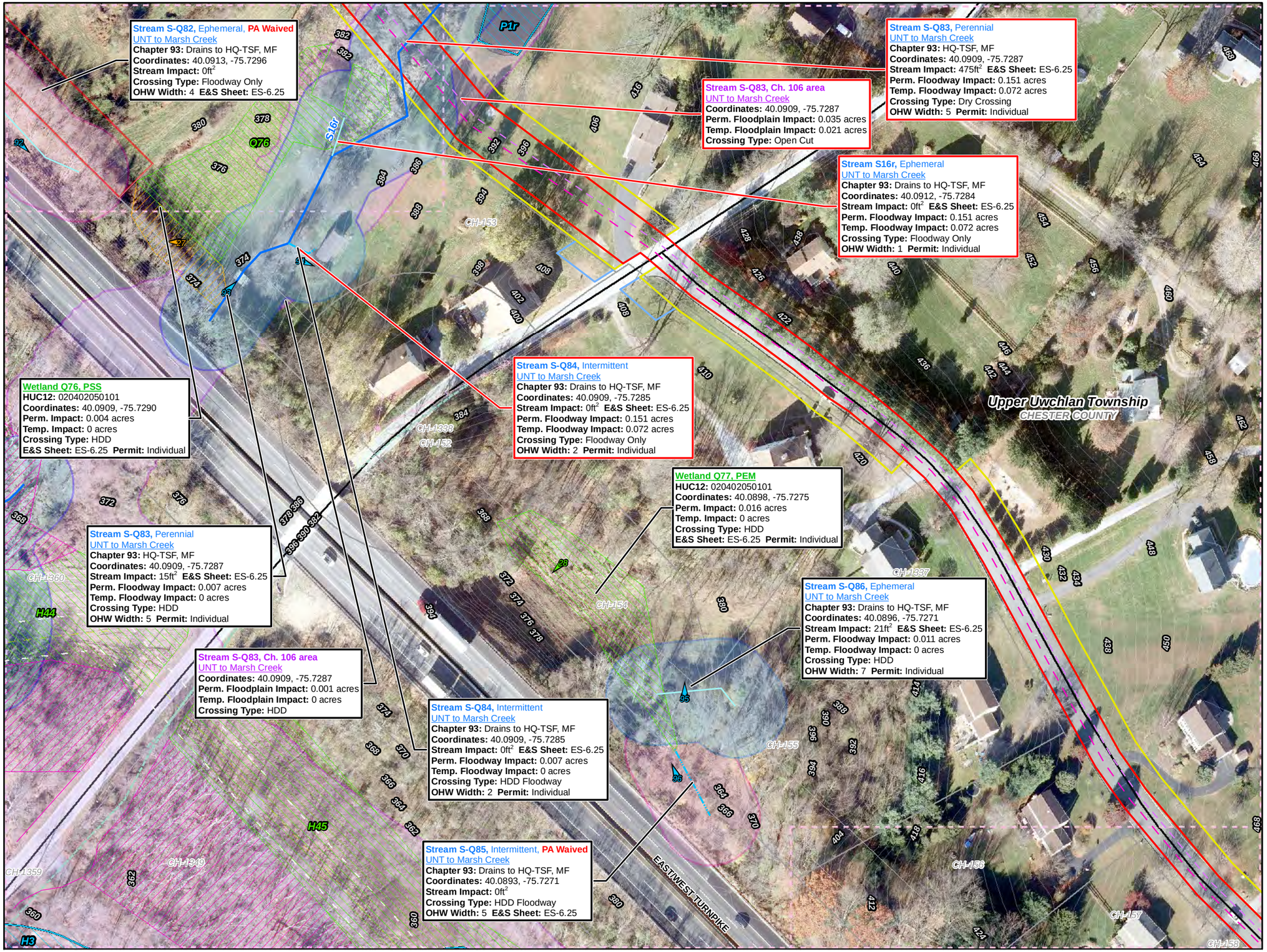

Legend

- Sheet Boundary
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- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, FlexBor
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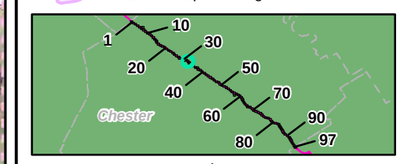
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



N

0 25 50 100 150 200

1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 32 of 98

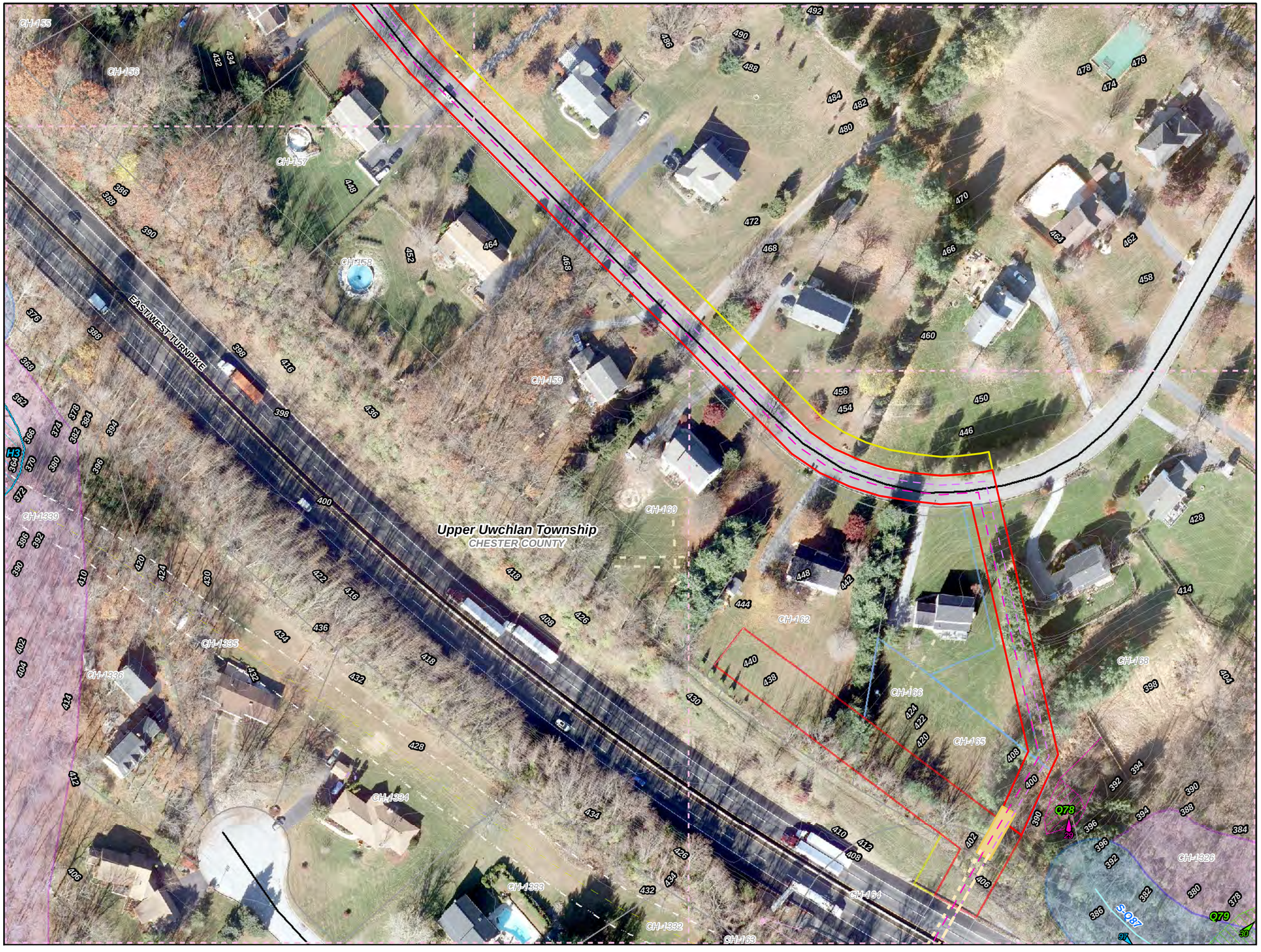
Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

P:GIS/Projects/112/C5958-PPP/MXD/Permits/CountyPermits/ChesterCountySitePlan_Rev5



Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
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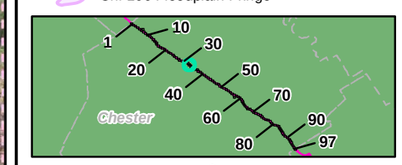

N

0 25 50 100 150 200

1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 33 of 98

Prepared By: TETRA TECH

Date: 02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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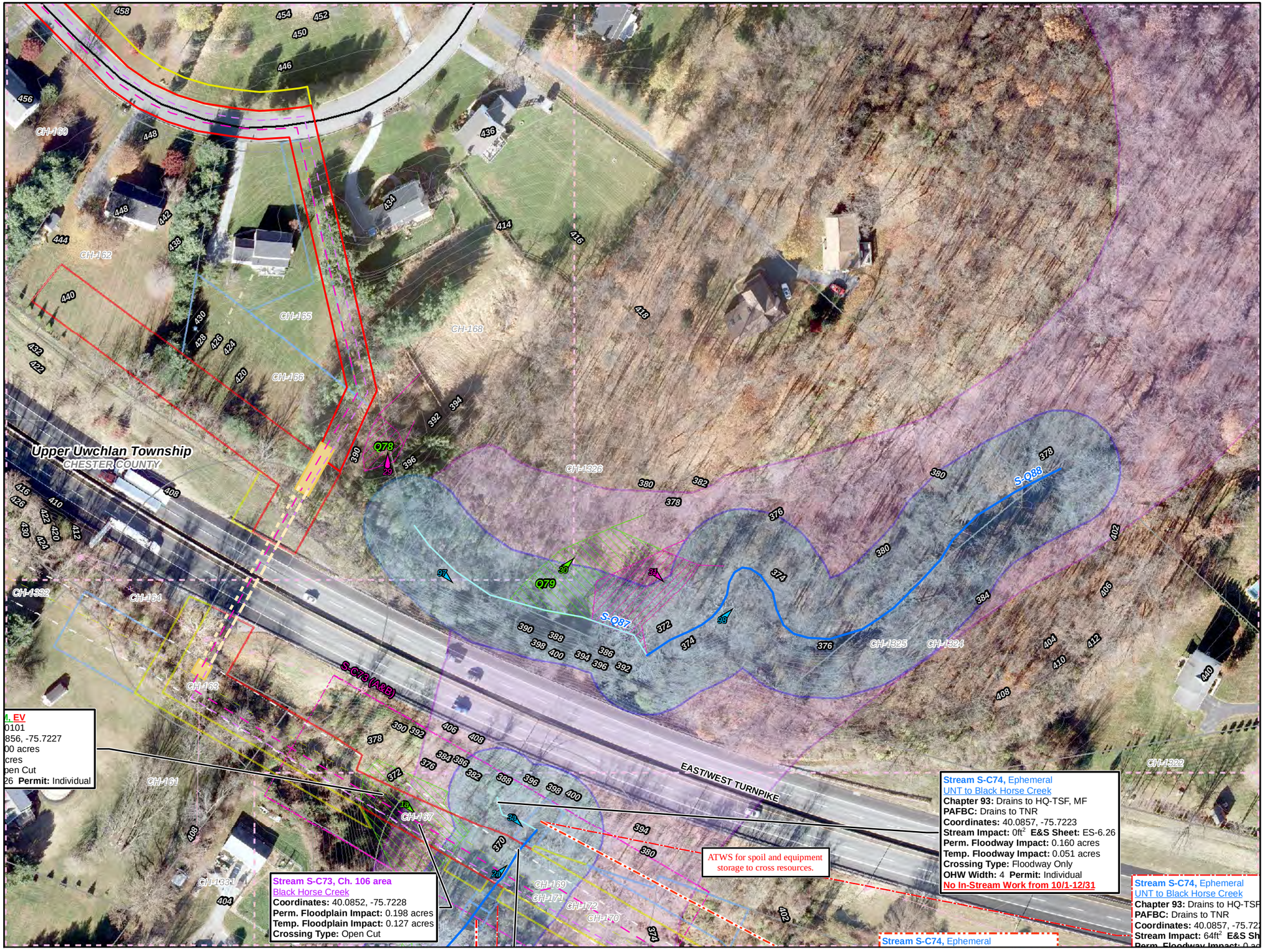

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, FlexBor
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, FlexBor
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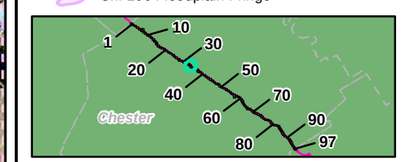

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1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Chester County, PA.
Sheet 98 of 98

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; SPLP 2014-2016, Roads from NRCS Geo-spatial Data Giveaway, 100-Year Floodplain from FEMA NFHL, downloaded 9/2016. Aquatics, TT 2013-2016.

Coordinate System: NAD 83 Stateplane, PA South, Feet

P:\GIS\Projects\112\C5938-PPP\MXD\Permits\ChesterCountySitePlan_Rev5

Attachment C-1

PAFBC Defer Bog Turtle Review to USFWS

Division of Environmental Services
Natural Gas Section
450 Robinson Lane
Bellefonte, PA 16823

January 27, 2014

IN REPLY REFER TO
SIR# 41856

TETRA TECH
Preston Smith
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No.
Sunoco Mariner East 2 Pipeline
ALLEGHENY County: - BERKS County: - BLAIR County: - CAMBRIA County: - CHESTER County: - CUMBERLAND County: - DAUPHIN County: - DELAWARE County: - HUNTINGDON County: - INDIANA County: - JUNIATA County: - LANCASTER County: - LEBANON County: - PERRY County: - WASHINGTON County: - WESTMORELAND County: - YORK County:

Dear Preston Smith:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Timber Rattlesnake (*Crotalus horridus*, PA Candidate)

Timber rattlesnakes occur in the forested, mountainous regions of the Commonwealth. They prefer forested areas to forage for small mammals (e.g., mice and chipmunks) and southerly-facing slopes for hibernating and other thermoregulatory activities. The timber rattlesnake is threatened by habitat loss/alteration, wanton killing, and poaching.

Based on the review of this information and the proximity of the project to known critical habitat of the Timber Rattlesnake, we recommend completion of a **habitat assessment** to determine presence/absence of potential habitat at the proposed project areas:

County	Potential Conflict	Western End of Habitat Assessment		Eastern End of Habitat Assessment		Comment
		Latitude	Longitude	Latitude	Longitude	
Cambria	Timber Rattlesnake	40.423856	-78.918485	40.419370	-78.884942	Laurel Ridge South Exposure
Blair	Timber Rattlesnake	40.465277	-78.489083	40.464433	-78.444829	West of Altoona
Huntingdon	Timber Rattlesnake	40.348146	-77.953475	40.337198	-77.912710	Jacks Mountain, SGL 71
Huntingdon	Timber Rattlesnake	40.329852	-77.820093	40.312663	-77.745830	Blacklog Mountain, Shade Mountain
Perry	Timber Rattlesnake	40.289980	-77.635604	40.284410	-77.612818	Conococheague Mountain, Tuscarora State Forest
Perry	Timber Rattlesnake	40.266702	-77.508005	40.262470	-77.491688	Bowers Mountain, Tuscarora State Forest
Cumberland	Timber Rattlesnake	40.256799	-77.469902	40.251875	-77.448899	Blue Mountain
Cumberland	Timber Rattlesnake	40.246850	-77.428032	40.245663	-77.385058	Wildcat Ridge, Tuscarora State Forest

We have included a list of qualified surveyors and habitat assessment protocol for your convenience. This list is not an exhaustive list of qualified rattlesnake surveyors in Pennsylvania as there may be qualified surveyors who have not asked to be placed on this list. It is not mandatory that you use someone on this list.

Freshwater Mussels

The following rare freshwater mussel species are known from the vicinity of the project area:

County	Potential Conflict	Latitude	Longitude	Water Name
Huntingdon	Yellow Lampmussel (*Lampsilis cariosa*)	40.342806	-77.853210	Aughwick Creek
Huntingdon	Rainbow Mussel (*Villosa iris*)	40.342806	-77.853210	Aughwick Creek
Juniata	Rainbow Mussel (*Villosa iris*)	40.301386	-77.696168	Tuscarora Creek
Cumberland	Rainbow Mussel (*Villosa iris*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Elktoe (*Alasmidonta marginata*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Triangle Floater (*Alasmidonta undulata*)	40.239506	-77.176329	Conodoguinet Creek
Cumberland	Yellow Lampmussel (*Lampsilis cariosa*)	40.239506	-77.176329	Conodoguinet Creek

Freshwater mussels are the most imperiled taxonomic group in North America. Nearly 20% of the species historically known to occur in the Commonwealth are now extirpated (locally extinct). Additionally 60% of Pennsylvania's remaining species are of conservation concern. We are concerned about direct and indirect (i.e., runoff) effects that the proposed project may have on the species of concern. The freshwater mussel species known from the project area are especially vulnerable to physical (dredging, rip-rap, etc.) and chemical (pH, dissolved oxygen, temperature, heavy metals and organic contaminants) changes to their aquatic environment. Therefore, **we recommend using directional boring** rather than open cutting for the Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek crossings. Open cutting will most likely adversely impact the species of concern. Work should be conducted from the bank (e.g., no in-stream disturbance). Likewise, no erosion or sediment should be allowed to enter into the river (e.g., strict erosion and sedimentation control measures need to be employed).

Provided that directional boring methodology is used, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the mussel species of special concern. The **applicant should implement the following contingencies to prevent impacts to water quality from drilling/boring operations:**

• Have a designated environmental inspector on site for the duration of the entire crossing operation
• Stop the bore/drill immediately if anyone on site observes an Inadvertent Return.
• Have a Vac Truck on site or on call (within three hours) to begin clean-up of the release in the stream channel to prevent downstream migration of drilling fluids
• Notify PFBC Bureau of Law Enforcement Regional Office within 24 hours http://fishandboat.com/dir_regions.htm (NC 814-359-5250; NE 570-477-5717; NW 814-337-0444; SW 814-445-8974)

Additionally, any release of sediment to the stream should be reason to initiate contact with the PFBC Bureau of Law Enforcement to address these issues. Any unauthorized disturbance, unpermitted discharge, or release of sediment(s) that is determined to be a pollution event (generally described http://www.fish.state.pa.us/fishpub/summary/reporting.html) per the Pennsylvania Fish and Boat Code will be subject to the appropriate legal enforcement action.

If, however, the work will necessitate any direct (e.g. equipment intrusion) or indirect impacts (e.g. runoff) to Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek, a mussel survey & relocation should be conducted to avoid potential impacts to these rare mussel species. It is recommended that a qualified malacologist complete a mussel survey to identify any mussel species present and determine their abundance. Additionally, if mussels are encountered it is recommended that the mussels in the area of direct impact be relocated to suitable habitat outside of the disturbance area.

A list of qualified malacologists and a Pennsylvania Fish & Boat Commission approved mussel survey protocol is enclosed for your convenience when arranging for a mussel survey. Prior to conducting a survey, qualified malacologist should submit a proposed survey and relocation plan to this office. Upon completion of the mussel survey and relocation, please send a copy of the final report to this office for further evaluation.

Fish

The following rare or protected fish species are known from the vicinity of the project area:

County	Potential Conflict	Latitude	Longitude	Water Name
Washington / Allegheny	Ghost Shiner (*Notropis buchanani*, PA Endangered)	40.230011	-79.971321	Monongahela River
Cambria	Brook Stickleback (*Culaea inconstans*, PA Candidate)	40.449661	-78.605685	Little Conemaugh River

The fish species known from the project area are especially vulnerable to physical (dredging, substrate modification, etc.) and chemical (turbidity, pH, dissolved oxygen, temperature, heavy metals and organic contaminants) changes to their aquatic environment. Although the mobile adults of these protected fish species may be capable of moving from the project area, their spawning grounds (including eggs, fry, and immature fish) are vulnerable to burial, crushing by equipment, and siltation from in-stream construction projects. We are concerned about potential impacts to the fish, eggs and the hatching fry from any instream work.

Provided that directional boring is used for the Monongahela River and Little Conemaugh River crossings, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the fish species of special concern.

If, however, the Monongahela River work will necessitate any direct impacts such as instream work or open cut stream crossings, we will need more information to allow for a more thorough evaluation of potential adverse impacts from the proposed project. Items such as a detailed narrative accurately describing the crossing including possible instream work, sequence of activities, basic site plans and map, aerial maps of the general area, project alternatives, acreage to be impacted, general habitat descriptions or onsite color photographs (keyed to a site map) would expedite our review process. Pending the review of this information a survey for the species of concern may be warranted.

If, however, the Little Conemaugh River work will necessitate any direct impacts such as instream work or open cut stream crossings, we request that all in-stream activity be avoided from April 1 to June 15 in order to avoid adverse impacts during the spawning season for the Brook Stickleback. Likewise, all work should be done during low flow periods, and strict erosion and sedimentation control measures need to be employed. Provided that these recommendations are followed, as well as best management practices and an approved erosion and sedimentation control plan is maintained, then we do not anticipate the proposed activity to have any significant adverse impacts to the fish species of special concern.

Eastern Redbelly Turtle (*Pseudemys rubriventris*, PA Threatened)

The eastern redbelly turtle is one of Pennsylvania's largest native aquatic turtles. This turtle species is known to inhabit relatively large, deep streams, rivers, ponds, lakes, and marshes with permanent water and ample basking sites. Redbelly turtles are restricted to the southcentral and southeastern regions of the Commonwealth. The existence of this turtle species is threatened by habitat destruction, poor water quality and competition with aggressive non-native turtle species that share its range and habitat (e.g. red-eared slider).

If large, deep streams, rivers, ponds, lakes and wetlands with permanent water or the area within 300ft of these water features in Chester and Delaware counties are to be disturbed from the

project activity, we request completion of a habitat assessment to determine presence/absence of potential redbelly turtle habitat and/or nesting habitat at the proposed project area.

A qualified biologist, who possesses the necessary Scientific Collector's Permit issued by the Pennsylvania Fish and Boat Commission, must conduct this habitat/nesting habitat assessment. A list of biologists recognized as qualified by the Pennsylvania Fish and Boat Commission to perform redbelly turtle surveys is enclosed. Following completion of the assessment, a report of the qualified redbelly turtle biologist's observations and conclusions must be submitted to this office for further review and consultation.

However, if permanent water wetlands, vernal pools, or water bodies or the area within 300ft of these water features in Chester and Delaware counties are not to be disturbed in any way by the proposed activity, and provided that best management practices are employed and strict erosion and sedimentation measures are maintained, I do not foresee any adverse impacts to the Eastern Redbelly Turtle from the proposed project.

Bog Turtle (*Glyptemys muhlenbergii*, PA Endangered, Federal Threatened)

In an effort to streamline our threatened and endangered species environmental review process, reduce the redundancy in project reviews and ease our staff workload, the Pennsylvania Fish and Boat Commission has delegated coordination/consultation of joint state/federally listed species impact reviews to the PA Field Office of the U.S. Fish and Wildlife Service (USFWS). Please send your project materials *if you have not already done so* to them at: **U.S. Fish and Wildlife Service, Endangered Species Section, 315 South Allen St, Suite 322, State College, PA 16801-4851.**

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gary Smith at 814-279-3080 and refer to the SIR # 41856. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Heather Smiles

Heather A. Smiles, Chief
Natural Gas Section

HAS/GAS/dn

Attachment C-2

PAFBC Redbellied Turtle Clearance

Division of Environmental Services
Natural Gas Section
450 Robinson Lane
Bellefonte, PA 16823

October 26, 2015

IN REPLY REFER TO
SIR# 41856

TETRA TECH
Preston Smith
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No.
Sunoco Mariner East 2 Pipeline
ALLEGHENY County: - BERKS County: - BLAIR County: - CAMBRIA County: - CHESTER County: - CUMBERLAND County: - DAUPHIN County: - DELAWARE County: - HUNTINGDON County: - INDIANA County: - JUNIATA County: - LANCASTER County: - LEBANON County: - PERRY County: - WASHINGTON County: - WESTMORELAND County: - YORK County:

Dear Preston Smith:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Freshwater Mussels

Rare freshwater mussel species are known from the vicinity of the project area in Aughwick Creek (Rainbow Mussel & Yellow Lampmussel), Tuscarora Creek (Rainbow Mussel), and Conodoguinet Creek (Elktoe, Rainbow Mussel, Triangle Floater, Yellow Lampmussel). Your October 9, 2015 letter stated that Sunoco plans to drill/bore Aughwick Creek, Tuscarora Creek, and Conodoguinet Creek and implement our contingency recommendations for drilling/boring operations as listed in our January 27, 2014 letter. Provided that drilling/boring is conducted on these three streams and our recommendations are followed, as well as best management practices and an approved strict erosion and sedimentation control plan is maintained, then we do not anticipate the proposed activity to have any significant adverse impacts to the freshwater mussel species of special concern.

Fish

Rare or protected fish species are known from the vicinity of the project area in the Monongahela River (Ghost Shiner) and Little Conemaugh River (Brook Stickleback). Your October 9, 2015 letter stated that Sunoco plans to drill/bore the Monongahela River and Little Conemaugh River. Provided that directional boring is used for the Monongahela River and Little Conemaugh River crossings, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the fish species of special concern.

Eastern redbelly turtle (*Pseudemys rubriventris*, PA threatened)

Per our request, an Eastern Redbelly Turtle habitat assessment survey was conducted by a qualified biologist and the habitat assessment report was provided to us. Based on the report, 34 properties were deemed as suitable RBT habitat (aquatic or nesting) within or adjacent to the pipeline ROW. Of the 34 properties that were suitable RBT habitat, only 2 areas identified as suitable nesting habitat and 1 area identified as suitable aquatic habitat would be disturbed by the construction of the project. All other suitable habitat areas would be outside the limit of disturbance or would be crossed via drilling/boring.

Based on our review of the habitat assessment report, the project site contains accessible potential redbelly turtle nesting habitat that would be disturbed by the construction of the project at the following locations: areas near Pond A4 (Habitat Assessment Report Attachment 4, Figure 2b) and Wetland I2 (Habitat Assessment Report Attachment 4, Figure 2i). The following measures will be necessary at areas near Pond A4 and Wetland I2 in order to avoid impacts to redbelly turtles during the construction of this project:

1) A silt fence barrier should be placed at the edge of the proposed area of disturbance, in between the waterway and the work area, to prevent turtles from accessing active work zones in the segments that were determined to be potential habitat. This fence should be installed during the inactive period of the redbelly turtle (October 15-April 15) so that active turtles or their nests do not get trapped in the work zone.

2) Any turtle found on site should be relocated to the nearest aquatic habitat. Additionally, the PFBC must be contacted within 48 hours of the find.

We are concerned that eastern redbelly turtles could be using the project area at Stream H52 near Wetland Q75 (Habitat Assessment Report Attachment 4, Figure 2d) for overwintering (brumation). Any dewatering or disturbance to the sediments during the brumation of the turtles could cause harm or even death to turtles that are in a dormant state and unable to move away. Therefore, we recommend that no construction be conducted in the water at Stream H52 near Wetland Q75 during the overwintering period of the redbelly turtle (October 15 through April 15). Any instream **construction activities should take place between April 15 and October 15 at Stream H52 near Wetland Q75 in order to allow turtles to avoid the project area while they are active.** Any turtles found within the staging area of the project should be safely moved outside the work zone in appropriate habitat.

Provided that the potential nesting habitat areas can be fenced and overwintering season can be avoided as recommended, best management practices are followed, and an approved strict erosion and sedimentation control plan is maintained, then I do not anticipate the proposed activity to have any significant adverse impacts to the eastern redbelly turtle.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not

necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Gary Smith at 814-279-3080 and refer to the SIR # 41856. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Heather A. Smiles, Chief
Natural Gas Section

HAS/GAS/dn

Attachment C-3

USFWS Bog Turtle Clearance

RECEIVED
SEP 20 2016
BY:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
110 Radnor Road, Suite 101
State College, Pennsylvania 16801-4850

September 15, 2016

Brad Schaeffer
Tetra Tech
301 Ellicott Street
Buffalo, NY 14203

RE: USFWS Project #2014-0200

Dear Mr. Schaeffer:

Thank you for your letter dated August 19, 2016, which provided the Fish and Wildlife Service (Service) with additional information regarding Sunoco Pipeline, L.P., proposed Pennsylvania Pipeline (formerly part of the Sunoco Mariner East 2 Pipeline) project located in Washington, Allegheny, Westmoreland, Indiana, Cambria, Blair, Huntington, Juniata, Perry, Cumberland, York, Dauphin, Lebanon, Lancaster, Berks, Chester, and Delaware counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species and the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended) to ensure the protection of migratory bird species.

The project involves the phased installation of approximately 561 miles of two parallel pipelines within a 306-mile, 50-foot wide right-of-way (ROW) from Houston, Washington County, Pennsylvania to Sunoco Pipeline, L.P.'s (SPLP), Twin Oaks facility in Delaware County, Pennsylvania with the purpose of interconnecting with existing SPLP Mariner East pipelines. As initially described, a 20-inch diameter pipeline would be installed within the ROW from Houston, PA to the Twin Oaks facility (306 miles) and a second, up to 20-inch diameter pipeline, is proposed to be installed in the same ROW. The second line is proposed to be installed from SPLP's Delmont Station, Westmoreland County, Pennsylvania to the Twin Oaks facility, paralleling the initial line for approximately 255 miles.

Federally listed species

Bog Turtle

The project area is within the range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. The species inhabits shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy.

To determine the potential effects of the proposed project on bog turtles and their habitat, Stan Boder, James Drasher, Kevin Keat, Jason Tesauro, Ben Berra, Andy Brookens, and Logan Zugay conducted Phase 1 bog turtle habitat assessments on all wetlands within 300 feet of the project's proposed limit of disturbance (LOD). According to their reports, 430 wetlands extend to within 300 feet of the proposed LOD within the range of the bog turtle. Following the methods described under "Bog Turtle Habitat Survey" (Phase 1 survey) of the Guidelines for Bog Turtle Surveys (revised April 2006), the surveyors determined that 334 of the subject wetlands do not have the combination of soils, vegetation, and hydrology typical of habitat occupied by bog turtles. We agree with their habitat determination for those wetlands.

Species presence surveys (Phase II surveys) were initiated at 99 wetlands determined by the surveyors to have the combination of habitat characteristics typical of areas occupied by bog turtles. Based on survey results and known bog turtle occurrences, Tetra Tech reported that there are four wetlands within the LOD and four wetlands within 300 feet of the LOD that are occupied by bog turtles (Table 1.).

Table 1. Occupied wetlands the will be directly or indirectly affected by the action.

Wetlands	BT Occupancy	Location
A54	Occupied	Within LOD
A55	Occupied	Within LOD
AM2	Occupied	Within LOD
AM3	Occupied	Within 300 feet
C6	Occupied	Within LOD
C7	Occupied	Within 300 feet
C8	Occupied	Within 300 feet
C44	Occupied	Within 300 feet

To avoid adverse effects to the known bog turtle populations in wetlands A54 and A55 the applicant has proposed the following measures:

1. Drill under Wetlands A54 and A55 using horizontal directional drilling (HDD). The pilot hole for the HDD will be completed during the bog turtle active season (April 1 through October 31), but the subsequent low pressure reaming of the hole may occur during the bog turtle inactive season (November 1 through March 31);
   a. Prior to performing any construction work in wetlands, streams, or uplands within 300 feet of the potential bog turtle habitat, all areas of expected disturbance must be surveyed by a qualified surveyor for the presence of bog turtles immediately prior to construction commencement.
   b. Prior to the survey, herbaceous vegetation should be cut to a height of 4 to 6 inches using a hand-held trimmer/weed-cutter, and then carefully raked away from the area to be searched. A qualified bog turtle surveyor should be present when this vegetation clearing occurs.
   c. Immediately following the survey, silt-fencing should be placed between the wetland and the proposed construction zone while the bog turtle surveyor is present to ensure that the fencing is properly installed in the correct location. The silt-fencing should be removed immediately following construction.

2. Ensure the HDD will be in bedrock prior to drilling beneath the wetlands by utilizing the information provide in geotechnical reports;
3. Implement Service-approved Inadvertent Return Contingency Plan;
4. Install a series of piezometers to monitor groundwater conditions before, during, and after the HDD following a Service-approved monitoring plan.
5. Implement its bog turtle radio-telemetry study protocol (see Appendix A)
6. Implement a Service-approved vibration monitoring plan along the alignment and within the wetlands if HDD activities extend into the bog turtle dormant season.
7. Post-construction routine pipeline operation and maintenance protective measures:
   a. "No Mowing" signs will be placed along the boundary of Wetlands A54 and A55 to prevent disturbance during post-construction right-of-way (ROW) maintenance activities;
   b. Additional signs will be placed at the edge of Zone 2 (300 feet from the wetland edge) to demarcate the limit of herbicide application within the ROW;
   c. Only hand clearing will occur in Zone 2 and will be conducted between October 1 and March 31.

During an April 6, 2016, field view, Service-biologist Brian Scofield, acknowledged the marginal, but suitable, habitat conditions of Wetland AM2 and recommended a time-of-year restriction or pre-construction survey. The same recommendation was given for Wetlands AM3, C7, C8, and C44 because of their proximity to known bog turtle populations. Therefore, the applicant has proposed that either construction will take place between November 1 and March 31, when bog turtles are hibernating, or a pre-construction survey will be performed if construction occurs between April 1 and October 31, during which time bog turtles are active. If construction takes place during the active season the following measures will be followed.

1. Prior to performing any construction work in wetlands, streams, or uplands within 300 feet of the potential bog turtle habitat, all areas of expected disturbance must be surveyed by a qualified surveyor for the presence of bog turtles immediately prior to construction commencement.
2. Prior to the survey, herbaceous vegetation should be cut to a height of 4 to 6 inches using a hand-held trimmer/weed-cutter, and then carefully raked away from the area to be searched. A qualified bog turtle surveyor should be present when this vegetation clearing occurs.
3. Immediately following the survey, silt-fencing should be placed between the wetland and the proposed construction zone while the bog turtle surveyor is present to ensure that the fencing is properly installed in the correct location. The silt-fencing should be removed immediately following construction.
4. If any bog turtles are located during these searches, the Service and Pennsylvania Fish and Boat Commission (PFBC) should be contacted immediately, and construction should not proceed until further consultation occurs. Survey results should be submitted to the Service and PFBC.

To avoid the risk of take to the known bog turtle population in Wetland C6 the applicant has proposed the use of a dry-bore to go under the wetland and avoid surface impacts. Because dry-bore technology does not utilize pressurized fluid to bore, there is no risk of an inadvertent

return; therefore, the applicant has proposed the same minimization measures as Wetlands AM2, AM3, C7, C8, and C44.

With the implementation of the avoidance and conservation measures listed above and in the applicant's April 2016 Bog Turtle Conservation Plan, we anticipate that the effects of this project to bog turtles will be insignificant or discountable. If you are unable to implement all proposed avoidance measures or project plans change, further consultation with the Service will be required, pursuant to the Endangered Species Act.

Indiana bat

The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Mist-net surveys were conducted within the appropriate survey windows between May 15, 2014, and August 4, 2015, for Indiana bats. Surveys were carried out only where suitable habitat existed and where those areas occurred outside of already assumed occupied habitats (swarming areas).

According to the April 2016 survey report, surveys were conducted at 294 survey blocks within the project area, in accordance with the Fish and Wildlife Service's 2014 and 2015 Indiana bat summer survey guidelines, which are designed to detect the presence of Indiana bat maternity colonies. During these surveys, no Indiana bats were captured. Additionally, 12 portals were analyzed as potential hibernacula. Harp traps and acoustic surveys were performed, but did not yield any Indiana bat captures or calls. Therefore, based on these survey results, we conclude (1) there is no higher population density of Indiana bat activity that would be typical of a maternity colony, and (2) it is unlikely that the studied mine portals support Indiana bats.

Portions of the project area are within two known Indiana bat hibernacula swarming areas. Swarming areas are habitat surrounding known hibernation sites that the bats depend on for spring staging and fall swarming (the periods following emergence from hibernation and prior to reentering hibernation, respectively). These swarming areas are also used by some male bats, and nonreproductive females through the warmer seasons. As such, Sunoco Pipeline, L.P., has submitted an Indiana Bat Conservation Plan. The proposed project will affect approximately 258 acres of forest habitat in the vicinity of the Hartman Mine Indiana bat swarming area. To avoid adverse effects on Indiana bats, Sunoco Pipeline, L.P, has agreed to implement the measures outlined in their April 2016 Indiana Bat Conservation Plan for the subject pipeline project. This includes a commitment to cut trees between November 15 and March 31 in the Indiana bat swarming area. The Conservation Plan also details specific measures that will be implemented to avoid indirect effects of the cumulative forested habitat loss on Indiana bats, including the contribution of $1,002,819 into the Indiana Bat Conservation Fund that will be used for permanent conservation of Indiana bat habitat.

The project information and our analysis include a portion of the pipeline project that traverses through Raystown Lake Recreation Area, which is located in Hartman Mine Indiana Bat Swarming Area. Sunoco Pipeline, L.P. has committed to removing these trees between November 15 and March 31 during a time when bats are assumed to be hibernating to avoid the risk of directly killing roosting bats.

Additionally, a small segment of the pipeline will traverse a portion of the Layton Fire Clay Mine Indiana bat swarming area. There is limited tree clearing proposed here (approximately 0.62 acres), due to this portion of the line being collocated with an existing right-of-way. To avoid the risk of directly killing or injuring Indiana bats, Sunoco Pipeline L.P., has agreed to implement tree clearing in this swarming area between November 15 and March 31.

The Service has reviewed the Conservation Plan and found it to address the recommended avoidance and conservation measures outlined in our guidance. Therefore, with the implementation of these measures: (1) time of year restrictions on tree clearing to avoid the risk of direct take of Indiana bats, (2) the results of the mist-net and hibernacula surveys that failed to locate maternity colonies or new hibernation sites, and (3) use of the Indiana Bat Conservation Fund to offset indirect effects to bats that may result from aggregate forest habitat loss of swarming habitat, we conclude that effects of the project on the Indiana bat are insignificant or discountable.

Northern long-eared bat

The proposed project is located within the range of the federally threatened northern long-eared bat (*Myotis septentrionalis*). On February 16, 2016, the final rule that tailors protections for the northern long-eared bat under the Endangered Species Act became effective (81 FR 1900; see: http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/FRnlebFinal4dRule14Jan2016.pdf).

Mist-net surveys were conducted within the appropriate survey windows between May 15, 2014 and August 4, 2015, for northern long-eared bats.

According to the April 2016 survey report, surveys were conducted at 294 survey blocks within the project area, in accordance with the Fish and Wildlife Service's 2014 and 2015 Indiana bat summer survey guidelines. During the 2014 surveys, 30 northern long-eared bats were captured and 13 were radio-tracked. Two more northern long-eared bats were captured and radio-tracked in 2015 surveys. Additionally, 12 portals were analyzed as potential hibernacula. Harp trapping and acoustic surveys were performed at the portals, but did not yield any northern long-eared bat captures or calls.

Although several northern long-eared bat roost trees were documented close to the LOD, only one roost tree was identified within 150 feet of project disturbance. In accordance with the final 4(d) rule, removal of this roost tree will not occur between June 1 and July 31. Additionally, your project is not located within 0.25 mile of a known northern long-eared bat hibernaculum. Therefore, following the June 1 –July 31 time of year restriction on roost tree clearing, any incidental take that might result from tree removal is not prohibited, and no further consultation regarding this species is necessary. More information on the northern long-eared bat and the 4(d) rule can be found here: http://www.fws.gov/midwest/endangered/mammals/nleb/

Northeastern bulrush

The project is within the known range of the northeastern bulrush (*Scirpus ancistrochaetus*), a federally listed, endangered plant. Surveys were conducted for this species in 2014 and 2015. 231 potential northeastern bulrush habitat areas were identified. These 231 habitat areas revealed

two previously undocumented northeastern bulrush populations. The Blair County population is located approximately 340 feet from the edge of the proposed LOD and is not hydrologically connected to Wetland L70, which is located in the ROW.

The Cambria County population is located within the LOD, approximately 75 feet from a proposed access road. To minimize and avoid impacts to this population, Sunoco Pipeline, L.P., proposes to install the pipeline under this wetland system via HDD. While we support this method of crossing to reduce vernal pool and wetland impacts, best management practices need to be employed to minimize potential harm to listed species. The pipeline will be approximately 50 feet below the surface. The entry point will be about 150 feet from the population and the exit point will be about 1,534 feet southeast of the population. The HDD length will be approximately 1,684 feet.

Despite best intentions, drilling fluids can still be released to the surface. Damage to the wetlands, its hydrology, flora or fauna can occur from equipment used to clean up the drilling fluid material. Therefore, all precautions to prevent an inadvertent release (IR) should be implemented, including examining the subsurface soil and bedrock material to determine geotechnical limitations or IR probability, and designing a drill path to minimize drill pressure and entry angles. As a means to minimize impacts should an IR occur, you provided an HDD Inadvertent Release Contingency Plan. In addition to the instructions in this Plan, please add the USFWS phone number (provided below) as an agency to be contacted should an IR occur, and inform the HDD contractor about the sensitive nature of the drill at this location.

With the aforementioned buffers in place and a successful HDD, this project is not likely to adversely affect these northeastern bulrush populations.

Assessment of Risks to Migratory Birds

The Service received Sunoco's draft Migratory Bird Conservation Plan on July 15, 2016, and provided comments on the plan during our August 10, 2016, meeting. The Service is awaiting Sunoco's final Migratory Bird Conservation Plan.

The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the FWS recognizes that some birds may be taken during activities such as pipeline construction even if all reasonable measures to avoid take are implemented. The FWS's Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seek to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

Please contact Pamela Shellenberger or Brian Scofield of this office at (814) 234 4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

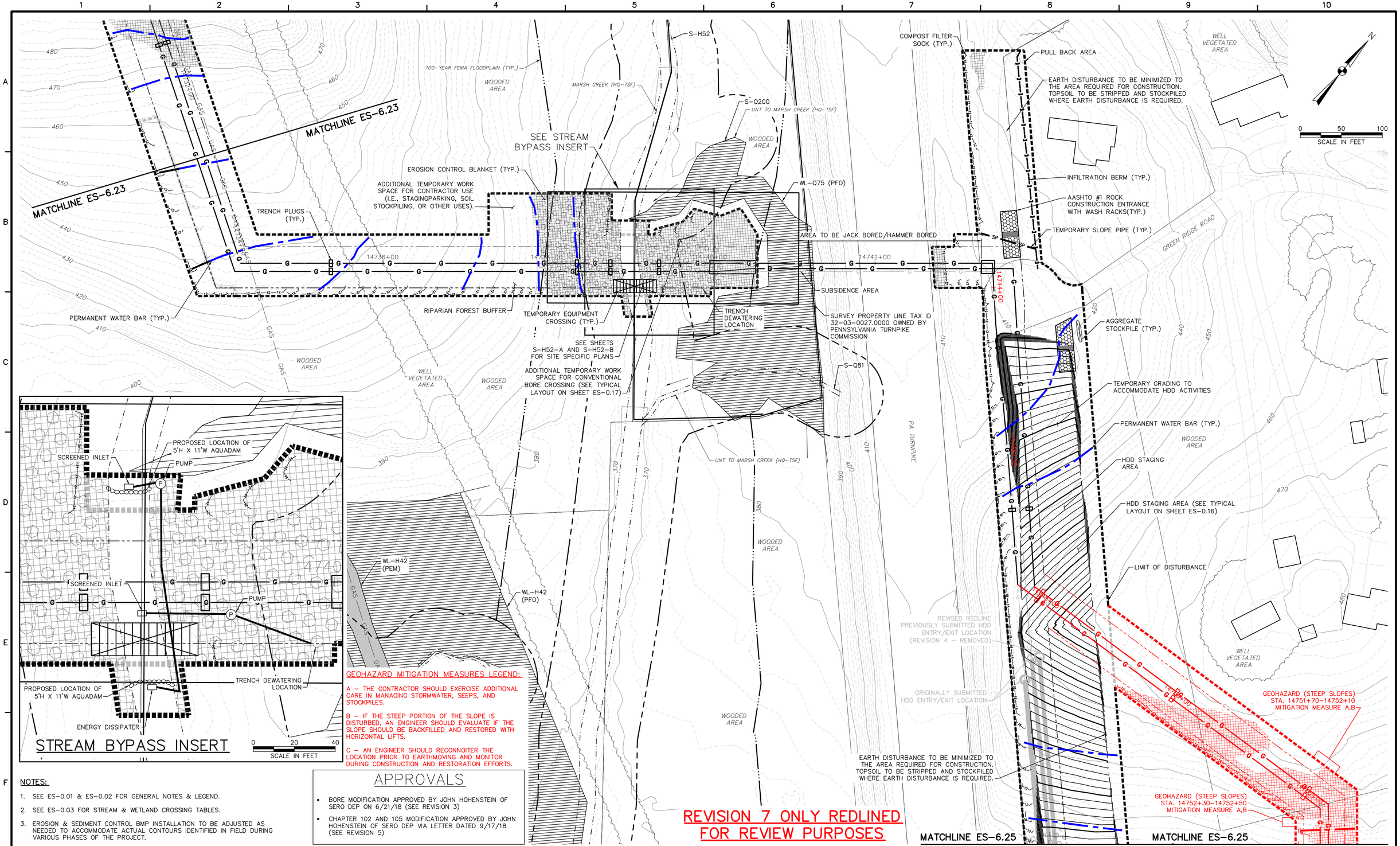
for Lora Z. Lattanzi
Field Office Supervisor

Enclosure

cc:
Corps – W. Chandler
DEP – A. McDonald

Attachment D

Revised Erosion and Sediment Control Plan Sheets



GEOHAZARD MITIGATION MEASURES LEGEND:

A – THE CONTRACTOR SHOULD EXERCISE ADDITIONAL CARE IN MANAGING STORMWATER, SEEPS, AND STOCKPILES.

B – IF THE STEEP PORTION OF THE SLOPE IS DISTURBED, AN ENGINEER SHOULD EVALUATE IF THE SLOPE SHOULD BE BACKFILLED AND RESTORED WITH HORIZONTAL LIFTS.

C – AN ENGINEER SHOULD RECONNOITER THE LOCATION PRIOR TO EARTHMOVING AND MONITOR DURING CONSTRUCTION AND RESTORATION EFFORTS.

APPROVALS

- BORE MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP ON 6/21/18 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY JOHN HOHENSTEIN OF SERO DEP VIA LETTER DATED 9/17/18 (SEE REVISION 5)

NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

REVISION 7 ONLY REDLINED FOR REVIEW PURPOSES

TETRA TECH
www.tetratech.com
661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	3/5/18	BORE METHOD REVISION
4	RS	6/26/18	HDD AND CENTERLINE MODIFICATION
5	RS	8/3/18	ATWS ADDED FOR STREAM BYPASS INSERT
6	RS	12/17/18	PROPERTY LINE AND SUBSIDENCE ADDED
7	RS	2/10/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 24 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-6.24
SHEET 6.24 OF 99

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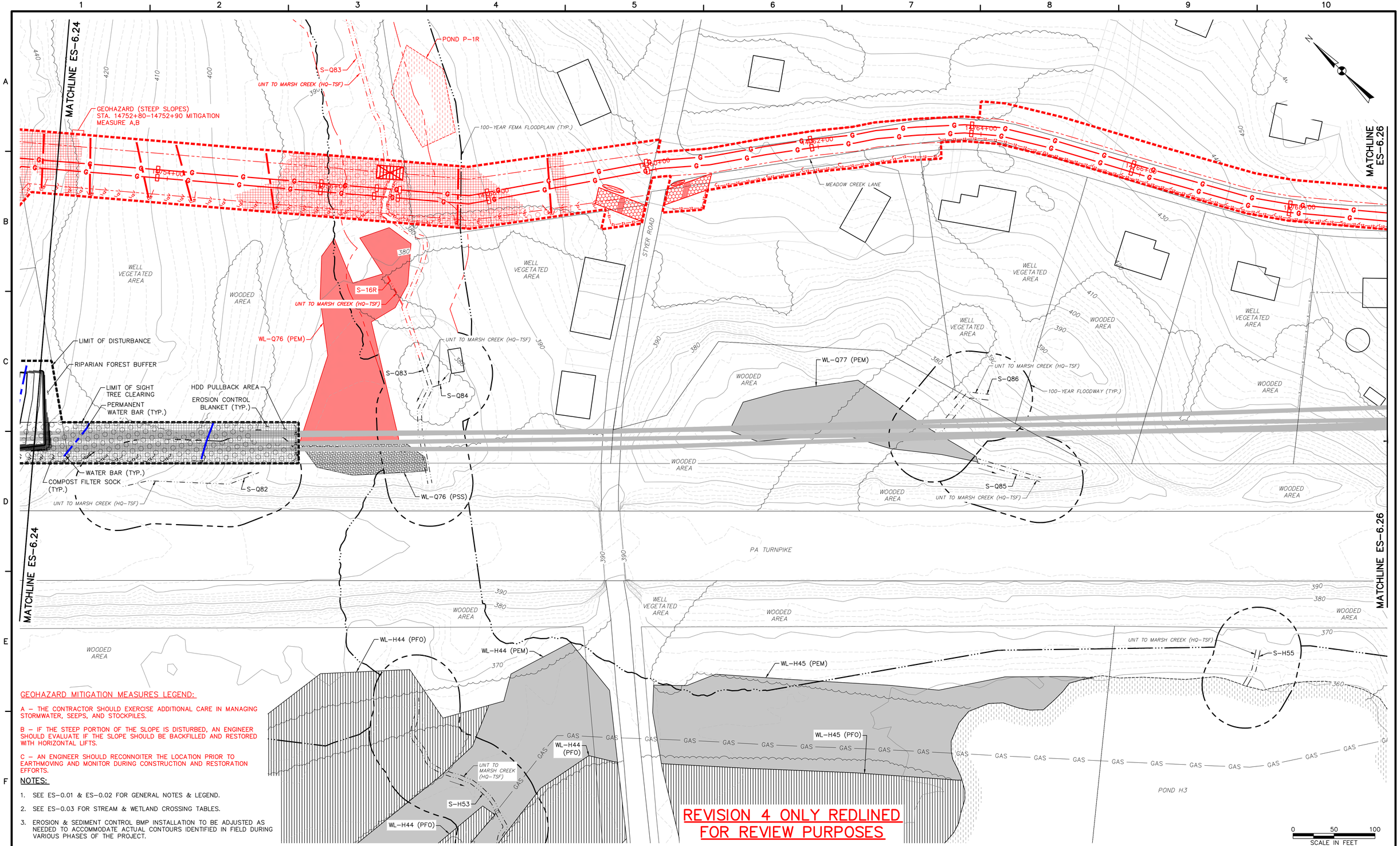

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3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.

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2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/26/18	HDD MODIFICATION
4	RS	2/10/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/6/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 25 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-6.25
SHEET 6.25 OF 99

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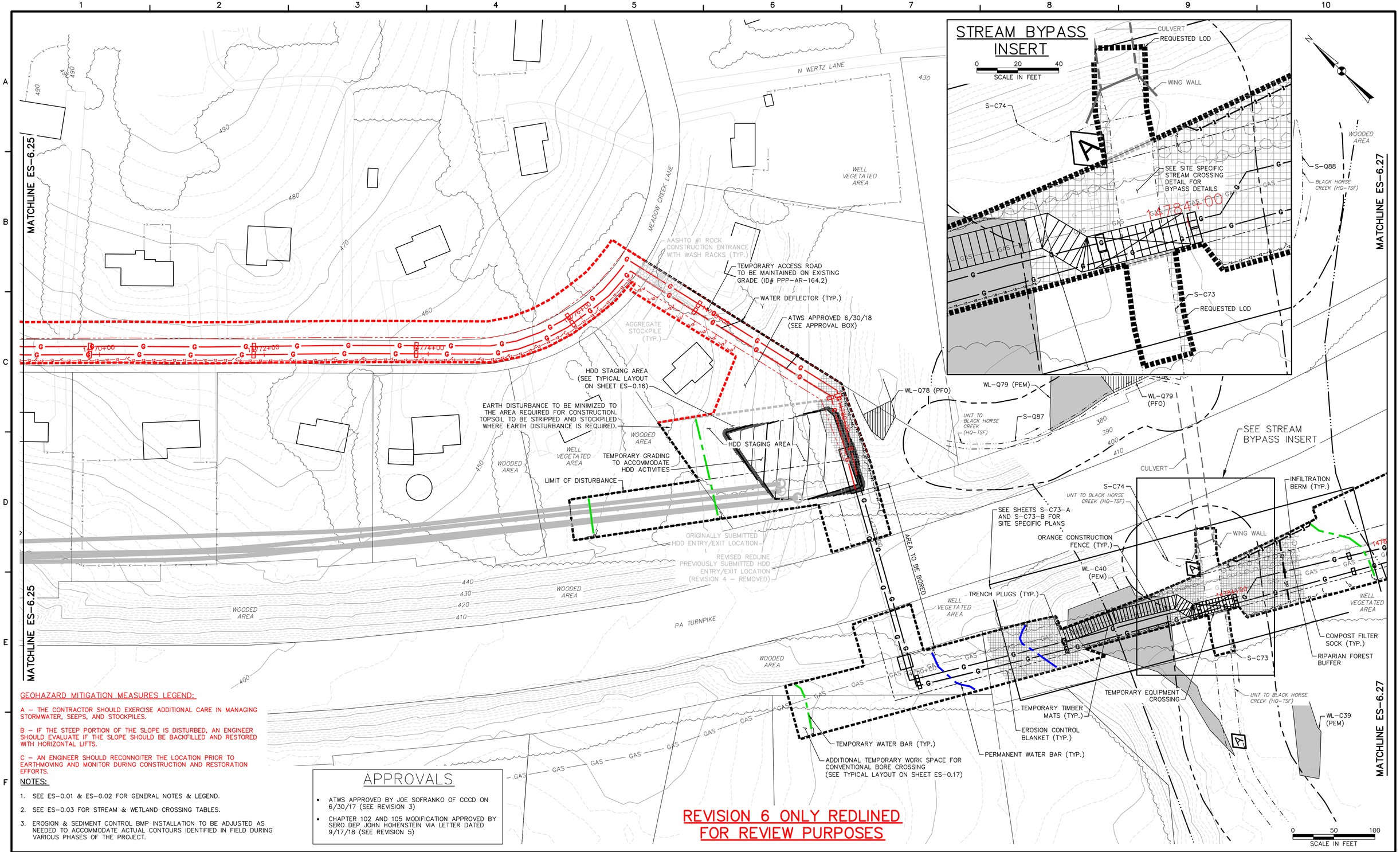

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APPROVALS

- ATWS APPROVED BY JOE SOFRANKO OF CCCD ON 6/30/17 (SEE REVISION 3)
- CHAPTER 102 AND 105 MODIFICATION APPROVED BY SERO DEP JOHN HOHENSTEIN VIA LETTER DATED 9/17/18 (SEE REVISION 5)

REVISION 6 ONLY REDLINED FOR REVIEW PURPOSES

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/28/17	ATWS ADDED
4	RS	6/26/18	HDD MODIFICATION
5	RS	7/26/18	ATWS MODIFICATION AND STREAM BYPASS INSERT
6	RS	2/10/19	16" AND 20" RE-ROUTE

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 075843-E 2/11/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1–20" & 1–16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 26 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

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ES-6.26
SHEET 6.26 OF 99

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7. POST-CONSTRUCTION STORMWATER MANAGEMENT AND SITE RESTORATION PLAN

Site Restoration and Post-Construction Stormwater Management Plan

Pennsylvania Pipeline Project - South East Region: Spread 6

Major Modification-HDD 280

March 2019

Prepared for:
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Prepared by:
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COMMONWEALTH OF PENNSYLVANIA
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PE-050435-E

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2 Soils Map, Soil Descriptions, Geologic Formations Map, Sinkhole Repair Plan

3 Construction Details

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LIST OF ACRONYMS

ACRONYM	MEANING
% CCE	Calcium carbonate equivalent
% ENV	Effective neutralizing value
ABACT	Antidegradation Best Available Combination of Technologies
BMP	Best Management Practice
E&SC	Erosion and Sediment Control
EV	Exceptional value
HDD	Horizontal directional drilling
HDPE	High-density polyethylene
HQ	High quality

NGL	Natural gas liquids
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PASDA	Pennsylvania Spatial Data Access
PCSM	Post-Construction Stormwater Management
Pls	Pure live seed
ROW	Right of way
SPPP	Sunoco Pennsylvanian Pipeline Project
SR	Site Restoration
TSF	Trout stock fisheries
Tt	Tetra Tech, Inc.
UNT	Unnamed tributary
WWF	Warm water fisheries

1.0 INTRODUCTION

Tetra Tech, Inc. (Tt) has prepared this Site Restoration and Post-Construction Stormwater Management (PCSM) Plan (Plan) for Sunoco Pipeline, L.P. (SPLP) – Pennsylvania Pipeline Project, South East Region: Spread 6. The Plan addresses activities associated with the Sunoco Pennsylvania Pipeline Project (SPPP) installation. Spread 6 (South East Region) of this project is located in Chester and Delaware Counties, Pennsylvania (PA). The plan addresses activities associated with a major modification to the Sunoco Pennsylvania Pipeline Project (SPPP) installation. The 280 HDD modification is located in Upper Uwchlan, Chester County. Site location maps are provided in Attachment 1.

2.0 SITE DESCRIPTION

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project that would expand existing pipeline systems to provide natural gas liquid (NGL). The project involves the installation of approximately two parallel pipelines within a 306.8-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in Delaware County, The 20-inch pipeline and 16-inch line will be installed in the same trench. Any temporary stabilization required will be implemented in accordance with this Erosion and Sediment (E&S) Plan. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration. The additional LOD for this Amendment in Chester County is 4.86 acres.

The HDD 280 Major Modification consists of a change in the route and installation method for the 16 and 20-inch diameter pipeline previously permitted as Horizontal Directional Drill (HDD) 280. The permit request is to convert the installation method of both the 16 and 20-inch diameter pipelines from a HDD to an open cut installation and one conventional bore. The change in methodology is to minimize impacts to Waters of the Commonwealth and avoid future expansions of PA Turnpike 76. The requested reroute will cross the floodways of streams S-Q83, S-16r, and S-Q84. Stream S-Q83 will be crossed in accordance with one of the approved open-trench excavation methods for installation of the pipeline across waterbodies. The reroute includes an additional 4.86 acres of LOD.

Past and present land use of the project area is residential, roadways, and forested. Future land use will be a maintained vegetated natural gas pipeline ROW in residential areas and restore roadway in those areas. Relevant topographic features including streams, streets, pipelines, structures, utility lines, fences, paving and other significant items along the gas line alignment are indicated on the plans, where applicable.

2.1 TOPOGRAPHY

The work zone is located on ground of varying elevations. Site elevations vary from 380 feet (Station 14756+00) to 472 feet (Station 14772+00) above mean sea level based on the Pennsylvania Spatial Data Access (PASDA). The construction plans show the topography of the site and the surrounding area.

2.2 GEOLOGY AND SOILS

The soils and geologic formations surrounding the site are shown on the figures provided in Attachment 2. Attachment 2 also provides soil descriptions and properties of the soils found at the site. In general, the following actions will be taken to counteract soil limitations:

1. Erodible Soils - Prompt stabilization practices will be implemented to minimize the risk of erosion. PCSM facilities have been designed to minimize point-source discharges which increase the likelihood of downstream erosion.

2. Cut Banks Caves - Almost all Pennsylvania soils are susceptible to caving of cut banks. Cut slopes will be stabilized as soon as possible with seed and mulch to prevent sliding. Slopes are designed to not exceed 2H:1V.

3. Corrosive to Concrete or Steel Pipe - Pipes to be used on site shall be either HDPE or coated steel.

4. High Water Table - A seasonal high groundwater determination was conducted at the proposed block valve sites. PCSM facilities that infiltrate have been designed to maintain a 20" separation from the seasonal high groundwater table.

5. Low Strength - Most of Pennsylvania soils (73%) have relatively low strength. Precautions will be taken to prevent slope failures due to improper construction practices. Soils will be evaluated during construction of block valve sites and PCSM facilities to determine whether additional measures will need to be taken.

6. Piping Tendencies -Piping is the erosion by percolating waters or seepage in layer of subsoil resulting in caving and the formation of tunnels or pipes thorough which the soluble or granular material is removed. Where necessary, anti-seep collars will be used to prevent piping.

7. Poor Topsoil -Soil amendments will be added to site soils to promote vegetative growth.

8. Potentially Hydric -A wetland delineation has been performed to determine the presence of wetlands.

9. Potential Sinkhole - Should a sinkhole be encountered during construction, repair should be done under the direct observation and supervision of a professional geologist or licensed geotechnical engineer. Site specific sinkhole repairs should be developed on a case by case basis. Block valves located within karst topography have been identified, and infiltration practices have been designed to minimize the risk of sinkholes.

To prevent sediment from leaving the site, stabilization practices will be implemented in disturbed areas as soon as practical. Geologic formations or soil conditions that may have the potential to cause pollution after earth disturbance were not observed during field activities. Infiltration tests are being performed and results are being evaluated for the design of the proposed post construction stormwater BMPs.

2.3 SURFACE WATER HYDROLOGY

The receiving waters for the 280 HDD Major Modification LOD is a UNT to Marsh Creek and a UNT to Black Horse Creek, which are designated as HQ-TSF in Pa. Code 25 Chapter 93. The project will also drain to an additional PEM wetland. Descriptions of the Primary Receiving Waters can be found in Table 1.

The plan contains Antidegradation Best Available Combination of Technologies (ABACT) BMPs to maintain the designated use of the receiving waters and prevent additional siltation from polluting the streams. The locations of the receiving waters relative to the project area can be seen on the USGS location map in Attachment 1.

3.0 SITE RESTORATION PRACTICES

Section 3.0 addresses restoration of the mainline pipeline, temporary workspaces, temporary access roads, and the block valve sites which will be vegetated. Following completion of pipeline installation and trench backfilling, the pipeline ROW, associated workspaces, and temporary access roads shall be returned to the general grade present prior to pipeline installation in order to maintain preconstruction drainage patterns. After completion of major construction work, topsoil that was stockpiled during construction will be placed along the ROW. Grounds disturbed by any of the operations necessary to complete the work for this project within the ROW are to be permanently seeded, or if specified, sodded, unless occupied by structures, paved, or designated as a permanent access road. Disturbed areas, which are at final grade, shall be seeded and mulched once final grades are achieved. The permanent seed mixture will restore disturbed areas to a meadow in good condition or better. If seeding cannot be completed within a 4 day period due to weather conditions, the disturbed area will be mulched with straw at the rate of 3 tons per acre. This straw will be anchored using a method described in Section 3.4.

3.1 BMP DESCRIPTION AND CONSTRUCTION SEQUENCE

A generalized construction sequence is provided below. The construction sequence is intended to provide a general course of action to conform to the applicable regulatory agency requirements for restoration and post-construction stormwater management of the site. Necessary steps for proper and complete execution of work pertaining to this plan, whether specifically mentioned or not, are to be performed by the contractor. The contractor will comply with all requirements listed in this section. The contractor may be required to alter controls based on the effectiveness of controls or differing conditions encountered in the field. The appropriate county conservation district and DEP shall be contacted and must approve any deviation to the authorized plans.

A pre-construction meeting is required prior to the start of any construction activity. The Pennsylvania Department of Environmental Protection (PADEP) or applicable county conservation district, contractors, the landowner, appropriate municipal officials, and the plan preparer must be invited to this meeting at least 7 days in advance.

General Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.

2. Surface roughening will be utilized to rough the soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces

within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are recommended. Surface roughening shall be accomplished using dozers affixed with grouser tracked equipment. Dozers shall run up and down the slopes leaving horizontal grooves perpendicular to the slope. Dozer blades shall be raised and not used during surface roughening. Where compaction does occur, contractor shall scarifiy the soil or provide additional roughening such as deep ripping or chisel ripping to restore the area to a minimal compacted state. In areas of proposed infiltration, soils shall be amended to 2' below grade. See Soil Amendment and Restoration construction sequence below.

3. Place topsoil from topsoil stockpiles as the upper layer of backfill. Topsoil shall not be placed when the subgrade is frozen or when it is excessively wet or dry and shall not be handled when in a frozen or muddy condition.

4. Remove gravel and geotextile from the temporary access roads and scarify the soil. Refer to step 2 of this sequence to address compaction at access roads. After addressing compaction concerns, place topsoil that was stripped prior to installation of the access roads.

5. Immediately seed and mulch disturbed areas in accordance with the permanent seeding schedule once final grade is established and topsoil is placed.

6. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70-percent perennial vegetative cover is established. Regrade and revegetate areas disturbed during the removal of the erosion and sediment controls.

Permanent Seeding

Site preparation and establishment of permanent cover in areas other than lawns will be conducted according to the following guidelines:

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED) WELL-DRAINED VARIABLE DRAINAGE	 1 PLUS 1 PLUS	 3, 5, 8, OR 12 (1) 3 OR 7
SLOPES AND BANKS (MOWED) WELL-DRAINED **SLOPES AND BANKS (GRAZED/HAY)** WELL-DRAINED	1 PLUS 1 PLUS	2 OR 10 2,3, OR 13
GULLIES AND ERODED AREAS	1 PLUS	3, 5, 7, OR 12 (1)
EROSION CONTROL FACILITIES (BMPS) SOD WATERWAYS, SPILLWAYS, FREQUENT WATER FLOW AREAS DRAINAGE DITCHES	1 PLUS	2, 3, OR 4

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SHALLOW, LESS THAN THREE FEET DEEP	1 PLUS	2, 3, OR 4
DEEP, NOT MOWED	1 PLUS	5 OR 7
POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS		
MOWED AREAS	1 PLUS	2 OR 3
NON-MOWED AREAS	1 PLUS	5 OR 7
FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS	3 OR 13
HIGHWAYS		
NON-MOWED AREAS		
WELL-DRAINED	1 PLUS	5, 7, 8, OR 10
VARIABLE DRAINED	1 PLUS	3 OR 7
POORLY DRAINED	1 PLUS	3
AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS	2, 3, OR 10
UTILITY ROW		
WELL-DRAINED	1 PLUS	5, 8, OR 12 (1)
VARIABLE DRAINED	1 PLUS	3 OR 7
WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS	2, 3, OR 13
EFFLUENT DISPOSAL AREAS	1 PLUS	3 OR 4
SANITARY LANDFILLS	1 PLUS	3, 5, 7, 11 (1), OR 12 (1)
SURFACE MINES		
SPOILS, MINE WASTES, FLY ASH, SLAG, SETTLING BASIN RESIDUES AND OTHER SEVERELY DISTURBED AREAS (LIME TO SOIL TEST)	1 PLUS	3, 4, 5, 7, 8, 11 (1) OR 12(1)
SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS	3 OR 13
LAWN	1 PLUS	PENNDOT Formula B

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	**SPECIES**	**SEEDING RATES – PLS (1)**	
		MOST SITES	ADVERSE SITES (8)
1 (2)	spring oats (spring), or 64 96	64	96
	annual ryegrass (spring or fall), or	10	15
	winter wheat (fall), or	90	120
	winter rye (fall)	56	112
2 (3)	tall fescue, or 75	60	75
	fine fescue, or 40	35	40
	kentucky bluegrass, plus 25 30	25	30
	redtop(4), or	3	3
	perennial ryegrass	15	20
3	birdsfoot trefoil, plus 6 10	6	10
	tall fescue	30	35
4	birdsfoot trefoil, plus	6	10
	reed canarygrass	10	15
5 (5)	Big Bluestem, plus	10	15
	tall fescue, or	20	25
	perennial ryegrass	20	25

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	**SPECIES**	**SEEDING RATES – PLS (1)**	
		MOST SITES	ADVERSE SITES (8)
6 (5,6)	Big Bluestem, plus	10	15
	annual ryegrass	20	25
7 (5)	birdsfoot trefoil, plus	20	30
	Big Bluestem, plus	20	30
	tall fescue	20	25
8	flatpea, plus	20	30
	tall fescue, or	20	30
	perennial ryegrass	20	25
9	Not applicable to project	N/A	N/A
10	tall fescue, plus	40	60
	fine fescue	10	15
11	deertongue, plus	15	20
	birdsfoot trefoil	6	10
12(7)	switchgrass, or	15	20
	big bluestem, plus	15	20
	birdsfoot trefoil	6	10
13	orchardgrass, or	20	30
	smooth bromegrass, plus	25	35
	birdsfoot trefoil	6	10

1. Pure live seed (pls) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds pls shown on the seed tag. Thus, if the pls content of a given seed lot is 35 percent, divide 12 pls by 0.35 to obtain 34.3 pounds of seed required to plant one-acre. All mixtures in this table are shown in terms of pls.

2. If high-quality seed is used, for most sites seed spring oats at a rate of two bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at one bushel per acre. If germination is below 90 percent, increase these suggested seeding rates by 0.5 bushel per acre.

3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.

4. Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.

5. Use for highway slopes and similar sites where the desired species after establishment is Big Bluestem.

6. Use only in extreme southeastern or extreme southwestern PA. Serecia lespedeza is not well adapted to most of PA.

7. Do not mow shorter than 9 to 10 inches.

8. If liming, fertilization, and preparation of seedbed are properly done and if care is taken to drill and cover the seed (or mulch applied), the rate for "most sites" should suffice. However, on eroded or coarse and poorly prepared seedbeds, particularly if the soil is very acidic or infertile, the rate for "adverse sites" should be used.

9. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.

In lawn areas, permanent cover will be established using the following PENNDOT seed mixture:

PENNDOT FORMULA B				
Seeding Rate	3 lbs. per 1,000 square feet			
Species	**% by Weight**	**Purity %**	**Minimum % Germination**	**Maximum % Weed Seed**
Kentucky Bluegrass	50	98	80	0.20
Perennial Rye	20	98	90	0.15
Red Fescue	30	98	85	0.15

Liming Rates

Minimum 6 tons per acre at 100% effective neutralizing value (% ENV), unless the soil test determines that a lesser amount is needed. To determine the actual amount of regular lime to apply, divide the amount called for by the soil test by the % ENV for the product used. For example, if 6 tons per acre is needed and the %ENV for the lime used is 88%, divide 6 by 0.88 resulting in 6.8 tons needing to be applied. For dolomitic lime, which has a significant amount of magnesium in it, divide the amount called for by the soil test by the % calcium carbonate equivalent (% CCE) listed for the product instead of the % ENV. The % CCE may be above 100% which accounts for the fact that magnesium has a greater effect per pound than the calcium in regular lime. Note: When a soil test requires more than 8,000 pounds of lime per acre, the lime must be mixed into the top 6 inches of soil.

Fertilization Rates

Apply 10-20-20 at 600 pounds/acre, if top dressed or 1,000 pounds/ac, if incorporated, unless the soil test determines that the rate can be less than these minimums.

SOIL AMENDMENT APPLICATION RATE EQUIVALENTS				
Soil Amendment	Per Acre	Per 1,000 sq. ft.	Per 1,000 sq. yds.	
AGRICULTURAL LIME	6 TONS	240 LBS.	240 LBS.	or as per soil test; may not be required in agricultural fields
10-20-20 FERTILIZER	1,000 LBS.	25 LBS.	25 LBS.	or as per soil test; may not be required in agricultural fields

Temporary Seeding

Temporary grass cover will be established in the following areas where soil stockpiles are exposed for a period greater than 4 days. The seed mixture for temporary cover will consist of 100% annual ryegrass. Seed will be applied at the rate of 40 pounds per acre or as recommended by a local recognized seed supplier approved by the Owner's representative. Prior to seeding, apply 1 ton of agricultural grade limestone per acre plus 10-10-10 fertilizer at the rate of 500 pounds per acre and work into the soil.

Mulching

The purpose of mulch is to reduce runoff and erosion, prevent surface compaction or crusting, conserve moisture, aid in establishing plant cover, and control weeds. Mulch will be applied on any area subject to erosion or that has unfavorable conditions for plant establishment and growth. The practice may be used alone or in conjunction with other structural and vegetative conservation practices such as waterways, ponds, sedimentation traps, or critical area planting. On sediment-producing areas where the period of exposure is less than 2 months, mulch materials will be applied according to the following guidelines:

1. Straw mulch will be applied at the rate of 3 tons per acre. Chemically treated or salted straw is not acceptable as mulch.

2. Straw mulch will be anchored immediately after application by at least one of the following methods:

   A. "Crimped" into the soil using tractor-drawn equipment (straight-bladed coulter or similar).

      This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended.)

   B. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.

C. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided that sufficient documentation is provided to show that it is non-toxic to native plant and animal species.

D. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

Mulched areas will be checked periodically and after each runoff event (e.g., rain, snowmelt, etc.) for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

3.2 MATERIAL RECYCLING AND DISPOSAL

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with PADEP's solid waste management regulations at 25 Pennsylvania Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. Expected construction wastes during site restoration will consist of packaging material and sediment cleaned from E&SC BMPs. Packaging from materials brought on site will be disposed of by a licensed hauler. Sediment removed from BMPs will either be spread in a protected area to dry and then recycled as fill material prior to permanent seeding or disposed of off-site. In cases where disposal is necessary, waste materials will be disposed of at an approved PADEP waste site.

3.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

Thermal impacts have been minimized by limiting the disturbed area to the maximum extent practicable. By minimizing the extent of the disturbed area, vegetative clearing, including forested areas, has been minimized. Vegetated block valve sites will be restored to a meadow in good condition or better, and no impervious surface will be created at those sites. Following installation of the pipelines, existing grades along the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored, permanent seeding will

occur as soon as practicable to facilitate vegetative growth during germinating months, and the addition/creation of impervious surfaces in riparian areas has been avoided. By returning these areas to their existing grades, stormwater is unlikely to pond in these locations therefore minimizing the potential for ponded water to result in significant contributions to thermal impacts in receiving waters. In addition, thermal impacts will be minimized during site restoration by facilitating permanent seeding as soon as practicable to encourage vegetative growth. Although shade cover will be reduced in areas that were previously forested, there is no anticipated adverse effect to the receiving watersheds because the project will only clear a narrow corridor of vegetation within each respective watershed. The Project does not have thermal impacts. Specifically, thermal impacts will be avoided by implementing the following:

- Siting parallel to and overlapping with existing ROWs to minimize vegetation clearing at stream crossings;
- Reducing the construction ROW width and additional temporary workspaces at stream crossings;
- No grubbing, grading, or clearing of trees will occur within 50 feet of the top of stream bank until pipeline construction/installation is ready to proceed through that area.
- Restoring (seeding) disturbed areas/ROW as soon as practicable and /or directing runoff to vegetated areas to reduce the temperature of runoff prior to discharge into the streams; and,
- Restoring the stream banks and seeding/planting as soon as practicable to facilitate vegetative growth along the stream channel.

3.4 RIPARIAN FOREST BUFFERS

HDD 280 Major Modification - Riparian Forest Buffer Waiver Request

The Pennsylvania Pipeline Project qualifies for an exception of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. A detailed riparian buffer waiver request has been prepared as an attachment to the ESCGP-3 Notice of Intent.

Demonstration of Waiver Necessity

A riparian buffer waiver is necessary to complete the intended scope of the pipeline project including the Major Modification. The project crosses through Chester County for approximately 23.6 miles, and Delaware County for approximately 11.4 miles. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

Alternatives Analysis

During the development and siting of the proposed Major Modification, SPLP considered several alternate routes and construction design methods. Impacts to environmental resources, including riparian forest buffers, were evaluated during the major modification routing. Field teams were deployed to evaluate alternate routes based on environmental and constructability constraints. The final route that was selected minimizes environmental impacts to the maximum extent practicable while still maintaining the project's overall constructability and ensuring a safe working environment while also taking landowner constraints into consideration. Additionally, several variations of horizontal direction drill profiles were evaluated to minimize pullback areas, additional workspaces, and overall disturbance within riparian forest buffers. A summary of the alternatives analysis is provided as Attachment 6 of the NOI.

Demonstration of Minimizing Impacts

All disturbance activities, including those which impact riparian buffers, have been reduced to the maximum extent practicable. The limit of disturbance (LOD) has been reduced to 50 feet within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the PADEP manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control best management practices (BMPs). In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less. Workspaces that provide additional space for stream crossing activities have been placed outside of riparian buffers where possible.

Meeting Requirements of Chapter 102

All other aspects of Chapter 102 are being met. The project's E&SC Plan and SR/Post-Construction Stormwater Management Plan have been designed in accordance with Chapter 102. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas. A SR plan is proposed to revegetate the areas adjacent to the buffers within the ROW.

3.5 INSPECTION AND MAINTENANCE PROCEDURES

Seeded areas will be inspected weekly and after each runoff event for bare spots, washouts, and healthy growth. Necessary repairs will be made immediately. Mulched areas will be checked periodically and after severe storms for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

All sedimentation control measures will remain in place until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established. Any area not achieving a 70-percent vegetative cover will be reseeded and mulched within 24 hours of detection. If BMPs are found to be inoperative or ineffective during an inspection, PADEP should be contacted within 24 hours, followed by submission of a written noncompliance report to PADEP within 5 days of the initial contact.

Long-Term Maintenance

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

3.6 ANTIDEGRADATION REQUIREMENTS

The 280 HDD Major Modification is located within HQ special protection watersheds. A combination of non-discharge alternatives and the use of ABACT BMPs on site will protect the water quality of the receiving waters, in accordance with 25 Code §102.8(h).

Non-discharge alternatives were evaluated to minimize accelerated erosion and sedimentation and achieve zero net change in runoff between the pre- and post-construction conditions. The non-discharge alternatives evaluated were the use of infiltration and maintaining pre-construction drainage patterns within the right of way, temporary additional workspaces, and temporary access roads. The permanent waterbars will not divert or diminish the amount of water within the watershed but are intended to manage runoff velocity and potential degradation related to sediment laden runoff into receiving waters. As such, the will be no change to pre-existing drainage patterns as the permanent water bars will continue to direct water to the same receiving waters while providing the protection required in the PADEP Manual regarding slopes. The non-discharge alternatives were incorporated wherever feasible by minimizing soil compaction, restoring the infiltration capacity of the soil prior to permanent seeding, and restoring the disturbed area back to its original grade and cover condition for the mainline pipeline. To alleviate compaction, surface roughening techniques such as deep ripping or chisel ripping will restore compacted areas to a minimal compacted state prior to permanent stabilization. The extent of the disturbed area will be minimized, and the duration of disturbance will be minimized by stabilizing disturbed areas as soon as practicable. ABACT BMPs will be used on site to protect and maintain the existing water quality of receiving waters.

Due to the linear nature of this project, all of the siltation impaired and HQ/EV special protection watersheds received the same non discharge alternative evaluation and incorporation of ABACT site restoration BMPs throughout the pipeline.

There will not be an increase in stormwater runoff rate or volume to prevent the physical degradation of the receiving water, such as scour, and stream bank destabilization. Stormwater runoff volume is not increasing throughout post-construction, and any post-construction stormwater discharge is managed so that it will not degrade the physical, chemical or biological characteristics of the receiving stream.

ABACT site restoration BMPs will include the following:

- Pre-construction drainage pattern intact
- Minimizing the disturbed area
- No direct discharge to surface waters
- Prompt site restoration
- Proper vegetative cover techniques

3.7 STORMWATER RUNOFF ANALYSIS

The pre-construction drainage patterns surrounding the project will be maintained. All disturbed areas within the 280 HDD Major Modification LOD will be restored to existing conditions or better. As a result of restoring the pipeline right of way and additional temporary workspaces to existing conditions or better and maintaining pre-construction drainage patterns in accordance with 25 Pa Code § 102.8(n), there will be no increase in stormwater runoff rate or volume attributed to these locations, and a quantitative stormwater analysis is not required. There are no proposed permanent access roads or block valves associated with this major modification.

The proposed mainline pipeline will be restored in accordance with 102.8(n) and meet the requirements outlined in §§ 102.8(b), (c), (e), (f), (h), (i), (l), and (m).

In accordance with § 102.8(b), the following principles have been incorporated into the project design in accordance with the numbering in § 102.8(b): (1) The integrity of stream channels and the physical, biological, and chemical qualities of the receiving waters will remain unchanged. The site restoration principles will protect the existing and designated uses of the receiving waters. BMPs will be maintained until the site achieves stabilization during site restoration to ensure that runoff which leaves the project site will have no short-term adverse effects on the physical, biological, or chemical qualities of downstream receiving waters. The permanent seed mixture will restore the majority of the right of way to a meadow condition. Those areas which are not restored to a meadow condition will be restored to a lawn condition or forest. As a result of restoring

the pipeline right of way as specified in the restoration plan, there will be no long-term effects to the physical, biological, or chemical qualities of downstream receiving waters. (2) The mainline pipeline will be restored to original grade so flow paths will not be altered. The right of way will be restored to achieve a meadow in good condition or better, with the exception of areas that will be returned to lawn or forest. In addition, the pipeline right of way accounts for only a narrow corridor of development within each drainage area to the nearest receiving water. As a result, post-development runoff rates to the nearest receiving water will not increase. (3) The right of way will be restored to a meadow in good condition or better in most areas, with the exception of specified locations where the right of way will be restored to the equivalent of its predevelopment land cover (lawn or forest). As a result, any potential increase in stormwater runoff volume has been minimized to the maximum extent practicable. (4) There are no proposed, permanent impervious features associated with the mainline pipeline. Temporary access roads will be restored to a vegetated condition following installation of the pipeline. (5) Existing drainage features and vegetation will be protected by restoring the project area back to its original grade. As a result, drainage features and existing vegetation surrounding the project area will be preserved. (6) Land clearing and grading will be minimized because the project area has been limited to the area required to safely install the natural gas pipelines. The pipeline right of way will be returned to original grade following installation of the pipelines. (7) Soil compaction will be minimized by utilizing travel lanes within the pipeline right of way. Following construction, areas that have been compacted will be scarified or ripped, or soil amendments will be incorporated prior to backfilling topsoil and seeding. After initiating restoration, vehicular traffic will be restricted to prevent soil compaction. (8) As demonstrated in 102.8(2) and 102.8(3), potential increases in post development stormwater runoff has been minimized to the maximum extent practicable utilizing nonstructural restoration BMPs.

In accordance with § 102.8(c), the mainline Site Restoration and Post Construction Stormwater Management Plan has been planned and designed and will be implemented in consistency with the E&S Plan.

In accordance with § 102.8(e), the Site Restoration and Post Construction Stormwater Management Plan has been prepared by Robert F. Simcik, P.E. who is trained and experienced in PCSM design methods and techniques applicable to the size and scope of the proposed pipeline project.

In accordance with § 102.8(f), the Site Restoration and Post Construction Stormwater Management Plan contains drawings and a narrative consistent with the requirements of Chapter 102. The Plan has been designed to minimize the threat to human health, safety, and the environment to the greatest extent practicable. The Plan includes the required information as outlined in § 102.8(f)(1) through § 102.8(f)(15).

In accordance with § 102.8(h), nondischarge alternatives for Special Protection waters are evaluated in the Antidegradation section of the Site Restoration and Post Construction Stormwater Management Plan. The Plan includes ABACT BMPs where nondischarge alternatives do not exist for the project.

In accordance with § 102.8(i), the applicant has submitted the Site Restoration and Post Construction Stormwater Management Plan to the applicable county conservation districts and Department of Environmental Protection for review and approval. Upon complaint or site inspection, the Plan will be available for subsequent review and inspection by the reviewing agencies.

In accordance with § 102.8(l), the permittee will include with the notice of termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:

"I (name) do hereby certify pursuant to the penalties of 18 Pa.C.S.A. § 4904 to the best of my knowledge, information and belief, that the accompanying record drawings accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices."

In accordance with § 102.8(m), the Site Restoration and Post Construction Stormwater Management Plan identifies that the permittee shall be responsible for long-term operation and maintenance of PCSM BMPs associated with permanent surface sites. However, there are no PCSM BMPs proposed as part of the mainline pipeline.

There are no proposed permanent gravel access roads and block valve pads in the South East Region.

4.0 POST-CONSTRUCTION STORMWATER MANAGEMENT ANALYSIS

The construction and restoration practices for the proposed major modification have been designed to meet the provisions PADEP Chapter 102 regulations. No new impervious area is proposed with the Major Modification. In general, the pre-construction drainage patterns surrounding the project will be maintained, and all disturbed areas within the pipeline ROW will be restored to existing conditions or better. As a result of restoring all disturbed areas within the pipeline ROW to a meadow condition, the project will not result in increased stormwater runoff rate or volume.

4.1 BMP DESCRIPTION NARRATIVE AND CONSTRUCTION SEQUENCE

There are no proposed PCSM BMPs for the 280 HDD Major Modification.

4.2 MATERIAL RECYCLING AND DISPOSAL

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with PADEP's solid waste management regulations at 25 Pennsylvania Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. In cases where disposal is necessary, waste materials will be disposed of at an approved PADEP waste site.

4.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

4.4 RIPARIAN FOREST BUFFERS

HDD 280 Major Modification - Riparian Forest Buffer Waiver Request

The Pennsylvania Pipeline Project qualifies for an exception of the riparian forest buffer requirement under Chapter 102.14(d)(1)(ix) for areas within the Chapter 105 permit area. Existing riparian forest buffers within the project area are identified on the E&S plan drawings in Attachment 2 of the E&S Plan.

In addition to the exception, we are requesting a waiver under 102.14(d)(2)(ii) for areas within 150' of surface waters that are outside of the Chapter 105 permit area. A detailed riparian buffer waiver request has been prepared as an attachment to the ESCGP-3 Notice of Intent.

Demonstration of Waiver Necessity

A riparian buffer waiver is necessary to complete the intended scope of the pipeline project including the Major Modification. The project crosses through Chester County for approximately 23.6 miles, and Delaware County for approximately 11.4 miles. Due to the linear nature of the project and the surrounding topography, riparian forest buffers could not be avoided altogether.

Alternatives Analysis

During the development and siting of the proposed Major Modification, SPLP considered several alternate routes and construction design methods. Impacts to environmental resources, including riparian forest buffers, were evaluated during the major modification routing. Field teams were deployed to evaluate alternate routes based on environmental and constructability constraints. The final route that was selected minimizes environmental impacts to the maximum extent practicable while still maintaining the project's overall constructability and ensuring a safe working environment while also taking landowner constraints into consideration. Additionally, several variations of horizontal direction drill profiles were evaluated to minimize pullback areas, additional workspaces, and overall disturbance within riparian forest buffers. A summary of the alternatives analysis is provided as Attachment 6 of the NOI.

Demonstration of Minimizing Impacts

All disturbance activities, including those which impact riparian buffers, have been reduced to the maximum extent practicable. The limit of disturbance (LOD) has been reduced to 50 feet within 10 feet of the stream banks to limit the proximity of the work areas as per the stream crossing detail from the PADEP manual. The operations within the LOD near stream crossings typically includes a topsoil stockpile, a stockpile for pipe trench excavation material, a pipe trench, a travel lane, a work area for equipment operation and pipeline welding outside the trench, and an area to install the erosion control best management practices (BMPs). In addition, site conditions such as steep slopes, varying depths of topsoil, and other on-site conditions limit the amount of work area. Reducing the LOD to a greater extent could potentially result in unsafe working conditions and would hinder the ability to complete the stream crossing within the required time frame of 24 hours or less. Workspaces that provide additional space for stream crossing activities have been placed outside of riparian buffers where possible.

Meeting Requirements of Chapter 102

All other aspects of Chapter 102 are being met. The project's E&SC Plan and SR/Post-Construction Stormwater Management Plan have been designed in accordance with Chapter 102. In accordance with Chapter 102, and E&S plan has been developed to minimize the sediment entering the buffer areas. The post construction stormwater management plan has been design to control runoff rate and volume which may be discharge through riparian buffer areas.

4.5 INSPECTION AND MAINTENANCE PROCEDURES

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

Inspection and maintenance procedures for permanent post-construction stormwater management facilities and stormwater conveyance BMPs are summarized below. If any post-construction stormwater management facilities are constructed prior to stabilization of upslope contributory drainage areas, inspections shall occur weekly and after runoff events until the surrounding area achieves stabilization. Sites located within karst terrain require more frequent long-term inspections, as specified in the Sinkhole Repair Plan in Attachment 2.

4.6 ANTIDEGRADATION REQUIREMENTS

The 280 HDD Major Modification earth disturbance activities will be located within a HQ watershed. ABACT BMPs will be implemented to protect and maintain the existing water quality of the receiving waters.

Portions of the earth disturbance activities associated with the SPPP will be located within a HQ/EV watershed. A combination of non-discharge alternatives and the use of ABACT BMPs will be implemented to protect and maintain the existing water quality of the receiving waters.

Non-discharge alternatives were evaluated to minimize accelerated E&S and achieve zero net change in runoff between the pre and post-construction conditions. Non–discharge alternatives exist when the existing land use is revegetated and grade is restored therefore no increase in runoff rate or volume from pre to post construction results. Other non-discharge alternatives implemented are limiting and minimizing the extent of disturbed areas and limiting the extent and duration of disturbance (phasing and sequencing) then stabilizing disturbed areas

as soon as practicable. ABACT BMPs will be used onsite to protect and maintain the existing water quality of receiving waters also in areas where non-discharge alternatives exist.

There are no sites that require post-construction stormwater management within special protection watersheds in the South East region. See section 3.6 for additional discussion related to Antidegradation Requirements during Site Restoration.

4.7 STORMWATER RUNOFF ANALYSIS

The pre-construction drainage patterns surrounding the project will be maintained. All disturbed areas within the 280 HDD Major Modification LOD will be restored to existing conditions or better. As a result of restoring the pipeline ROW and associated workspaces associated with the Major Modification to existing conditions or better and maintaining pre-construction drainage patterns, there will be no increase in stormwater runoff rate or volume attributed to those areas.

5.0 REFERENCES

Erosion and Sediment Pollution Control Program Manual, Commonwealth of Pennsylvania, Department of Environmental Protection, Office of Water Management, March 2012.

Stormwater Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices, United States Environmental Protection Agency, Office of Water, 1993.

Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection, Bureau of Watershed Management, December 2006.

Downingtown, Elverson, Pottstown, Washington, Malvern, West Chester, and Media Quadrangles, Pennsylvania – Chester County, Geological Survey, United States Department of Interior.

Soil Survey of Chester County, Pennsylvania, United States Department of Agriculture, Soil Conservation Service.

County-wide Act 167 Stormwater Management Plan for Chester County, PA. Chester Creek Act 167 Plan – Volume I and Volume II. Conestoga River Act 167 Plan. Ridley Creek Act 167 Plan.

DCNR, 2016. *Invasive Plants in Pennsylvania, Crown Vetch,* Coronilla varia. Accessed October 25, 2016. http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_010284.pdf.

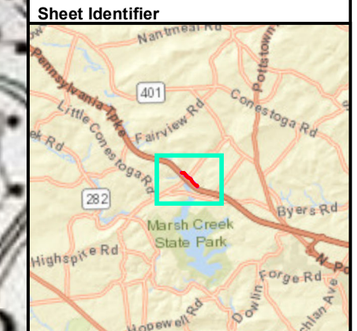
ATTACHMENT 1:

USGS Location Maps

Legend

- Major Modification
- Alignment Centerline

Sheet Identifier



N

0 300 600 Feet

0 91.5 183 Meters

PROJECT LOCATION MAP
ATTACHMENT 1
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

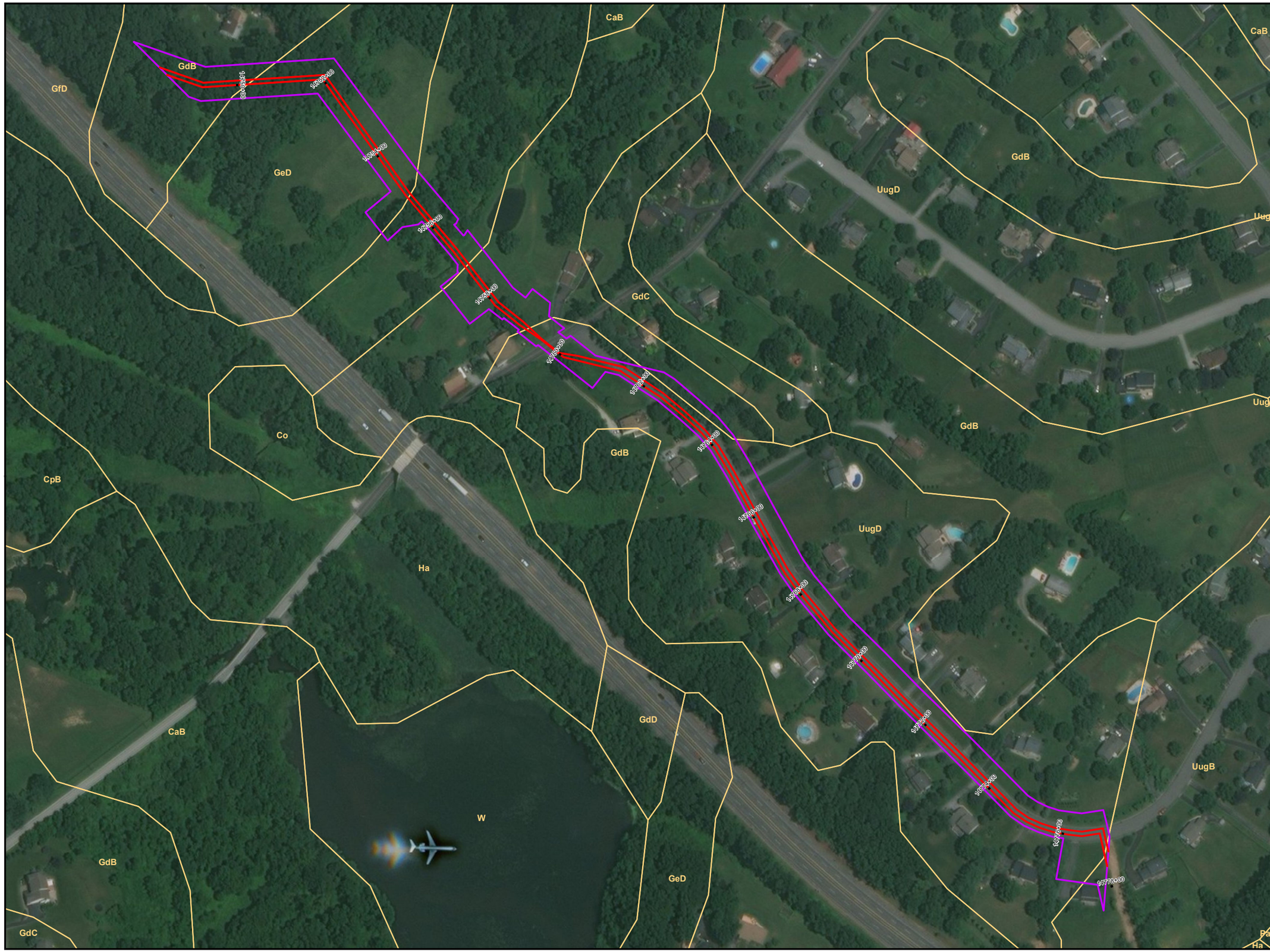
Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangle displayed is Downingtown.

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP ESC\GIP\PENNPIPELINE_SOUTHEAST_USGS_ESCGP_OPT3_20190920.MXD 09/24/19 TT

ATTACHMENT 2:

Limiting Soil Characteristics Table, Soil Descriptions,

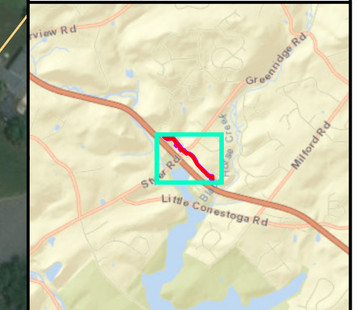
Soil and Geological Maps, KARST Plan



Legend

- Stationing
- Major Modification
- Alignment Centerline
- Natural Resources Conservation Service (NRCS) Soils & Code

Sheet Identifier



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Meters: 0 30.48 60.96

NRCS SOILS MAP
ATTATCHMENT 5
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY, PA

TETRA TECH

Notes:
Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

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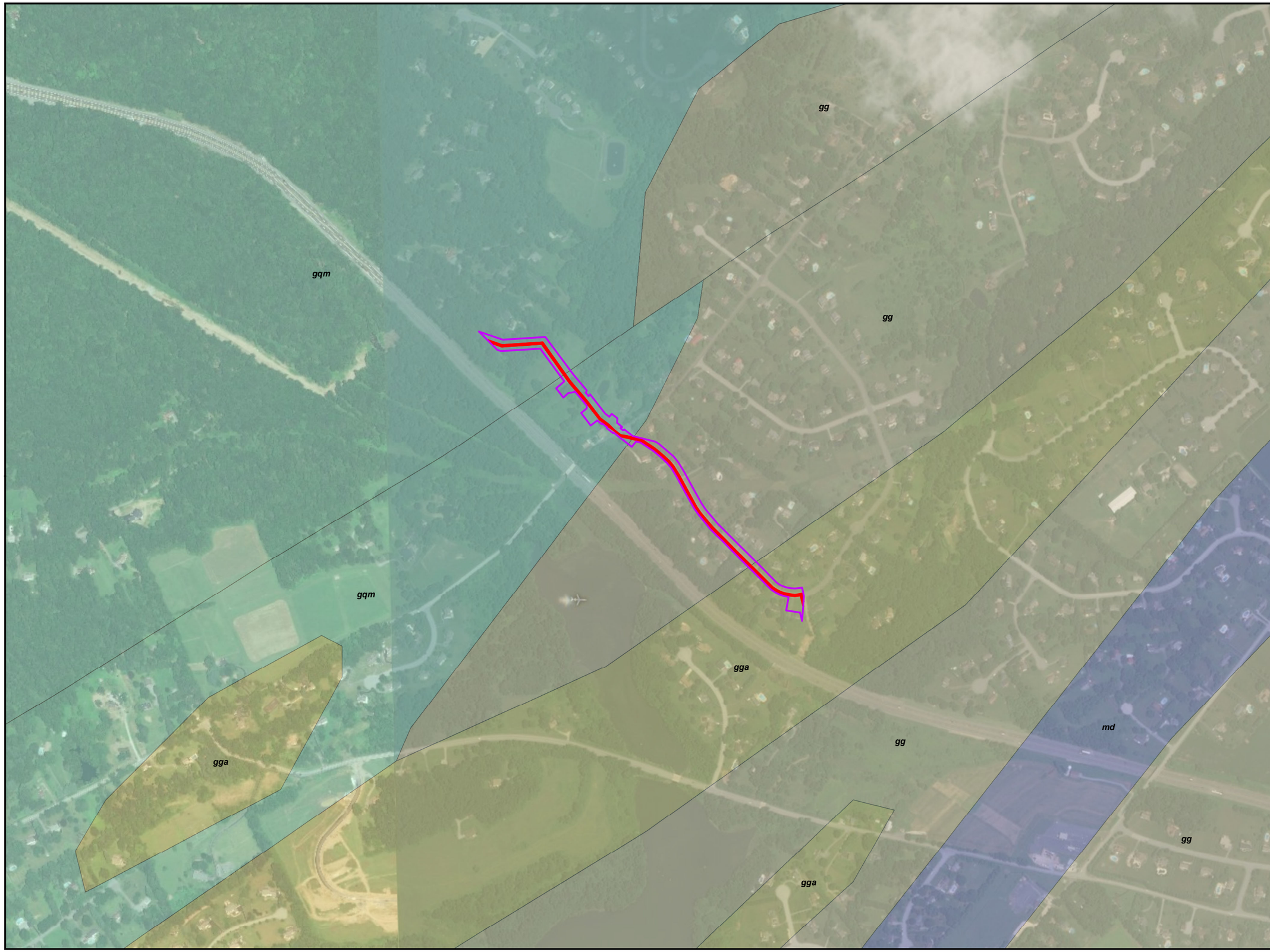
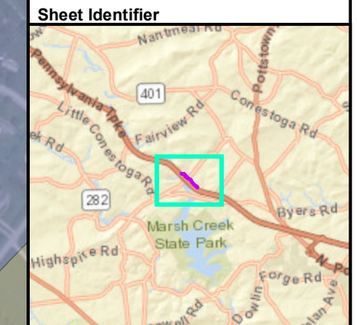


Legend

- Major Modification
- Alignment Centerline
- Graphitic felsic gneiss (gg)
- Banded mafic gneiss (gga)
- Graphitic felsic gneiss (gqm)
- Metadiabase (md)

Sheet Identifier



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GEOLOGIC UNIT MAP
ATTACHMENT 5
PENNSYLVANIA PIPELINE PROJECT
HDD 280 MAJOR MODIFICATION
SUNOCO PIPELINE, L.P.
CHESTER COUNTY,
PENNSYLVANIA

TETRA TECH

Notes:
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9. NOV'S

SUNOCO PIPELINE L.P.
COMPLIANCE HISTORY

Permit Number	HDD/Bore ID	Township	County	Status	Incident Date	Date Resolved
E21-449 ESG030015002	PA-CU-0062.0000-WX-HDD	Lower Frankford	Cumberland	Resolved	2/28/2018 6:00	2/27/2018 0:00
E38-194 ESG030015002	PA-LE-0055.0000-RD-HDD	West Cornwall	Lebanon	Resolved	3/16/2018 6:00	6/9/2018 0:00
E07-459 ESG030015002	PA-BL-0001.0094-WX-HDD	Frankstown	Blair	Resolved	3/16/2018 6:00	Drilling resumed on 3/31/2018.
E07-459 ESG030015002	HDD PA-BL-0122.0000-WX	Frankstown	Blair	Resolved	3/19/2018 6:00	HDD abandoned for Direct Pipe Method following submission of a Minor Mod. 4/22/2018
E31-234 ESG030015002	PA-HU-0106.0000-RD-HDD	Shirley	Huntingdon	Resolved	3/26/2018 6:00	4/9/2018 0:00
E50-258, ESG0300015002	PA-PE-0002.0000-RD-HDD	Toboyne	Perry	Resolved	3/29/2018 0:00	4/3/2018 0:00
E07-459 ESG030015002	PA-BL-0001.0094-WX-HDD	Frankstown	Blair	Resolved	4/6/2018 6:00	Restart approved. Setup changes on 4/20/2018 and ream resumed on 4/21/2018.
E07-459 ESG030015002	PA-BL-0001.0048-RR-HDD	Blair	Blair	Resolved	4/10/2018 6:00	Restart approval received on 5/25/2018.
E38-194 ESG030015002	PA-LE-0055.0000-RD-HDD	West Cornwall	Lebanon	Resolved	4/20/2018 6:00	8/21/2018 0:00
E23-524 ESG0100015001	PA-DE-0100.0000-RR-HDD	Middletown	Delaware	Resolved	5/3/2018 6:00	IR(s) were contained and cleaned up on the dates that they occurred (4/18/18, 4/19/18(emerged with in containment), and 4/20/18. Restoration of this area was completed on 10/19/18.
E11-352 ESG0500015001	PA-CA-0023.0000-RD-HDD	Jackson	Cambria	Resolved	5/8/2018 16:30	5/8/2018 20:00:00 PM
E11-352 ESG0500015001	PA-CA-0016.0000-RD	Jackson	Cambria	Resolved	5/15/2018 6:00	1/7/2019 restoration
E63-674 ESG0500015001	PA-WA1-0127.0000-RD	Nottingham	Washington	Resolved	5/15/2018 0:00	9/1/2018 0:00
E38-194 ESG030015002	PA-LE-0055.0000-RD-HDD	West Cornwall	Lebanon	Resolved	6/1/2018 6:00	8/21/2018 0:00
E38-194 ESG030015002	PA-LE-0055.0000-RD-HDD	West Cornwall	Lebanon	Resolved	6/11/2018 6:00	8/21/2018 0:00
E23-524 ESG0100015001	PA-DE-0104.0008-WX-HDD	Middletown	Delaware	Resolved	6/14/2018 6:00	6/10/2018 0:00
E07-459 ESG030015002	PA-BL-0001.0048-RR-HDD	Blair	Blair	Resolved	6/15/2018 6:00	7/6/2018 0:00
E65-973 ESG0500015001	PA-WM1-0023.0000-RD-HDD	West Newton	Westmoreland	Resolved	6/19/2018 6:00	6/18/2019 1830
E11-352 ESG0500015001	PA-CA-0023.0000-RD-HDD	Jackson	Cambria	Resolved	6/21/2018 0:00	6/21/2018 0:00

SUNOCO PIPELINE L.P.
COMPLIANCE HISTORY

Permit Number	HDD/Bore ID	Township	County	Status	Incident Date	Date Resolved
E38-194 ESG030015002	PA-LE-0055.0000-RD-HDD	West Cornwall	Lebanon	Resolved	6/28/2018 6:00	8/21/2018 0:00
E06-701 ESG0300015002	PA-BR-0181.0000-RD-HDD	Caernarvon	Berks	Resolved	6/28/2018 6:00	7/31/2019 0:00
E63-674 ESG0500015001	PA-WA-0127.0000-RR-HDD	Nottingham	Washington	Resolved	5/29/2018 6:00	5/25/2018 0:00
E21-449 ESG030015002	PA-CU-0136.0002-WX	Middlesex	Cumberland	Resolved	7/7/2018 6:00	8/1/2018 0:00
E63-674 ESG0500015001	PA-WA-0119.0000-RD-HDD	North Strabane	Washington	Resolved	7/16/2018 6:00	7/30/18 with completion of anomaly repair. No drilling was occurring when this instance occurred.
E23-524 ESG0100015001	PA-DE-0100.0000-RR-16	Middletown	Delaware	Restoration Pending	7/18/2018 23:00	IR was contained and cleaned up on 7/14/18. Currently waiting on soil approval from PADEP to complete restoration of wetland WL-I1.
E11-352 ESG0500015001	PA-CA-0016.0000-RD	Jackson	Cambria	Resolved	7/23/2018 23:00	Stream impact ended on 07/22/2018. 7/25/2018 17:00:00 PM recovery of the turbid water from the spring house was completed.
E21-449 ESG0300015002	PA-CU-0136.0002-WX	Middlesex	Cumberland	Resolved	7/24/2018 23:00	7/25/2018 0:00
E23-524 ESG0100015001	PA-DE-0100.0000-RR-16	Middletown	Delaware	Resolved	7/24/2018 23:00	IR was contained and cleaned up on 7/20/18 at each location. Restoration of storm drain outlet containment area was completed on 10/6/18.
E23-524 ESG0100015001	PA-DE-0100.0000-RR-16	Middletown	Delaware	Resolved	7/30/2018 23:00	IR was contained and cleaned up on 7/30/18. Upland restoration completed on 10/19/18. Storm drain outlet restoration completed on 10/6/18. Parking lot restoration completed on 11/2/18.
E23-524 ESG0100015001	PA-DE-0104.0008-WX-HDD (or possibly PA-DE-0104.0015-RD-HDD?)	Aston	Delaware	Resolved	8/8/2018 23:00	Repairs were made on 7/9/18
E63-674 ESG0500015001	PA-WA1-0127.0000-RD	Nottingham	Washington	Resolved	8/12/2018 23:00	8/30/2018 0:00
E11-352 ESG0500015001	PA-CA-0069.0000-RD	Munster	Cambria	Resolved	8/12/2018 23:00	Remediation of the 08/03/2018 IR site was completed on 08/03/2018. Remediation of the 08/04 IR site was completed in 08/06/2018.
E38-194 ESG0300015002	PA-LE-0055.0000-RD	West Cornwall	Lebanon	Resolved	8/15/2018 23:00	8/21/2018 0:00
E23-524 ESG0100015001	PA-DE-0100.0000-RR-16	Middletown	Delaware	Resolved	8/28/2018 23:00	IR was contained and cleaned up on 8/22/18 and 8/26/18. Upland restoration was completed on 10/19/18.

SUNOCO PIPELINE L.P.
COMPLIANCE HISTORY

Permit Number	HDD/Bore ID	Township	County	Status	Incident Date	Date Resolved
E11-352 ESG0500015001	PA-CA-0023.0000-RD	Jackson	Cambria	Resolved	8/25/2018 0:00	IR containment and recovery completed on 08/25/2018. Relief well drilled on 09/23 as indicated on the restart procedures issued by PADEP.
E21-449 ESG0300015002	PA-CU-0136.0002-WX	Middlesex	Cumberland	Resolved	9/13/2018 23:00	9/3/2018 0:00
E06-701 ESG0300015002	PA-BR-0181.0000-RD	Caernarvon	Berks	Resolved	9/16/2018 23:00	9/18/2018 0:00
E11-352 ESG0500015001	PA-CA-0016.0000-RD-HDD	Munster	Cambria	Resolved	9/17/2018 23:00	10/25/2018 0:00
E11-352 ESG0500015001	PA-CA-0016.0000-RD-HDD	Jackson	Cambria	Resolved	9/17/2018 23:00	Drilling fluid recovery completed on 09/14 following 09/12 IR. IR recovery completed on 09/15 IR event. Relief well completed on 10/07/2018.
E06-701 ESG0300015002	PA-BR-0181.0000-RD-HDD	Caernarvon	Berks	Resolved	9/17/2018 23:00	1/15/119
E07-459 ESG0300015002	PA-BL-0126.0000-RD-HDD	Woodbury	Blair	Resolved	10/2/2018 23:00	Restart Report submitted on 10/4/2018 with DEP approval on 10/6/2018.
E07-459 ESG0300015002	PA-BL-0126.0000-RD-HDD	Woodbury	Blair	Resolved	10/8/2018 23:00	Restart Report submitted on 10/8/2018 with DEP approval on 10/9/2018.
E07-459 ESG0300015002	PA-BL-0126.0000-RD-HDD	Woodbury	Blair	Resolved	10/10/2018 23:00	Bore hole grouted on 10/11/2018.
E07-459 ESG0300015002	PA-BL-0126.0000-RD	Woodbury	Blair	Resolved	10/15/2018 23:00	12/23/2018 0:00
E07-459 ESG030015002	PA-BL-0001.0078-WX-FlexBore	Blair	Blair	Resolved	10/17/2018 23:00	Restart approval received on 10/26/2018.
PAG103570	Not Applicable	Multiple	Cumberland, Huntingdon, Juniata	Pending Resolution	10/22/2018 23:00	Pending Resolution

10. AQUATIC RESOURCE REPORT

Aquatic Resources Report
0280 Reroute
Chester County, Pennsylvania

February 2019

Prepared for:

Sunoco Pipeline, L.P.
535 Fritztown Road
Sinking Spring, PA 19608

Prepared by:

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(716) 849-9419
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ATTACHMENTS

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Attachment B – Waterbody Photographic Log
Attachment C – Waterbody Data Forms

Aquatic Resources Report
0280 Reroute
Chester County, Pennsylvania

1.0 Introduction

Tetra Tech, Inc. (Tetra Tech) was contracted by Sunoco Pipeline L.P. to perform a wetland assessment of an approximately 8-acre area surrounding a section of Right-of Way (ROW) located between Greenridge Rd. and Styler Rd. in Upper Uwchlan Township, Chester County, Pennsylvania.

The purpose of this investigation was to determine the presence and extent of resources within the survey area that meet the criteria for federal wetlands designation according to the United States Army Corps of Engineers (USACE) guidelines and are potentially jurisdictional and regulated under Section 404 of the Clean Water Act (CWA). Background review information such as U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) mapped soils and presence of U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS NWI) features are summarized within Survey Methods below.

The following report summarizes the characteristics of delineated resources and report attachments include: Attachment A – Figures, Attachment B – Wetland Photographic Log, and Attachment C – Waterbody Photographic Log, Attachment D – Wetland Data Forms, and Attachment E – Stream Data Forms.

2.0 Survey Methods

2.1 Background Research

Prior to conducting fieldwork, Tetra Tech reviewed existing information for the survey area, including:

- United States Geological Survey (USGS) 7.5-minute series topographic quadrangle maps for the survey areas (Downingtown, PA 2001).
- Soil survey maps, descriptions, and lists, to determine presence and extent of hydric and upland soils (USDA NRCS 2007), Web Soil Survey database for Chester County, PA.
- NWI geospatial data available from the USFWS for the survey area (USFWS, Wetlands Mapper, data downloaded January 2019); and,
- Aerial photographs to identify drainage and other hydrologic features (Environmental Sciences Research Institute, Inc. [ESRI] online mapping services, available at: services.arcgisonline.com/arcgis/service).

2.2 On-Site Delineation

Following the review of background information, two wetland scientists performed a field survey on January 31, 2019. The survey consisted of walk-through inspection of the survey area to identify topographic, drainage, and vegetation features that would indicate the potential for a wetland determination. Potential wetlands were further evaluated by collecting soil, vegetation, and hydrology data at upland and wetland sample locations at suspected wetland boundaries. Sample plot data were recorded on Eastern Mountains and Piedmont Region Wetland Determination Data Forms provided within the regional supplement.

The survey area was evaluated for the presence and extent of wetlands using the routine, Level-2 determination method described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual:*

Eastern Mountains and Piedmont Region (Version 2.0) (USACE 2012). Wetlands identified and delineated were subsequently classified in accordance with the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et al*. 1979). Classifications were restricted to palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Wetland boundaries were also flagged and marked in the field and each wetland area was photographed.

Each wetland and waterbody was further evaluated to characterize the hydrological connection to adjacent upland, wetland, and waterbody regions occurring in proximity to the survey area investigated. Specific methods for characterizing and evaluating the soils, vegetation, and hydrologic indicators are described below.

Vegetation: Dominant plant species in each major vegetation stratum (tree, sapling/shrub, herbaceous, and woody vine) were identified within 30-foot radius sample plots. The wetland indicator status of each species was assigned according to the *Eastern Mountains and Piedmont Regional Wetland Plant List* (Lichvar *et al.* 2016). Hydrophytic vegetation was determined to be present where more than 50 percent of the dominant species from all vegetation strata were classified as facultative (FAC), facultative wetland (FACW), or obligate wetland species (OBL). Other tests used to evaluate the dominance of hydrophytic species included the Dominance Test and the Prevalence Index (USACE 2012).

Soils: A soil auger was used at each sample plot to extract a core sample to a depth where either hydric indicators were observed, approximately 20 inches, or until rocky substrate resulted in auger refusal. The soils were characterized by determining the color and texture of each soil horizon. Soil matrix and mottle colors were identified using Munsell Soil Color Charts (Munsell Color 2012). Soils were considered hydric if they exhibited one (1) or more of the following indicators, including, but not limited to: histosols, histic epipedons, black histic, hydrogen sulfide, stratified layers, 2 cm muck, depletion below dark surface, thick dark surface, sandy mucky mineral, sandy gleyed matrix, sandy redox, stripped matrix, dark surface, polyvalue below surface, thin dark surface, loamy gleyed matrix, depleted matrix, redox dark surface, depleted dark surface, redox depressions, iron-manganese masses, umbric surface, Piedmont floodplain soils, and red parent material. These indicators support a hydric soil determination, although secondary or additional indicators may also be present.

Hydrology: Each sample plot was examined for evidence of wetland hydrology. Indicators of wetland hydrology include: surface water, high water table, saturations, water marks, sediment deposits, drift deposits, algal mat or crust, iron deposits, visible inundation on aerials, water stained leaves, aquatic fauna, true aquatic plants, hydrogen sulfide odor, oxidized rhizospheres on living roots, presence of reduced iron, recent iron reduction in tilled soils, or a thin muck surface. Presence of standing water or depth to soil saturation was recorded at each sampling location.

2.3 Waterbody Identification

Prior to field surveys, known waterbodies in the survey area were identified on USGS topographic quadrangle maps. During the field investigation, a qualified biologist examined the entire field survey area for mapped and unmapped waterbodies. Waterbodies identified included perennial, intermittent, and ephemeral streams and ponds. Data recorded included stream name, associated wetlands, flow regime (perennial, intermittent, or ephemeral), direction of flow, water width, bank-to-bank width, bank height and slope, water depth, bottom and bank substrates, observed water quality, channel meander, and adjacent vegetation type. In addition, indicators of aquatic habitat, wildlife use, and soil erosion potential were recorded.

2.4 GPS Mapping

Wetland and waterbody boundaries/alignments were flagged at regular intervals to accurately represent the boundary between the aquatic resource and the adjacent upland. Flag points were then land surveyed using a Trimble, Inc. (Sunnyvale, CA) Geo XH Global Positioning System (GPS). Each point used an identification code and was numbered consecutively to facilitate the desktop mapping process. Flag points were differentially corrected in accordance with Trimble, Inc. sub-meter accuracy standards. All data was recorded in the WGS 84 coordinate zone and then projected into NAD 83 State Plane Pennsylvania South using ArcGIS 10.2.

Attribute data for all flag points was recorded, including the following information:

- Unique number or name;
- NAD 1983 coordinates;
- Date;
- Time;
- Number of positions recorded;
- Max value position dilution of precision (PDOP); and,
- Horizontal accuracy (in meters)

GPS data were differentially corrected using Pathfinder Office 5.60 software (Trimble Inc., Sunnyvale, CA) and commercial base station control points. Corrected flag points were then imported into ArcView 10.2 (ESRI; Redlands, CA) Geographic Information System (GIS) mapping software where points were connected in consecutive order and according to surveyor notes. Wetland boundaries were left “open” when the wetland extended beyond the survey boundaries and were “closed” when contained entirely within the survey boundaries. Stream alignments were connected in a similar manner and designated as “line” data. A geo-referenced wetland delineation boundary suitable for overlay onto themed base layers was created using ArcView 10.2 GIS software. The same GIS software was also used as an analytical tool, providing acreages of the delineated wetlands and coordinate location of the centroids of the polygons.

3.0 Survey Results

3.1 Background Data Review

General Area Description
Land use within the survey boundary is rural and consists of residential lawn, mowed field, scrub-shrub, woodlots, and several sparsely-concentrated residential homes. Land use in the general vicinity of the survey area is the same. Attachment A, Figure 1 provides an aerial basemap of the survey area.

Soils
A review of published and publicly available soils data for the survey area indicates that four (4) soils series are mapped within the survey boundary (Attachment A, Figure 1). Mapped soil series are summarized in Table 1 below.

Table 1. Mapped Soil Types on 0280 Reroute

Soil Symbol	Soil Name and Brief Description[1]	Hydric Soil Classification
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	Not Hydric
GeD	Gladstone-Parker gravelly loams, 15 to 25 percent slopes	Not Hydric
Ha	Hatboro silt loam	Hydric
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	Partially

[1]USDA, NRCS, Soil Series Descriptions for Chester County, PA, 2017.

Mapped Wetlands
One (1) USFWS mapped NWI feature was identified in the survey area. The NWI feature is classified as a temporary flooded, broad-leaved deciduous palustrine forested system (USFWS code PFO1A).

Mapped Waterbodies
No waterbodies were identified on the USGS topographic maps.

3.2 Delineated Aquatic Resources

Two (2) new aquatic resources consisting of one (1) stream and one (1) pond were identified during the field survey. Additionally, one (1) existing wetland and one (1) existing stream were extended through the new survey area.

Wetlands
No new wetlands were identified within the survey corridor during survey efforts. One wetland, Q76, was extended from its original delineation limits. The extension of wetland Q76 is a palustrine emergent wetland located in a small valley adjacent to stream S-Q83.

Waterbodies
Previously-identified stream S-Q83 [unnamed tributary (UNT) to Marsh Creek] was extended through the survey area from the initially reported limits and there were no significant changes to previously-supplied data. Stream S16r is a newly identified ephemeral drainage that has a confluence with stream S-Q83. Pond P1r is a newly delineated pond located in residential lawn. A brief summary of the identified waterbodies is provided in Table 2 below, photos of each stream are provided in Attachment B, and stream data forms are provided in Attachment C.

Table 2. Waterbodies Identified During Field Survey at 0280 Reroute

Stream ID	Flow Regime	Water Depth (in.)	Bankfull Width (ft.)	Figure 2 Sheet	Photo Numbers	Description
S-Q83	Perennial	<1	6	1	1, 2	UNT to Marsh Creek – extended about 0.1 mile to the northeast of the existing delineation during this field survey. Southwest flowing perennial stream that drains to Marsh Creek Reservoir.
S16r	Perennial	<1	1	1	3, 4	Southwest-flowing ephemeral stream that has a confluence with UNT to Marsh Creek (S-Q83). Stream receives drainage from nearby wetland W-Q76.
Pond P1r	-	5	20	1	5	Small residential drainage pond located at base of slope adjacent to stream S-Q83.

*Note that widths and depths are averages based on the assessed limits of the features

4.0 Summary

Tetra Tech completed an aquatic resource survey on an approximately surrounding a section of Right-of Way (ROW) located between Interstate-76 and Styer Road in Upper Uwchlan Township, Chester County, Pennsylvania. Tetra Tech expanded the boundary of one (1) existing wetland and delineated two (2) new waterbodies that meet USACE criteria for aquatic resources. Attachment A provides figures regarding the site location and geometry and alignments of the delineated features. Attachment B provides a photographic log for each of the new resources delineated within the survey area, and Attachment C provides data forms for each of the features.

5.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31, Washington, D.C. 131 pp.

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Munsell Color. 2009. Munsell Soil Color Chart. MacBeth Division of Kollmorgen Instruments Corporation. Baltimore, MD. 27 pp.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

United States Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont (Version 2.0). Vicksburg, MS. 179 pp.

United States Department of Agriculture, Natural Resources Conservation Service and University of California Davis. 2011. SoilWeb App. Available at http://casoilresource.lawr.ucdavis.edu /soilweb-apps/.

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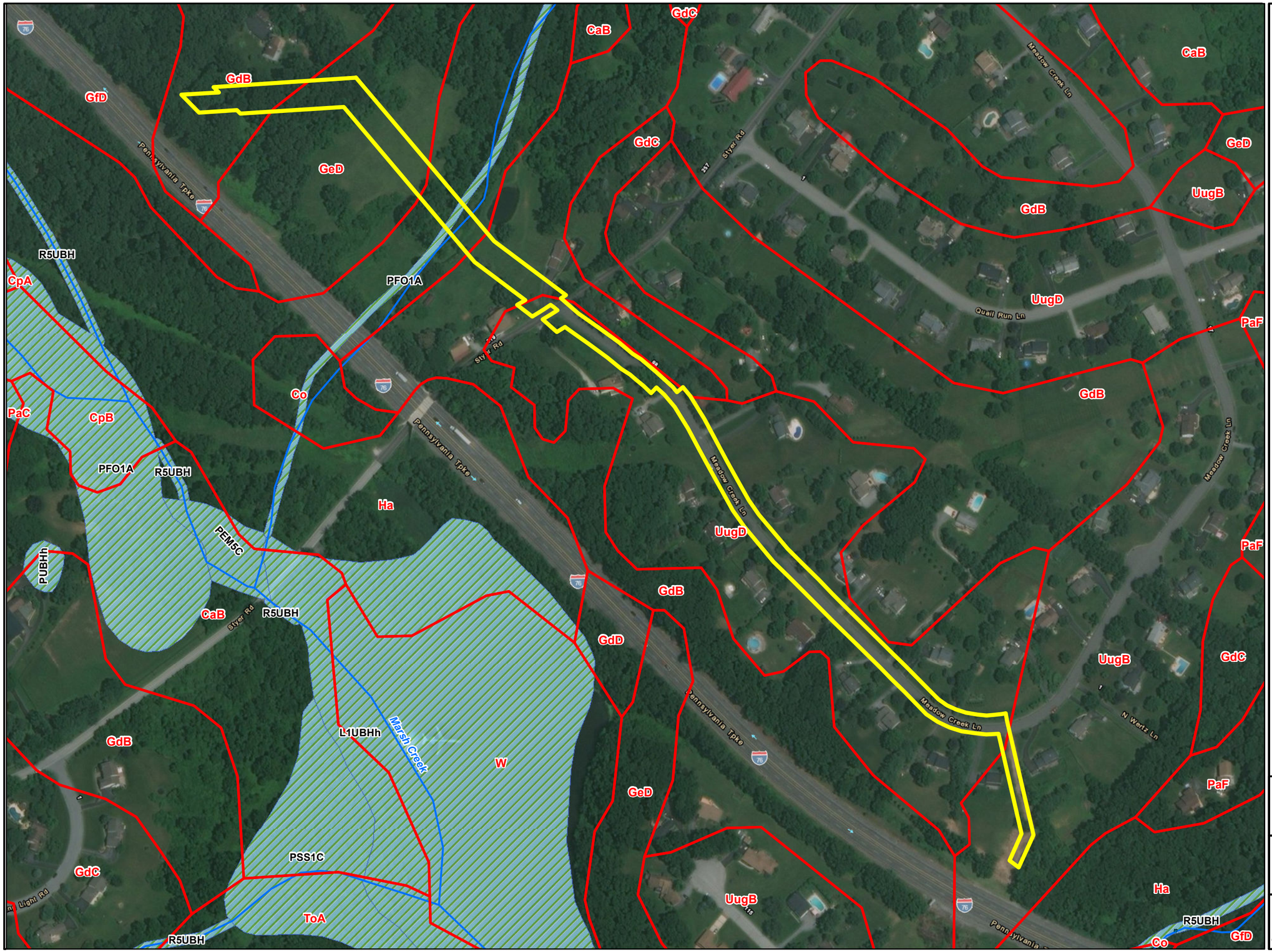
ATTACHMENT A

FIGURES



Legend

- Survey Area
- NHD
- NWI Wetlands
- Soils

Location

0 125 250 500

1 inch = 250 feet

Figure 1. NWI Features and Soils on the Sunoco Pennsylvania Pipeline Project, Chester County, PA. Sheet 1 of 1

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI World Imagery 07/03/2017.
Soils USDA 09/18/2018 Chester County,
NWI Wetlands USFWS 09/19/2016

Coordinate System: NAD 83 Stateplane, PA South, Feet

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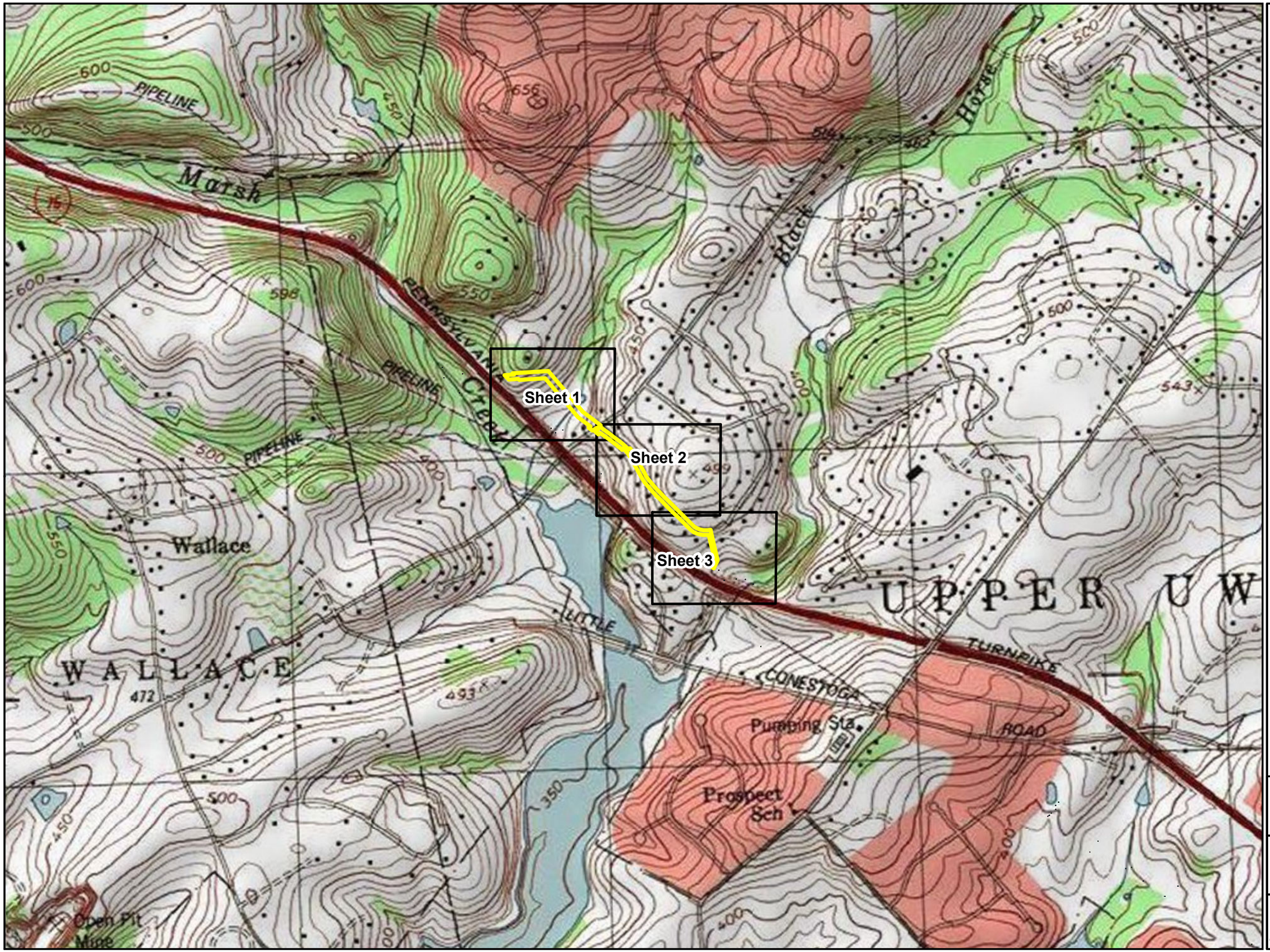
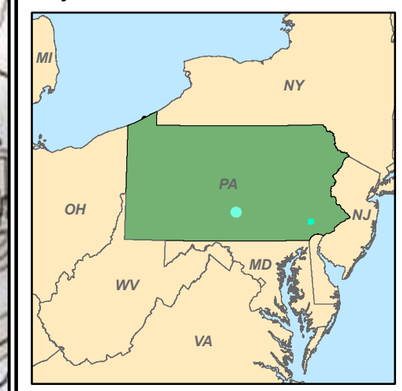


Legend

- Survey Area
- Sheet Boundary

Project Location



0 500 1,000 2,000

1 inch = 1000 feet

Figure 2. Delineated Aquatic Resources on the Sunoco Pennsylvania Pipeline Project, Chester County, PA. Sheet Key

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI US Topo Maps

Coordinate System: NAD 83 Stateplane, PA South, Feet

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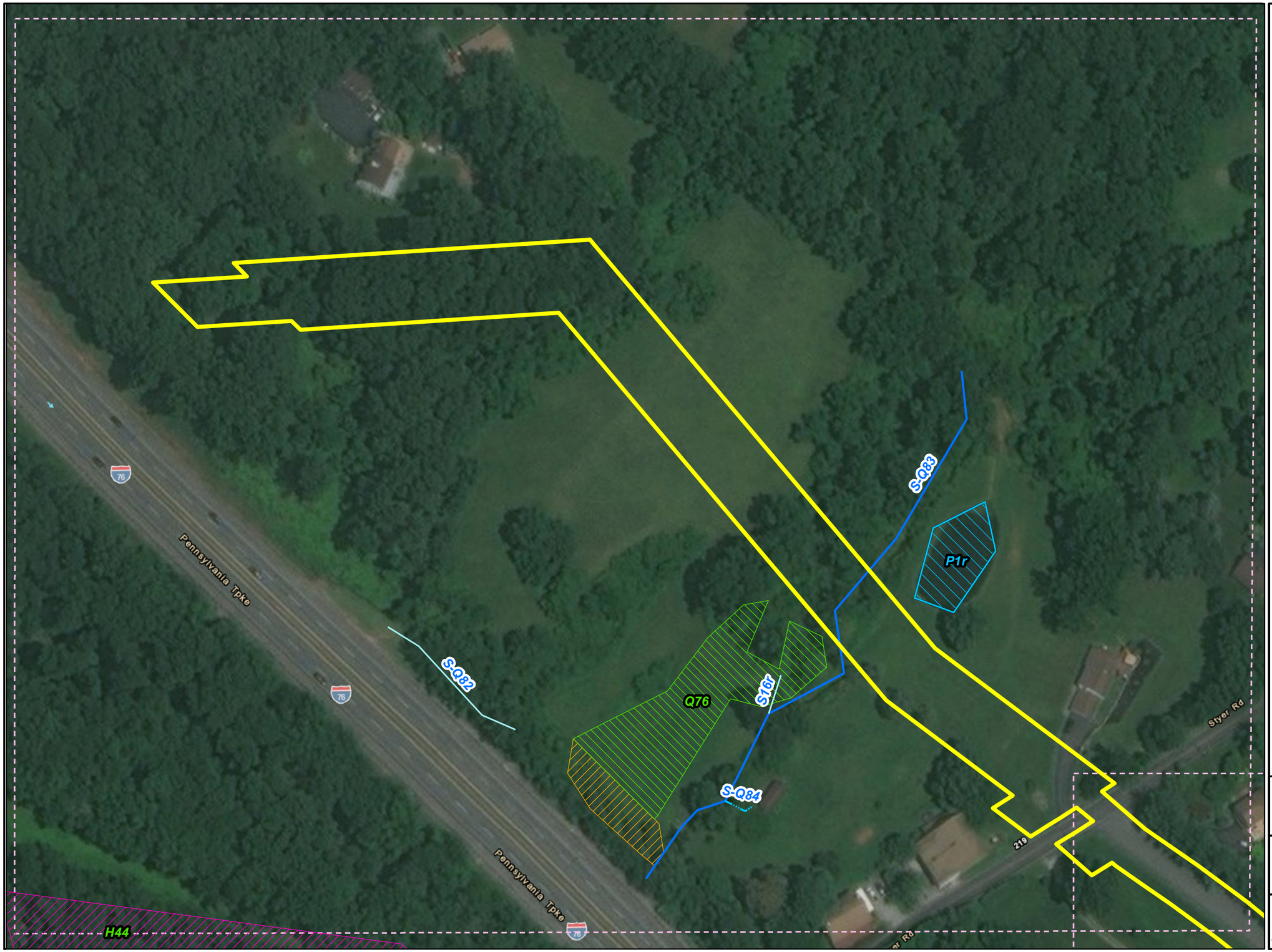
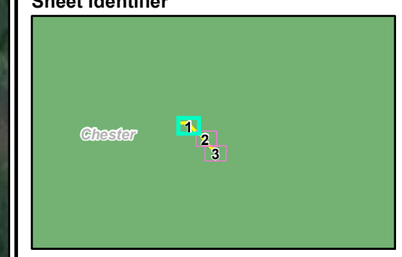


Legend

- Survey Area
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- PEM Wetland
- PFO Wetland
- PSS Wetland
- Pond
- Sheet Boundary

Sheet Identifier



N

0 50 100 200

1 inch = 100 feet

Figure 2. Delineated Aquatic Resources on the Sunoco Pennsylvania Pipeline Project, Chester County, PA. Sheet 1 of 3

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI World Imagery 07/03/2017

Coordinate System: NAD 83 Stateplane, PA South, Feet

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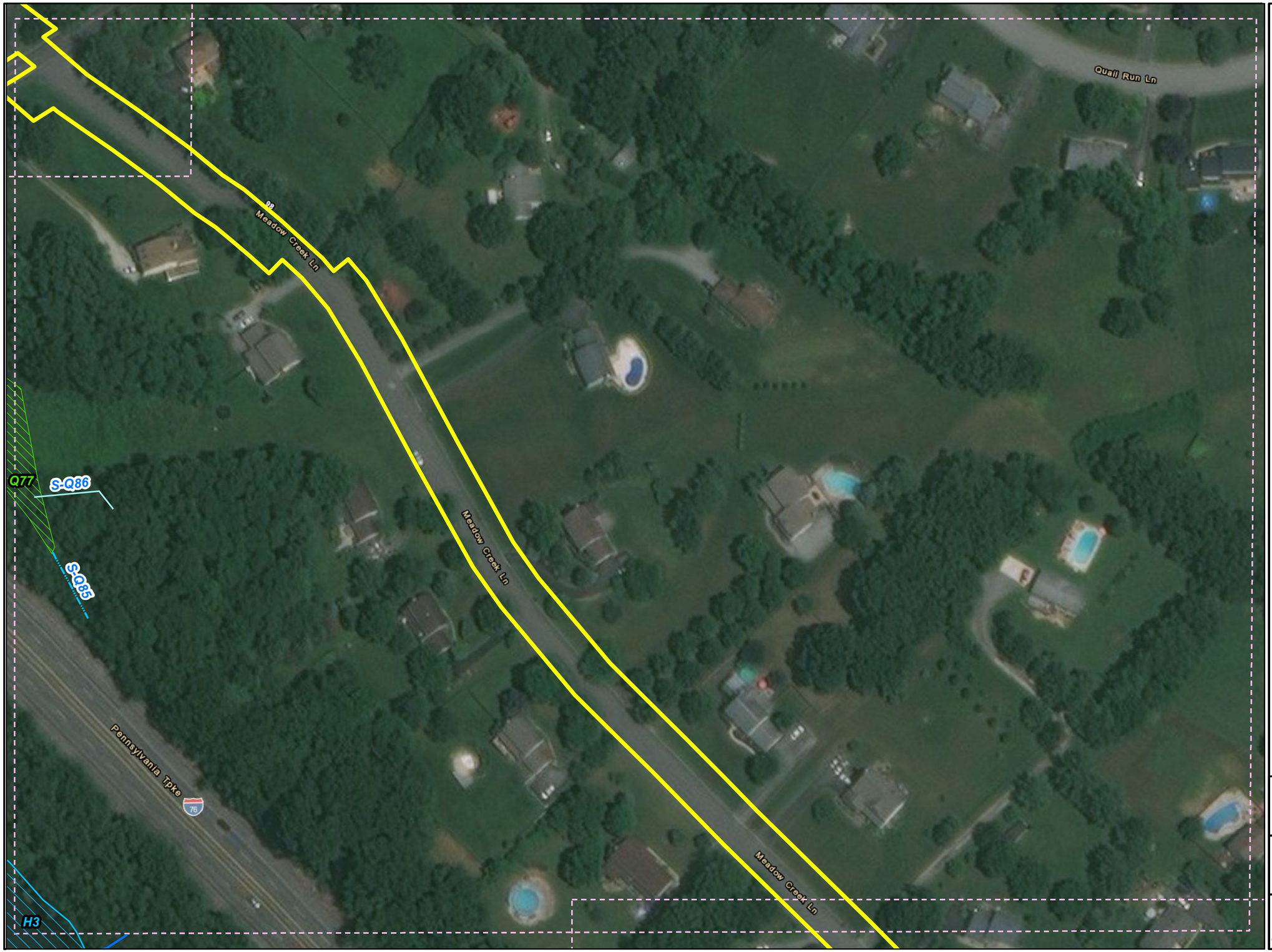
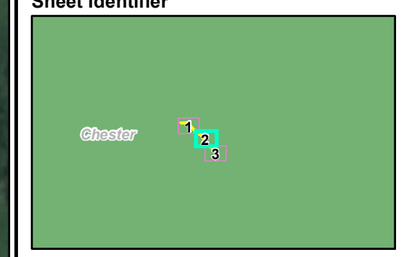


Legend

- Survey Area
- Ephemeral Stream
- Intermittent Stream
- Perennial Stream
- PEM Wetland
- Pond
- Sheet Boundary

Sheet Identifier



N

0 50 100 200

1 inch = 100 feet

Figure 2. Delineated Aquatic Resources on the Sunoco Pennsylvania Pipeline Project, Chester County, PA. Sheet 2 of 3

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI World Imagery 07/03/2017

Coordinate System: NAD 83 Stateplane, PA South, Feet

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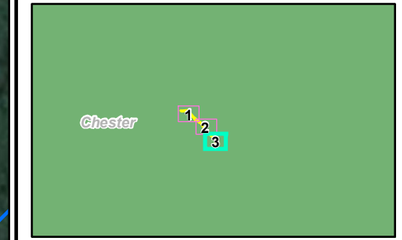
Legend

- Survey Area
- Ephemeral Stream
- Perennial Stream
- PEM Wetland
- PFO Wetland
- Sheet Boundary

Sheet Identifier



N

0 50 100 200

1 inch = 100 feet

Figure 2. Delineated Aquatic Resources on the Sunoco Pennsylvania Pipeline Project, Chester County, PA. Sheet 3 of 3

Prepared By:	Date:
TETRA TECH	02/2019

Base Map; ESRI World Imagery 07/03/2017

Coordinate System: NAD 83 Stateplane, PA South, Feet

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ATTACHMENT B

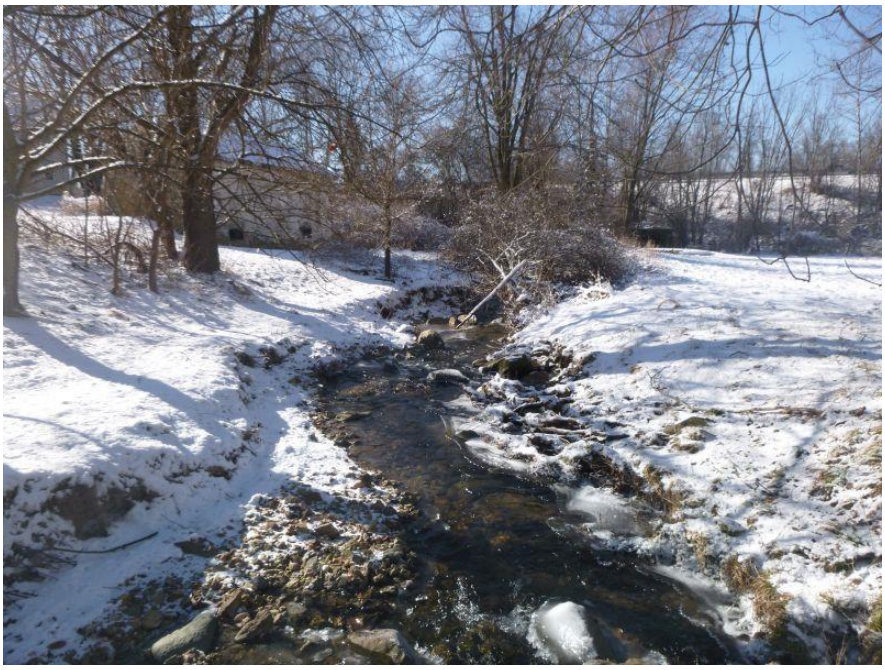
WATERBODY PHOTOGRAPHIC LOG

WATERBODY PHOTOGRAPHIC LOG

Company: Sunoco Pipeline, L.P.
Project: Pennsylvania Pipeline Project (PPP) – 0280 Re-route

Photographer: K. Berend
Date: 1/31/2019
Photo No.: 1
Direction: Northeast

Comments: Stream S-Q83 extension, upstream view facing northeast



Photographer: K. Berend
Date: 1/31/2019
Photo No.: 2
Direction: North

Comments: Stream S-Q83 extension, downstream view facing southwest

WATERBODY PHOTOGRAPHIC LOG

Company: Sunoco Pipeline, L.P.
Project: Pennsylvania Pipeline Project (PPP) – 0280 Re-route

Photographer: K. Berend
Date: 1/31/2019
Photo No.: 3
Direction: Southeast

Comments: Stream S16r, downstream view facing southeast

Photographer: K. Berend
Date: 1/31/2019
Photo No.: 4
Direction: Northwest

Comments: Stream S16r, upstream view facing northwest

WATERBODY PHOTOGRAPHIC LOG

Company: Sunoco Pipeline, L.P.
Project: Pennsylvania Pipeline Project (PPP) – 0280 Re-route

Photographer: K. Berend
Date: 1/29/2019
Photo No.: 5
Direction: Northwest

Comments: Pond P1r, view facing northeast

ATTACHMENT C

WATERBODY DATA FORMS

Tetra Tech Stream Data Sheet

Surveyors: K. Berend + M. Guman Date: 1/31/19 Resource ID Number: S16r
Project: SPLP - PPP State: PA County: Chester
Photo Number (s): 0495-0496 Canopy Cover: 25 %

Flow Direction: SE **Bank Width:** 1 feet **Water Width:** 1 feet
High Water Depth: _____ feet **Water Depth:** 0.5 feet **Turbidity:** none

Flow Regime: [ ] Perennial [ ] Intermittent [ ] Ephemeral [✓] Flowing Ditch [ ] Dry/Stagnant Ditch

Sinuosity:
[✓] Low
[ ] Medium
[ ] High

Features:
[ ] Riffles [ ] Sand/Mud Bar [ ] Run/Glide
[ ] Pools [ ] Gravel Bar [ ] Braided
[ ] Rapids [ ] Aquatic Vegetation [ ] Other _____

Substrate:
[ ] Bedrock ___%
[ ] Boulder ___%
[✓] Cobble/Gravel 50 %
[ ] Sand ___%
[ ] Silt/Clay ___%
[✓] Organic 50 %

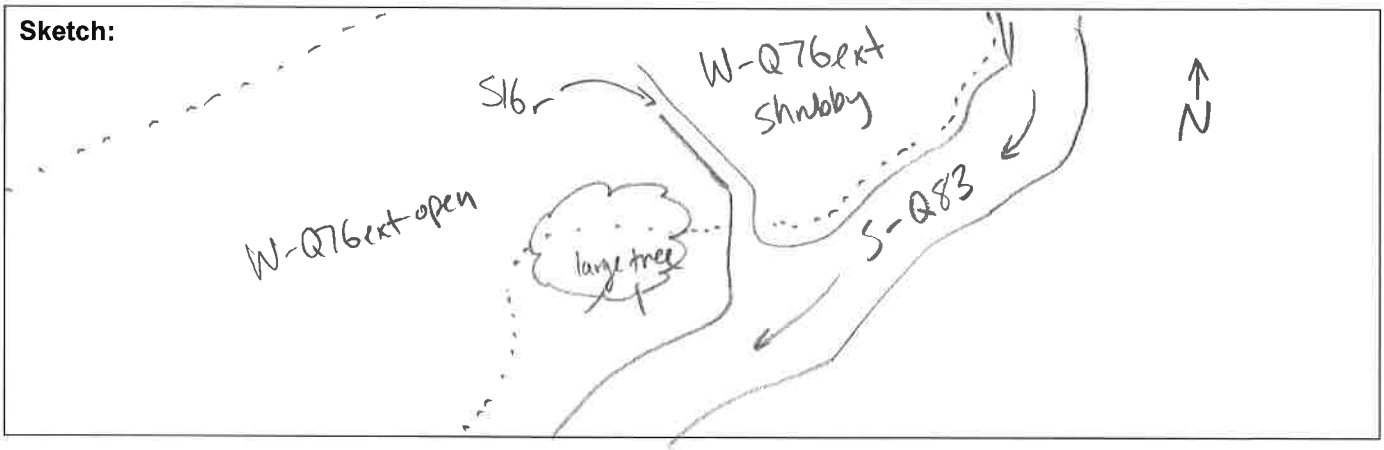
Bank Substrate:
Height: Left 1' Right 1'

[ ]	Bedrock	[ ]
[ ]	Boulder	[ ]
[✓]	Gravel	[✓]
[ ]	Sand	[ ]
[ ]	Silt/Clay	[ ]
[✓]	Organic	[✓]

Floodplain Width:

Left		Right
[✓]	<10 feet	[✓]
[ ]	<25 feet	[ ]
[ ]	<50 feet	[ ]
[ ]	<100 feet	[ ]
[ ]	>100 feet	[ ]

Dominant Vegetation:
[ ] Forested
Species: /
[ ] Shrub
Species: /
[✓] Herbaceous
Species: grass

Wildlife Observed/Notes:

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