TETRA TECH

PITT-03-19-040

March 25, 2019

Via E-mail and overnight Fed Ex
Mr. John Hohenstein
Pennsylvania Department of Environmental Protection
Waterways and Wetlands Program
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania 19401

Re: Sunoco Pipeline L.P. – Pennsylvania Pipeline Project (Mariner East II)
Chapter 105 Permit No. E23-524 – Major Modification
Chapter 102 Permit No. ESG0100015001 – Minor Modification
Modification Request Installation Method Change at 0620 HDD
Middletown Township, Delaware County, PA

Dear Mr. Hohenstein:

On behalf of Sunoco Pipeline L.P. (SPLP), please accept the enclosed revised drawings and information as a request for a major modification to the referenced Chapter 105 permit and a minor modification to the referenced Chapter 102 permit. This modification is being requested for a change in the horizontal directional drill (HDD) installation method for the 20-inch and portions of the 16-inch diameter pipelines to a conventional open trench construction through Wetland WL-I1 and Stream S-I2, conventional auger bore under Glen Riddle Road, and a direct pipe under Riddlewood Drive and the Southeast Pennsylvania Transportation Authority's (SEPTA) Railroad.

During installation of the permitted 16-inch HDD through this area, several inadvertent returns (IRs) occurred which resulted in drilling mud/fluid entering Waters of the Commonwealth. This required the implementation of IR corrective actions/responses and an extended period of work through this area. In addition, groundwater was encountered at the eastern end of the HDD near Stream S-I2, resulting in dewatering issues and safety concerns in the pits. As a result, SPLP has elected to abandon any future HDD attempts through this area and has identified an alternate installation method that eliminates IR impacts to Waters of the Commonwealth and facilitates restoration of areas where IR containment measures remain.

In accordance with the Chapter 105 major permit amendment requirements, the following information is provided for your information/review and files:

- A – Project Description and Alternatives Analysis
- B – Resource Photographs
- C – Environmental Assessment
- D – Applicable 102 Drawings (Bore Plan / Profile and E&S / Site Restoration Plans)
- E – Site Plan and Aquatic Resource Impact Table
- F – Proof of PHMC Coordination
- G – PNDI Update
- H – Application Fee Calculation

Tetra Tech
661 Andersen Drive, Suite 200, Pittsburgh, PA 15220-2700
Tel 412.921.7090 Fax 412.921.4040 www.tetratech.com

Mr. John Hohenstein
Department of Environmental Protection
March 25, 2019

Enclosed are two (2) hard copies of the modification request to facilitate your review. The enclosed fee of $6,900 is for the processing of a Chapter 105 major modification and the additional resource impacts (Attachment H). Please note that the Delaware County Conservation District and U.S. Army Corps of Engineers-Philadelphia District will also be provided a copy of this request and attachments.

SPLP appreciates your timely review of this modification request. 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.
Project Manager
Tetra Tech, Inc.

Enclosures: 1 original, 1 copy

cc: File 212IC-PB-00387
C. Smith, PADEP Southeast Region
M. Wheeler, Delaware 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, Gremminger Associates, Inc.
B. Schaeffer, Tetra Tech

ATTACHMENT A

Project Description and Alternative Analysis

Project Description

Sunoco Pipeline L.P. (SPLP) requests a major permit modification for a change in the installation method of the 20-inch and portions of the 16-inch diameter pipelines previously permitted as the 0620 Horizontal Directional Drill (HDD) in Middletown Township, Delaware County. This permit request is to convert the HDD to a direct pipe through the residential areas Riddlewood Drive and Southeast Pennsylvania Transportation Authority's (SEPTA) Railroad, a conventional auger bore under Glen Riddle Road, and conventional open trench construction through Wetland WL-11 and Stream S-I2.

During the pilot hole drilling phase on the permitted 0620 HDD for the 16-inch pipeline installation through this area, there were several inadvertent returns (IRs) which resulted in drilling mud/fluid entering Waters of the Commonwealth, including three unnamed tributaries to Chester Creek (Streams S-I1, S-I2, and S-I3) and a wetland (WL-I1). In order to contain and clean-up these IRs, SPLP installed sand bag containments, flumes, and pump arounds. In addition, groundwater was encountered at the eastern end of the HDD near Stream S-I2, resulting in dewatering issues and safety concerns in the pits. As a result, given SPLP's experience during the 16-inch HDD at this location, SPLP has elected install the pipelines through this area with an alternate installation method that eliminates the potential for IRs to impact Waters of the Commonwealth.

This permit modification requests the conversion of an approximate 0.66-mile (3,500 feet) HDD to a combination of direct pipe, conventional bore, and open cut installation methods for the 20-inch and portions of the 16-inch diameter pipelines. The new installation method will involve the open cut of Wetland WL-I1, an Exceptional Value (EV) wetland, to install both pipes and an open cut to install the 20-inch pipe across Stream S-I2 (refer to *Attachments C and E* for additional information about these water resources). An open trench installation method across these resources will result in temporary, short term impacts to streams and wetlands, but will eliminate the risk of uncontrolled discharges associated with IRs and facilitate restoration of areas where IR containment measures remain or were implemented in these resources.

Stream S-I2 will be crossed in accordance with PPP's original Chapter 105 Joint Permit Application utilizing one of the following open-trench excavation methods for installation of the pipeline across waterbodies (refer to the E&S Plan standard typical drawings for details):

- **Dry Open Cut** - Minor waterbodies with no flow at the time of construction may be crossed using the open-cut crossing method.
- **Dry Flume** – A flumed crossing directs and contains the stream flow through an alternate mechanism across the stream channel to allow for the trenching and pipe installation to occur in dry conditions. Where practical, this allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow.
- **Dry Pump Bypass** - The dam and pump bypass method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the workspace. Similar to the flume crossing, this method allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow.
- **Dry Cofferdam** – The cofferdam method, typically used on large streams/rivers, involves the installation of a cofferdam to isolate and divert flow around the workspace in two phases. The first phase consists of the cofferdam installation on one of the banks and approximately halfway into the river to allow safe and dry installation of the pipeline across the river. The second phase involves the same process but from the opposite bank. This method allows continuous flow around the workspace and eliminates concerns about sensitive species passage.

The selected open cut, dry stream crossing method will convey stream flow across the workspace and outlet downstream within the permitted limit-of-disturbance, such that work will be conducted in a dry stream channel. After the stream flow is contained and directed/conveyed across the work area, the trench will be excavated, and the 20-inch pipe will be installed via the open trench method through the stream in

accordance with all permit conditions and requirements. In order to efficiently complete all construction activities and minimize resource impacts, SPLP is proposing a 50-foot-wide limit of disturbance (LOD) across the perennial stream (S-I2).

Wetland WL-I1 will be crossed via the open trench method for both the 20 and 16-inch pipelines in accordance with all applicable permit conditions and requirements. In order to efficiently complete all construction activities and install both pipes at the same time through Wetland WL-I1 while minimizing the duration of construction and maintaining safety standards for working near "hot lines", SPLP is requesting an approximately 110-foot wide LOD through the PEM portion of WL-I1: there will be no impact to the PFO portion of this EV wetland. A large portion of the requested LOD in wetland WL-I1 is currently disturbed as part of the Mariner East 1 valve station upgrades as well as the approved restoration efforts associated with the previous IRs in this area.

Timber mats and bridges will be placed within the travel lane where the wetland and stream are crossed to avoid soil compaction, allow for trench excavation, segregation of the wetland topsoil and stream substrate material, and stockpiling of excavated materials. Once the pipes and appropriate trench plugs are installed, the trench will be backfilled, restored to pre-existing elevations and hydrology, and revegetated. All work will be conducted in accordance with permit conditions/requirements as well as the revised/updated Erosion & Sediment and Restoration plan (refer to *Attachment D* of this permit modification). The requested modification will not result in any loss of wetland area or water quality/quantity, and the localized resource impacts are considered minor and temporary.

Refer to *Attachment C - Environmental Assessment* for a discussion of existing conditions, potential impacts, mitigation/restoration, antidegradation compliance, and agency coordination associated with this requested change in construction method. In addition, *Attachment E* provides an updated Site Plan and Aquatic Resource Impact tables for the requested modification.

Alternatives Analysis

The crossing of stream resources is unavoidable due to the linear nature of the proposed PPP Project, and as described in the Environmental Assessment, S1.B – Water Dependency (refer to *Attachment C* of this permit modification). Therefore, to avoid direct impacts to these resources, SPLP originally planned to HDD under both the wetland and stream. However, there were complications encountered during the 16-inch pipeline HDD and drilling fluid discharges resulted in IRs into the Waters of the Commonwealth.

SPLP evaluated other routes around the area, but these are limited due to the density of roads and residential properties surrounding the proposed route. In addition, a route to the west or east would likely impact more forested areas, possibly wetlands, and require a "greenfield", or new, right-of-way through these areas resulting in more permanent forested impacts. Similarly, a conventional auger bore was evaluated for the wetland and stream areas, but it was determined not to be feasible due to the underlying geology and concerns regarding groundwater management. SPLP evaluated an open cut of the existing permitted right-of-way and determined this would have the least impact and is the most effective means for installing the pipelines and restoring the previous IR areas.

In conclusion, given the IRs that occurred during the initial HDD attempt, SPLP has elected to utilize an alternate method of installation. Alternative routes were evaluated but were not considered favorable as they could likely result in more permanent impacts to environmental resources, as well as residential and developed areas. Therefore, the professional opinion of the HDD Reevaluation Team, consisting of the Geotechnical Evaluation Leader, Professional Geologists, Professional Engineers, and other construction specialists, is that an open cut with a dam and pump bypass in place for the stream crossing will have the least impact, as the wetland area and stream flow will be managed in accordance with all permit conditions (dam and pump) and can completed in the most efficient and timely manner, including restoration/stabilization of all resources.

ATTACHMENT B

Resource Photographs

Sunoco Pipeline L.P.

Photo Log - 0620 HDD Major Modification

Notes: 02/02/2019 -- Wetland WL-I1

Facing south, view of wetland from the northern extent, path of existing underground infrastructure and proposed workspace. Mats in place for ME1 Operations, not ME2 related.

Notes: 02/02/2019 -- Wetland WL-I1

Facing west, view of wetland from northern extent across the existing underground infrastructure and proposed workspace.

Notes: 02/02/2019 -- Wetland WL-I1

Facing southwest, view of wetland from the northeastern extent, path of existing underground infrastructure and proposed workspace. Perimeter erosion controls in place following stabilization of inadvertent return locations.

Notes: 02/02/2019 -- Wetland WL-I1

Facing north, view of wetland from the access road (Martin's Lane), path of existing underground infrastructure and proposed workspace. Perimeter controls, orange safety fence, and sand bag containments in place for inadvertent return response.

Notes: 02/02/2019 -- Wetland WL-I1

Facing northeast, view of wetland from the access road (Martin's Lane, near Aqua facility), path of existing underground infrastructure and proposed workspace. Mats in place for ME1 Operations activity, not ME2 related.

Notes: 02/02/2019 -- Wetland WL-I1

Facing north, view of wetland from access road (Martin's Lane, near Aqua facility), path of existing underground infrastructure and proposed workspace. Mats in place for ME1 Operations activity, not ME2 related.

Sunoco Pipeline L.P.

Photo Log - 0620 HDD Major Modification

Notes: 02/02/2019 -- Stream S-I1: floodway impact only

Facing south, view of Stream S-I1 through wetland WL-I1. Stream flows north to south through wetland complex, along PFO and PEM boundary then under access road (Martin's Lane) where it converges with stream S-I2. Stream will not be impacted.

Notes: 02/02/2019 -- Stream S-I1: floodway impact only

Facing south, view of Stream S-I1 south of access road (Martin's Lane) after flowing through 18-inch corrugated pipe under access road. Stream located on east side of existing aboveground infrastructure. Stream will not be impacted.

Notes: 02/04/2019 -- Stream S-I2 (UNT to Chester Creek)

Facing northeast, view of Stream S-I2 just south of the confluence where Stream S-I1 flow into Stream S-I2.

Notes: 02/04/2019 -- Stream S-I2 (UNT to Chester Creek)

Facing southwest, view of Stream S-I2 as it flows northeast to southwest through proposed workspace. Stream bed and banks were recently stabilized following clean up and restoration of inadvertent returns.

Notes: 02/04/2019 -- Stream S-I3: floodway impact only

Facing northeast, view of Stream S-I3 at the confluence of Stream S-I2. Stream S-I3 flows into Stream S-I2 northeast of existing aboveground infrastructure and along the boundary of wetland WL-I1. Stream will not be impacted.

Notes: 02/13/2019 -- Stream S-I4: floodway impact only

Facing southeast, view of Stream S-I4 along the bank that parrallels the modification LOD (shown as linear open area in photo). Stream will not be impacted.

ATTACHMENT C

Environmental Assessment

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

CHAPTER 105 ENVIRONMENTAL ASSESSMENT FORM

			Included	Item Location
Note: The Department may waive a specific information requirement in writing, at the request of the Applicant, during the pre-application review process if the Department determines the information is not necessary to complete the review.				
Module S1: Project Summary				
This module is intended to organize information in order to present an overall summary of the project scope, certain key information requirements and when applicable, a comprehensive view of the overall project and related projects.				
A. Provide an overall project description and If the answer to the question below is **YES**, address CEA requirements; otherwise proceed to **S1.B** Comprehensive Environmental Assessment (CEA) when applicable. Answer the following question:			☒	Mod S1.A; Att A
Does the "overall" project require more than one Ch. 105 permit in more than one county or will the project be completed in more than one phase?	☒ Yes	☐ No		
B. Provide information related to the project purpose, need, water dependency and summarize the amount and type of resources present and the temporary and permanent impacts proposed to those resources.			☒	Mod S1.B
Module S2: Resource Identification and Characterization				
This module is intended to organize information related to the identification of the resources present on the project site and to characterize those resources that may be affected by the proposed project.				
A. Provide the standard resource identification information, location map, wetland determination or delineation reports; watercourse reports; identification and qualifications of preparers; location map, and answer the related questions.			☒	App. S2.A-1; S2.A-2
Is the site located within or adjacent to any of the following; or within 100 feet of items vii or viii?				
i. National, state or local park, forest or recreation area	☐ Yes	☒ No		
ii. National natural landmark	☐ Yes	☒ No		
iii. National wildlife refuge, or Federal, state, local or private wildlife or plant sanctuaries	☐ Yes	☐ No		
iv. State Game Lands	☐ Yes	☒ No		
v. Areas identified as prime farmland	☒ Yes	☐ No		Mod S3.B
vi. Source for a public water supply	☒ Yes	☐ No		Mod S3.B; App S2.A-4
vii. A National Wild or Scenic River or the Commonwealth's Scenic Rivers System	☐ Yes	☒ No		
viii. Designated Federal wilderness area	☐ Yes	☒ No		
B. Identify all aquatic resources present on the project site and provide an identifier, the resource type; size of the resource(s); fishery designations, Ch. 93 uses and special protection status; and Exceptional Value (EV) wetland analysis.			☒	Mod S2.B; Att. E
C. Provide the following information related to habitat for Federal threatened and endangered (T&E) plant and animal species or State T&E species or species of special concern - copies of search forms or search receipts; identification of avoidance and minimization efforts taken to resolve identified conflicts.			☒	Mod S2.C; Att. G;
Did the PNDI search or agency coordination identify any potential conflicts?	☒ Yes	☐ No		Att. G
If the above is answered **YES**; answer the following two questions related to PNDI Coordination:				
a. ***Is the applicant utilizing a sequential review of the PNDI coordination?***	☒ Yes	☐ No		Att. G
b. ***Is the applicant utilizing a concurrent review of the PNDI coordination?***	☐ Yes	☒ No		Att. G
D. Characterize the aquatic resources: riverine, wetland and lacustrine present on the project site that are proposed to be directly or indirectly affected by the project. Including but not limited to the following, resource classification information, Level 2 rapid condition assessment results, discussion of resource functions, characterization of riparian properties and any other relevant information or studies conducted.			☒	Mod S2.D; App S2.A-4
Module S3: Identification and Description of Potential Project Impacts				
This module is intended to organize and present information concerning the potential impacts or effects of the proposed project ***in this*** *application. Impacts related to the "over all" project that are proposed under related but separate application(s) should be addressed as part of the CEA Policy response under* ***S1.A****.*				

A. Provide a summary table of the proposed temporary and permanent direct and indirect impacts for <u>each</u> effected resource category (e.g. riverine, wetlands and lacustrine resources).	☒	Mod S3.A
B. If any questions from **S2.A** Standard Information Response questions were answered YES, discuss in detail any potential impacts to those resource(s).	☒	Mod S3.B
<u>IMPORTANT NOTE</u>: If either item vii or viii from S2.A is answered YES, the project is not eligible as a "Small Project Application" type. Complete all applicable sections of the EA form for the standard application type unless an item was otherwise waived by the Department in writing (see previous Note on waiving of information requirements).		N/A

	Included	Item Location
C. Provide a table(s) of all proposed water obstruction(s), encroachment activities and dams (e.g. subfacility codes) and provide an identifier, the subfacility code and description, resource identifier from **S2.B**, latitude and longitude, the proposed temporary and permanent direct and indirect impacts and subfacility details.	☐	N/A
D. Provide a discussion of how the proposed subfacility(ies) individually and in combination directly and/or indirectly impact the identified resource(s) and the effects on the applicable resource functions: hydrologic, biogeochemical, habitat, recreation, any other environmental impacts and the effects on the property or riparian rights of owners upstream, downstream or adjacent to the project.	☒	Mod S3.D
E. **Antidegradation Analysis** - The applicant should demonstrate consistency with State antidegradation requirements as described in the Water Quality Antidegradation Implementation Guidance Policy Document Number 391-0300-002. Project application information provided below in **S3.F, G and H** may be cross-referenced.	☒	Mod S3.E
F. **Alternatives Analysis** - The scope and extent of this analysis should be commensurate with the size and scope of the proposed project impacts *in this* application, information provided in **S4.A** below, related to avoidance and minimization efforts, may be cross-referenced.	☒	Mod S3.F; Att A
G. **Potential Secondary Impact Evaluation** - Identify and describe environmental impacts on adjacent land and water resources associated with but not that direct result of the project.	☒	Mod S3.G
H. Identify and evaluate the potential cumulative environmental impacts of this project and other potential or existing projects like it, and the impacts that may result through numerous piecemeal changes to the wetland resource.	☒	Mod. S3.H
Module S4: Mitigation Plan		
*This module is intended to organize and present information concerning actions undertaken in accordance with the definition of **Mitigation** in Title 25 Pa. Code Chapter 105 - §105.1, 105.16, 105.18a(a)(3), 105.18a(b)(7), 105.20a, and 105.21 as related to the potential impacts or effects of the proposed project **in this** application.*		
A. Identify and discuss any measures taken that resulted in avoiding or minimizing unavoidable resource impacts, provide detailed responses for individual proposed impact area(s) **and** the project as a whole.	☒	Mod S4.A
B. Identify and discuss any repair, rehabilitation or restorative actions taken to rectify an impacted resource, provide detailed responses for individual proposed impact area(s) and the project as a whole. Identify and discuss any proposed preservation and maintenance operations that will be taken to reduce or eliminate an impact during the life of the project.	☒	Mod S4.B
C. Identify and discuss any actions undertaken to provide compensatory mitigation including the purchase of credits from an approved provider, a detailed discussion of proposed compensation actions and how they will offset the lost resource functions. Provide detailed plans including performance standards and success criteria.	☐	N/A
Answer the following question. If the answer to the question is **YES**, provide the information regarding the mitigation credit provider; otherwise provide a detailed mitigation plan. If the application proposes to utilize both mitigation bank credits and conduct permittee responsible mitigation; both the credit provider and mitigation plan information shall be submitted.	☐	N/A
Does the applicant propose to utilize an approved mitigation bank to provide all or a portion of the compensation? ☐ Yes ☒ No		N/A
D. When applicable, provide a plan to monitor the identified actions proposed in **S4.B** and/or **S4.C** compensatory mitigation area. Applicants should utilize the Department's Design Criteria and the USACE's RGL 08-03 -(http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl08_03.pdf) to develop monitoring plans for compensatory mitigation proposals. The plan should include performance standards/success criteria, duration and timeframes of monitoring, monitoring report template, and template remedial action or adaptive management plan.	☒	Mod S4.D; Att D

Note: All or portions of this Module may apply to "Small Project" type applications under case specific circumstances and should be discussed during any pre-application meetings or prior to application submittal.

CERTIFICATION

I certify that the above statements, attachments including those labeled and identified as Enclosures, and all conclusions are true, correct, and based upon current environmental principles and science, to the best of my knowledge and belief.

Signature	Date
Robin Dingle	3/21/2019

Environmental Assessment (E.A. Form) Rev. 6/2017

March 2019

Note: The EA provided herein provides information relevant to the major permit modification required at the Glen Riddle/0620 HDD Modification in Delaware County, Pennsylvania, and includes specific excerpts and information previously submitted by Sunoco Pipeline L.P. as part of the approved Pennsylvania Pipeline Project (PPP) Chapter 105 Joint Permit (E23-524).

Module S1: Project Summary

S1.A Overall Project Description

Sunoco Pipeline L.P. (SPLP) requests a major permit modification for a change in the installation method for both the 20-inch and portions of the 16-inch diameter pipelines previously permitted as the 0620 Horizontal Directional Drill (HDD) in Middletown Township, Delaware County. This permit request is to convert the HDD to a direct pipe through the residential areas at Riddlewood Drive and Southeast Pennsylvania Transportation Authority's (SEPTA) Railroad, a conventional auger bore under Glen Riddle Road, and conventional open trench construction through Wetland WL-11 and Stream S-I2. During the pilot hole drilling phase on the permitted 0620 HDD for the 16-inch pipeline installation through this area, there were several inadvertent returns (IRs) in which drilling mud/fluid entered Waters of the Commonwealth, three unnamed tributaries to Chester Creek (Streams S-I1, S-I2, and S-I3) and a Wetland (WL-I1). In order to address these IRs (contain and clean-up), SPLP installed sand bag containments, flumes, and pump arounds. In addition, groundwater was encountered at the eastern end of the HDD, near Stream S-I2 resulting in dewatering issues and safety concerns in the pits. Therefore, given SPLP's experience during the 16-inch HDD at this location, SPLP has elected to install the pipelines via an alternate installation method that minimizes impacts to Waters of the Commonwealth.

This permit modification requests the conversion of an approximate 0.66-mile (3,500 feet) HDD to a combination of direct pipe, conventional bore, and open cut installation methods for the 20-inch and portions of the 16-inch diameter pipelines. The new installation method will involve the open cut of Wetland WL-I1, an Exceptional Value (EV) wetland, to install both pipes and an open cut to install the 20-inch pipe across Stream S-I2. In addition, the overlapping floodways of streams S-I1, S-I2, S-I3, and S-I4 will be crossed via open cut (refer to *Attachments C (Module 2) and E* for additional information about these water resources). An open trench installation method across these resources will result in temporary, short term impacts to streams and wetlands, but will eliminate the risk of uncontrolled discharges associated with IRs and facilitate restoration of areas where IR containment measures remain or were implemented in these resources.

Stream S-I2 will be crossed in accordance with PPP's original Chapter 105 Joint Permit Application utilizing one of the following open-trench excavation methods for installation of the pipeline across waterbodies (refer to the E&S Plan standard typical drawings for details):

- **Dry Open Cut** - Minor waterbodies with no flow at the time of construction may be crossed using the open-cut crossing method.
- **Dry Flume** – A flumed crossing directs and contains the stream flow through an alternate mechanism across the stream channel to allow for the trenching and pipe installation to occur in dry conditions. Where practical, this allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow.
- **Dry Pump Bypass** - The dam and pump bypass method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the workspace. Similar to the flume crossing, this method allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow.
- **Dry Cofferdam** – The cofferdam method, typically used on large streams/rivers, involves the installation of a cofferdam to isolate and divert flow around the workspace in two

phases. The first phase consists of the cofferdam installation on one of the banks and approximately halfway into the river to allow safe and dry installation of the pipeline across the river. The second phase involves the same process but from the opposite bank. This method allows continuous flow around the workspace and eliminates concerns about sensitive species passage.

The selected open cut, dry stream crossing method will convey stream flow across the workspace and outlet downstream within the permitted limit-of-disturbance, such that work will be conducted in a dry stream channel. After the stream flow is contained and directed/conveyed across the work area, the trench will be excavated, and the 20-inch pipe will be installed via the open trench method through the stream in accordance with all permit conditions and requirements. In order to efficiently complete all construction activities and minimize resource impacts, SPLP is proposing a 50-foot-wide limit of disturbance (LOD) across the perennial stream (S-I2).

Wetland WL-I1 will be crossed via the open trench method for both the 20 and 16-inch pipelines in accordance with all applicable permit conditions and requirements. In order to efficiently complete all construction activities and install both pipes at the same time through Wetland WL-I1 while minimizing the duration of construction and maintaining safety standards for working near "hot lines", SPLP is requesting an approximately 110-foot wide LOD through the PEM portion of WL-I1: there will be no impact to the PFO portion of this EV wetland. A large portion of the requested LOD in wetland WL-I1 is currently disturbed as part of the Mariner East 1 valve station upgrades as well as the approved restoration efforts associated with the previous IRs in this area.

Timber mats and bridges will be placed within the travel lane where the wetland and stream are crossed to avoid soil compaction, allow for trench excavation, segregation of the wetland topsoil and 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 to pre-existing elevations and hydrology, and revegetated. All work will be conducted in accordance with permit conditions/requirements as well as the revised/updated Erosion & Sediment and Restoration plan (refer to *Attachment D* of this permit modification). The requested modification will not result in any loss of wetland area or water quality/quantity, and the localized resource impacts are considered minor and temporary.

CEA Requirements

Per PADEP Technical Policy Guidance Document No. 310-2137-006, a Comprehensive Environmental Assessment that analyzes the alternatives, impacts, mitigation and antidegradation for all structures and activities associated with the overall Project was included with the original PPP Chapter 105 Joint Permit Application submitted to PADEP (E23-524. APS 879056). Specifically, Attachment 11 EAF, Enclosure E Part 3 addresses alternatives; Part 2 includes impacts; Part 4 identifies impact avoidance minimization and mitigation; and Part 5 discusses antidegradation.

Information applicable to this specific permit modification request are presented in this submittal as follows:

- Alternatives – Module S3, S3.F
- Impacts – Module S3, S3.B
- Avoidance, Minimization, and Mitigation – Module S4
- Antidegradation – Module S3, S3.E

S1.B Project Purpose, Need, Water Dependency, and Summary of Resources and Impacts

Project Purpose & Need

As presented in the original PPP Chapter 105 Joint Permit (E23-524), the overall Project will provide transportation service of natural gas liquids (NGLs) with the combined pipelines from the Utica and Marcellus Shale formations for both domestic and international markets. NGLs are separated from the natural gas stream before consumer ready (dry) natural gas is shipped on the natural gas pipeline network. Upstream shippers are currently limited by the shortage of NGL transport systems. In addition, the Project will provide various delivery points to local Pennsylvania distributors for supply of needed propane supplies, at affordable prices, for use as heating and/or cooking fuel by consumers in Pennsylvania and neighboring states, increasing fuel access and supply during peak demand periods when supplies would otherwise become short. Butane will also be shipped to local markets as a component of gasoline to ensure gasoline suppliers can meet seasonal vapor pressure restrictions.

Water Dependency

As presented in the original PPP Chapter 105 Joint Permit (E23-524), constructing and operating a natural gas liquids pipeline is not, per se, a water-dependent project. However, because of Pennsylvania's abundant water and wetland resources, any project which travels approximately 300 miles west to east across the Commonwealth requires the crossing of, and therefore access to, waters and wetlands. The overall Project requires access and proximity to and siting in, on, over or under waters and wetlands in order to achieve its primary purpose to transport natural gas liquids from Houston, Washington County to SPLP's existing facility in Marcus Hook, Delaware County. Therefore, the linear nature and approximately 300-mile length of the Project across 17 counties west to east in Pennsylvania makes the Project water-dependent.

Summary of Resources & Impacts

The impacts associated with the Glen Riddle/0620 HDD permit modification will result in approximately 0.20 acre of permanent and 0.19 acre of temporary wetland impacts, approximately 0.01 acre of permanent and no temporary stream impacts, and approximately 0.32 acre of permanent and 0.14 acre of temporary floodway impacts [Note: additional information related to the impact calculations is provided in *Attachment E*]. Although PADEP defines pipeline operation and maintenance activities as permanent impacts, the impacts are considered minor/localized and temporary as the entire disturbed area of the streams will be restored to preconstruction conditions (i.e., elevation, flow, stream substrate, stream banks, hydrologic conditions, etc.). Furthermore, the resource crossings will not involve any permanent fill; the streams will not be relocated, and there will be no permanent loss of streams or aquatic habitat associated with the reroute modification request. Please refer to *Attachment E* of this permit modification request packet for an updated Aquatic Resource Impact Table.

The open cut/bore crossing would cross a wetland classified as EV because it is located within 0.5 mile upstream of a known public or private water drinking supply. SPLP will restore the disturbed EV wetland to its pre-existing condition such that surface water hydrology is restored and the re-establishment of hydrophytic vegetation is facilitated. SPLP will also implement E&S best management practices (BMPs) including the appropriate antidegradation best available combination of technologies (ABACT) measures for the EV wetland. No long-term impacts to this resource are anticipated.

The proposed modification would cross streams designated under the Drainage List A of Pennsylvania Code, Title 25, Chapter 93, § 93.9h as Trout Stocked (TSF) or drains to TSF and Migratory Fishes (MF) and designated by the PA Fish and Boat Commission (PAFBC) as approved trout waters (ATW) or drains into ATW streams, and stocked trout streams (STS). Accordingly, SPLP will comply with timing window restrictions/limitations (i.e., 3/1 through 6/15 for ATW) during construction and will work with the appropriate agencies to avoid and minimize potential impacts to trout/spawning/migrating fish.

In addition, an updated Pennsylvania Natural Diversity Index (PNDI) review (PNDI-677014) identified potential impacts to a sensitive species within the general area of the proposed modification. Specifically, the PA Fish and Boat Commission (PFBC) identified the Eastern Redbelly Turtle (*Pseudemys rubriventris)*, a state-listed Threatened Species, and required further review of the proposed modification. SPLP provided information to the PFBC regarding the proposed Glenn Riddle/ 0620 HDD modification on February 13, 2019. A clearance letter was received from PFBC on March 6, 2019. Per PFBC's recommended avoidance measures, SPLP will maintain a barrier between the Project LOD and Chester Creek, and conduct pre-constructions surveys for the Eastern Redbelly Turtle. In addition, should any Eastern Redbelly turtles be found, SPLP will contact the PFBC within 48 hours and document the turtle found onsite and relocate the turtle to the nearest aquatic habitat. With implementation of these avoidance measures, potential impacts to the Eastern Redbelly Turtle are not anticipated. For further information, please refer to Module 2, S2.C of this Environmental Assessment and *Attachment G* of this permit modification request packet for the updated PNDI and agency coordination.

Module S2: Resource ID & Characterization

S2.A Location Map & Wetland Delineation Report.

The original location of the Project is provided in the Location Map prepared and submitted for the Project's Chapter 105 Joint Permit Application for Delaware County. The applicable page from the original application is provided in Appendix S2.A-1 and has been modified to reflect the location of the Project with the proposed Glenn Riddle/0620 HDD permit modification as well as the locations of the wetland and streams, including floodways affected.

Similarly, an *Aquatic Resources Report* for Delaware County was prepared in August 2015 and submitted as part of the PPP Chapter 105 Joint Permit Application. The Aquatic Resources Report presents the results and conclusions of wetland and stream identification activities completed for the entire Project right-of-way. Excerpts from the Aquatic Resources Report (prepared in August 2015) including information on Wetland WL-I1 and Stream S-12 (including floodways) and a supplemental Aquatic Resources Report (prepared in March 2016) including information on an extended portion of Stream S-12 are included as Appendix S2.A-2.

One public water supplier's (PWS) groundwater well was identified within 0.5 mile of the Project site at the Aqua PA PWS source and/or facility. SPLP sent a letter notification requesting additional information to the PWS on September 20, 2016 as part of the Project's Chapter 105 Joint Permit Application for Delaware County. The proposed open cut installation method is not anticipated to have an impact on groundwater resources or surface water quality and is not expected to impact this PWS. Nonetheless, SPLP notified Aqua PA on March 18, 2019 of the proposed permit modification, including revised site plans, which is provided in Appendix S2.A-4.

S2.B Aquatic Resources

For this permit modification request, SPLP identified all aquatic resources present within the Project area and the resources that could be affected by the proposed modification including one wetland and four streams. The proposed modification includes open cut crossing of one wetland and one stream, as well as the floodways of four streams.

The aquatic resources that would be affected have been identified as Wetland WL-I1 and Streams S-I2 (an unnamed tributary to [UNT] Chester Creek), S-I1 (UNT to Chester Creek), Stream S-I3 (UNT to Chester Creek), and Stream S-I4 (Chester Creek).

Wetland WL-I1, within the proposed modification LOD, is a palustrine emergent (PEM) wetland cover type with dominant vegetation consisting of Japanese stilt grass (*Microstegium vimineum*), dark-green bulrush (*Scirpus atrovirens*), and lamp rush (*Juncus effusus*). The soil between 0 and 12 inches exhibits a low-chroma matrix (10YR 4/2) with a clay loam texture that contains redoximorphic features (7.5YR 4/4). In accordance with 25 Pa. Code § 105.17(1), Wetland WL-I1 is classified as EV wetland resource due to its proximity to a Public Water Supply (PWS). Streams S-I1 and S-I2 are associated water resources. The Wetland Function-Value Evaluation Form from the original application is provided in Appendix S2.A-3.

Stream S-I2 is identified as a perennial unnamed tributary (UNT) to Chester Creek, with bank to bank width of approximately 7 feet. The left bank height is 3 feet. The right bank height is 5 feet. The stream bed contains a boulder, cobble, gravel, and sand substrate.

Stream S-I1 is identified as an ephemeral stream with a bank to bank width of approximately 2 feet. The stream bed contains a silt and organic substrate. Stream S-I3 is identified as an ephemeral stream, with a bank to bank width of 2 feet. The stream bed contains a sand, silt, and organic substrate. Stream S-I4 or Chester Creek is a perennial stream with a bank to bank width of 70 feet. These streams' channels will not be crossed by the proposed modification, but their floodways are located in the requested LOD.

Based on review of eMapPA maintained by the PADEP and a review of Drainage List A of Pennsylvania Code, Title 25, Chapter 93, § 93.9h, the designated/protected uses and fisheries classification for Streams S-I2 and S-I4 are classified as Trout Stocked (TSF), Streams S-I1 and S-I3 are classified as drains to TSF, and all four streams are also classified as Migratory Fishes (MF) streams. PFBC designates Streams S-I1 and S-I2, and S-I3 as Drains to ATW and Stream S-I4 is classified as ATW. PFBC also classifies all four streams as Stocked Trout Streams (STS).

S2.C PNDI T&E plant and animal species or State T&E Species or Species of Special Concern Agency Coordination and Search Receipts

For this permit modification, a request was submitted to the Pennsylvania Natural Diversity Index on February 12, 2019 (PNDI-677014) regarding the potential of species of concern or unique habitat within the proposed modification corridor. Based on the results of this search, the PFBC identified the Eastern Redbelly Turtle (*Pseudemys rubriventris)*, a state-listed Threatened Species, and required further review of the proposed modification. SPLP provided the requested information to the PFBC regarding the proposed Glenn Riddle/ 0620 HDD modification on February 13, 2019. A clearance letter was received from PFBC on March 6, 2019. Per PFBC's recommended avoidance measures, SPLP will maintain a barrier between the Project LOD and Chester Creek, and conduct pre-construction surveys for the Eastern Redbelly Turtle. Should any Eastern Redbelly turtles be found, SPLP will contact the PFBC within 48 hours and document the turtle found onsite and relocate the turtle to the nearest aquatic habitat. With implementation of these avoidance measures, potential impacts to the Eastern Redbelly Turtle are anticipated to be avoided. For further information, please refer to Module 2, S2.C of this Environmental Assessment and *Attachment G* of this permit modification request packet for the updated PNDI and agency coordination.

No other T&E plant and animal species, or State T&E Species, or Species of Special Concern were identified. However, as noted above, SPLP is aware of the timing window restriction associated with the designated trout streams (i.e., 3/1 through 6/15 for ATW) and will comply with timing window restrictions/limitations during construction and will work with the appropriate agencies to avoid and minimize potential impacts to trout/spawning/migrating fish. Again, SPLP will provide PADEP with future coordination/responses from PAFBC as they become available.

Please refer to *Attachment G* of this permit modification request packet for the updated PNDI request and agency submittal.

S2.D Resource Classification Information; Level 2 Rapid Condition Assessment Results, Resource Function, Riparian properties and any other relevant studies.

This permit modification requests the conversion of an approximate 0.66-mile (3,500 feet) HDD to a combination of direct pipe, conventional bore, and open cut installation methods for the 20-inch and portions of the 16-inch diameter pipelines. The new installation method will involve the open cut of Wetland WL-I1, an Exceptional Value (EV) wetland, to install both pipes and an open cut to install the 20-inch pipe across Stream S-I2. Because the change in installation method

would directly or indirectly impact aquatic resources, a brief description of the wetland, stream, and floodways (streams S-I1, S-I2, S-I3, and S-I4) are presented below.

Wetland WL-I1, the three UNTs to Chester Creek, and Chester Creek are located within the physiographic province of the Piedmont Upland section. The surrounding land uses are dominated by developed residential areas, including both single family residences and apartment buildings; open maintained grass and wooded areas; Riddlewood Drive; Glen Riddle Road; and SEPTA Railroad. There are some existing trees and shrubs in the riparian buffer, but they are limited due to the developed nature in the Project area.

A wetland function-value assessment of Wetland WL-I1 (EV wetland) was conducted and is included as Appendix S2.A-3. As presented therein, the principal functions and values identified for this wetland include groundwater recharge/discharge, floodflow alteration, and sediment/toxicant retention. The wetland is also suitable for nutrient removal, sediment/shoreline stabilization, and wildlife habitat. The wetland is not believed to be substantially utilized during the migration of wildlife or birds.

Streams S-I2 and S-I4 are identified as perennial streams. These streams provide potential habitat for seasonal spawning of game and non-game fish species. These streams also have the potential to be used for resting by a variety of birds and mammals. However, wildlife is likely to utilize more remote and secluded areas that offer more protection/cover for resting. As these streams are perennial, they support a continuous flow of water with moderate rates of flushing and residence times. Streams S-I1 and S-I3 are ephemeral streams and do not support a continuous flow of water. Streams S-I1 and S-I3 support similar habitat as Streams S-I2 and S-I4, except for providing a year-round water source.

Although all four streams are either classified as PAFBC ATW or Drains to ATW streams, seasonal migration of trout during spawning would likely be limited to stream Streams S-I2 and S-I4 based on their perennial flow characteristics. Similarly, even though all four streams are also designated TSF or drains to TSF, and MF streams, the potential for anadromous fish migration to occur is likely limited to Streams S-I2 and S-I4. Regardless, SPLP is aware of the timing window restriction associated with these streams (i.e., 3/1 to 6/15 for ATW) and will work with the appropriate agencies to avoid/minimize potential impacts to the streams' trout resources and comply with any agency restrictions or limitations. SPLP will provide PADEP with all future agency coordination/responses as they become available.

The streams also provide a food source for invertebrates, birds, reptiles, amphibians, and mammals. Growth of herbaceous plants constitute the food chain base that supports primary consumers such as invertebrates and small mammal herbivores. Secondary and tertiary consumers are supported by the diversity and abundance of prey in the wetland and stream ecosystems. In addition, most of the streams support photosynthetic algae, overhanging woody vegetation, and/or small aquatic vascular plants that support invertebrate herbivores. Such invertebrates are consumed by small reptiles and fish that can inhabit the streams. Both the wetland and streams likely support aquatic insects or amphibians that meet specific prey requirements of birds and mammals with an affinity for stream habitats such as raccoon (*Procyon lotor*). The streams are also likely utilized by a variety of wildlife species as a source of drinking water.

The water quality of the streams is considered good, as evidenced by the TSF and trout classifications. The area is developed residential with a mix of single-family residential lots and

apartment buildings with open and wooded areas surrounding most of the streams. The stream designations offer recreational and sport fishing opportunities; however, these opportunities may be limited due to property access issues (i.e., private property).

Module S3: Identification and Description of Potential Project Impacts

S3.A Impact Summary

Table S3.A-1 Summary of Project Impacts
Permit Modification Request for the Glenn Riddle/0620 HDD Modification

Resource Category	Corps 404		PADEP/105	
	Temporary (acres)	Permanent (acres)	Temporary (acres)	Permanent (acres)
Wetland WL-I1 PEM	0.392	NA	0.191	0.201
Stream S-I2	0.01	NA	NA	0.01
Floodway (S-I1, S-I2, S-I3, SI4)	NA	NA	0.139	0.316*

* Floodway disturbance includes the stream impacts within the calculations, i.e. the floodway disturbance is the total proposed disturbance according to Chapter 105 regulations.

S3B. Standard Information Responses

The requested permit modification for the Glen Riddle/0620 HDD will not impact any resources identified in Module S2, Part A, except for Prime Farmland and potentially one public water supply, described below.

The proposed modification area is located near War Trophy Lane Park (0.07 mile to the east) and the Chester Creek Trail (0.09 mile to the west). War Trophy Lane Park includes baseball fields and a recreational swim club and pool. The Chester Creek Trail is a paved, multi-use trail used for walking, running and biking and managed/maintained by Delaware County. However, the proposed modification is not anticipated to result in direct or long-term impacts to the purpose/functions of these recreational areas as there would be no change in existing land use.

Prime Farmland

The proposed Glen Riddle/0620 HDD permit modification would cross a small amount of designated prime farmland soils. Specifically, this modification would cross approximately 0.18 acre of prime farmland soils. However, while the area contains prime farmland soils, no agricultural activities occur in the area. Potential short-term impacts to prime farmland soils associated with construction of the Project may include increased soil erosion and sedimentation associated with runoff; compaction of soils caused by construction vehicles and equipment; and, poor revegetation. However, SPLP will prevent and minimize impacts on prime farmland soils by utilizing the required BMPs to avoid and minimize sedimentation and erosion or runoff, and soil compaction where needed. Specifically, SPLP will employ, as needed general, stabilization and structural controls to divert stormwater flows, convey runoff, prevent sediments from moving off-site, and reduce the erosive forces of runoff waters. Compost filter socks and other structural controls will be utilized during construction activities. The proposed modification would not have long-term impacts on Prime Farmland soils.

Public Water Supply

As previously noted, there is one PWS identified within 0.5 mile of the proposed modification. SPLP sent a letter notification requesting additional information to the Aqua PA on September 20, 2016 as part of the Project's Chapter 105 Joint Permit Application for Delaware County. The proposed open cut installation method will have minimal to negligible impact on groundwater

resources as well as surface water quality and is not expected to impact this PWS. Nonetheless, SPLP notified Aqua PA on March 18, 2019 of the proposed permit modification, including revised site plans, which is provided in Appendix S2.A-4.

S3.C Subfacility Details

Information related to the proposed water obstruction, encroachment activities, and temporary/permanent impacts associated with the requested permit modification to open cut wetland and stream resources was provided in the original PPP Chapter 105 Joint Permit Application (E23-524. APS 879056) and is summarized within this Environmental Assessment, as well as the other attachments comprising this permit modification packet.

S3.D Direct and Indirect Impacts

As discussed above, direct and indirect impacts for the overall Project were presented in Attachment 11, Enclosure E (Part 2) of the original PPP Chapter 105 Joint Permit Application (E23-524. APS 879056). Excerpts from the submittal relevant to the Glen Riddle / 0620 HDD modification are presented below.

Wetland

The open cut crossing (open trench) of Wetland WL-I1 will result in approximately 0.20 acre of permanent and 0.19 acre of temporary impacts. As defined by PADEP, permanent impacts include direct and indirect impacts resulting from the placement or construction of the pipeline and impacts to those areas necessary for the operation and maintenance of the pipeline. Temporary impacts include areas affected during the construction of the Project that will be restored when construction is completed. All physical/ecological impacts are considered minor and temporary: topsoil and subsoils will be segregated, trench plugs will be installed at wetland boundaries to maintain wetland hydrology, and the wetland will be restored to its original condition (i.e., wetland soils, hydrophytic vegetation, elevation, hydrologic conditions, etc.). SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre-and post-construction conditions of the wetlands will remain the same. In addition, the Project would not involve any permanent fill or conversion of cover type/vegetation, and there would be no permanent loss of wetlands or streams associated with this permit modification.

As previously noted, Wetland WL-I1 is classified as EV as it is located near an identified PWS. The ATWS and open cut/trench construction LOD in WL-I1 would be a temporary disturbance to the wetlands' vegetation, hydrology, soils, and functions and values. In order to reduce impacts, SPLP will separate topsoil during construction and replace the wetland soils to their original horizon and elevations to maintain the natural seed bed and facilitate revegetation of the disturbed wetland area; use timber mats to reduce soil compaction; and, minimize the duration of construction to the extent possible. Based on implementation of these BMPs, effects of the requested modification are likely to be minimal. As previously noted, SPLP will restore the disturbed wetland area to its pre-existing condition such that surface water hydrology is restored and the re-establishment of hydrophytic vegetation is facilitated. SPLP will also implement E&S BMPs and the appropriate ABACT measures for this EV wetland. Consequently, the functions and values of Wetland WL-I1 will incur nominal impacts and its classification as EV will not be altered. Similarly, temporary and minor impacts would occur to the food chain, nesting/resting, and feeding activities within the wetland. Additional detail regarding wetland construction methods were provided in the Project's Chapter 105 Joint Permit Application in Attachment 11 Enclosure E Part 2.

Streams

The open cut crossing of Stream S-I2 will result in approximately 0.01 acre of permanent and no temporary impacts, since the entire construction right-of-way will be maintained for operation. Construction activities within the floodways of Streams S-I1, S-I2, S-I3, and S-I4 will result in approximately 0.32 acre of permanent and 0.14 acre of temporary floodway impacts. As defined by PADEP, permanent impacts include direct and indirect impacts resulting from the placement or construction of the pipeline and impacts to those areas necessary for the operation and maintenance of the pipeline. Temporary impacts include areas affected during the construction of the Project that will be restored when construction is completed, and the total floodway impacts include the total stream impacts. All physical/ecological impacts are considered minor and temporary as the streams would be restored to their original condition (i.e., elevation, flow, stream substrate, hydrologic conditions, etc.). In addition, the Project would not involve any permanent fill and there would be no permanent loss of streams associated with the Project.

Impacts to Stream S-I2 would occur as a result of in-stream construction activities and would result in a temporary localized increase in turbidity levels and downstream sediment deposition. Sediments that become suspended during the short period of in-stream disturbance (i.e., installation of the dam and pump) are expected to settle out of the water column relatively quickly.

Temporary impacts would occur to aquatic life in the streams at or downstream from the construction site (pipe crossing), including potential degradation of benthic habitat due to direct disturbance to the bottom substrate in the trench zone, and associated disturbances to aquatic vegetation and invertebrates with the construction ROW. Indirect impacts from sedimentation may affect areas downstream, but generally conditions would be expected to resolve relatively quickly (e.g., dry crossing methods involving in-stream excavation would have a limited effect on downstream sedimentation for a period of 1 to 3 days).

Indirect, long-term impacts to fish spawning/migration could occur if substantial changes to Stream S-I2 (as it is a perennial stream) substrate or current patterns result from Project construction. However substantial changes to stream substrate and current patterns are not anticipated because the native stream substrate will be replaced, and stream bed and banks will be restored as closely as possible to the original contours following construction. Furthermore, SPLP is aware of the timing window restriction associated with trout streams (i.e., 3/1 to 6/15 for ATW) and will work with the appropriate agencies to avoid/minimize potential impacts to trout resources and comply with any agency restrictions or limitations. No impacts to fish spawning/migration are anticipated during Project operations.

Impacts to riparian areas have been minimized to the maximum extent practicable by locating the stream crossing and ATWSs in areas previously disturbed by construction and restoration of IRs in the area. In addition, riparian buffers and stream banks disturbed by the Project will be revegetated (seeded/planted) following construction as soon as practicable to facilitate vegetative growth along the stream channel in accordance with the included E&S Plan (*Attachment D* of this permit modification packet). For more information please refer to Attachment 11, Enclosure E (Part 4) Impact Avoidance, Minimization and Mitigation Procedures of PPP's Chapter 105 Joint Permit Application.

In addition to the above, Project construction will result in no fill, aboveground facilities or alteration of surface elevations/contours are proposed within the streams' floodways as they will be restored

to pre-construction conditions. As such, the modification would not result in long-term impacts to the associated floodways.

Construction of the proposed Project is not expected to affect the flushing characteristics of the streams. In addition, the Project will not alter the volume of water or flow rates that the streams typically/naturally experience. Furthermore, the stream channel will be restored to pre-construction contours, thereby restoring pre-existing flushing characteristics and patterns within the stream crossed. Similarly, operation of the Project would not have any impact on natural drainage patterns.

Construction of the proposed modification is not expected to affect groundwater discharge that may be important for supporting stream baseflow or hydrology. Trench plugs will be installed in the trench at the entry and exit of all streams crossed to prevent draining of streams along the trench line. In addition, there are no groundwater control features or interceptor structures incorporated into the Project design. Topographic contours and drainage patterns will be restored following construction of the Project and impacts to groundwater discharge are not anticipated.

As there are no proposed aboveground facilities associated with this permit modification request, construction will not negatively impact the ability of the wetland and streams to either store or control storm and flood waters.

SPLP has designed the Project to avoid and minimize impacts to stream resources to the greatest extent possible. SPLP will conduct all activities in accordance with the Chapter 102 Permit requirements and will implement erosion and sediment control BMPs and ABACT measures, as necessary. Thus, this requested permit modification will not cause long-term degradation of water quality, alter flow volumes, or change the direction of flow.

S3.E Antidegradation Analysis

An Antidegradation Analysis was prepared for the overall Project and submitted as part of the PPP Chapter 105 Joint Permit Application (E23-524. APS 879056) in Attachment 11, Enclosure E (Part 5). The Antidegradation Analysis was prepared in accordance with 25 Pa. Code § 105.14(b)(11). Specifically, SPLP's Joint Permit Application for a Pennsylvania Water Obstruction and Encroachment Permit Application for the Project needed to ensure consistency with State antidegradation requirements contained in Chapters 93, 95 and 102 (relating to water quality standards; wastewater treatment requirements; and erosion and sediment control) and the Clean Water Act (CWA) (33 U.S.C.A. § § 1251—1376).

PADEP has implemented an Antidegradation Program to promote the maintenance and protection of existing water quality for Exceptional Value (EV) waters, and the protection of existing uses for all surface waters (PADEP 2003). Wetland WL-I1 is classified as an EV water and UNTs to Chester Creek (Streams S-I2, S-I1, S-I3) and Chester Creek (Stream S-I4) are classified as Trout Stocked (TSF), or drains to TSF, MF streams, and ATW or drains to ATW. Therefore, the antidegradation requirements applicable to this permit modification include protection of existing instream water uses (93.4a(b)) and the level of water quality (93.4a(d)) of EV waters.

- **Section 93.4a(b)** states that "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." In order to reduce water use impacts, SPLP has limited the land disturbance to the excavated trench line, and temporary minor grading of the stream banks at the travel lane crossing, as

required; limited the time/duration of in-stream construction (typically less than 2 days); designed the crossings such that the pipeline will be 5 feet under the streams, as compared to the PADEP 3 foot depth requirement; and, implemented erosion and sediment control measures for all land disturbances in accordance with PADEP's Erosion and Sediment Pollution Control Program Manual (PADEP 2012) as demonstrated throughout the Project's ESCGP Permit applications. With the proper implementation and maintenance of these protective measures, construction-related Project impacts to water quality such as increased turbidity related to sedimentation and in-stream construction will be minor, temporary, and localized and will not adversely impact or degrade the water resources. Specifically, the water quality and designated/existing uses of Stream S-I2, and the floodways of Streams S-I1, S-I2, S-I3 and S-I4 will be maintained and protected post-construction.

- **93.4a(d): Protection for Exceptional Value Waters** states that "The water quality of Exceptional Value Waters shall be maintained and protected." The proposed Project will protect and maintain the existing/designated uses and water quality of the EV wetland impacted by this requested permit modification. Specifically, SPLP will install both pipes at the same time to minimize the duration of construction through Wetland WL-I1 while maintaining safety standards for working over "hot lines", and SPLP limit construction activities to the PEM portion of Wetland WL-I1 such that there are no impacts to the PFO portion of this EV wetland. A large portion of the requested LOD is currently disturbed as part of the ME1 valve station upgrades as well as the approved restoration efforts associated with the previous IRs in this area. SPLP will limit the land disturbance to the excavated trench line and minor grading of the travel lane crossing, as required; roots/stumps will be left in place, to the extent possible, so that the roots stabilize the soils (minimize erosion), and re-establishment of native vegetation is facilitated; require the use of timber mats when working in and travelling through the wetland; design the crossing such that the 20-inch and 16-inch pipe will be 4 feet under wetlands, as compared to the PADEP 3 foot depth requirement; and, implement erosion and sediment control measures for all land disturbances in accordance with PADEP's Erosion and Sediment Pollution Control Program Manual (PADEP 2012) as demonstrated throughout the Project's ESCGP Permit applications.

  In addition, SPLP has incorporated ABACT BMPs into their E&S Plan to further reduce potential erosion and sediment impacts to the EV wetland crossing. Specifically, standard and ABACT BMPs that SPLP will implement to control/manage erosion and sedimentation within the Project area include:

  - Use of wash racks at rock construction entrances;
  - Placement of compost filter socks on the downgradient side of the filter bags and/or dewatering structure;
  - Application of erosion control blanket within 100 feet of receiving waters and on slopes 3:1 (H:V) or steeper;
  - Installation of compost filter socks at slope breaker outlets to provide additional filtration prior to discharge to surface waters;
  - Installation of berms and trenches to promote infiltration and manage flow rate;

- Implementation of the PPC Plan; and,
- Application of permanent seeding for site restoration.

As previously stated, Project impacts to streams and EV resources, will be minor, temporary, and localized. As further demonstrated above, Project implementation of the requested crossing method, PADEP-approved ABACT BMPs identified above, and the revised 102 drawings (*Attachment D* of this permit modification request packet) will ensure the maintenance and protection of the overall water quality of the streams by reducing/controlling turbidity associated with sedimentation and in-stream construction activities.

Chapter 93.4c(a)(2) requires the protection of endangered or threatened species if PADEP has confirmed the presence, critical habitat, or critical dependence of endangered or threatened Federal or Pennsylvania species in or on a surface water. Accordingly, SPLP has coordinated and will continue to coordinate with federal and state agencies to identify and ensure protection of any endangered and threatened species and/or their critical habitat, or dependence on the surface waters crossed by this requested permit modification. Please refer to Module 2, S2.C of this Environmental Assessment and *Attachment G* of this permit modification request packet for additional information related to the protection of endangered/threatened species associated with the requested modification (i.e., Eastern Redbelly Turtle).

Chapter 93.6 states that a project will not introduce/discharge any substance "in concentrations or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant, or aquatic life," including actions that could produce turbidity. The requested permit modification will result in minor, temporary, and localized impacts to surface waters of the Commonwealth. The requested permit modification does not involve any permanent structures/facilities that will discharge any treated or created industrial wastewater, nor will it alter the existing natural conditions (chemical, biological, or physical) of the water resources crossed by the Project. In addition, the Project does not involve the addition or discharge of any toxic (Section 93.8a) or harmful substances into the waters of the Commonwealth. All water resources will be restored to their pre-existing conditions following Project construction such that their designated/existing water uses are not impacted by the Project. Accordingly, the proposed Project does not have the potential to alter the water quality such that the existing water uses or aquatic life of the EV resource will be affected.

Please refer to the complete *Antidegradation Analysis* for additional details/information.

S3.F Alternatives Analysis

An Alternatives Analysis was prepared and submitted as part of the PPP Chapter 105 Joint Permit Application (E23-524) in Attachment 11, Enclosure E (Part 3). For this permit modification request, an Alternatives Analysis specific to the Glen Riddle/0620 HDD Modification has been prepared.

The crossing of stream resources is unavoidable due to the linear nature of the proposed PPP Project, and as described in the Environmental Assessment, S1.B – Water Dependency (refer to *Attachment C* of this permit modification). Therefore, to avoid direct impacts to these resources, SPLP originally planned to HDD under both the wetland and stream. However, there were complications encountered during the 16-inch pipeline HDD and drilling fluid discharges resulted in IRs into the Waters of the Commonwealth.

SPLP evaluated other routes around the area but are limited due to the density of roads and residential properties surrounding the proposed route. In addition, a route to the west or east would likely impact more forested areas, possibly wetlands, and require a “greenfield”, or new, right-of-way through these areas resulting in more permanent forested impacts. Similarly, a conventional auger bore was evaluated for the wetland and stream areas, but it was determined not to be feasible due to the underlying geology and concerns regarding groundwater management.

Because of the IRs that occurred during the initial HDD attempt, SPLP has elected to use a combination of alternate methods of installation. Alternative routes were evaluated but were not considered favorable as they would likely result in more permanent impacts to environmental resources, as well as residential and developed areas. Therefore, the professional opinion of the HDD Reevaluation Team, consisting of the Geotechnical Evaluation Leader, Professional Geologists, Professional Engineers, and other construction specialists is that an open cut with a dam and pump bypass in place for the stream crossing will have the least impact, as the wetland area and stream flow will be managed in accordance with all permit conditions (dam and pump) and can completed in the most efficient and timely manner, including restoration/stabilization of all resources and previous IRs.

S3.G Potential Secondary Impact Evaluation

A Resource ID and Project Impacts Report was prepared and submitted as part of the PPP Chapter 105 Joint Permit Application (E23-524) in Attachment 11, Enclosure E (Part 2). Potential secondary impacts to wetland/streams and the aquatic habitat, water quantity, and water quality resulting from the Project were discussed in Section 4.1 of the report. Excerpts applicable to the proposed permit modification affected wetland and streams and additional pertinent information are discussed below.

Potential secondary impacts to wetland/stream habitats could result from the modification including short-term release of sediments into waterways and vegetation clearing, that could result in the temporary displacement of wildlife to adjacent areas. These short-term impacts adjacent to and downgradient of the LOD could temporarily alter substrate and make it less suitable for spawning and foraging, and may create temporary turbidity that could alter the feeding habits of local wildlife. In addition, the clearing of vegetation reduces the shelter and buffer capacity to adjacent habitats and creates new edge habitat when located through greenfield areas. SPLP has mitigated for these potential secondary impacts by minimizing/reducing the area of disturbance and clearing, and minimizing the duration of construction activities in stream and wetland areas, implementing the E&S BMPs (Attachment D) and appropriate ABACT measures, and restoring the disturbed areas with vegetation to avoid impacts off the ROW.

Other potential secondary impacts to wetlands such as the introduction of invasive or exotic vegetation will be avoided by topsoil segregation of trench material, which maintains the native seed source, and the prompt establishment of native or temporary cover immediately following construction. In addition, restoration of wetland areas by planting native shrub vegetation will avoid secondary impacts to adjacent habitat caused by changes in vegetative community or establishment of invasive or exotic vegetation.

Potential secondary impacts on adjacent stream/aquatic habitat functions could result from the short-term release of turbid waters and vegetation clearing, resulting in the temporary displacement of wildlife that use adjacent areas for spawning, foraging, nesting, rearing, and

resting. However, the potential secondary impacts from the release of turbid waters, at most, will be negligible in nature given the short duration of in-stream construction, the intermittent flow characteristics of the streams, and through implementation of temporary and permanent E&S controls (refer to Attachment D of this permit modification packet). As noted above, the streams have some riparian areas which would be revegetated. Restoration of these areas with native plant species will minimize potential secondary impacts to adjacent habitat from the establishment of invasive or exotic vegetation.

Potential secondary impacts on water quantity or the hydrology of streams could result from changes in natural/current drainage patterns and alteration in flow and water levels from construction. However, the modification does not involve any stream relocations, enclosures, channel deepening/dredging activities, and addition of structures or impervious surfaces in the wetland/stream complex. Given that the modification does not involve direct impacts to natural and current drainage patterns, the modification will likewise not result in secondary impacts to natural and current drainage patterns. Temporary dam and flow bypass methods will be used to maintain a continuous downstream flow during construction.

Potential secondary impacts to stream water quality beyond the Project's limit of disturbance could result from: release of sediments/turbid waters from trenching, dewatering, clearing and grading of adjacent land and stream banks, and post-construction stream bank subsidence; and, release of pollutants from construction equipment or activities adjacent to waters. However, in accordance with the Chapter 102 E&S requirements, trench dewatering will be monitored and directed into appropriate receiving structures located in well-vegetated uplands to allow for filtration. Released water will naturally infiltrate to prevent secondary impacts to water quality of streams outside the ROW. Potential secondary impacts from stream bank subsidence will be avoided by leaving roots/stumps in place, except for over the trench, and by stabilizing/revegetating stream banks as soon as possible after construction. Post-construction monitoring will ensure that successful restoration occurs, or necessary corrective actions are implemented to result in successful restoration, thereby avoiding potential secondary impacts from stream bank subsidence/subsequent downstream erosion and sedimentation. Additionally, aerial and ground inspections during Project operation will identify stream bank subsidence and soil erosion issues which will be rectified by repairs or installation of temporary erosion control devices until permanent erosion control measures become effective.

Potential secondary impacts to adjacent resources will be avoided and minimized to the extent possible such that there is no loss of aquatic habitat, water quantity, or water quality.

S3.H Potential Cumulative Impacts

A Cumulative Impact Analysis (CIA) was prepared for the overall Project and submitted as part of the PPP Chapter 105 Joint Permit Application (E23-524) in Attachment 11, Enclosure E (Part 6). The CIA addresses the cumulative impact for the entire Project and other potential or existing SPLP and other oil and gas projects within the Cumulative Impact Assessment Area (CIAA) of the Project.

The wetland affected by construction for the proposed Glen Riddle/0620 HDD modification will be restored as a wetland. Some functions and values of the wetland would be temporarily affected during construction. However, as this wetland extends beyond the Project boundaries, the wetland would also continue to provide functions and values during construction as the impact area relative to the size of the wetlands is minor. Furthermore, the PEM wetland affected by the

modification will be replanted onsite to mitigate temporal impacts to functions and values. Some functions/values may be slightly reduced (wildlife habitat), some will not be altered (groundwater discharge), and others may be increased due to the establishment of a thick herbaceous ground layer (sediment retention and nutrient removal). There will be a temporal loss of the previously listed functions during construction and near-term post construction until the wetland is restored. No permanent fill in wetland is proposed; consequently, no loss of wetland area would result from construction or operation of the requested modification in crossing method. When the impacts to the wetlands from the proposed modification are added to the wetland impacts from all other projects in the CIAA, a maximum of approximately 47.82 acres of wetlands would be disturbed. However, with implementation of BMPs for each potential or existing project and compliance with permit conditions, disturbances to wetlands are (existing projects) or are anticipated to be (potential projects) minor and temporary and would result in no more than minimal individual and cumulative adverse environmental effects.

The cumulative impacts to streams (including floodways) associated with proposed modification would be limited to the aggregate impacts of the Project (and other potential or existing SPLP projects, and other evaluated projects within the CIAA) on waterbodies. As reported in the CIA, implementation of the Project, including the addition of impacts associated with the requested modification, and other potential or existing SPLP projects, and other projects evaluated within the CIAA will result in a cumulative waterbody disturbance of approximately 64,960 linear feet. These disturbances will result in no loss of waters or long-term water-quality and quantity. As documented in the CIA, with the implementation of each potential or existing project in compliance with BMPs and permit conditions, all the disturbances to streams are (existing projects) or are anticipated to be (potential projects) minor and temporary; therefore, no more than minimal and temporary individual and cumulative adverse environmental effects are anticipated.

Module S4: Mitigation Plan

S4.A Avoidance, Minimization and Unavoidable Impacts

The crossing of Wetland WL-I1, Stream S-I2, (including floodway) and the floodways of Streams S-I1, S-I3, and S-I4 is unavoidable due to the linear nature of the proposed PPP Project and as described above in S1.B – Water Dependency. SPLP originally proposed an HDD installation of both the 20-inch and 16-inch pipe to avoid direct impacts to these resources. However, as described in the Project Description (Attachment A of this permit modification request) during the pilot hole drilling phase on the permitted 0620 HDD for the 16-inch pipeline installation through this area, there were several inadvertent returns (IRs) in which drilling mud/fluid entered Waters of the Commonwealth. In order to contain and clean-up these IRs, SPLP installed sand bag containments, flumes, and pump arounds. In addition, groundwater was encountered at the eastern end of the HDD, near Stream S-I2 resulting in dewatering issues and safety concerns in the pits. Therefore, given SPLP's experience during the 16-inch HDD at this location, SPLP has elected to abandon any future HDD attempts to install the pipelines through this area and has identified an alternate installation method that minimizes impacts to Waters of the Commonwealth.

SPLP evaluated other routes around the area but are limited due to the density of roads and residential properties surrounding the proposed route. In addition, a route to the west or east would likely impact more forested areas, possibly wetlands, and require a "greenfield", or new, right-of-way through these areas resulting in more permanent forested impacts. Similarly, a conventional auger bore was evaluated for the wetland and stream areas, but it was determined not to be feasible due to the underlying geology and concerns regarding groundwater management. SPLP evaluated an open cut of the existing permitted right-of-way and determined this would have the least impact and allow the most effective means for installing the pipelines and restoring the previous IR areas.

Given the existing conditions at the Glen Riddle/ 0620 HDD modification location and numerous IRs that occurred during the 16-inch HDD, the HDD evaluation staff has elected to install the 20-inch and portions of the 16-inch pipeline through this area using an alternate method of installation. Alternative routes were evaluated but were not considered favorable as they would likely result in more permanent impacts to environmental resources, as well as residential and developed areas. Therefore, the professional opinion of the HDD Reevaluation Team, consisting of the Geotechnical Evaluation Leader, Professional Geologists, Professional Engineers, and other construction specialists is that an open cut with a dam and pump bypass in place for the stream crossing will have the least impact, as the wetland area and stream flow will be managed in accordance with all permit conditions (dam and pump) and can completed in the most efficient and timely manner, including restoration/stabilization of all resources and previous IRs.

As demonstrated within SPLP's Chapter 105 Joint Permit Application (JPA), SPLP has avoided and minimized potential impacts to waters from the Project. In so doing, there is no practicable alternative to each of the crossings that would have less effect on each waterbody, and not have other significant adverse effects on the environment, taking into consideration construction costs, existing technology, safety, and logistics. Those remaining unavoidable impacts are outlined within the resource impact tables located within the Impact Avoidance, Minimization, and Mitigation Procedures provided in Attachment 11, Enclosure E, Part 4 of the PPP Chapter 105 Joint Permit Application (E23-524) and *Attachment E* of this permit modification request.

S4.B Repair, Rehab, and Restoration Actions/Proposed Preservation and Maintenance Operations

SPLP will construct the requested permit modification in accordance with the Chapter 102 Permit requirements and will implement erosion and sediment control BMPs as required and presented throughout this permit modification request, during all construction and restoration activities. Please refer to *Attachment D* of this permit modification request packet for the updated E&S and Restoration plans specific to the requested open cut (open-trench) dry crossing of Wetland WL-I1 and Stream S-I2 (including floodway), and the floodways of Streams S-I1, S-I3 and S-I4.

In addition, SPLP will implement all protective and/or preventative requirements required by the agencies with regard to wild trout resources and species of concern. Please refer to *Attachment G* of this permit modification request packet for the PNDI Update and Agency Coordination specific to the modification.

S4.C Compensatory Mitigation

This permit modification request for a construction methodology change to an open cut (open-trench) dry crossing at the proposed modification would result in minor, short-term, and temporary resource impacts. No permanent fill of wetland or stream and/or relocation of these resources would occur. The wetland and stream would be restored to their original conditions and there will be no loss of resource function; therefore, compensatory mitigation is not required or offered.

S4.D Project Monitoring Plan

Utility Inspection Program & Environmental Compliance Program

All aspects of construction, operation, and maintenance of the PPP Project are supervised by SPLP personnel. Utility or “Craft” inspectors working on behalf of SPLP are staffed throughout all phases of construction to ensure the construction and installation activities are conducted in accordance with SPLP, state, local, and federal specifications and standards.

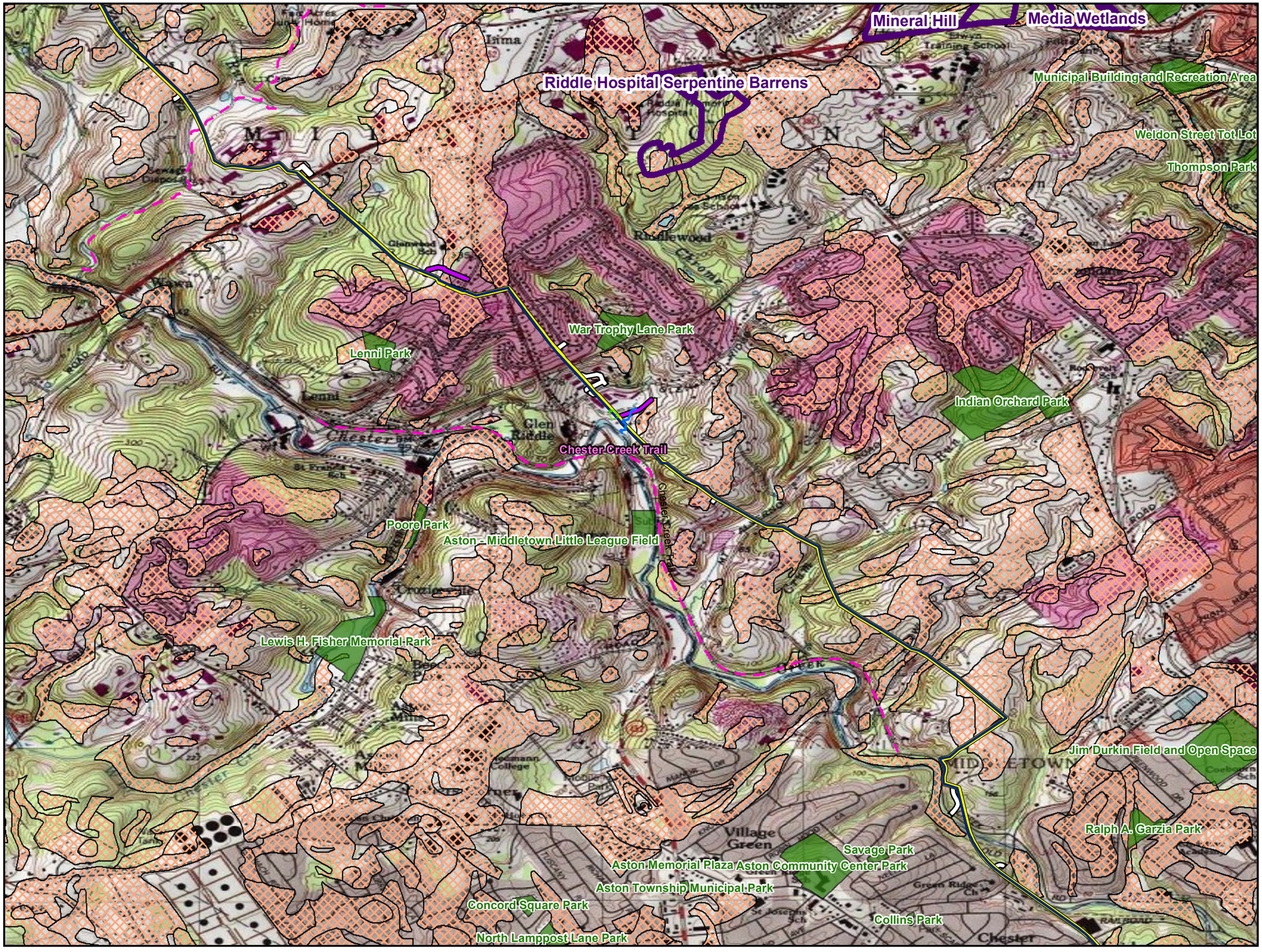
Supplemental to their Utility Inspection Program, SPLP has implemented a comprehensive Environmental Compliance Program (ECP). The ECP encompasses highly integrated and essential program elements designed to ensure compliance with the requirements of the E&S Plan, permit conditions, and approved mitigation measures and conditions. The primary elements of the ECP are environmental training; environmental inspection; biological and cultural resource monitoring/training; and, agency and Project team notification and documentation requirements. Each of these elements is incorporated into the single integrated ECP organization structure and execution plan.

Post-Construction Monitoring

Wetland WL-I1, Stream S-I2 (including floodway), and the floodways of Streams S-I1, S-I3, and S-I4 will be temporarily impacted and restored to original grade, stabilized, and vegetated in accordance with the E&S Plan (refer to *Attachment D* of this permit modification request packet). Post-construction, the wetland and streams will be monitored in accordance with the Project’s Impact Avoidance, Minimization, and Mitigation Procedures provided in Attachment 11, Section E, Part 4 of the PPP Chapter 105 Joint Permit Application (E23-524. APS 879056) as well as all applicable permits and clearances, including any specific requirements/reporting associated with sensitive species (i.e., Eastern Redbelly Turtle).

Appendix S2.A-1

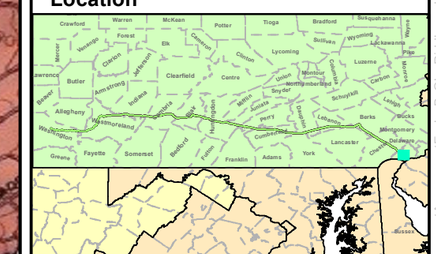
Location Map



Legend

- PPP Original Proposed 20 & 16-inch Pipeline Corridor
- PPP Proposed Pipeline Modification
- Permanent Access
- Temporary Access
- PEM Wetland
- Perennial Stream
- Trails
- Wildlife Management
- Local Parks
- USDA Soils-Prime Farmlands

Location



0 1,000 2,000

1 inch = 2,000 feet

Pennsylvania Pipeline Project:
Environmental Assessment
Enclosure B - Resource Identification
Sheet 1 of 2

Prepared By: TETRA TECH

Prepared for: Sunoco Logistics

Base Map; ESRI ArcGIS Online
Coordinate System: NAD 83 UTM 17N

Date: 02/2019

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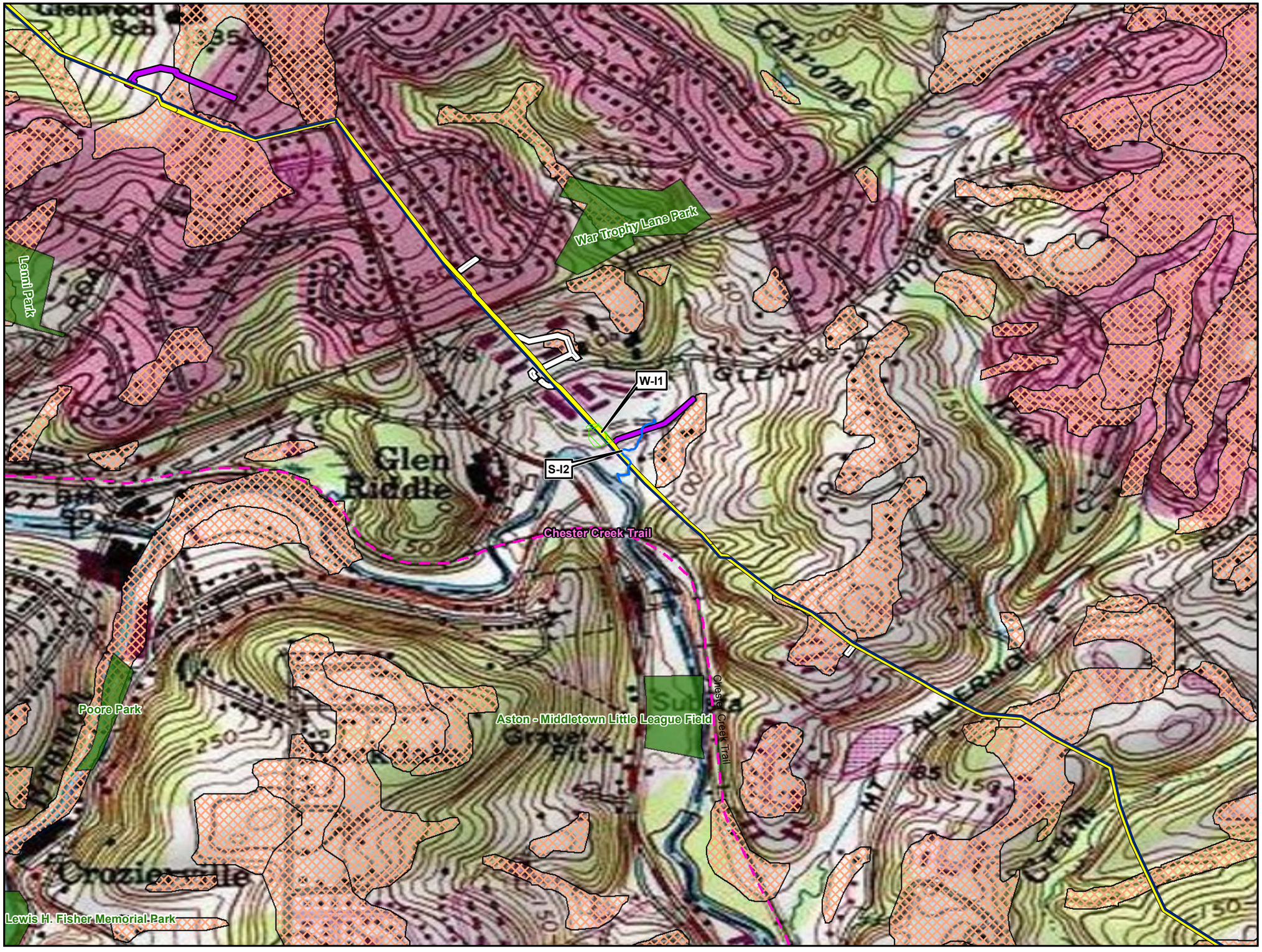
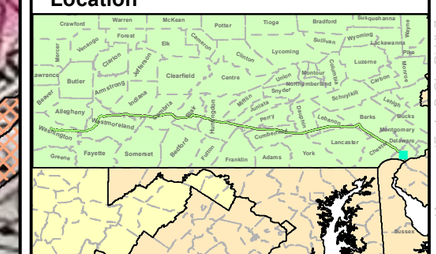


Legend

- PPP Original Proposed 20 & 16-inch Pipeline Corridor
- PPP Proposed Pipeline Modification
- Permanent Access Road
- Temporary Access Road
- PEM Wetland
- Perennial Stream
- Trails
- Local Parks
- USDA Soils-Prime Farmlands

Location



N

0 400 800

1 inch = 800 feet

Pennsylvania Pipeline Project:
Environmental Assessment
Enclosure B - Resource Identification
Sheet 2 of 2

Prepared By: TETRA TECH

Prepared for: Sunoco Logistics

Base Map; ESRI ArcGIS Online

Coordinate System: NAD 83 UTM 17N

Date: 02/2019

P:\GIS\projects\112C06968-PPP\MXD\Permits\PermitMods\EnclosureB_Maps\PPP_EnvironmentAssessmentEnclosB_GlenRiddlezoomedin.mxd JL

Appendix S2.A-2

Excerpts from the Aquatic Resources Report (August 2015) & Supplemental Aquatic Resources Report (March 2016)

Aquatic Resource Report for the Pennsylvania Pipeline Project, Southeast Region, Delaware County, Pennsylvania

Prepared By:

Tetra Tech, Inc. For

Sunoco Pipeline L.P.

525 Fritztown Road

Sinking Spring, PA

NOTE: This Aquatic Resources Report excerpts information relevant to the major permit modification for the Glen Riddle/SEPTA HDD and previously submitted information by Sunoco Pipeline L.P. as part of the approved PPP Chapter 105 Joint Permit (E23-524. APS 879354)]

August 2015

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F RESUMES

ACRONYMS

1987 Manual	Corps of Engineers Wetland Delineation Manual
Corps Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information Systems
GPS	Global Positioning System
HQ-CWF	High Quality Cold Water Fishes
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project	Southeastern Region, Pennsylvania Pipeline Project
PSS	Palustrine Scrub Shrub
ROW	Right-of-Way
SF	Square Feet
SPLP	Sunoco Pipeline, LP
TSF	Trout Stocking
UNT	Unnamed Tributary
UPL	Upland
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WWF	Warm Water Fishes

1.0 INTRODUCTION

This Aquatic Resources Report for Delaware County, located within the Southeastern Region of the Pennsylvania Pipeline Project (Project) has been prepared by Tetra Tech, Inc. on behalf of Sunoco Pipeline, LP (SPLP). Wetland areas were delineated on site using methodology enumerated in the United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987) (1987 Manual), as amended by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, April 2012 (Corps Regional Supplement).

The subject of this report is a wetland delineation and stream identification field investigation for a proposed natural gas pipeline right-of-way (ROW), associated access roads, and workspaces located across southern Pennsylvania.

The Project study area drains to Chester Creek along with its unnamed tributaries (UNT), Chrome Run, Crum Run along with its UNTs, which are all listed as Trout Stocking (TSF), as designated in Chapter 93 of Title 25 of the PA Code. The study area drains to Rocky Run, which are listed as High Quality Cold Water Fishes (HQ-CWF), as designated in Chapter 93 of Title 25 of the PA Code. Additionally, the study area drains into Baldwin Run, which is listed as Warm Water Fishes (WWF), as designated in Chapter 93 of Title 25 of the PA Code.

The content of this report presents the methodology, results, and conclusions of wetland delineation and stream identification activities completed for the proposed Project.

2.0 METHODOLOGY

USACE requires the use of the procedures enumerated in the *1987 Manual* (Environmental Laboratory, 1987) and the *Corps Regional Supplement* (Environmental Laboratory, 2012) for making jurisdictional determinations. According to the *1987 Manual*, an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria:

1. Predominance of hydrophytic vegetation (plants which are adapted for life in saturated soil conditions);
2. Hydric soils (soils which were formed under water, or in saturated conditions); and
3. Wetland hydrology (or the presence of inundated or saturated soils at some time during the growing season).

Wetlands identified in the field were classified in accordance with the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). Wetland classifications are as follows: palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Dominant vegetation was identified and classified according to The National Wetland Plant List: 2014 Update of Wetland Ratings (Lichvar, 2014). Plant classifications are as follows:

Obligate (OBL) - essentially always found in wetlands; estimated probability >99%

Facultative Wetland (FACW) - usually found in wetlands; estimated probability 67%-99%

Facultative (FAC) - equally likely to occur in wetlands and non-wetlands;
estimated probability 34%-66%

Facultative Upland (FACU) - usually occurs in non-wetlands; estimated probability 1%-33%

Upland (UPL) - essentially always found in non-wetlands; estimated probability >99%

The field investigations for the proposed pipeline Project were performed during numerous field visits from November 2013 through July 2015. The study area was preliminarily limited to a 200-foot wide corridor along a proposed center line. Once the proposed pipeline ROW, access roads, and workspaces were finalized any additional areas that extended beyond the preliminary study area were investigated for potential wetlands and streams. The final study area is illustrated on the project mapping. Preliminary site reconnaissance of the study area was conducted through a

review of available Geographic Information Systems (GIS) resources. Existing information reviewed included the following:

- United States Geological Survey (USGS) topographic mapping (Figures 1-1 to 1-3)
- Natural Resources Conservation Service (NRCS) National Cooperative Soil Survey (Figure 2-1 to 2-3)
- United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Mapping (Figure 3-1 to 3-3)

The delineation consisted of establishment of the wetland/upland margin with flagging hung at intervals that accurately depicted the outline of the boundary. The individual flags were then located using a Global Positioning System (GPS) receiver and later added to the project area mapping. Wetland flagging was limited to the bounds of the investigated study area and wetlands are shown as closed or partially closed systems on the detail map (Figure 4-1 to 4-23).

Data concerning soils, hydrology, and vegetation were collected and recorded on USACE Wetland Determination Data Forms at wetlands and upland point locations associated with wetlands, which are provided in Appendix A. Photographs depicting wetland topography and vegetation are included in Appendix B. Stream data sheets detailing stream characteristics are provided in Appendix C. Appendix D contains photographs of streams located within the study area. Appendix E provides a list of hydric soils known to occur within the counties of the study area. Resumes of project personnel are included in Appendix F.

3.0 RESULTS

The field investigations identified 33 areas within the proposed Pennsylvania Pipeline Project study area that met the wetland criteria outlined in the 1987 Manual, as amended by the Corps Regional Supplement. Additionally, 51 streams were identified within the Project study area. A narrative summary of field data collected for these systems is presented below. The detail maps provided as Figures 4-1 to 4-23 illustrate the wetland and watercourse locations in relation to the project LOD and study area.

3.1 WETLAND IDENTIFICATION AND DELINEATION

Hydric soils and soils with hydric components are often associated with wetlands. A review of the NRCS Soil Survey and hydric soil list (Appendix E) indicated that there are 17 soils mapped within the study area classified as hydric or containing hydric components. These soils can be found in Table 2, Mapped Hydric Soils in Study Area. The NRCS soil survey maps are included as Figures 2-1 to 2-3. Confirmation of the soil mapping units was not performed during this site evaluation.

Two NWI wetlands are mapped within the Project study area (Figure 3-3). Both of these wetlands are palustrine, unconsolidated bottom, permanently flooded, excavated wetlands.

Based on field evidence and best professional judgment, it was determined that 33 wetlands are present within the study area. The areas demonstrated the presence of all three wetland parameters required by the 1987 Manual and the Regional Supplement. The vegetative community was dominated by hydrophytic plant species or had a prevalence index ≤ 3, the soils exhibited hydric characteristics, and the areas contained wetland hydrology indicators.

USACE wetland determination data forms that detail the existing vegetation, soil characteristics, and hydrology were prepared for each wetland and its associated upland point (Appendix A).

Wetland B37

Wetland B37 (W-B37) is a 607-square foot (SF) palustrine emergent (PEM) wetland (Figure 4-2). Indicators of wetland hydrology include a high water table, saturation within the upper 12 inches of the soil profile, and a positive FAC-neutral test. Dominant vegetation consists Northern spicebush (*Lindera benzoin*) and skunk-cabbage (*Symplocarpus foetidus*). The soil between 0 and 8 inches exhibits a low-chroma matrix (7.5YR 2.5/1) with a muck texture. The soil below 8 inches exhibits refusal coarse fragments.

Wetland I1 PFO (1)

Wetland I1 PFO (1) (W-I1 PFO (1)) is a 10,454-SF PFO wetland (Figure 4-13). Indicators of wetland hydrology include water-stained leaves, drainage patterns, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), red osier (*Cornus alba*), twinsisters (*Lonicera tatarica*), and common reed (*Phragmites australis*). The soil between 0 and 12 inches exhibits a low-chroma matrix (10YR 4/2) with a clay loam texture that contains redoximorphic features (7.5YR 4/4).

Wetland I1 PFO (2)

Wetland I1 PFO (2) (W-I1 PFO (2)) is a 26,887-SF PFO wetland (Figure 4-13). Indicators of wetland hydrology include water-stained leaves, drainage patterns, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), slippery elm (*Ulmus rubra*), red osier (*Cornus alba*), twinsisters (*Lonicera tatarica*), and Japanese stilt grass (*Microstegium vimineum*). The soil between 0 and 8 inches exhibits a low-chroma matrix (2.5Y 4/2) with a silt loam texture that contains redoximorphic features (7.5YR 4/4).

Wetland I1 PEM

Wetland I1 PEM (W-I1 PEM) is a 21,537-SF PEM wetland (Figure 4-13). Indicators of wetland hydrology include drainage patterns, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), Japanese stilt grass (*Microstegium vimineum*), dark-green bulrush (*Scirpus atrovirens*), and lamp rush (*Juncus effusus*). The soil between 0 and 12 inches exhibits a low-chroma matrix (10YR 4/2) with a clay loam texture that contains redoximorphic features (7.5YR 4/4).

Wetland I2

Wetland I2 (W-I2) is a 9,500-SF PFO wetland (Figure 4-13). Indicators of wetland hydrology include water-stained leaves, standing dead vegetation, drainage patterns, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of reed canary grass red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), common reed (*Phragmites australis*), and an unidentified grape vine (*Vitis* sp.) The soil between 0 and 12 inches exhibits a low-chroma matrix (2.5Y 4/2) with a silt loam texture that contains redoximorphic features (7.5YR 4/4).

Wetland H34 PEM (1)

Wetland H34 PEM (W-H34 PEM (1)) is a 2,535-SF PEM wetland (Figure 4-14). Indicators of wetland hydrology include a high water table, saturation within the upper 12 inches of the soil profile, water-stained leaves, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of reed canary grass (*Phalaris arundinacea*), dark-green bulrush (*Scirpus*

Wetland I6

Wetland I6 (W-I6) is a 6,197-SF PEM wetland (Figure 4-23). Indicators of wetland hydrology include surface water, a high water table, saturation within the upper 12 inches of the soil profile, oxidized rhizospheres on living roots, geomorphic position, and a positive FAC-neutral test. Dominant vegetation consists of dark-green bulrush (*Scirpus atrovirens*), lamp rush (*Juncus effusus*), and lesser poverty rush (*Juncus tenuis*). The soil between 0 and 10 inches exhibits a low-chroma matrix (10YR 4/2) with a gravelly clay loam texture that contains redoximorphic features (5YR 4/4).

Wetland I5

Wetland I5 (W-I5) is a PEM wetland greater than 532,450-SF (Figure 4-23). Indicators of wetland hydrology include surface water, a high water table, saturation within the upper 12 inches of the soil profile, and oxidized rhizospheres on living roots, and a positive FAC-neutral test. Dominant vegetation consists of common rush (*Juncus effusus*), common reed (*Phragmites australis*), and chufa (*Cyperus esculentus*). The soil between 0 and 5 inches exhibits a low-chroma matrix (10YR 4/2) with a silt loam texture that contains redoximorphic features (5YR 4/4). The soil between 5 and 12 inches exhibits a low-chroma matrix (2.5Y 5/1) with a silt loam texture that contains redoximorphic features (7.5YR 4/6 and 2.5YR 6/1).

3.2 STREAM IDENTIFICATION AND EVALUATION

Based on field evidence and best professional judgment, it was determined that 51 streams were identified within the evaluated study area. A data sheet that details the bank and channel characteristics, substrate composition, aquatic habitat, and hydrology was prepared for each of the streams (Appendix C).

Stream B36

Stream B36 (S-B36) is an ephemeral tributary to Chester Creek (Figure 4-2). The stream bank is approximately 4 feet in width. The bank height is 2 feet. The stream bed contains a boulder and cobble substrate. At the time of the field investigation, the stream exhibited an average water depth of 5 inches.

Stream B37

Stream B37 (S-B37) is an ephemeral tributary to Chester Creek (Figure 4.2). The stream bank is approximately 6 feet in width. The bank height is 1 foot. The stream bed contains a boulder,

Stream I1

Stream I1 (S-I1) is an ephemeral tributary to Chester Creek (Figure 4-13). The stream bank is approximately 2 feet in width. The bank height is 2 feet. The stream bed contains a silt and organic substrate. At the time of the field investigation, the stream exhibited an average water depth of 1 inch.

Stream I3

Stream I3 (S-I3) is an ephemeral tributary to Chester Creek (Figure 4-13). The stream bank is approximately 2 feet in width. The bank height is 1.5 feet. The stream bed contains a sand, silt, and organic substrate. At the time of the field investigation, the stream exhibited an average water depth of 3 inches.

Stream I2

Stream I2 (S-I2) is a perennial tributary to Chester Creek (Figure 4-13). The stream bank is approximately 7 feet in width. The left bank height is 3 feet. The right bank height is 5 feet. The stream bed contains a boulder, cobble, gravel, and sand substrate. At the time of the field investigation, the stream exhibited an average water depth of 11 inches.

Stream I6

Stream I6 (S-I6) is an ephemeral tributary to Chester Creek (Figure 4-13). The stream bank is approximately 5 feet in width. The bank height is 4 feet. The stream bed contains a cobble, gravel, and organic substrate. The stream exhibited no flow at the time of the field investigation.

Stream I5

Stream I5 (S-I5) is an intermittent tributary to Chester Creek (Figure 4-13). The stream bank is approximately 6 feet in width. The left bank height is 8 feet. The right bank height is 12 feet. The stream bed contains a cobble, gravel, sand, silt, and organic substrate. At the time of the field investigation, the stream exhibited an average water depth of 3 inches.

Stream H29

Stream H29 (S-H29) is Chrome Run, a perennial tributary to Chester Creek (Figure 4-14). The stream bank is approximately 18 feet in in width. The bank height is 3 feet. The stream bed contains a boulder, cobble, gravel, and sand substrate. At the time of the field investigation, the stream exhibited an average water depth of 7 inches.

4.0 CONCLUSIONS

During the field investigations in Delaware County, located within the Southeastern Region of the proposed Pennsylvania Pipeline Project, 33 areas were identified within the evaluated study area which exhibited all three criteria necessary to be classified as a jurisdictional wetland in accordance with the 1987 Manual and the Regional Supplement:

1. Predominance of hydrophytic vegetation (plants which are adapted for life in saturated soil conditions);
2. Hydric soils (soils which were formed under water, or in saturated conditions); and
3. Wetland hydrology (or the presence of inundated or saturated soils at some time during the growing season).

Additionally, 51 streams were identified within the evaluated study area.

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TABLE

Table 1
Wetland and Stream Summary
Pennsylvania Pipeline Project

Water Resource	Dominant Plant Community/Flow Regime	Bank Full Width	Water Depth	Channel Depth	Wetland Size (Square Feet)	Wetland Size (Acres)	Associated Water Resource
Wetlands							
W- B37	PEM	-	-	-	607	0.01	S-B37, S-B38
W- B51	PEM	-	-	-	7569	0.17	S-B52, S-B54
W- B51	PFO (1)	-	-	-	24727	0.57	S-B52, S-B54
W- B51	PFO (2)	-	-	-	6419	0.15	S-B52, S-B54
W- B52	PFO	-	-	-	26662	0.61	S-B56, S-B57
W- B53	PFO	-	-	-	10948	0.25	S-B58
W- B54	PEM	-	-	-	4252	0.10	N/A
W- C21	PFO	-	-	-	4303	0.10	N/A
W- C20	PEM	-	-	-	3873	0.09	N/A
W- C19	PEM	-	-	-	18693	0.43	N/A
W- C18	PEM	-	-	-	3443	0.08	S-C40, S-C41
W- C24	PEM	-	-	-	1777	0.04	N/A
W-BA1	PEM	-	-	-	757	0.02	S-C45
W- C23	PEM	-	-	-	195874	4.50	S-C44, S-C45
W- C10	PEM	-	-	-	2430	0.06	S-C23
W- C10	PSS (1)	-	-	-	6047	0.14	S-C23
W- C10	PSS (2)	-	-	-	3556	0.08	S-C23
W- I1	PFO (1)	-	-	-	10454	0.24	S-I1, S-I4
W- I1	PFO (2)	-	-	-	26887	0.62	S-I4
W- I1	PEM	-	-	-	21537	0.49	S-I1, S-I4
W- I2	PFO	-	-	-	9500	0.22	S-I1, S-I3
W- H34	PEM (1)	-	-	-	2535	0.06	S-H29
W- H34	PEM (2)	-	-	-	394	0.01	S-H29
W- H34	PFO (1)	-	-	-	8685	0.20	S-H29
W- H34	PFO (2)	-	-	-	1601	0.04	S-H29
W- H33	PEM	-	-	-	513	0.01	N/A
W- H32	PEM	-	-	-	2948	0.07	N/A
W-Q62	PSS	-	-	-	2803	0.06	S-H36
W- H37	PSS	-	-	-	1135	0.03	N/A
W- H39	PEM	-	-	-	1079	0.02	S-H41
W- H40	PEM	-	-	-	8091	0.19	S-H44
W-BB131	PEM	-	-	-	288	0.01	N/A
W- H41	PEM	-	-	-	4048	0.09	S-H47
W- I14	PFO	-	-	-	16719	0.38	N/A
W-BA4	PEM	-	-	-	843	0.02	N/A
W- I15	PFO	-	-	-	16309	0.37	N/A

* = See Data Sheet for Channel Depth - Right and Left Bank Measurements Differ.
' = Feet
" = Inches

Table 1
Wetland and Stream Summary
Pennsylvania Pipeline Project

Water Resource	Dominant Plant Community/Flow Regime	Bank Full Width	Water Depth	Channel Depth	Wetland Size (Square Feet)	Wetland Size (Acres)	Associated Water Resource
W- I16	PFO (1)	-	-	-	134503	3.09	S-I18
W- I16	PEM	-	-	-	32396	0.74	S-I18
W- I16	PFO (2)	-	-	-	133838	3.07	S-I18
W-BA7	PEM	-	-	-	2641	0.06	N/A
W-BA5	PFO	-	-	-	1312	0.03	N/A
W-BA6	PFO	-	-	-	14977	0.34	N/A
W- I6	PEM	-	-	-	6197	0.14	N/A
W- I5	PEM	-	-	-	532450	12.22	S-I10, S-I11
Streams							
S-B36	Ephemeral	4'	5"	2'	-	-	N/A
S-B37	Ephemeral	6'	5"	1'	-	-	S-B38, W-B37
S-B38	Perennial	10'	1'	2'	-	-	S-B38, W-B37, S-B39
S-B39	Ephemeral	1.5'	3"	6"	-	-	S-B38
S-B55	Ephemeral	2'	1"	5"	-	-	S-B54
S-B51	Ephemeral	1'	1"	6"	-	-	S-B52, W-B51
S-B52	Intermittent	1.5'	4"	1'	-	-	S-B51, S-B54, W-B51
S-B53	Intermittent	2'	8"	1.5'	-	-	S-B52, S-B54, W-B51
S-B54	Perennial	3.5'	8"	1.5'	-	-	S-B51, S-B52, W-B51
S-B56	Intermittent	4'	3"	1'	-	-	W-B52
S-C43	Ephemeral	1'	0.5"	5"	-	-	N/A
S-C42	Intermittent	5'	2"	4'	-	-	N/A
S-C40	Intermittent	3'	3"	10"	-	-	S-C41, S-C39, W-C18
S-C41	Ephemeral	2.5'	0"	10"	-	-	S-C40, W-C18
S-C39	Ephemeral	2'	0"	10"	-	-	S-C40, W-C18
S-C45	Intermittent	5'	2"	15"	-	-	S-C44, W-BA1, W-C23
S-C44	Perennial	20'	12"	4"	-	-	S-C45, W-C23
S-C26	Ephemeral	4'	3"	1'	-	-	N/A
S-C24	Ephemeral	1.5'	2"	3'	-	-	S-C25
S-C25	Ephemeral	1'	2"	1'	-	-	S-C24
S-C23	Perennial	10'	9"	4'	-	-	W-C10
S-C17	Perennial	16'	7"	2'	-	-	S-C16
S-C16	Perennial	8'	6"	2.5'	-	-	S-C17, S-C16, S-C15
S-C22	Intermittent	7'	5"	5'	-	-	S-C16
S-C15	Ephemeral	2'	1"	6"	-	-	S-C16
S-C20	Ephemeral	2'	3"	6"	-	-	N/A
S-I1	Ephemeral	2'	1"	2'	-	-	S-I2, W-I1
S-I3	Ephemeral	2'	3"	1.5'	-	-	S-I2

* = See Data Sheet for Channel Depth - Right and Left Bank Measurements Differ.
' = Feet
" = Inches

Table 1
Wetland and Stream Summary
Pennsylvania Pipeline Project

Water Resource	Dominant Plant Community/Flow Regime	Bank Full Width	Water Depth	Channel Depth	Wetland Size (Square Feet)	Wetland Size (Acres)	Associated Water Resource
S-I2	Perennial	7'	11"	*	-	-	S-I1, S-I3
S-I6	Ephemeral	5'	0"	4'	-	-	S-I5
S-I5	Intermittent	6'	3"	*	-	-	S-I6
S-H29	Perennial	18'	7"	3'	-	-	W-H34
S-H28	Perennial	15'	8"	*	-	-	N/A
S-H27	Perennial	12'	4"	1.5'	-	-	N/A
S-H35	Perennial	7'	5"	2'	-	-	S-H36, W-Q62
S-H36	Intermittent	3'	4"	5'	-	-	S-H35, W-Q62
S-H34	Intermittent	8'	2"	5'	-	-	N/A
S-H37	Perennial	100'	2'	6'	-	-	S-H37
S-H38	Intermittent	8'	3"	*	-	-	S-H38
S-H39	Ephemeral	8"	0"	8"	-	-	N/A
S-H40	Ephemeral	5.5'	0"	2'	-	-	N/A
S-H41	Perennial	100'	4'	*	-	-	N/A
S-H42	Ephemeral	0.5'	0.5"	2"	-	-	N/A
S-H44	Ephemeral	4'	4"	4"	-	-	S-H43, W-H40
S-H43	Perennial	20'	6"	4'	-	-	S-H44
S-H47	Ephemeral	8'	1"	3'	-	-	W-H41
S-H48	Ephemeral	2'	0"	4"	-	-	N/A
S-I17	Ephemeral	4'	1"	3'	-	-	W-I16
S-I19	Ephemeral	5'	2"	6"	-	-	S-I20, S-I18
S-I20	Ephemeral	3'	2"	8"	-	-	S-I19
S-I18	Perennial	13'	2'	1'	-	-	W-I16

* = See Data Sheet for Channel Depth - Right and Left Bank Measurements Differ.
' = Feet
" = Inches

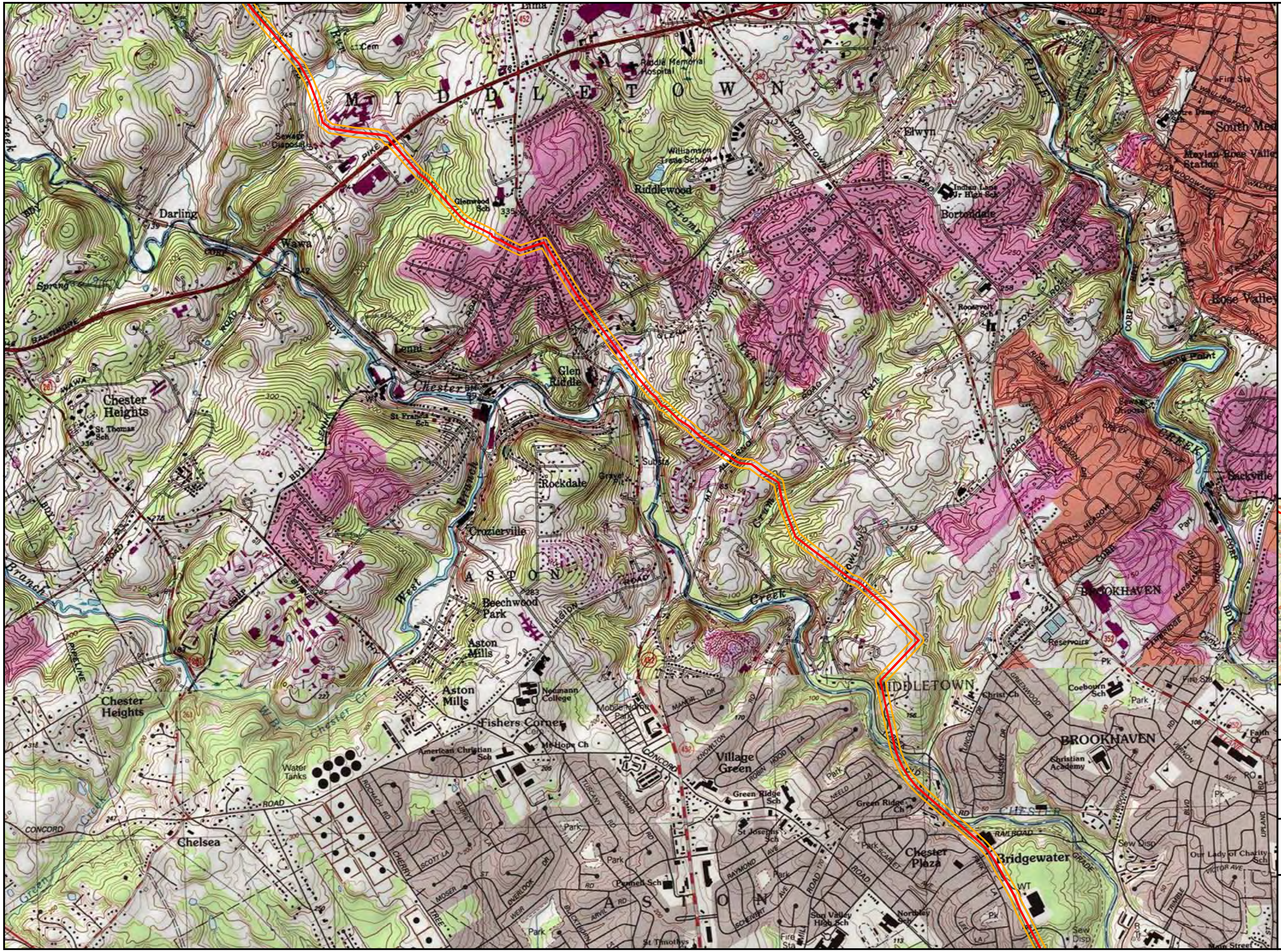
Table 2
Mapped Hydric Soils in Study Area
Pennsylvania Pipeline Project, Delaware County

Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
BeA	Beltsville silt loam, 0 to 3 percent slopes	Othello	5	
BeB2	Beltsville silt loam, 3 to 8 percent slopes, moderately eroded	Othello	5	
ByA	Butlertown silt loam, 0 to 3 percent slopes	Othello	5	
ByB2	Butlertown silt loam, 3 to 8 percent slopes, moderately eroded	Othello	5	
Ch	Chewacla silt loam	Wehadkee	5	
GnA	Glenville silt loam 0 to 3 percent slopes	Baile	5	
GnB	Glenville silt loam, 3 to 8 percent slopes	Baile	5	
GnB2	Glenville silt loam, 3 to 8 percent slopes, moderately eroded	Worsham	7	
Me	Made land, schist and gneiss materials	Hatboro	1	
MgB2	Manor loam, 3 to 8 percent slopes, moderately eroded	Hatboro	2	
Mn	Melvin silt loam	Melvin	85	
NsD	Neshaminy very stony silt loam, 8 to 25 percent slopes	Towhee, extremely stony	3	
NsF	Neshaminy very stony silt loam, 25 to 45 percent slopes	Towhee, extremely stony	3	
OtA	Othello silt loam	Othello	90	

Table 2
Mapped Hydric Soils in Study Area
Pennsylvania Pipeline Project, Delaware County

OtA	Othello silt loam	Nanticoke	2	
WoA	Worsham silt loam, 0 to 3 percent slopes	Worsham	85	
WsB	Worsham very stony silt loam, 0 to 8 percent slopes	Worsham	85	
Modified from Hydric Soils of the United States (NRCS 2014)				

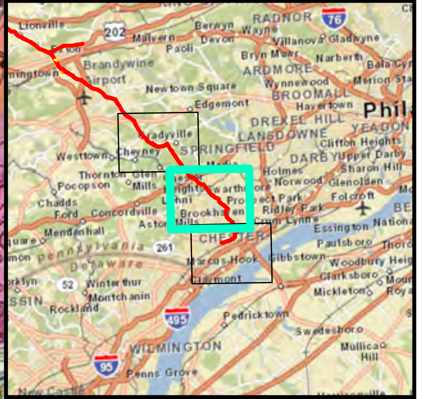
FIGURES



Legend

- Access Road
- Alignment Centerline
- Study Area
- County Boundary

Sheet Identifier



Feet: 0 | 1,000 | 2,000

Meters: 0 | 300 | 600

USGS PROJECT LOCATION MAP
FIGURE 1-2
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
DELAWARE COUNTY, PA

TETRA TECH

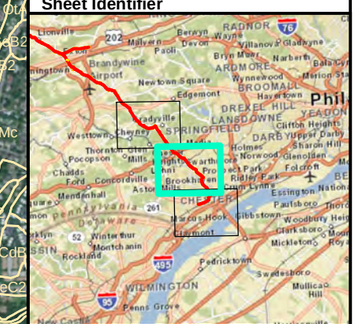
Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangles being displayed are Media, Marcus Hook

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP WETLANDS SE\PENNPIPELINE_SOUTHEAST_USGS_DELAWARECO.MXD 08/20/15 JN

Legend

- Access Road
- Alignment Centerline
- Study Area
- County Boundary
- NRCS Soils and Codes

Sheet Identifier



N

0 1,000 2,000 Feet

0 300 600 Meters

NRCS SOILS MAP
FIGURE 2-2
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
DELAWARE COUNTY, PA

TETRA TECH

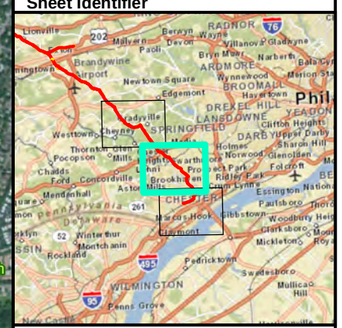
Notes:
Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PIPP WETLANDS SEPEENINPIPELINE_SOUTHEAST_SOILS_DELAWARECO.MXD 08/20/15 JN

Legend

- Access Road
- Alignment Centerline
- Study Area
- County Boundary
- NWI Wetlands and Codes

Sheet Identifier



N

0 1,000 2,000 Feet

0 300 600 Meters

NWI WETLANDS MAP
FIGURE 3-2
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
DELAWARE 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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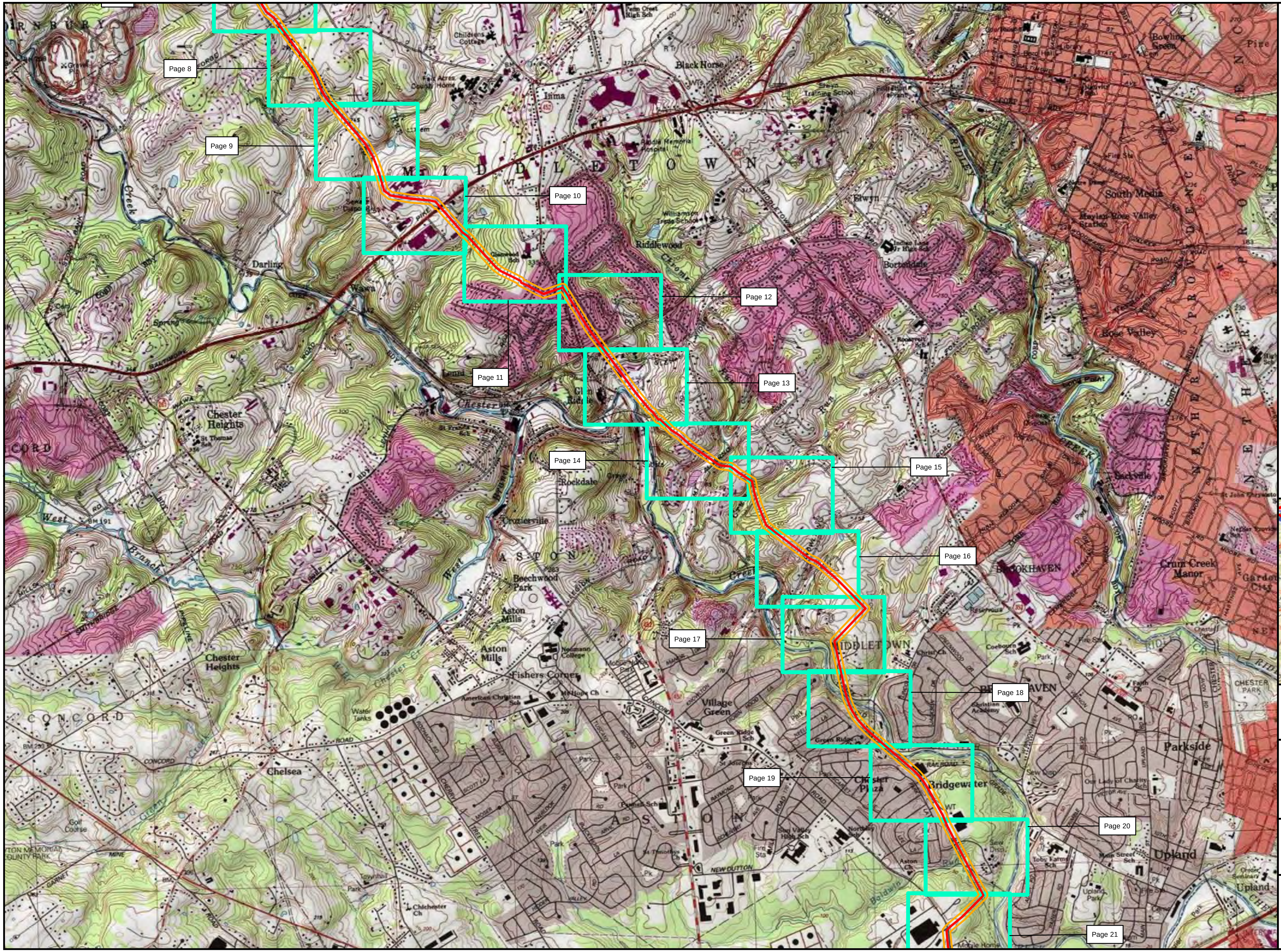


Legend

- Access Road
- Alignment Centerline
- Study Area
- County Boundary
- Index

Sheet Identifier

Feet: 0, 1,000, 2,000

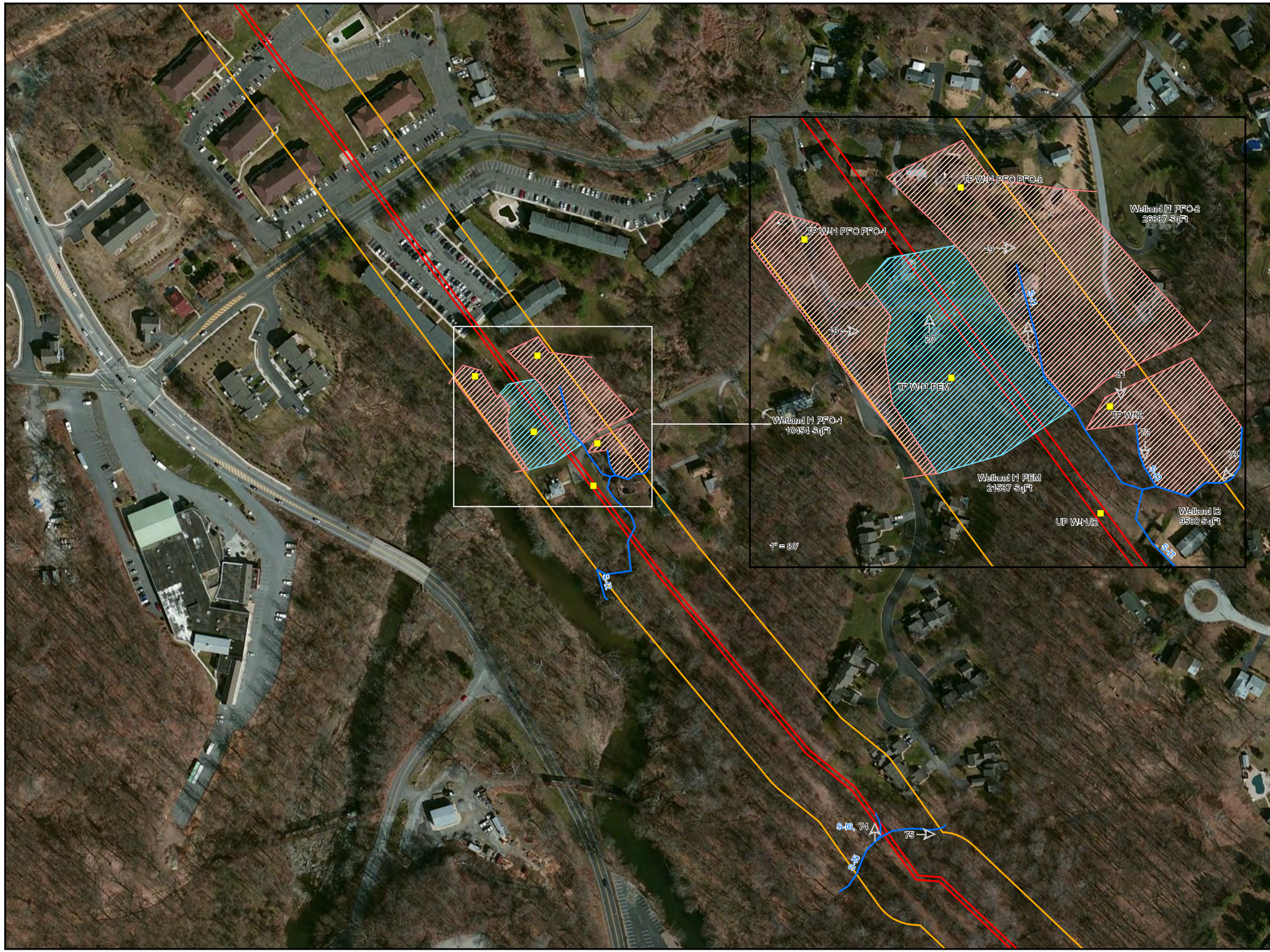
Meters: 0, 300, 600

USGS PROJECT LOCATION MAP
FIGURE 4-INDEX-2
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, ALIGNMENT
SUNOCO LOGISTICS, L.P.
DELAWARE COUNTY, PA

TETRA TECH

Notes:
1) Topographic map provided by ESRI's ArcGIS Online USA Topo Maps map service (© 2013 National Geographic Society, i-cubed).
2) Quadrangles being displayed are Media, Marcus Hook

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP WETLANDS SE\PENNPIPELINE_SOUTHEAST_INDEX_DELAWARECO.MXD 08/20/15 JN



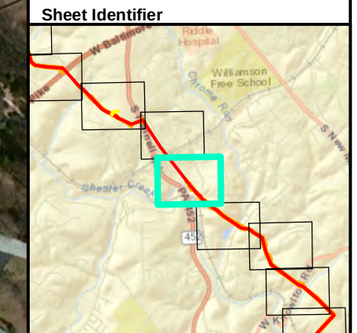
Legend

- Access Roads
- Alignment Centerline
- Study Area
- County Boundary
- Culvert
- Sample Location
- Photo Location
- Drainage Feature
- Stream

Wetland

- PEM
- PFO
- PSS
- PuB

Sheet Identifier



N

Feet: 0 100 200

Meters: 0 30.45 60.9

DETAIL MAP
FIGURE 4-13
PENNSYLVANIA PIPELINE PROJECT
AUGUST 19, 2015 ALIGNMENT
SUNOCO LOGISTICS, L.P.
DELAWARE COUNTY, PA

TETRA TECH

Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2011 ESRI and its data suppliers).
2) Map insets are at a scale of 1 inch = 50 feet unless otherwise noted.

PGH P:\GIS\SUNOCO\MARINER EAST 2\MXD\PPP WETLANDS SEPEN\PIPELINE_DELAWARE\CO_DETAIL.MXD 8/31/2015 JN

APPENDIX A

USACE DATA SHEETS

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Delaware Sampling Date: 03/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-I1 PFO (1)

Investigator(s): J. McGuirk, D. Quinn Section, Township, Range: Middletown

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRRS Lat: 39.894647 Long: -75.432381 Datum: NAD 83

Soil Map Unit Name: Wehadkee silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** **Yes ✔ No ____**
Hydric Soil Present?	Yes ✔	No ____	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:
Cowardin Code: PFO
HGM: Riverine
WT: RPWWD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes ✔ No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-I1 PFO (1)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	30	✔	FAC
2. Fraxinus pennsylvanica	25	✔	FACW
3. Platanus occidentalis	5		FACW
4. Ulmus rubra	5		FAC
5.			
6.			
7.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	10	✔	FACW
2. Lonicera tatarica	10	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Herb Stratum (Plot size: 5')			
1. Phragmites australis	70	✔	FACW
2. Carex vulpinoidea	10		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: W-I1 PFO (1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12"	10YR 4/2	85	7.5YR 4/4	15	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Delaware Sampling Date: 03/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-I1 PFO (2)

Investigator(s): J. McGuirk, D. Quinn Section, Township, Range: Middletown

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRRS Lat: 39.894707 Long: -75.431693 Datum: NAD 83

Soil Map Unit Name: Wehadkee silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Cowardin Code: PFO
HGM: Riverine
WT: RPWWD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-I1 PFO (2)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	40	✔	FAC
2. Fraxinus pennsylvanica	20	✔	FACW
3. Ulmus rubra	20	✔	FAC
4. Platanus occidentalis	10		FACW
5.			
6.			
7.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	15	✔	FACW
2. Lonicera tatarica	10	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	10	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-I1 PFO (2)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5Y 4/2	95	7.5YR 4/4	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Deleware Sampling Date: 03/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-I1 PEM

Investigator(s): J. McGuirk, D. Quinn Section, Township, Range: Middletown

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRRS Lat: 39.894491 Long: -75.431984 Datum: NAD 83

Soil Map Unit Name: Wehadkee silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Cowardin: PEM
HGM: Riverine
WT: RPWWD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-I1 PEM

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	✔	FAC
2. Fraxinus pennsylvanica	10	✔	FACW
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	35	✔	FAC
2. Scirpus atrovirens	30	✔	OBL
3. Juncus effusus	20	✔	FACW
4. Phalaris arundinacea	10		FACW
5. Boehmeria cylindrica	5		FACW
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Trees located in the middle of the R.O.W.

SOIL

Sampling Point: W-I1 PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12"	10YR 4/2	85	7.5YR 4/4	15	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: PPP City/County: Delaware Sampling Date: 03/24/2014

Applicant/Owner: Sunoco State: PA Sampling Point: W-I1, W-I2 UPL

Investigator(s): J. McGuirk, D. Quinn Section, Township, Range: Middletown

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRRS Lat: 39.894112 Long: -75.431548 Datum: NAD 83

Soil Map Unit Name: Wehadkee silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ____	No ✔	

Remarks:
Upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✔	Depth (inches): ____
Water Table Present?	Yes ____	No ✔	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✔	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W-I1, W-I2 UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	70	✔	FACU
2. Alopecurus sp.	20	✔	ND
3. Microstegium vimineum	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1* (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

ND - Not determined

*Vegetation not ID'd down to the species level not included in dominance test.

SOIL

Sampling Point: W-I1, W-I2 UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12"	10YR 3/3	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

APPENDIX B

WETLAND PHOTOGRAPHS

Photograph Number:	17	**Feature Name:**	W-C10	**Date:**	01/15/2014
Direction:	N	**Plant Community:**	PSS (2)	**Remarks:**	N/A

Photograph Number:	18	**Feature Name:**	W-I1	**Date:**	03/24/2014
Direction:	E	**Plant Community:**	PFO (1)	**Remarks:**	N/A

Photograph Number:	19	**Feature Name:**	W-I1	**Date:**	03/24/2014
Direction:	E	**Plant Community:**	PFO (2)	**Remarks:**	N/A

Photograph Number:	20	**Feature Name:**	W-I1	**Date:**	03/24/2014
Direction:	N	**Plant Community:**	PEM	**Remarks:**	N/A

APPENDIX C

STREAM DATA SHEETS

Tetra Tech Stream Data Sheet

Surveyors: J. McGuirk, D. Quinn Date: 03/24/2014 Resource ID Number: S-I1
Project: PPP State: PA County: Delaware
Photo Number (s): _____ Canopy Cover: 30 % Location: 39.894402°, -75.431664°

Flow Direction: S **Bank Width:** 2 Feet **Water Width:** 1 Feet
High Water Depth: 3 Inches **Water Depth:** 1.00 Inches **Turbidity:** Low
Flow Stage: Low
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 ___%
[ ] Sand ___%
[✔] Silt/Clay 50 %
[✔] Organic 50 %

Bank Substrate:
Height: Left 2' Right 2'

[ ]	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: Acer rubrum, Fraxinus pennsylvanica
[✔] Shrub
Species: Cornus alba, Lonicera tatarica
[✔] Herbaceous
Species: Phragmites australis

Wildlife Observed/Notes:

Sketch:
See Attached Figure.

Tetra Tech Stream Data Sheet

Surveyors: J. McGuirk, D. Quinn Date: 03/24/2014 Resource ID Number: S-I3
Project: PPP State: PA County: Delaware
Photo Number (s): _____ Canopy Cover: 60 % Location: 39.894245°, -75.431416°

Flow Direction: S **Bank Width:** 2 Feet **Water Width:** 2 Feet
High Water Depth: 3 Feet **Water Depth:** 3.00 Inches **Turbidity:** Low
Flow Stage: Moderate
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 ___%
[✔] Sand 20 %
[✔] Silt/Clay 30 %
[✔] Organic 50 %

Bank Substrate:
Height: Left 1.5' Right 1.5'

[ ]	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: Acer rubrum, Fraxinus pennsylvanica
[✔] Shrub
Species: Cornus alba, Lonicera tatarica
[✔] Herbaceous
Species: Phragmites australis

Wildlife Observed/Notes:

Sketch:
See Attached Figure.

Tetra Tech Stream Data Sheet

Surveyors: J. McGuirk, D. Quinn Date: 03/24/2014 Resource ID Number: S-I2
Project: PPP State: PA County: Delaware
Photo Number (s): _____ Canopy Cover: 60 % Location: 39.893884°, -75.431238°

Flow Direction: S **Bank Width:** 7 Feet **Water Width:** 5 Feet
High Water Depth: 3 Feet **Water Depth:** 11.00 Inches **Turbidity:** Low
Flow Stage: Moderate
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 20 %
[✔] Cobble/Gravel 30 %
[✔] Sand 50 %
[ ] Silt/Clay ___%
[ ] Organic ___%

Bank Substrate:
Height: Left 3' Right 5'

[ ]	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: Acer rubrum, Fraxinus pennsylvanica
[✔] Shrub
Species: Cornus alba, Lonicera tatarica
[✔] Herbaceous
Species: Phragmites australis

Wildlife Observed/Notes:

Sketch:
See Attached Figure.

APPENDIX D

STREAM PHOTOGRAPHS

Photograph Number:	71	**Feature Name:**	S-I1	**Date:**	03/24/2014
Direction:	N, Downstream	**Flow Regime:**	Ephemeral	**Remarks:**	N/A

Photograph Number:	72	**Feature Name:**	S-I3	**Date:**	03/24/2014
Direction:	S, Upstream	**Flow Regime:**	Ephemeral	**Remarks:**	N/A

Photograph Number:	73	**Feature Name:**	S-I2	**Date:**	03/24/2014
Direction:	SW, Upstream	**Flow Regime:**	Perennial	**Remarks:**	N/A

Photograph Number:	74	**Feature Name:**	S-I6	**Date:**	03/24/2014
Direction:	N, Downstream	**Flow Regime:**	Ephemeral	**Remarks:**	N/A

APPENDIX E

HYDRIC SOILS LIST

Hydric Soils List
Delaware County, Pennsylvania

Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
AgB2	Aldino silt loam, 3 to 8 percent slopes, moderately eroded	Calvert	7	valleys
BeA	Beltsville silt loam, 0 to 3 percent slopes	Othello	5	terraces
BeB2	Beltsville silt loam, 3 to 8 percent slopes, moderately eroded	Othello	5	terraces
ByA	Butlertown silt loam, 0 to 3 percent slopes	Othello	5	terraces
ByB2	Butlertown silt loam, 3 to 8 percent slopes, moderately eroded	Othello	5	terraces
CaA	Calvert silt loam, 0 to 3 percent slopes	Calvert	85	depressions
CaB	Calvert silt loam, 3 to 8 percent slopes	Calvert	85	valleys
CaB2	Calvert silt loam, 3 to 8 percent slopes, moderately eroded	Calvert	100	valleys
CaaA	Califon loam, 0 to 3 percent slopes	Holly	4	flood plains
CaaA	Califon loam, 0 to 3 percent slopes	Baile	3	depressions
CaaA	Califon loam, 0 to 3 percent slopes	Fluvaquents	3	flood plains
Ch	Chewacla silt loam	Wehadkee	5	flood plains
Cm	Codorus silt loam	Hatboro	8	flood plains

Cm	Codorus silt loam	Baile	3	depressions
Cn	Congaree silt loam	Holly	8	flood plains
GdB	Gladstone gravelly loam, 3 to 8 percent slopes	Cokesbury	3	depressions
GdC	Gladstone gravelly loam, 8 to 15 percent slopes	Cokesbury	5	depressions
GnA	Glenville silt loam 0 to 3 percent slopes	Baile	5	depressions
GnB	Glenville silt loam, 3 to 8 percent slopes	Baile	5	depressions
GnB2	Glenville silt loam, 3 to 8 percent slopes, moderately eroded	Worsham	7	depressions
Ha	Hatboro silt loam	Hatboro	95	flood plains
Ma	Made land, gravelly materials	Croton	1	depressions
Me	Made land, schist and gneiss materials	Hatboro	1	flood plains
Mf	Made land, sanitary land fill	Croton	2	depressions
MgB2	Manor loam, 3 to 8 percent slopes, moderately eroded	Hatboro	2	flood plains
MgC	Manor loam, 8 to 15 percent slopes	Hatboro	2	flood plains
Mn	Melvin silt loam	Melvin	85	flood plains
MoB2	Montalto channery silt loam, 3 to 8 percent slopes, moderately eroded	Watchung	5	depressions
NaD	Neshaminy gravelly silt loam, 15 to 25 percent slopes	Towhee	5	depressions
NsB	Neshaminy very stony silt loam, 0 to 8 percent slopes	Towhee, extremely stony	5	depressions

Hydric Soil List – Delaware County, Pennsylvania

NsD	Neshaminy very stony silt loam, 8 to 25 percent slopes	Towhee, extremely stony	3	depressions
NsF	Neshaminy very stony silt loam, 25 to 45 percent slopes	Towhee, extremely stony	3	depressions
OtA	Othello silt loam	Othello	90	terraces
OtA	Othello silt loam	Nanticoke	2	tidal flats
UrlB	Urban land-Gladstone complex, 0 to 8 percent slopes	Cokesbury	5	depressions
UrlD	Urban land-Gladstone complex, 8 to 25 percent slopes	Cokesbury	5	depressions
UugB	Urban land-Udorthents, schist and gneiss complex, 0 to 8 percent slopes	Baile	1	depressions
UugD	Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes	Baile	1	depressions
WaA	Watchung silt loam, 0 to 3 percent slopes	Watchung, silt loam	86	depressions
WaA	Watchung silt loam, 0 to 3 percent slopes	Towhee	9	depressions
WcB	Watchung very stony silt loam, 0 to 8 percent slopes	Watchung	85	depressions
WoA	Worsham silt loam, 0 to 3 percent slopes	Worsham	85	drainageways
WoB	Worsham silt loam, 3 to 8 percent slopes	Worsham	85	drainageways
WoB2	Worsham silt loam, 3 to 8 percent slopes, moderately eroded	Worsham	85	drainageways
WsB	Worsham very stony silt loam, 0 to 8 percent slopes	Worsham	85	drainageways
Modified from Hydric Soils of the United States (NRCS 2014)				

Appendix S2.A-3

Excerpts from the Wetland Functions & Values Assessment

SUNOCO PIPELINE L.P.

Pennsylvania Pipeline Project

Wetland Functions and Values Assessment

-Delaware County

Joint Permit Application for a

Pennsylvania Water Obstruction & Encroachment Permit and a U.S. Army Corps of Engineers Section 404 Permit Application

Revised October 2016

NOTE: This Wetland Functions & Values Assessment excerpts information relevant to the major permit modification for the Glen Riddle/SEPTA HDD and previously submitted information by Sunoco Pipeline L.P. as part of the approved PPP Chapter 105 Joint Permit (E23-524. APS 879354)]

TETRA TECH

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Attachment A – EV Wetland Highway Method Function and Value Evaluation Forms

Attachment B – Other Wetland Highway Method Function and Value Assessments

WETLAND FUNCTIONS AND VALUES ASSESSMENT

1.0 INTRODUCTION

Sunoco Pipeline's, L.P. (SPLP) is seeking Pennsylvania Department of Environmental Protection (PADEP) Chapter 105 Water Obstruction and Encroachment and U.S. Army Corps of Engineers (USACE) Section 404 permits to allow temporary impacts to aquatic resources associated with the installation and operation of the Pennsylvania Pipeline Project (Project). To support the Delaware County Joint Application, and in accordance with *25 Pa Code §105.13(e)(3)*, a wetland functions and values assessment is required and has been prepared for the proposed wetland impacts. The USACE Highway Methodology (USACE 1999) was chosen as the assessment method as it is generally acceptable to the PADEP and the USACE.

SPLP has been diligent in siting and designing the Project to avoid and minimize adverse effects to environmental resources located along the approximately 300-mile route. As part of the application materials, an in-depth alternatives analysis is presented to demonstrate these efforts. Within that alternatives analysis it is apparent that the highest quality wetlands on the Project area being avoided through reroutes and use of horizontal directional drill (HDD) technology. Direct impacts to almost all forested wetlands, the majority of scrub-shrub wetlands, and all federally listed endangered species occupied wetlands are avoided. The remaining impacted wetlands are often small, man-made, palustrine emergent, and limited to occurring within existing rights-of-way. This functions and values assessment provides further characterization of the impacted wetlands to assist the PADEP in its evaluation of the Chapter 105 application.

2.0 METHODS

As stated, the USACE Highway Methodology (USACE 1999) was chosen as the assessment method as it is generally acceptable to the PADEP and the USACE. In accordance with the method the eight functions and five values listed below were assessed for each impacted wetland. A Wetland Function-Value Evaluation Form is provided within the method's workbook and was used in the assessment of this Project's exceptional value (EV) wetlands. As first step, descriptor information on the wetland or wetland complex is provided within the header portion of the form and allows for information in respect to surround landscape as well as the impacts to be entered. As a second step, the suitability of the wetland to provide the function is assessed. Those determined to not provide the function or value or provide it at an insignificant level were considered not to be providing the function and "No" was checked. The rational for making the suitability decision and the considerations/qualifiers are then listed by code within the form in accordance with those listed in Table 1. Having a consideration/qualifier present did not automatically qualify the wetland as suitable for the function or value, but was a result of a combination of the presence and the evaluator's best professional judgment. Wetland delineation data sheets, pictures, topographical maps, soils maps, aerial maps, wetland and stream delineations, agency information (e.g., endangered species presence, designated exceptional value), other field survey information (e.g., threatened and endangered species), and best professional judgement were used during each evaluation. The third and final step, was to identify principle functions and values as those determined to be the most important. The objective of filling out the form is to document an unbiased record of the wetland, including

its location, function, appearance and relationship to its adjacent land use (USACE 1999). For non-exceptional value wetlands or "other wetlands" the same methodology was used but the results are presented in tabular format and lists only the principle functions provided.

GROUNDWATER RECHARGE/DISCHARGE — this function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where groundwater can be discharged to the surface.

FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.

FISH AND SHELLFISH HABITAT — This function considers the effectiveness of seasonal or permanent waterbodies associated with the wetland in question for fish and shellfish habitat.

SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens.

NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

PRODUCTION EXPORT (Nutrient) — This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms.

SEDIMENT/SHORELINE STABILIZATION — This function relates to the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.

WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/ or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.

RECREATION (Consumptive and Non-Consumptive) — This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive activities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland, whereas non-consumptive activities do not.

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

UNIQUENESS/HERITAGE — This value relates to the effectiveness of the wetland or its associated waterbodies to produce certain special values. Special values may include such things as archaeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geologic features.

VISUAL QUALITY/AESTHETICS — This value relates to the visual and aesthetic qualities of the wetland.

THREATENED or ENDANGERED SPECIES HABITAT — This value relates to the effectiveness of the wetland or associated waterbodies to support threatened or endangered species.

Table 1 – Function-Value Considerations/Qualifiers

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
Groundwater Recharge/Discharge	1. Public or private wells occur downstream of the wetland. 2. Potential exists for public or private wells downstream of the wetland. 3. Wetland is underlain by stratified drift. 4. Gravel or sandy soils present in or adjacent to the wetland. 5. Fragipan does not occur in the wetland. 6. Fragipan, impervious soils, or bedrock does occur in the wetland. 7. Wetland is associated with a perennial or intermittent watercourse. 8. Signs of groundwater recharge are present or piezometer data demonstrates recharge. 9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet. 10. Wetland contains only an outlet, no inlet. 11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards. 12. Quality of water associated with the wetland is high. 13. Signs of groundwater discharge are present (e.g., springs). 14. Water temperature suggests it is a discharge site. 15. Wetland shows signs of variable water levels. 16. Other
Floodflow Alteration	1. Area of this wetland is large relative to its watershed. 2. Wetland occurs in the upper portions of its watershed. 3. Effective flood storage is small or non-existent upslope of or above the wetland. 4. Wetland watershed contains a high percent of impervious surfaces. 5. Wetland contains hydric soils which are able to absorb and detain water. 6. Wetland exists in a relatively flat area that has flood storage potential. 7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions. 9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands. 10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse. 11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland. 12. The watershed has a history of economic loss due to flooding. 13. This wetland is associated with one or more watercourses. 14. This wetland watercourse is sinuous or diffuse. 15. This wetland outlet is constricted. 16. Channel flow velocity is affected by this wetland. 17. Land uses downstream are protected by this wetland. 18. This wetland contains a high density of vegetation. 19. Other
Fish and Shellfish Habitat	1. Forest land dominant in the watershed above this wetland. 2. Abundance of cover objects present. STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE 3. Size of this wetland is able to support large fish/shellfish populations. 4. Wetland is part of a larger, contiguous watercourse. 5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter. 6. Stream width (bank to bank) is more than 50 feet. 7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations. 8. Streamside vegetation provides shade for the watercourse. 9. Spawning areas are present (submerged vegetation or gravel beds). 10. Food is available to fish/shellfish populations within this wetland. 11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland. 12. Evidence of fish is present. 13. Wetland is stocked with fish. 14. The watercourse is persistent. 15. Man-made streams are absent. 16. Water velocities are not too excessive for fish usage. 17. Defined stream channel is present. 18. Other
Sediment/Toxicant/Pathogen Retention	1. Potential sources of excess sediment are in the watershed above the wetland. 2. Potential or known sources of toxicants are in the watershed above the wetland. 3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	4. Fine grained mineral or organic soils are present. 5. Long duration water retention time is present in this wetland. 6. Public or private water sources occur downstream. 7. The wetland edge is broad and intermittently aerobic. 8. The wetland is known to have existed for more than 50 years. 9. Drainage ditches have not been constructed in the wetland. STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE. 10. Wetland is associated with an intermittent or perennial stream or a lake. 11. Channelized flows have visible velocity decreases in the wetland. 12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present. 13. No indicators of erosive forces are present. No high water velocities are present. 14. Diffuse water flows are present in the wetland. 15. Wetland has a high degree of water and vegetation interspersion. 16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present. 17. Other
Nutrient Removal/Retention/Transformation	1. Wetland is large relative to the size of its watershed. 2. Deep water or open water habitat exists. 3. Overall potential for sediment trapping exists in the wetland. 4. Potential sources of excess nutrients are present in the watershed above the wetland. 5. Wetland saturated for most of the season. Ponded water is present in the wetland. 6. Deep organic/sediment deposits are present. 7. Slowly drained fine grained mineral or organic soils are present. 8. Dense vegetation is present. 9. Emergent vegetation and/or dense woody stems are dominant. 10. Opportunity for nutrient attenuation exists. 11. Vegetation diversity/abundance sufficient to utilize nutrients. STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE. 12. Waterflow through this wetland is diffuse. 13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation. 14. Water moves slowly through this wetland. 15. Other
Production Export (Nutrient)	1. Wildlife food sources grow within this wetland. 2. Detritus development is present within this wetland 3. Economically or commercially used products found in this wetland. 4. Evidence of wildlife use found within this wetland. 5. Higher trophic level consumers are utilizing this wetland. 6. Fish or shellfish develop or occur in this wetland. 7. High vegetation density is present. 8. Wetland exhibits high degree of plant community structure/species diversity.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	9. High aquatic vegetative diversity/abundance is present. 10. Nutrients exported in wetland watercourses (permanent outlet present). 11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland. 12. Wetland contains flowering plants that are used by nectar-gathering insects. 13. Indications of export are present. 14. High production levels occurring, however, no visible signs of export (assumes export is attenuated). 15. Other
Sediment/Shoreline Stabilization	1. Indications of erosion or siltation are present. 2. Topographical gradient is present in wetland. 3. Potential sediment sources are present up-slope. 4. Potential sediment sources are present upstream. 5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland. 6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout. 7. Wide wetland (>10') borders watercourse, lake, or pond. 8. High flow velocities in the wetland. 9. The watershed is of sufficient size to produce channelized flow. 10. Open water fetch is present. 11. Boating activity is present. 12. Dense vegetation is bordering watercourse, lake, or pond. 13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond. 14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet). 15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events. 16. Other
Wildlife Habitat	1. Wetland is not degraded by human activity. 2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards. 3. Wetland is not fragmented by development. 4. Upland surrounding this wetland is undeveloped. 5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width. 6. Wetland is contiguous with other wetland systems connected by a watercourse or lake. 7. Wildlife overland access to other wetlands is present. 8. Wildlife food sources are within this wetland or are nearby. 9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	10. Two or more islands or inclusions of upland within the wetland are present. 11. Dominant wetland class includes deep or shallow marsh or wooded swamp. 12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present. 13. Density of the wetland vegetation is high. 14. Wetland exhibits a high degree of plant species diversity. 15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/ shrub/vine/grasses/mosses) 16. Plant/animal indicator species are present. (List species for project) 17. Animal signs observed (tracks, scats, nesting areas, etc.) 18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons. 19. Wetland contains or has potential to contain a high population of insects. 20. Wetland contains or has potential to contain large amphibian populations. 21. Wetland has a high avian utilization or it's potential. 22. Indications of less disturbance-tolerant species are present. 23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources,
Recreation	1. Wetland is part of a recreation area, park, forest, or refuge. 2. Fishing is available within or from the wetland. 3. Hunting is permitted in the wetland. 4. Hiking occurs or has potential to occur within the wetland. 5. Wetland is a valuable wildlife habitat. 6. The watercourse, pond, or lake associated with the wetland is unpolluted. 7. High visual/aesthetic quality of this potential recreation site. 8. Access to water is available at this potential recreation site for boating, canoeing, or fishing. 9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating. 10. Off-road public parking available at the potential recreation site. 11. Accessibility and travel ease is present at this site. 12. The wetland is within a short drive or safe walk from highly populated public and private areas. 13. Other
Education/Scientific Value	1. Wetland contains or is known to contain threatened, rare, or endangered species. 2. Little or no disturbance is occurring in this wetland. 3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible. 4. Potential educational site is undisturbed and natural.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	5. Wetland is considered to be a valuable wildlife habitat. 6. Wetland is located within a nature preserve or wildlife management area. 7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.). 8. Off-road parking at potential educational site suitable for school bus access in or near wetland. 9. Potential educational site is within safe walking distance or a short drive to schools. 10. Potential educational site is within safe walking distance to other plant communities. 11. Direct access to perennial stream at potential educational site is available. 12. Direct access to pond or lake at potential educational site is available. 13. No known safety hazards exist within the potential educational site. 14. Public access to the potential educational site is controlled. 15. Handicap accessibility is available. 16. Site is currently used for educational or scientific purposes. 17. Other
Uniqueness/Heritage	1. Upland surrounding wetland is primarily urban. 2. Upland surrounding wetland is developing rapidly. 3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands. 4. Three or more wetland classes are present. 5. Deep and/or shallow marsh or wooded swamp dominate. 6. High degree of interspersion of vegetation and/or open water occur in this wetland. 7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland. 8. Potential educational site is within a short drive or a safe walk from schools. 9. Off-road parking at potential educational site is suitable for school buses. 10. No known safety hazards exist within this potential educational site. 11. Direct access to perennial stream or lake exists at potential educational site. 12. Two or more wetland classes are visible from primary viewing locations. 13. Low-growing wetlands (marshes, scrub-shrub, bogs, and open water) are visible from primary viewing locations. 14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations. 15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons. 16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed. 17. Overall view of the wetland is available from the surrounding upland. 18. Quality of the water associated with the wetland is high. 19. Opportunities for wildlife observations are available.

FUNCTION/VALUE	CONSIDERATIONS/QUALIFIERS
	20. Historical buildings are found within the wetland. 21. Presence of pond or pond site and remains of a dam occur within the wetland. 22. Wetland is within 50 yards of the nearest perennial watercourse. 23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland. 24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species. 25. Wetland is known to be a study site for scientific research. 26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community. 27. Wetland has local significance because it serves several functional values. 28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique. 29. Wetland is known to contain an important archaeological site. 30. Wetland is hydrologically connected to a state or federally designated scenic river. 31. Wetland is located in an area experiencing a high wetland loss rate. 32. Other
Visual Quality/Aesthetics	1. Multiple wetland classes are visible from primary viewing locations. 2. Emergent marsh and/or open water are visible from primary viewing locations. 3. A diversity of vegetative species is visible from primary viewing locations. 4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons. 5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations. 6. Visible surrounding land use form contrasts with wetland. 7. Wetland views absent of trash, debris, and signs of disturbance. 8. Wetland is considered to be a valuable wildlife habitat. 9. Wetland is easily accessed. 10. Low noise level at primary viewing locations. 11. Unpleasant odors absent at primary viewing locations. 12. Relatively unobstructed sight line exists through wetland. 13. Other
Endangered Species Habitat	1. Wetland contains or is known to contain threatened or endangered species. 2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.

3.0 RESULTS AND IMPACT ASSESSMENT

The Project crosses a total of 3 exceptional value wetlands in Delaware County. The Wetland Function-Value Evaluation Form is filled out for each of these wetlands and is located in Attachment A. For the non-exceptional value wetlands, the assessment is provided in Tabular format and is located in Attachment B. Please see the Alternative Analysis part of the application, specifically prepared in accordance with Title 25 of the Pennsylvania Code 105.18a(a), to demonstrate that the Project has avoided impacts to aquatic resources to the maximum extent practicable and has been designed to avoid significant adverse impact on wetlands, either through aerial extent or impacts on wetland function and values.

The Project crosses 3 exceptional value wetlands and 6 other wetlands in Delaware County. Wetland impacts associated with the Project are temporary, and original grades and hydrology will be restored. Wetland functions and values, including exceptional value wetlands, will not be significantly altered. Those wetlands crossed by an HDD have already implemented measures to reduce the potential for inadvertent return through design phase geotechnical study and careful drill alignment planning. No surface impact or function and value impact to these drilled wetlands is expected as a result of the Project. During drill operation an inadvertent return contingency plan will be implemented at all times to further reduce the potential for impacts to wetlands or the functions and values provided.

Extra precautions are taken at each wetland to protect functions and values. Before construction begins, all Project workspaces are surveyed and marked including wetland boundaries. During construction these areas are inspected often to ensure these limits are adhered too. This ensures that only permitted wetland disturbances occur. Limiting the disturbance level to the authorized and minimum amount practicable significantly reduces the potential for unplanned impacts to functions and values.

The Project will be constructed under a PADEP Chapter 102 Erosion and Sediment Control General Permit authorization. This authorization, provides for the construction sequence and requires the installation of BMPs to protect the wetland during and post-construction. The BMPs are derived directly from PADEP manuals and are designed to protect aquatic resource function and value. For example, the installation of trench breakers at wetland entry and exit points is designed to protect wetland hydrology and maintain preconstruction groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, and production export when these functions are present. The erosion and control permit will also stipulate top-soil separation in non-saturated wetlands to ensure proper restoration of the native seedbank. In addition, permit authorizations will require monitoring and that monitoring will establish criteria for contour, hydrology, and vegetation restoration. This monitoring and required agency reporting will further ensure functions and values are not lost.

Stream bed and banks are required to be restored to stabilized condition, and as a result, for wetlands directly abutting stream banks the sediment/shoreline stabilization function is expected to remain unchanged. Fish and shellfish habitat is often degraded as a result of undue sedimentation at Project areas or within downstream waters. The implementation of dry crossing methods at all flowing streams, reduces during construction sedimentation impacts and restoration of stream beds and banks after installation further protects adjacent wetlands and downstream waters. In addition, stream bed substrate is required to be separated and restored to protect important fish spawning habitat. Most streams will be traversed

(trenched and backfilled) within 24 hours to reduce exposure to Project activities and unforeseen weather events.

Although many impacts are avoided and minimized, some functions and values would be temporarily affected by construction of the Project. All noted functions and values may be temporarily lost during construction as in the case of very small wetlands completely impacted by Project activities. However, these smaller wetlands often do not provide principal functions, unless an endangered species or unique/heritage value is noted. Large wetlands extending beyond the Project boundaries would still continue to provide the noted functions and values during construction as the impact area relative to the size of the wetland is minor. Several wetlands are noted as providing the wildlife habitat function. While temporary, short-term impacts may be unavoidable to non-mobile wildlife occupying these wetlands, the wetland will be restored and re-occupation is expected by the general wildlife community. More mobile species are expected to occupy adjacent habitats and all sensitive species occupied wetlands have been avoided through re-routes or Project design (e.g., HDD).

In summary, the exceptional value and other wetlands impacted provide functions and values at varying levels. SPLP has taken great steps to avoid and minimize wetland impacts across Delaware County. Permanent and temporary wetland impacts are based on PADEP definitions. Permanent impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway. Although PADEP defines operation and maintenance activities as permanent impacts, all wetlands affected by the Project will be restored to pre-construction conditions including the presence of wetland soils, hydrology, and hydrophytic vegetation. In addition, the Project does not involve any permanent fill and there will be no permanent loss of wetland area associated with the Project. SPLP will not maintain the ROW through wetland areas (i.e., no mowing); therefore, the pre- and post-construction conditions of the wetland areas will be the same, except for a nominal areal extent of forested wetland that will be converted to emergent wetland.

Temporary impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into the floodway.

Given the PADEP permanent and temporary impact definitions, Permanent ROW impacts total 0.455 acre and temporary impacts total 0.830 acre for the 11.5 miles of construction ROW located in Delaware County. These impacts include no cover type conversion in forested wetlands. As indicated in Attachment B, wetlands affected by the Project lack several of the 13 functions and values and are of low value. Impacts are not only small-scale, but also are minimal in nature with respect to functions and values. Impacts to functions and values will be temporary, especially given restoration will occur immediately following construction and revegetation of wetlands will occur within the first growing season.

4.0 REFERENCES

USACE. 1999. The Highway Methodology Workbook Supplemental. US Army Corps of Engineers New England Division. 39 pp. NAEEP-360-1-30a.

Attachment A

Wetland Function-Value Evaluation Form

Total area of wetland >3.0 ac Human made? No Is wetland part of a wildlife corridor? Yes or a "habitat island"? No

Adjacent land use Residential, Gas pipeline ROW, Riparian Forest Distance to nearest roadway or other development 0 ft.

Dominant wetland systems present PEM, PFO Contiguous undeveloped buffer zone present no

Is the wetland a separate hydraulic system? No If not, where does the wetland lie in the drainage basin? Lower

How many tributaries contribute to the wetland? 2 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. W-I1

Latitude 39.894491 Longitude -75.431984

Prepared by: KMM Date 10/18/2016

Wetland Impact:

See General Permit Table

Evaluation based on:

Office ✔ Field

Corps manual wetland delineation completed? Y ✔ N

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	✔		1, 2, 4, 5, 7, 8, 15	✔	Connected Tributary to a known Public Water Supply.
Floodflow Alteration	✔		4, 5, 6, 7, 8, 9, 10,13	✔	Connected Tributary to a known Public Water Supply.
Fish and Shellfish Habitat		✔			
Sediment/Toxicant Retention	✔		1, 2, 4, 5, 6, 9, 10	✔	Connected Tributary to a known Public Water Supply.
Nutrient Removal	✔		4, 5, 7		
Production Export		✔	1, 2		
Sediment/Shoreline Stabilization	✔		1, 3, 4, 6, 9		
Wildlife Habitat	✔		6, 7, 8		
Recreation		✔			
Educational/Scientific Value		✔			
Uniqueness/Heritage		✔			
Visual Quality/Aesthetics		✔			
ES Endangered Species Habitat		✔			
Other					

Notes: Evaluation based on delineated wetland within a 200-foot study corridor.

* Refer to backup list of numbered considerations.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-I1 PEM

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	✔	FAC
2. Fraxinus pennsylvanica	10	✔	FACW
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	35	✔	FAC
2. Scirpus atrovirens	30	✔	OBL
3. Juncus effusus	20	✔	FACW
4. Phalaris arundinacea	10		FACW
5. Boehmeria cylindrica	5		FACW
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Trees located in the middle of the R.O.W.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-I1 PFO (1)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	30	✔	FAC
2. Fraxinus pennsylvanica	25	✔	FACW
3. Platanus occidentalis	5		FACW
4. Ulmus rubra	5		FAC
5.			
6.			
7.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	10	✔	FACW
2. Lonicera tatarica	10	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Herb Stratum (Plot size: 5')			
1. Phragmites australis	70	✔	FACW
2. Carex vulpinoidea	10		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W-I1 PFO (2)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	40	✔	FAC
2. Fraxinus pennsylvanica	20	✔	FACW
3. Ulmus rubra	20	✔	FAC
4. Platanus occidentalis	10		FACW
5.			
6.			
7.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	15	✔	FACW
2. Lonicera tatarica	10	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	10	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Appendix S2.A-4

Notification Letter sent to Aqua PA

Baird, Josh

From: TrackingUpdates@fedex.com
Sent: Monday, March 18, 2019 1:55 PM
To: Baird, Josh
Subject: FedEx Shipment 774729271497 Notification

This shipment is scheduled to be sent on 03/18/2019.

See "Preparing for Delivery" for helpful tips

Tracking # 774729271497

Anticipated ship date:
Mon, 3/18/2019

JOSH BAIRD
TETRA TECH - HOME
Buffalo, NY 14203
US

Initiated

Scheduled delivery:
Tue, 3/19/2019 by 10:30 am

Curt Steffy
Aqua Pennsylvania, Inc.
762 W. Lancaster Avenue
BRYN MAWR, PA 19010
US

Shipment Facts

Tracking number:	774729271497
Reference:	212IC-BF-00037, 600
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	0.50 lb.
Special handling/Services:	Deliver Weekday

Preparing for Delivery

To help ensure successful delivery of your shipment, please review the below.

Won't be in?

You may be able to hold your delivery at a convenient FedEx World Service Center or FedEx Office location for pick up. Track your shipment to determine Hold at FedEx location availability.

TETRA TECH

March 18, 2019

VIA OVERNIGHT FEDEX TRACKING #: 7747 2927 1497

Mr. Curt Steffy
Vice President, Production
Aqua Pennsylvania, Inc.
762 W. Lancaster Avenue
Bryn Mawr, PA 19010

Reference: Sunoco Pipeline L.P. – Pennsylvania Pipeline Project
HDD # PA-DE-0100.0000-RR (S3-0620) Modification
Public Water Supply Coordination

Dear Mr. Steffy:

On behalf of Sunoco Pipeline L.P. (SPLP), Tetra Tech would like to inform you of SPLP's proposed modifications to the construction methodology for the installation of the second pipeline associated with Phase II of the Mariner East Pipeline Project. The Stipulated Order issued under Environmental Hearing Board Docket No. 2017-009-L requires SPLP to reevaluate the installation method and design of the second pipeline where installation of the first pipeline utilizing horizontal direction drill (HDD) installation methods experienced an inadvertent return (IR) of drilling fluid to the surface. As you are aware from previous correspondence, several IRs occurred during installation of the first pipe at SPLP's PA-DE-0100.0000-RRHDD site; therefore, the installation of the second pipe at this location requires reevaluation.

SPLP has completed the required reevaluation, and based on the conclusions of that reevaluation, SPLP proposes to replace the HDD installation method with a series of conventional open cuts, and auger bores under Riddlewood Drive, Southeast PA Transportation Authorities' s Railroad, and Glen Riddle Road. This redesign will not require drilling fluid during construction and will therefore eliminate the chance of an IR occurrence. The proposed change is considered a major modification to the erosion and sedimentation and water crossing permits originally issued by the Pennsylvania Department of Environmental Protection (PADEP).

As part of the PADEP major modification process, and due to the proximity of Aqua PA's Chester Creek intake to this site, we and SPLP respectfully request your review of the proposed modification as it relates to your Public Water Supply (PWS) source(s) and/or facility(s) and assess any potential impacts to the PWS. If you require additional information and/or consultation pertaining to the Project, please contact Joshua Baird using the contact info listed below.

The following attachments are included for your review:

- *Site Map showing the location of the proposed pipeline modification*

If you have further questions or require additional information, please do not hesitate to contact me at (716) 849-9419 or via email at Josh.Baird@TetraTech.com .

Thank you for your timely response to this matter.

Sincerely,

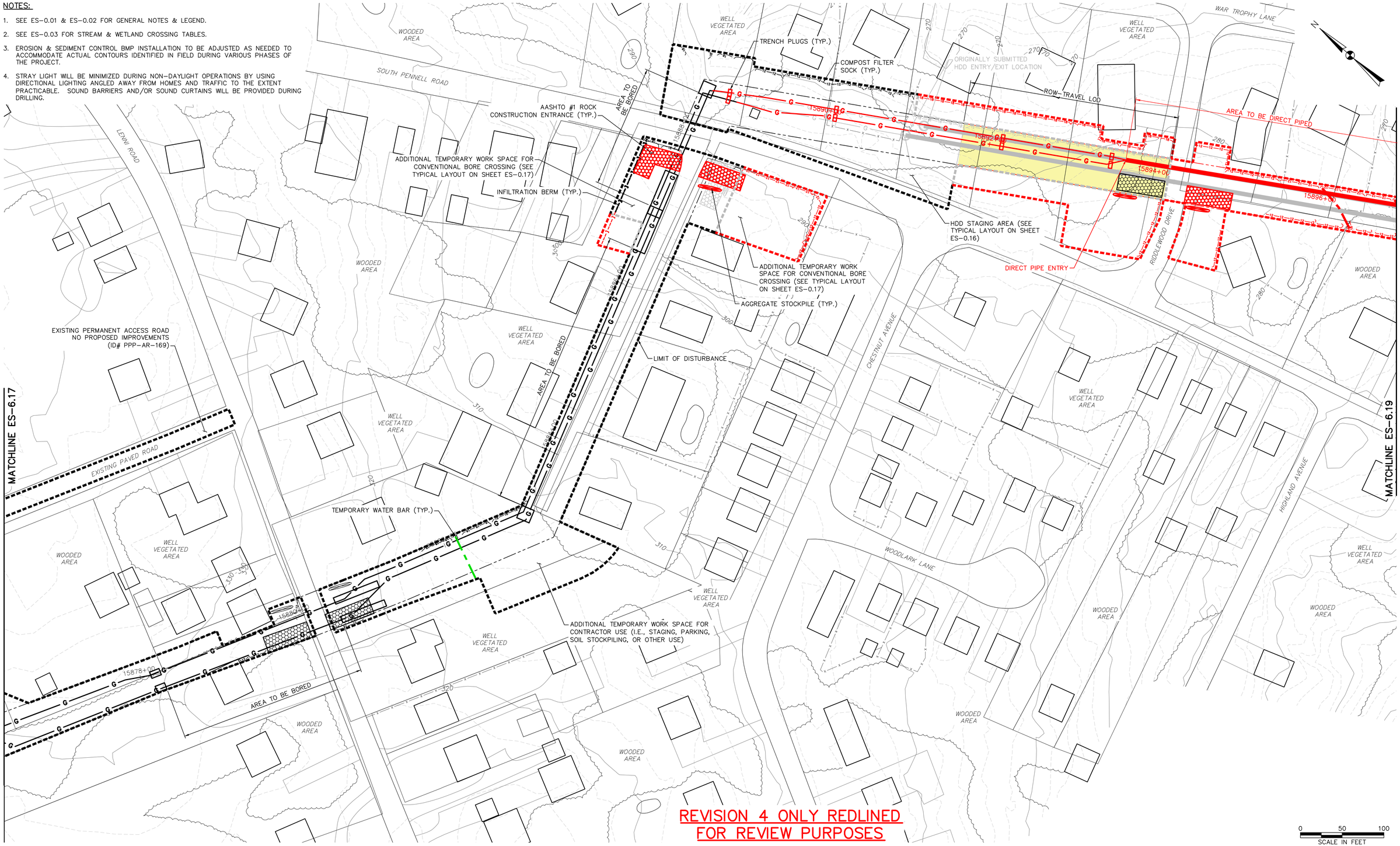
Joshua S. Baird
Tetra Tech, Inc.

Enclosures: Site Map

Tetra Tech, Inc.
301 Ellicott Street, Buffalo, New York 14203
Tel 716.849.9419 Fax 716.849.9420 tetratech.com

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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.



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TETRA TECH
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661 ANDERSEN DRIVE – FOSTER PLAZA 7
PITTSBURGH, PA 15220
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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	8/16/18	16" HDD MODIFICATION
4	RS	3/11/19	HDD CONVERTED TO DIRECT PIPE. ADDITIONAL LOD ADDED

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 18 OF 35

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

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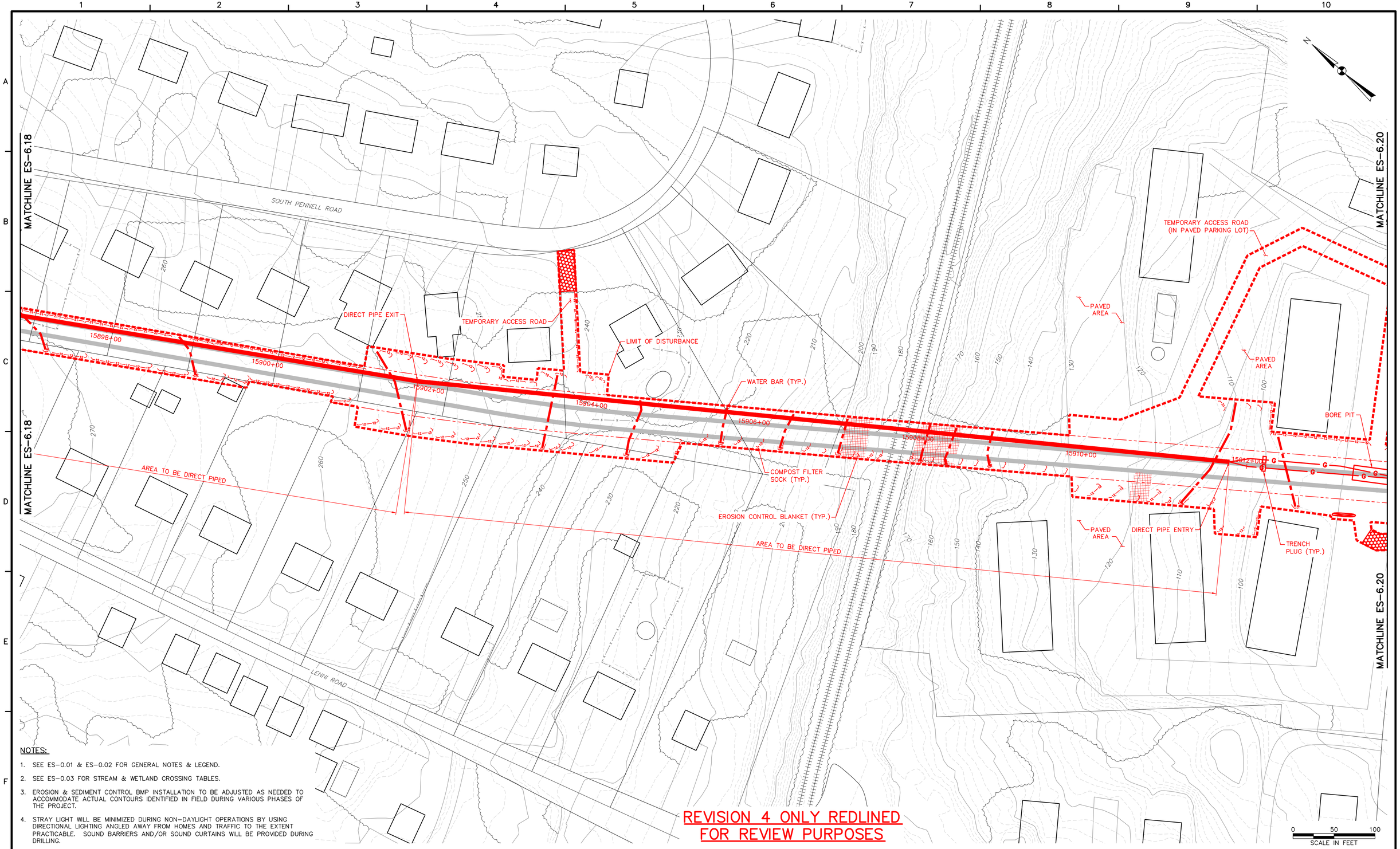
ES-6.18
SHEET 6.18 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\18 - Delaware\E&S\Drill 620 - Option 2\E&S\5958ES006.18 (2).dwg PIT NICHOLE.NAJESKI 3/11/2019 9:29:23 AM



NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
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SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 19 OF 35

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

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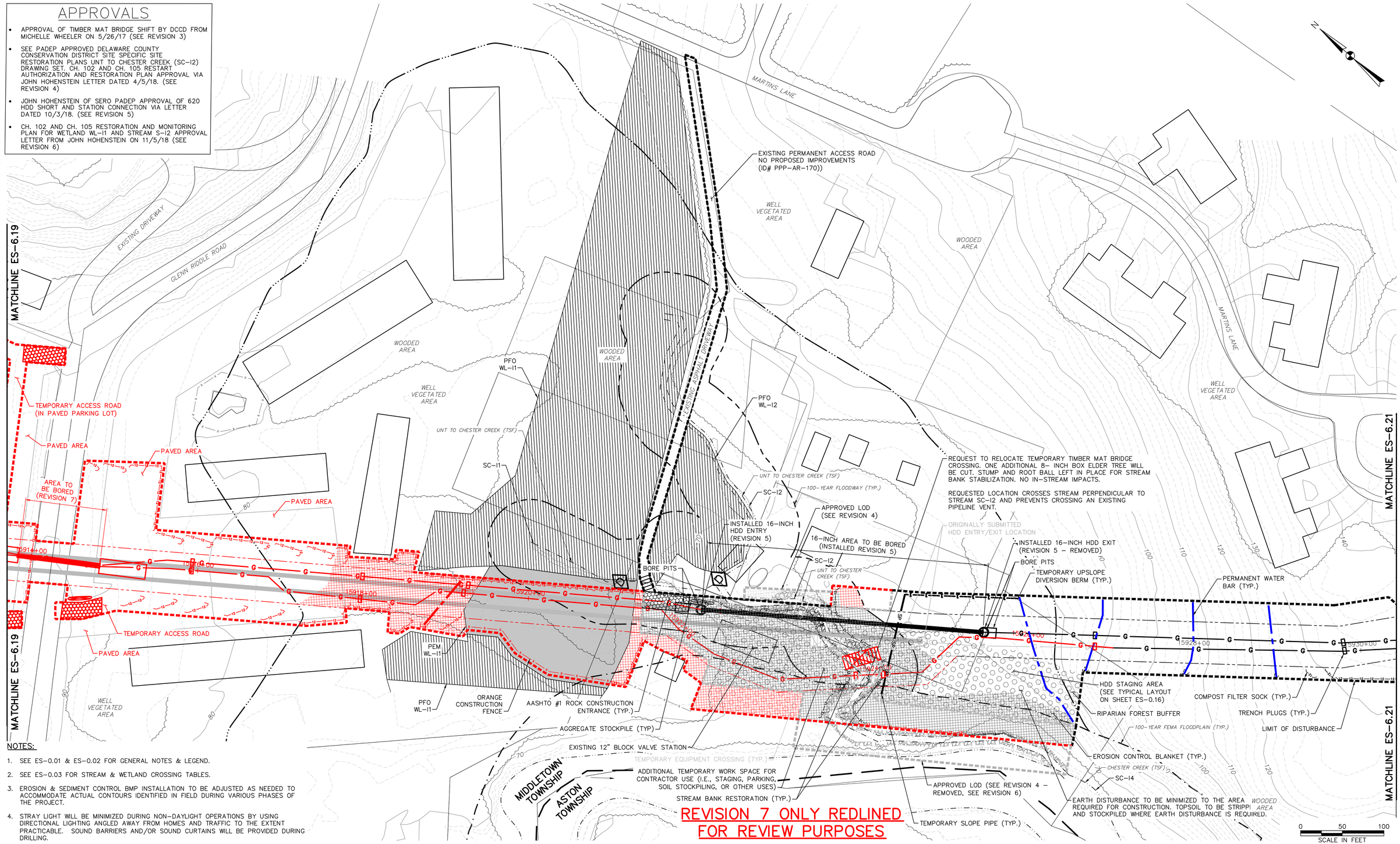
ES-6.19
SHEET 6.19 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\18 - Delaware\E&S\Drill 620 - Option 2\E&S\5958ES006.19 (2).dwg PIT NICHOLE.NAJESKI 3/11/2019 9:41:28 AM

APPROVALS

- APPROVAL OF TIMBER MAT BRIDGE SHIFT BY DCCD FROM MICHELLE WHEELER ON 5/26/17 (SEE REVISION 3)
- SEE PADEP APPROVED DELAWARE COUNTY CONSERVATION DISTRICT SITE SPECIFIC SITE RESTORATION PLANS UNT TO CHESTER CREEK (SC-I2) DRAWING SET. CH. 102 AND CH. 105 RESTART AUTHORIZATION AND RESTORATION PLAN APPROVAL VIA JOHN HOHENSTEIN LETTER DATED 4/5/18. (SEE REVISION 4)
- JOHN HOHENSTEIN OF SERO PADEP APPROVAL OF 620 HDD SHORT AND STATION CONNECTION VIA LETTER DATED 10/3/18. (SEE REVISION 5)
- CH. 102 AND CH. 105 RESTORATION AND MONITORING PLAN FOR WETLAND WL-I1 AND STREAM S-I2 APPROVAL LETTER FROM JOHN HOHENSTEIN ON 11/5/18 (SEE REVISION 6)



REVISION 7 ONLY REDLINED FOR REVIEW PURPOSES

NOTES:

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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.
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NO.	BY	DATE	REMARKS
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2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	5/26/17	TIMBER BRIDGE SHIFT
4	RS	1/31/18	ADDITIONAL LOD AND E&S CONTROLS ADDED-SEE SITE SPECIFIC DRAWING SET
5	RS	8/16/18	16" HDD MODIFICATION AND BYPASS CONNECTION
6	RS	9/1/18	WETLAND AND STREAM RESTORATION UPDATE
7	RS	2/8/19	HDD CONVERTED TO CONVENTIONAL BORES & OPEN TRENCH. ADDITIONAL LOD ADDED

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 20 OF 35

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

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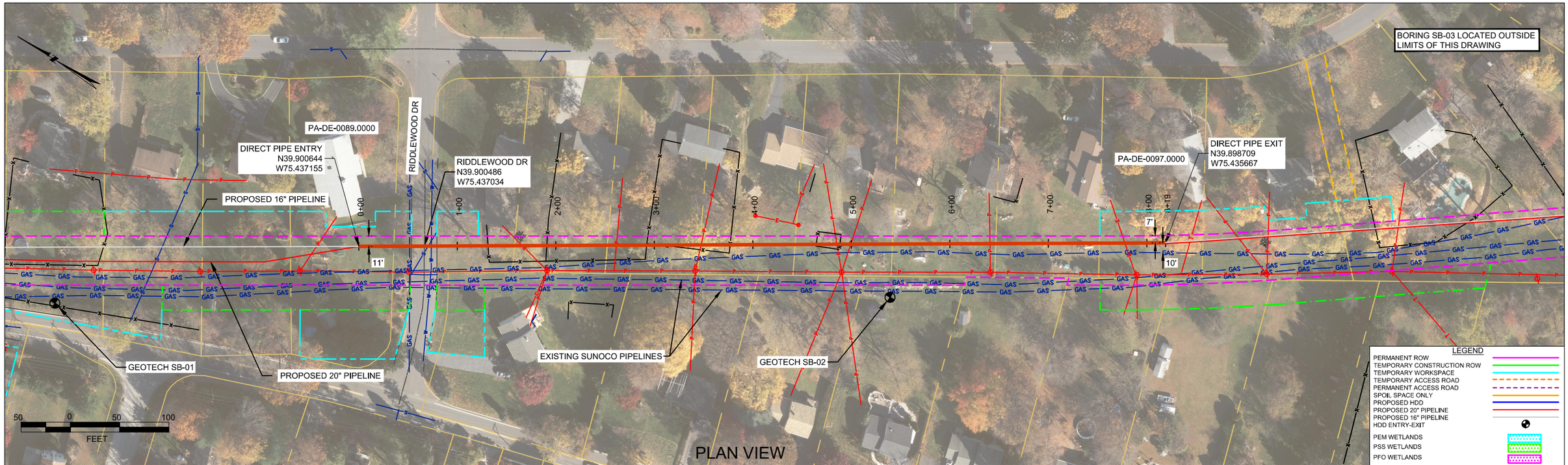
ES-6.20
SHEET 6.20 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\18 - Delaware\E&S\Drill 620 - Option 2\E&S\5958ES006.20 (2).dwg PIT NICHOLE.NAJESKI 3/11/2019 9:41:24 AM

ATTACHMENT D

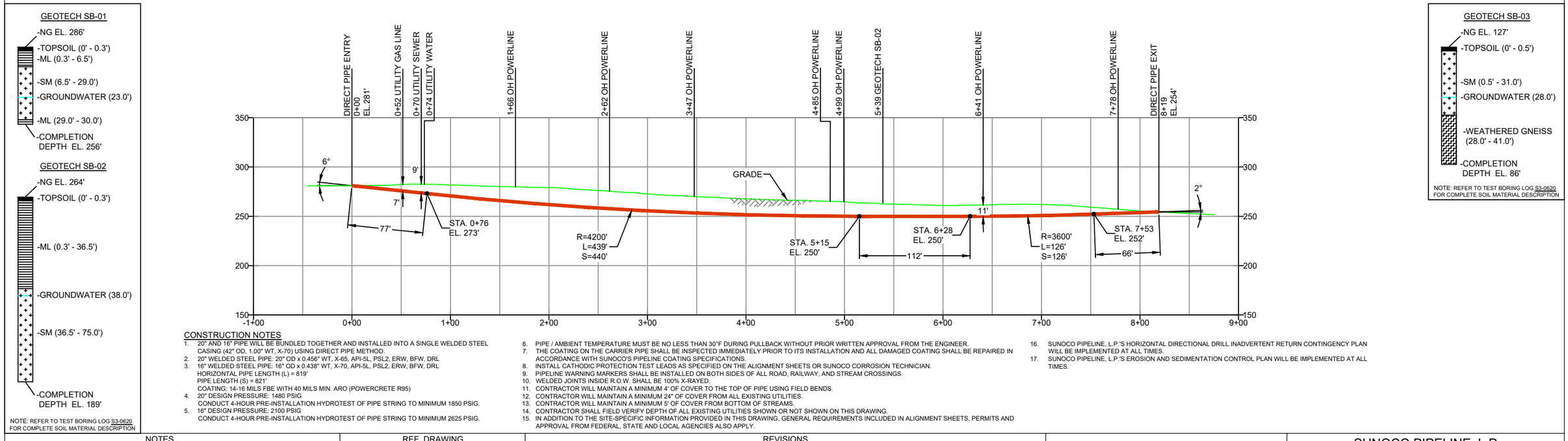
Applicable 102 Drawings
(E&S and Restoration)



PLAN VIEW

DELAWARE COUNTY, PENNSYLVANIA - UPPER CHICHESTER TOWNSHIP

PROFILE VIEW



CONSTRUCTION NOTES

1. 20" AND 16" PIPE WILL BE BUNDLED TOGETHER AND INSTALLED INTO A SINGLE WELDED STEEL CASING (42" OD, 1.00" WT, X-70) USING DIRECT PIPE METHOD.
2. 20" WELDED STEEL PIPE: 20" OD x 0.456" WT, X-65, API-5L, PSL2, ERW, BFW, DRL
3. 16" WELDED STEEL PIPE: 16" OD x 0.438" WT, X-70, API-5L, PSL2, ERW, BFW, DRL
   HORIZONTAL PIPE LENGTH (L) = 819'
   PIPE LENGTH (S) = 821'
   COATING: 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCRETE R95)
4. 20" DESIGN PRESSURE: 1480 PSIG
   CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF PIPE STRING TO MINIMUM 1850 PSIG.
5. 16" DESIGN PRESSURE: 2100 PSIG
   CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF PIPE STRING TO MINIMUM 2625 PSIG.
6. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
7. 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.
8. INSTALL CATHODIC PROTECTION TEST LEADS AS SPECIFIED ON THE ALIGNMENT SHEETS OR SUNOCO CORROSION TECHNICIAN.
9. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
10. WELDED JOINTS INSIDE R.O.W. SHALL BE 100% X-RAYED.
11. CONTRACTOR WILL MAINTAIN A MINIMUM 4' OF COVER TO THE TOP OF PIPE USING FIELD BENDS.
12. CONTRACTOR WILL MAINTAIN A MINIMUM 24" OF COVER FROM ALL EXISTING UTILITIES.
13. CONTRACTOR WILL MAINTAIN A MINIMUM 5' OF COVER FROM BOTTOM OF STREAMS.
14. CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
15. 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.
16. SUNOCO PIPELINE, L.P.'S HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN CONTINGENCY PLAN WILL BE IMPLEMENTED AT ALL TIMES.
17. 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-6.18	TO	ES-6.20	EROSION & SEDIMENT PLAN
SHEET 12	TO	SHEET 13	AERIAL SITE PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
0	ISSUED FOR CONSTRUCTION	MRS	03/08/19	RMB	03/08/19	AMC	03/08/19

Sunoco Logistics Partners L.P.

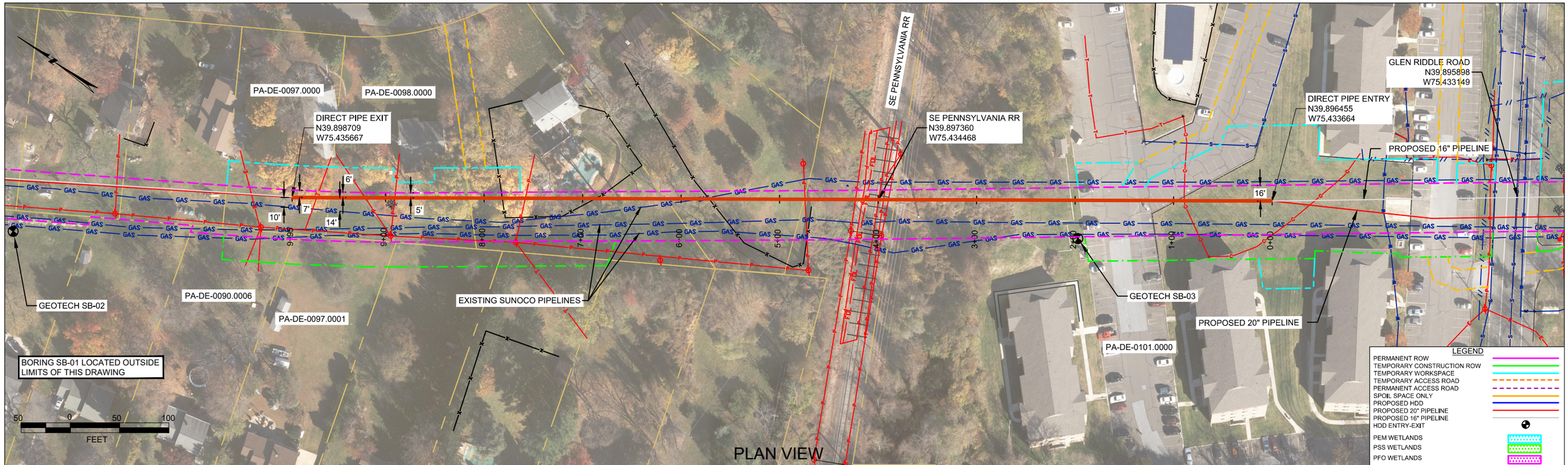
TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

DIRECT PIPE
RIDDLEWOOD DR
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=100'

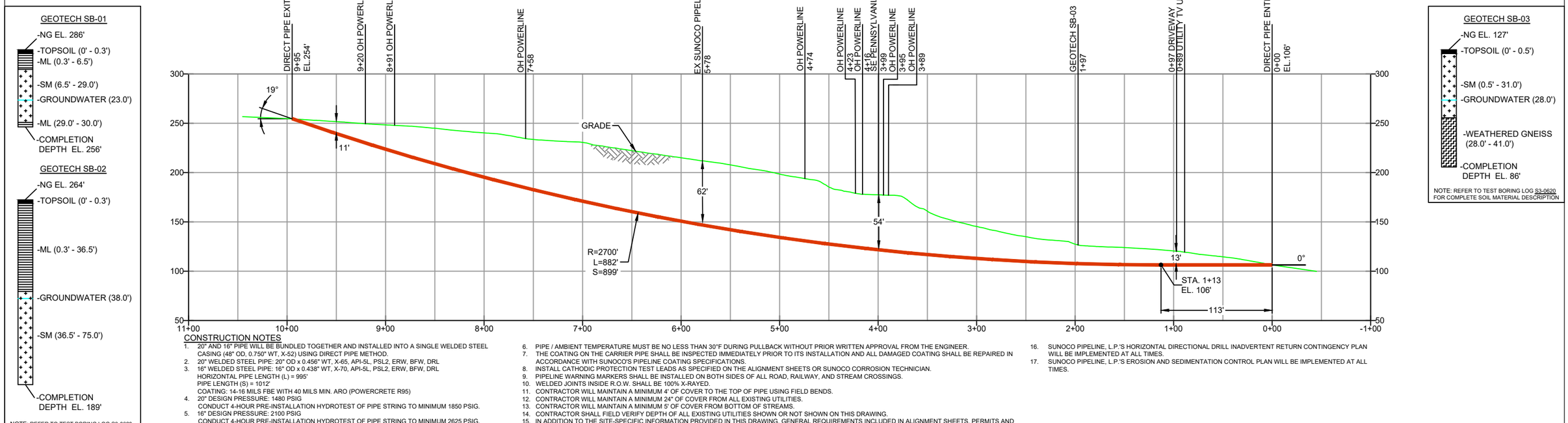
DWG. NO: PA-DE-0089.0000-RD



PLAN VIEW

DELAWARE COUNTY, PENNSYLVANIA - UPPER CHICHESTER TOWNSHIP

PROFILE VIEW



CONSTRUCTION NOTES

1. 20" AND 16" PIPE WILL BE BUNDLED TOGETHER AND INSTALLED INTO A SINGLE WELDED STEEL CASING (48" OD. 0.750" WT, X-52) USING DIRECT PIPE METHOD.
2. 20" WELDED STEEL PIPE: 20" OD x 0.456" WT, X-65, API-5L, PSL2, ERW, BFW, DRL
3. 16" WELDED STEEL PIPE: 16" OD x 0.438" WT, X-70, API-5L, PSL2, ERW, BFW, DRL
   HORIZONTAL PIPE LENGTH (L) = 995'
   PIPE LENGTH (S) = 1012'
   COATING: 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCRETE R95)
4. 20" DESIGN PRESSURE: 1480 PSIG
   CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF PIPE STRING TO MINIMUM 1850 PSIG.
5. 16" DESIGN PRESSURE: 2100 PSIG
   CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF PIPE STRING TO MINIMUM 2625 PSIG.
6. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
7. 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.
8. INSTALL CATHODIC PROTECTION TEST LEADS AS SPECIFIED ON THE ALIGNMENT SHEETS OR SUNOCO CORROSION TECHNICIAN.
9. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
10. WELDED JOINTS INSIDE R.O.W. SHALL BE 100% X-RAYED.
11. CONTRACTOR WILL MAINTAIN A MINIMUM 4' OF COVER TO THE TOP OF PIPE USING FIELD BENDS.
12. CONTRACTOR WILL MAINTAIN A MINIMUM 24" OF COVER FROM ALL EXISTING UTILITIES.
13. CONTRACTOR WILL MAINTAIN A MINIMUM 5' OF COVER FROM BOTTOM OF STREAMS.
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NOTES

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5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING

DWG NO		DWG NO	DESCRIPTION
ES-6.18	TO	ES-6.20	EROSION & SEDIMENT PLAN
SHEET 12	TO	SHEET 13	AERIAL SITE PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
0	ISSUED FOR CONSTRUCTION	MRS	03/08/19	RMB	03/08/19	AMC	03/08/19

Sunoco Logistics Partners L.P.

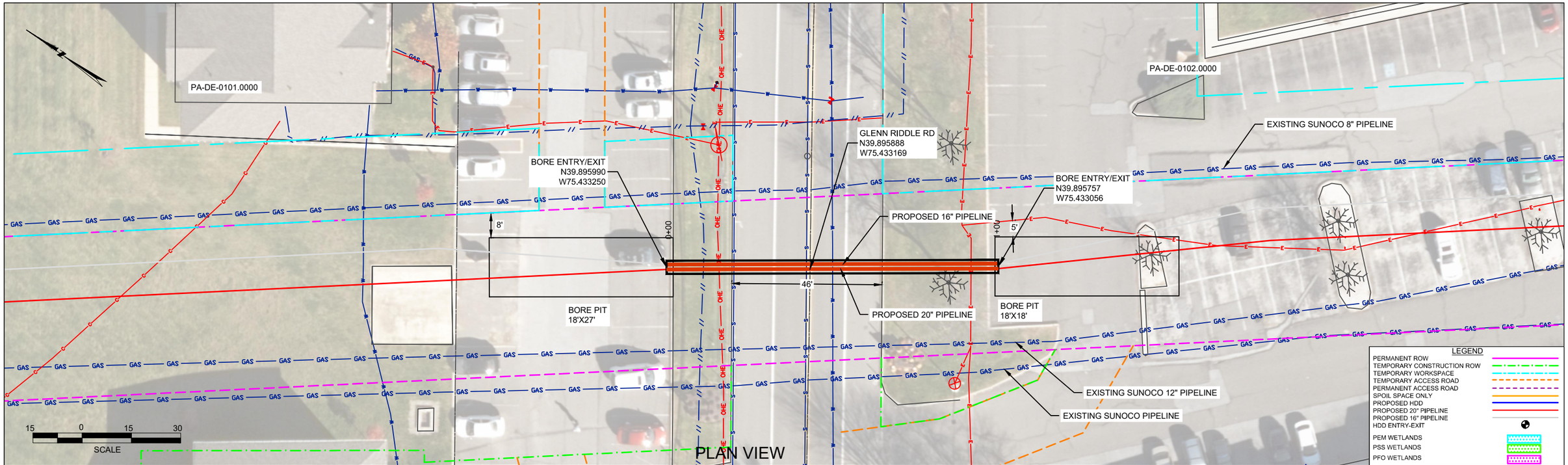
TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

DIRECT PIPE
SEPTA RAILROAD
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=100'

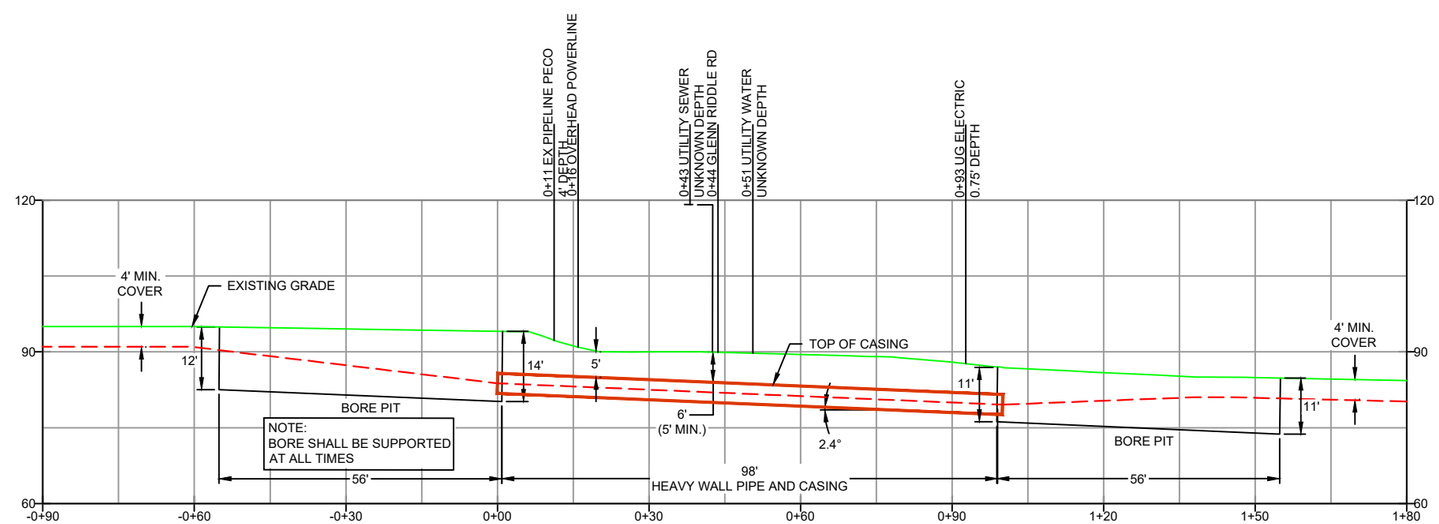
DWG. NO: PA-DE-0100.0000-RR



PLAN VIEW

DELAWARE COUNTY, PENNSYLVANIA - UPPER CHICHESTER 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) = 98'
   PIPE LENGTH (S) = 98'
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.
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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.
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5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING

DWG NO		DWG NO	DESCRIPTION
ES-6.18	TO	ES-6.18	EROSION & SEDIMENT PLAN
SHEET 12	TO	SHEET 12	AERIAL SITE PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
0	ISSUED FOR CONSTRUCTION	LKR	02/11/19	RMB	02/11/19	AMC	02/11/19

Sunoco Logistics Partners L.P.

TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

AUGER BORE (CASED)
GLENN RIDDLE DRIVE
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=30'

DWG. NO.: PA-DE-0101.0000-RD

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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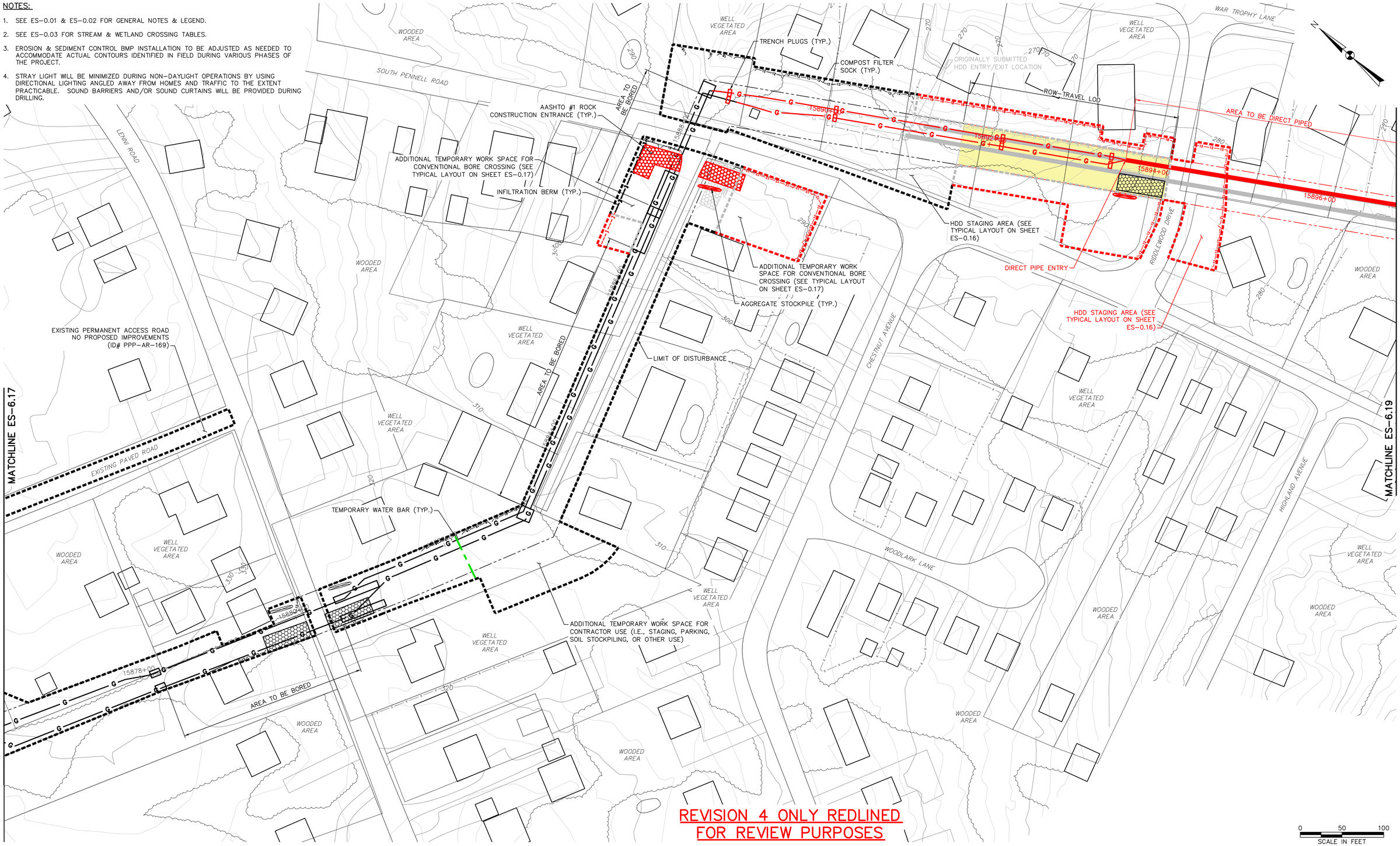

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SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 18 OF 35

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
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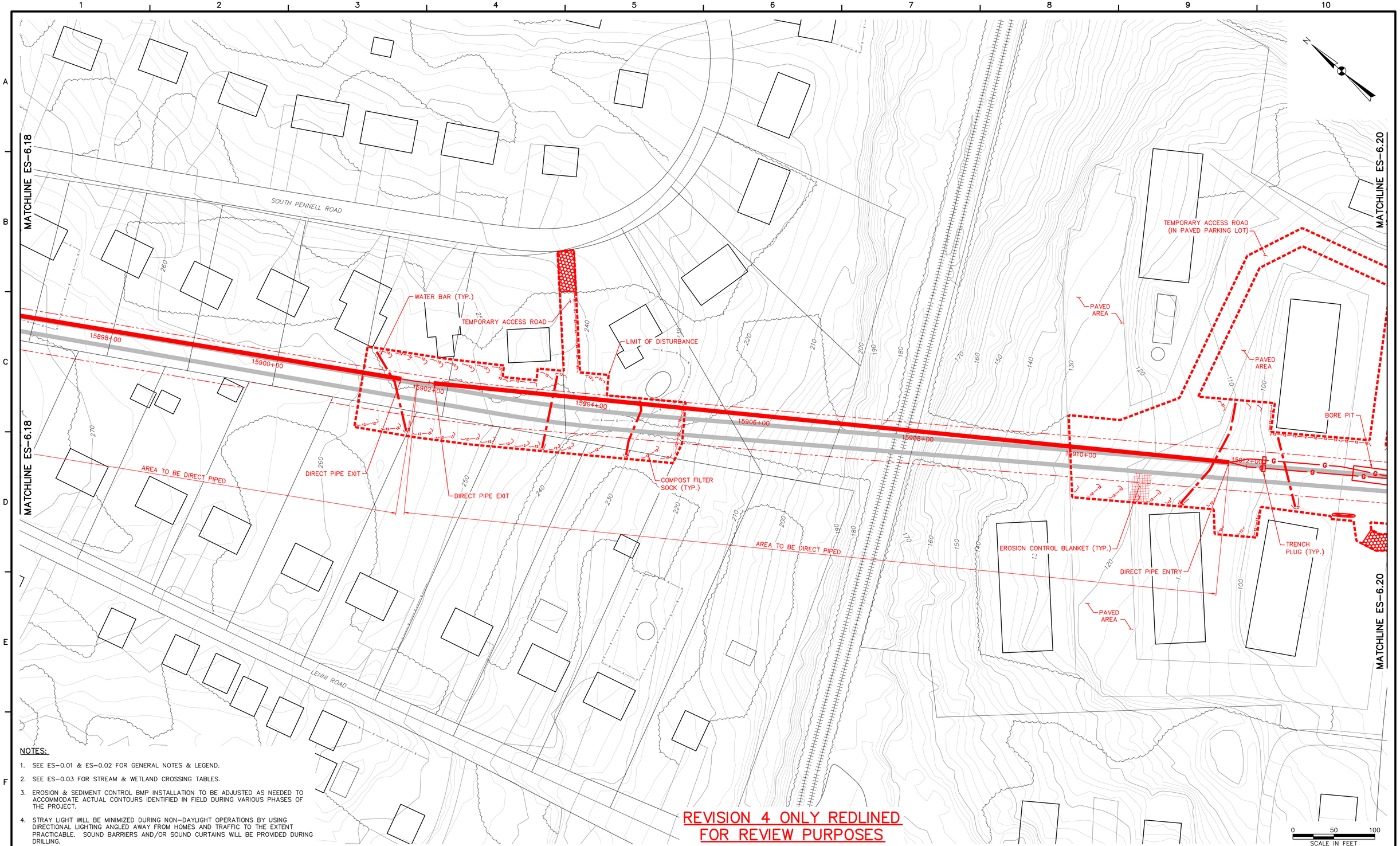
ES-6.18
SHEET 6.18 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\18 – Delaware\E&S\Drill 620 – Option 2\E&S\5958ES006.18 (2).dwg PIT BEN.HOPPE 3/19/2019 7:50:06 AM



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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.

REVISION 4 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	8/16/18	16" HDD MODIFICATION
4	RS	3/11/19	HDD CONVERTED TO DIRECT PIPE. ADDITIONAL LOD ADDED

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 19 OF 35

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

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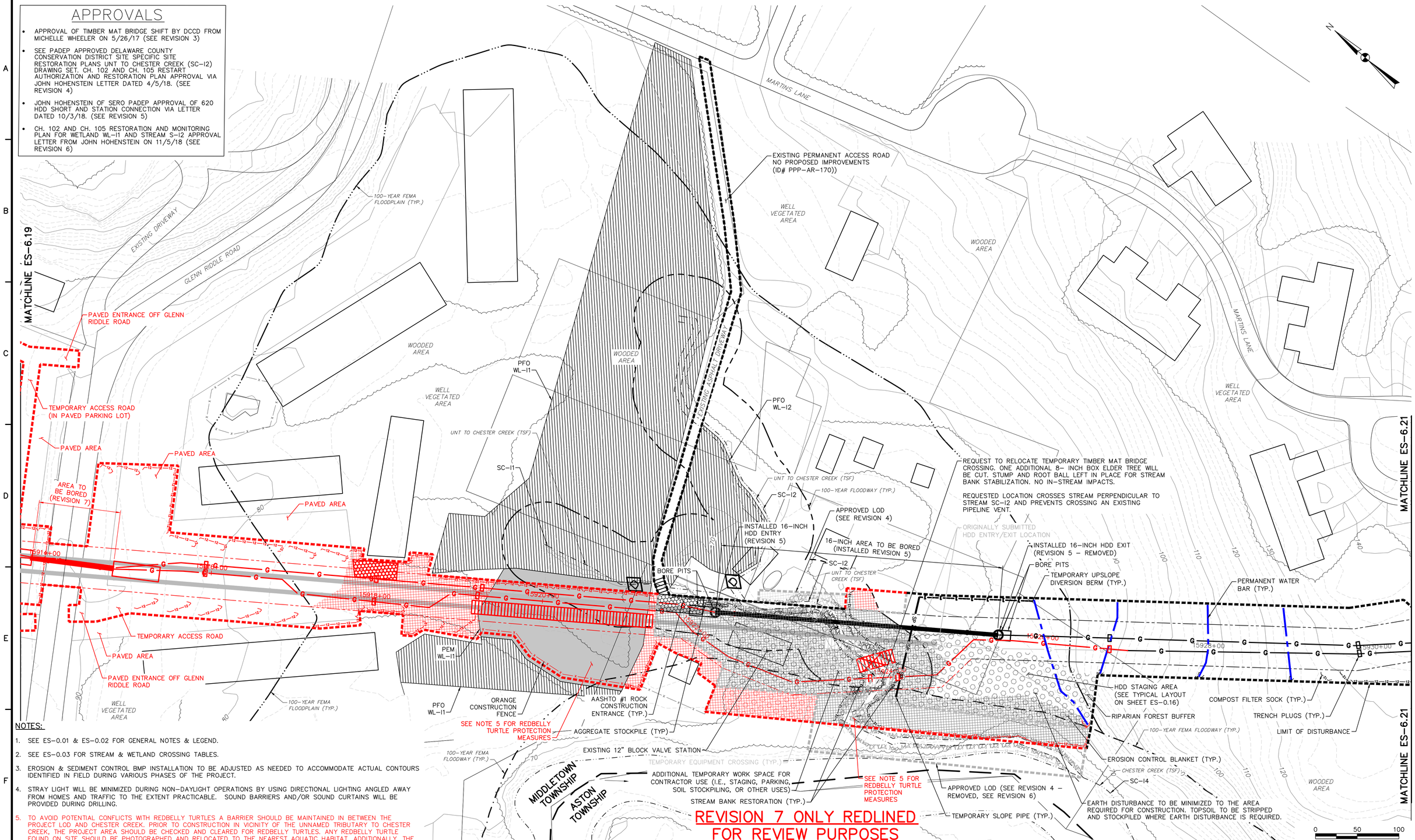
ES-6.19
SHEET 6.19 OF 60

APPROVALS

- APPROVAL OF TIMBER MAT BRIDGE SHIFT BY DCCD FROM MICHELLE WHEELER ON 5/26/17 (SEE REVISION 3)
- SEE PADEP APPROVED DELAWARE COUNTY CONSERVATION DISTRICT SITE SPECIFIC SITE RESTORATION PLANS UNT TO CHESTER CREEK (SC-I2) DRAWING SET. CH. 102 AND CH. 105 RESTART AUTHORIZATION AND RESTORATION PLAN APPROVAL VIA JOHN HOHENSTEIN LETTER DATED 4/5/18. (SEE REVISION 4)
- JOHN HOHENSTEIN OF SERO PADEP APPROVAL OF 620 HDD SHORT AND STATION CONNECTION VIA LETTER DATED 10/3/18. (SEE REVISION 5)
- CH. 102 AND CH. 105 RESTORATION AND MONITORING PLAN FOR WETLAND WL-I1 AND STREAM S-I2 APPROVAL LETTER FROM JOHN HOHENSTEIN ON 11/5/18 (SEE REVISION 6)



REVISION 7 ONLY REDLINED FOR REVIEW PURPOSES

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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.
5. TO AVOID POTENTIAL CONFLICTS WITH REDBELLY TURTLES A BARRIER SHOULD BE MAINTAINED IN BETWEEN THE PROJECT LOD AND CHESTER CREEK. PRIOR TO CONSTRUCTION IN VICINITY OF THE UNNAMED TRIBUTARY TO CHESTER CREEK, THE PROJECT AREA SHOULD BE CHECKED AND CLEARED FOR REDBELLY TURTLES. ANY REDBELLY TURTLE FOUND ON SITE SHOULD BE PHOTOGRAPHED AND RELOCATED TO THE NEAREST AQUATIC HABITAT. ADDITIONALLY, THE PFBC MUST BE CONTACTED WITHIN 48 HOURS OF THE FIND.

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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	5/26/17	TIMBER BRIDGE SHIFT
4	RS	1/31/18	ADDITIONAL LOD AND E&S CONTROLS ADDED-SEE SITE SPECIFIC DRAWING SET
5	RS	8/16/18	16" HDD MODIFICATION AND BYPASS CONNECTION
6	RS	9/1/18	WETLAND AND STREAM RESTORATION UPDATE
7	RS	2/8/19	HDD CONVERTED TO CONVENTIONAL BORES & OPEN TRENCH. ADDITIONAL LOD ADDED

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 20 OF 35

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

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ES-6.20
SHEET 6.20 OF 60

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PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

DELAWARE 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-6.35	EROSION & SEDIMENT CONTROL & SITE RESTORATION PLANS

PREPARED BY:

TETRA TECH

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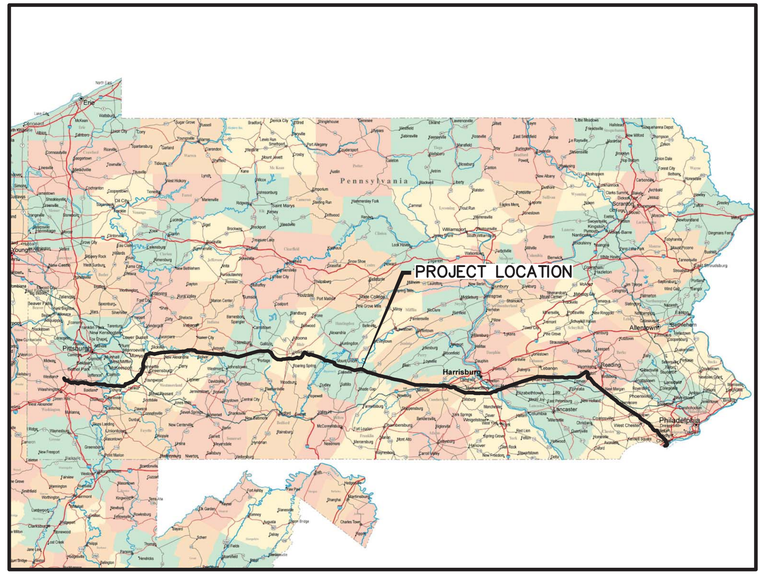
PREPARED FOR:

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 DELAWARE 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-0.08.
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
DELAWARE	THORNBURY	ES-6.01 TO ES-6.03
	EDGMONT	ES-6.03 TO ES-6.11
	MIDDLETOWN	ES-6.11 TO ES-6.27
	ASTON	ES-6.27 TO ES-6.30
	BROOKHAVEN	ES-6.27 TO ES-6.28
	CHESTER	ES-6.31 TO ES-6.33
	UPPER CHICHESTER	ES-6.34 TO ES-6.35

DELAWARE COUNTY LIMIT OF DISTURBANCE/PROJECT AREA TABLE

	LIMIT OF DISTURBANCE	PROJECT AREA
LINEAR PORTION	94 ACRES	94 ACRES
TWIN OAKS	2.39 ACRES	2.39 ACRES
TOTAL	97 ACRES	97 ACRES

DETAIL INDICATOR

DETAIL NUMBER

1

SHEET SHOWN ON

LEGEND

- 1320 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- EXISTING FENCELINE
- EXISTING STREAM WITH FLOW DIRECTION
- OVH — EXISTING ELECTRIC OVERHEAD
- UE — EXISTING ELECTRIC UNDERGROUND
- EXISTING LIGHT POLE
- W — EXISTING WATER LINE
- GAS — EXISTING GAS LINE
- DOMN — EXISTING DOMINION GAS LINE
- SAN — 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
- G — 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 — 5 / 0.05
- 24" COMPOST FILTER SOCK
- CT — CT — 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 — G — 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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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

DELAWARE 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 60

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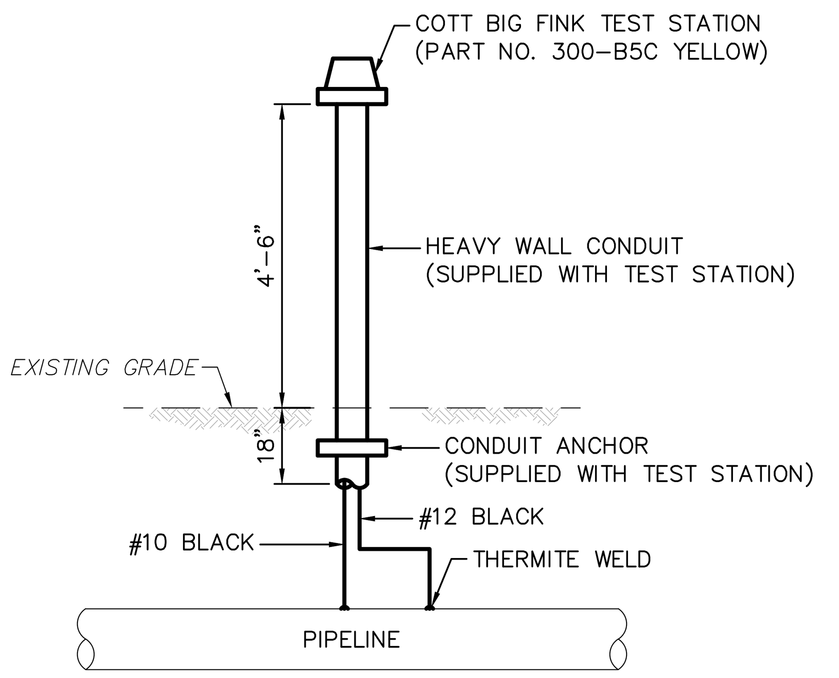
STREAM & WETLANDS CROSSING TABLES

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-B36	UNT to Chester Creek	39.9437, -75.502	Ephemeral	4	Dry Crossing	Drains to STS, ATW	Yes	ES - 6.03
S-B37	UNT to Chester Creek	39.9421, -75.4981	Ephemeral	6	Dry Crossing	Drains to STS, ATW	Yes	ES - 6.03, 6.04
S-B38	UNT to Chester Creek	39.9418, -75.4974	Perennial	~~10~~ 15	Dry Crossing	Drains to STS, ATW	Yes	ES - 6.03, 6.04
S-B39	UNT to Chester Creek	39.9421, -75.4972	Ephemeral	2	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.04
S-B51	UNT to Chester Creek	39.9407, -75.4945	Ephemeral	1	~~HDD/ Open Cut Floodway~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.04
S-B52	UNT to Chester Creek	39.9408, -75.4943	Intermittent	1.5	~~HDD/ Open Cut Floodway~~ HDD	Drains to STS, ATW	Yes	ES - 6.04
S-B53	UNT to Chester Creek	39.9407, -75.494	Intermittent	2	~~HDD/ Open Cut Floodway~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.04
S-B54	UNT to Chester Creek	39.9405, -75.4942	Perennial	2	~~HDD/ Open Cut Floodway~~ HDD	Drains to STS, ATW	Yes	ES - 6.04
S-B55	UNT to Chester Creek	39.9405, -75.4946	Ephemeral	2	~~HDD/ Open Cut Floodway~~ HDD	Drains to STS, ATW	Yes	ES - 6.04
S-B56	UNT to Chester Creek	39.9401, -75.4904	Intermittent	4	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.05
S-B57	UNT to Chester Creek	39.9402, -75.4906	Ephemeral	1	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.05
S-C15	UNT to Chester Creek	39.9031, -75.4442	Ephemeral	2	~~Dry Crossing~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C16	UNT to Chester Creek	39.9042, -75.4454	Perennial	8	Dry Crossing/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.17
S-C17	UNT to Chester Creek	39.9042, -75.446	Perennial	16	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C18	UNT to Chester Creek	39.9037, -75.4455	Perennial	7	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C19	UNT to Chester Creek	39.9030, -75.4444	Ephemeral	9	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C20	UNT to Chester Creek	39.9029, -75.4442	Ephemeral	2	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C21	UNT to Chester Creek	39.9038, -75.4455	Ephemeral	3	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C22	UNT to Chester Creek	39.9042, -75.4448	Intermittent	7	~~Open Cut Floodway~~ Floodway Only	Drains to STS, ATW	Yes	ES - 6.17
S-C23	UNT to Chester Creek	39.9054, -75.4469	Perennial	10	~~HDD/ Clearing Only~~ HDD	Drains to STS, ATW	Yes	ES - 6.16
S-C24	UNT to Chester Creek	39.9066, -75.448	Ephemeral	2	~~HDD/ Clearing Only~~ HDD	Drains to STS, ATW	Yes	ES - 6.16
S-C25	UNT to Chester Creek	39.9065, -75.448	Ephemeral	1	~~HDD/ Clearing Only~~ HDD	Drains to STS, ATW	Yes	ES - 6.16
S-C26	UNT to Rocky Run	39.9077, -75.4505	Ephemeral	4	HDD	Drains to TNR	Yes	ES - 6.15, 6.16
S-C39	UNT to Chester Creek	39.9155, -75.4595	Ephemeral	2	~~HDD~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.13
S-C40	UNT to Chester Creek	39.9156, -75.5494	Intermittent	3	HDD	Drains to STS, ATW	Yes	ES - 6.13
S-C41	UNT to Chester Creek	39.9159, -75.4595	Ephemeral	2.5	~~HDD~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.13
S-C42	UNT to Chester Creek	39.9206, -75.4637	Intermittent	5	HDD	Drains to STS, ATW	Yes	ES - 6.12
S-C43	UNT to Chester Creek	39.9275, -75.47	Ephemeral	1	Dry Crossing	Drains to STS, ATW	Yes	ES - 6.10
S-C44	Rocky Run	39.9102, -75.457	Perennial	~~20~~ 27	Dry Crossing	TNR	Yes	ES - 6.14
S-C45	UNT to Rocky Run	39.9122, -75.4568	Intermittent	5	~~Open Cut Floodway~~ Floodway Only	Drains to TNR	Yes	ES - 6.14
S-H27	UNT to Crum Run	39.8843, -75.4194	Perennial	12	Dry Crossing	-	Yes	ES - 6.23
S-H28	Crum Run	39.8861, -75.4198	Perennial	~~15~~ 27	Dry Crossing	-	Yes	ES - 6.23
S-H29	Chrome Run	39.8884, -75.4239	Perennial	~~18~~ 32	Dry Crossing	-	Yes	ES - 6.22
S-H34	UNT to Chester Creek	39.8737, -75.4124	Intermittent	8	Dry Crossing	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.26
S-CS6	Chester Creek	39.8733 -75.413	Perennial	80	Floodway Only	n/a	Yes	ES 6.26
S-H35	UNT to Chester Creek	39.8801, -75.4135	Perennial	7	Dry Crossing	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.24
S-H36	UNT to Chester Creek	39.8803, -75.4131	Intermittent	3	Dry Crossing	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.24
S-H37	Chester Creek	39.8700, -75.4111	Perennial	100	HDD	~~n/a~~ ATW, STS	Yes	ES - 6.26, 6.27
S-H38	UNT to Chester Creek	39.8700, -75.4117	Intermittent	8	~~HDD~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.27
S-H39	UNT to Chester Creek	39.8687, -75.4104	Ephemeral	8	~~HDD~~ Clearing LOD	Drains to STS, ATW	Yes	ES - 6.27
S-H40	UNT to Chester Creek	39.8670, -75.408	Ephemeral	5.5	~~HDD~~ HDD/Floodway Clearing LOD	Drains to STS, ATW	Yes	ES - 6.28
S-H41	Chester Creek	39.8659, -75.4069	Perennial	100	HDD	ATW, STS	Yes	ES - 6.28
S-H42	UNT to Chester Creek	39.8627, -75.4031	Ephemeral	6	~~HDD~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.29
S-H43	Baldwin Run	39.8575, -75.4006	Perennial	~~20~~ 33	~~HDD~~ HDD/Clearing LOD	n/a	Yes	ES - 6.30
S-H44	UNT to Baldwin Run	39.8573, -75.4001	Ephemeral	4	~~HDD~~ HDD/Clearing LOD	n/a	Yes	ES - 6.30
S-H47	UNT to Chester Creek	39.8543, -75.3989	Ephemeral	8	~~Open Cut Floodway~~ Floodway Only	~~Drains to STS, ATW~~ n/a	Yes	ES - 6.31
S-I1	UNT to Chester Creek	39.8944, -75.4317	Ephemeral	2	~~Open Cut Floodway/ Temp Crossing~~ Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.20
S-I2	UNT to Chester Creek	39.8939, -75.4312	Perennial	7	~~Dry Crossing~~ HDD/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.20
S-I3	UNT to Chester Creek	39.8942, -75.4314	Ephemeral	2	~~Open Cut Floodway/ Temp Crossing~~ HDD Floodway	Drains to STS, ATW	Yes	ES - 6.20
S-I4	Chester Creek	39.8932, -75.4312	Perennial	70	~~Open Cut Floodway/ Temp Crossing~~ HDD Floodway	STS, ATW	Yes	ES - 6.20
S-I5	UNT to Chester Creek	39.8919, -75.4293	Intermittent	~~6~~ 25	Dry Crossing/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.21
S-I6	UNT to Chester Creek	39.8920, -75.4293	Ephemeral	5	Dry Crossing/Temporary Bridge	Drains to STS, ATW	Yes	ES - 6.21
S-I7	UNT to Baldwin Run	39.8452 -75.4181	Ephemeral	1	Twin Oaks Station	n/a	Yes	ES - 6.35
S-I17	UNT to Baldwin Run	39.8452, -75.4181	Ephemeral	4	~~HDD~~ HDD Floodway	n/a	Yes	ES - 6.33
S-I18	UNT to Baldwin Run	39.8478, -75.4114	Ephemeral	13	HDD	n/a	Yes	ES - 6.33
S-I19	UNT to Baldwin Run	39.8478, -75.4114	Perennial	5	~~HDD~~ HDD Floodway	n/a	Yes	ES - 6.32, 6.33
S-I20	UNT to Baldwin Run	39.8481, -75.4057	Ephemeral	3	~~HDD~~ HDD Floodway	n/a	Yes	ES - 6.33
					57 Streams			

Wetland ID	USFWS Cowardin Classification	Coordinates	Crossing Method	Exceptional Value	E&S Plan Sheet Number
BA5	PFO	39.8466, -75.4103	HDD	n/a	ES - 6.34
BA6	PFO	39.8465, -75.4107	HDD	n/a	ES - 6.34
C10	PEM	39.9053, -75.4468	~~Drive Through~~ HDD	~~n/a~~ PuWS	ES - 6.16
	PSS	39.9055, -75.4467	HDD	~~n/a~~ PuWS	ES - 6.16, 6.17
C23	PEM	39.9107, -75.4566	Open Cut	Wild Trout	ES - 6.14
H41	PEM	39.8542, -75.3993	Open Cut	n/a	ES - 6.31
I1	PEM	39.8945, -75.4320	HDD	~~n/a~~ PuWS	ES - 6.20
I5	PEM	39.8460, -75.4139	Open Cut/ Temporary Matting	n/a	ES - 6.34
I16	PEM	39.8491, -75.4039	HDD	n/a	ES - 6.32, 6.33
	PFO	39.8485, -75.4035	HDD	n/a	ES - 6.32, 6.33
C21	PFO	39.9214, -75.4642	HDD	n/a	ES - 6.12
			9 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	Primary Condition
Eastern Redbelly Turtle	PAFBC	Pond A4 and Wetland I2	A4 (Chester), W-I2 (Delaware)	NA	Construction	10/26/15	NA	1. Pond A4 is adjacent to the workspaces. Wetland I2 is adjacent and will be crossed underneath via HDD. Wetland I2 will have no direct impact. A silt fence barrier will be placed at the edge of the LOD, between water and work areas, to prevent turtles from accessing active work zones at these two locations. The fence will be installed during inactive period (October 15-April 15) 2. Any turtle found on the site will be relocated to nearest aquatic habitat and the PFBC will be contacted within 48 hours. [PAFBC letter dated 10/26/2015]

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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 PE050435-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

DELAWARE 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 0.02 OF 60

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 PADEPS 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 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.~~ 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).
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 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 CONSTRUCTION ACTIVITIES, 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:

CONVENTIONAL BORES

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.

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 EQUIPMENT STREAM AND WETLAND CROSSINGS:

1. INSTALL TEMPORARY EQUIPMENT CROSSINGS AND TEMPORARY TIMBER MAT WETLAND CROSSINGS IN ACCORDANCE WITH PLAN SHEETS 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.

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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 PE050435-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

DELAWARE 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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ALL PERMIT CONDTIONS SET □ORT□ IN T□E E&S PERMIT NO□ES□ □□□□□ □□□□□ AND WATER O□STRUCTION AND ENCROAC□MENT PERMIT E□□□□□□ MUST □E □OLLOWED

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. BMP5 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 (CLEMMVS 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 ENGINEER — ROBERT F. SIMCIK — PE050435-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

DELAWARE 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 □ORT□ IN T□E E&S PERMIT NO□ES□ □□□□□ □□□□□ AND WATER O□STRUCTION AND ENCROAC□MENT PERMIT E□□□□□□ MUST □E □OLLOWED

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 PLACES 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 RIGIBT 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 BOTH.
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 MEANS 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 PLANS AS PRESENTED 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 THE REPLACEMENT 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)(II) THAT ARE DISTURBED, AS AUTHORIZED PURSUANT TO 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 POLLUTION PREVENTION 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 PLANS. IF CLEAN-UP 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 TO OBTAIN THE NECESSARY PERMITS TO CONDUCT HDD 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 THE PROJECT OR IN THE VICINITY OF THE PROJECT ON PA DCNR LANDS AS IDENTIFIED IN THE PGC CLEARANCE. PROVIDE A COPY OF THE PLAN TO THE DEPARTMENT PRIOR TO INITIATION OF ANY WORK UNDER THIS PENNIT.

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

RR. THE PERMITTEE SHALL IMPLEMENT ALL AVOIDANCE MEASURES IDENTIFIED BY THE JURISDICTIONAL RESOURCE AGENCIES FOR ANY THREATENED OR ENDANGERED SPECIES OR SPECIES OF SPECIAL CONCERN. (PERMIT SPECIFIC AVOIDANCE MEASURES SHOULD BE LISTED).

SS. THE PERMITTEE SHALL IMPLEMENT THE AVOIDANCE MEASURES IDENTIFIED IN APPENDIX A OF THE PERMIT FOR ALL OPEN TRENCH WETLAND CROSSINGS IN BOG TURTLE (CLEMMVS MUHLENBERGII) COUNTIES IDENTIFIED BY THE USFWS AS OCCUPIED, POTENTIALLY OCCUPIED OR ADJACENT HABITATS, UNLESS OTHERWISE SPECIFIED BY THE USFWS.

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

UU. 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 THE DEPARTMENT PRIM TO INITIATING SUCH MAINTENANCE WORK AND SHALL IMPLEMENT AND ADHERE TO ALL AVOIDANCE MEASURES OUTLINED IN SUCH CLEARANCE(S).

SEASONAL RESTRICTIONS:

VV. THE PERMITTEE SHALL NOT PERFORM ANY IN-STREAM WORK IN WATERS LISTED BY THE PAFBC AS TROUT STOCKED STREAMS AND THEIR TRIBUTARIES BETWEEN MARCH 1 AND JUNE 15 WITHOUT THE PRIOR WRITTEN APPROVAL FROM THE PENNSYLVANIA FISH & BOAT COMMISSION'S DIVISION OF ENVIRONMENTAL SERVICES, 450 ROBINSON LANE, BELLEFONTE, PA 16823-9620; TELEPHONE 814.359.5147.

WW. THE PERMITTEE SHALL NOT PERFORM ANY IN-STREAM WORK IN WATERS LISTED BY THE PENNSYLVANIA FISH AND BOAT COMMISSION AS CLASS A WILD TROUT FISHERY STREAMS AND THEIR TRIBUTARIES BETWEEN OCTOBER 1 AND APRILL WITHOUT THE PRIOR WRITTEN APPROVAL OF THE PENNSYLVANIA FISH & BOAT COMMISSION'S DIVISION OF ENVIRONMENTAL SERVICES, 450 ROBINSON LANE, BELLEFONTE, PA 16823; TELEPHONE 814.359.5147.

XX. THE PERMITTEE SHALL NOT PERFORM ANY IN-STREAM WORK IN WATERS LISTED BY THE PENNSYLVANIA FISH AND BOAT COMMISSION'S OTHER WILD TROUT STREAMS OR THEIR TRIBUTARIES BETWEEN OCTOBER 1 AND DECEMBER 31 WITHOUT THE PRIOR WRITTEN APPROVAL OF THE PENNSYLVANIA FISH AND BOAT COMMISSION'S DIVISION OF ENVIRONMENTAL SERVICES, 450 ROBINSON LANE, BELLEFONTE, PA 16823-9620; TELEPHONE 814.359.5147.

YY. OTHER SEASONAL RESTRICTIONS STATED IN THE VARIOUS HABITAT CONSERVATION PLANS SHALL BE COMPLIED WITH UNLESS A WRITTEN VARIANCE IS ISSUED BY THE APPROPRIATE RESOURCE AGENCY.

MISCELLANEOUS:

ZZ. MAINTENANCE MOWING OR HERBICIDE SPRAYING OF WETLANDS IS NOT AUTHORIZED BY THIS PERMIT. THE PERMITTEE SHALL PLACE AND MAINTAIN SIGNS OR OTHER DEMARCATION AROUND THE BOUNDARY OF EACH WETLAND TO CLEARLY DELINEATE THE AREAS WHERE THIS MAINTENANCE IS NOT AUTHORIZED. THE PERMITTEE SHALL PLACE THE SIGNS OR OTHER DEMARCATIONS WHEN ALL RESTORATION WORK IS COMPLETED AND PRIOR TO PERMIT TERMINATION.

AAA. THIS PERMIT DOES NOT CONVEY ANY REAL PROPERTY RIGHTS OR INTERESTS OR AUTHORIZATION TO TRESPASS ON PRIVATELY-OWNED RIPARIAN LAND. BY ACCEPTING THIS PERMIT, THE PERMITTEE CERTIFIES THAT HE/SHE HOLDS TITLE, EASEMENT, RIGHT OR OTHER REAL INTEREST IN THE RIPARIAN LAND. ANY DISPUTE OVER OWNERSHIP OF THIS LAND IS SOLELY A MATTER FOR PRIVATE LITIGATION.

BBB. THE PERMITTEE MAY NOT COMMENCE CONSTRUCTION ACTIVITIES ON PENNSYLVANIA GAME COMMISSION (PGC) LANDS WITHOUT PRIOR WRITTEN APPROVAL FROM PGC.

MISCELLANEOUS (CONTINUED)

CCC. RIPRAP AND STONE USED THROUGHOUT THE PROJECT, INCLUDING THE CONSTRUCTION OF CAUSEWAYS AND COFFER DAMS, SHALL BE FREE OF FINES AND SILTS, OR OTHER NON-ERODIBLE MATERIAL.

DDD. ALL TEMPORARY WATER WITHDRAWAL INTAKE STRUCTURES AND ALL APPURTENANT WORKS SHALL BE REMOVED FROM THE WATERCOURSE, BODY OF WATER, FLOODWAY, AND FLOODPLAINS WITHIN SIXTY (60) DAYS OF INITIAL PLACEMENT, UNLESS OTHERWISE EXTENDED IN WRITING BY THE DEPARTMENT.

EEE. TRENCH PLUGS SHALL BE PLACED AT EACH OF THE FOLLOWING LOCATIONS:

1. AT TEN (10) FEET FROM THE TOP OF EACH BANK OF A STREAM
2. AT FIFTY (50) FEET FROM THE TOP OF EACH BANK OF A STREAM
3. AT TEN (10) FEET FROM THE EDGE OF A WETLAND
4. AT FIFTY (50) FEET FROM THE EDGE OF A WETLAND

FFF. 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.

GGG. IF DURING EXCAVATION, A GROUNDWATER SEEP IS ENCOUNTERED, A TRENCH PLUG SHALL BE PLACED AT TEN (10) FEET FROM EACH SIDE OF THE SEEP.

HHH. ANY FRENCH DRAINS INSTALLED AS PART OF DE-WATERING FOR CONSTRUCTION ACTIVITIES SHALL BE REMOVED OR OTHERWISE RENDERED INOPERABLE PRIOR TO FINAL SITE RESTORATION.

III. WATER PUMPED FROM ANY CONSTRUCTION AREA SHALL BE DIVERTED INTO A SEDIMENT TRAP, BASIN, OR A FILTER BAG DISCHARGING INTO AN APPROPRIATE VEGETATED FILTER AREA TO PREVENT SEDIMENT FROM BEING DISCHARGED INTO ANY WATERS OF THE COMMONWEALTH.

JJJ. OPEN TRENCH CROSSINGS: THE PERMITTEE SHALL CONSTRUCT OPEN TRENCH PIPELINE CROSSINGS IN DRY CONDITIONS BY CONSTRUCTING DURING PERIODS OF NO WATER FLOW AND/OR BY INSTALLING STREAM FLOW BYPASS SYSTEMS (FLUMED OR PUMPED) THROUGH THE AFFECTED AREA.

1. EACH CROSSING SHALL BE CONDUCTED IN AN UNINTERRUPTED PROCESS IN THE SHORTEST PERIOD OF TIME POSSIBLE. IMPACTS TO RWC SHALL BE AVOIDED, TO THE EXTENT PRACTICABLE, AND IF NOT PRACTICABLE, THEN MINIMIZED IN ACCORDANCE WITH THE PERMITTEE'S APPROVED PLANS.
2. THE PERMITTEE MAY CROSS DRY CHANNELS, SWALES AND EPHEMERAL STREAMS WITHOUT THE USE OF STREAM FLOW BYPASS SYSTEMS IF THE CHANNEL HAS NO FLOW AND THE STREAM CROSSING AND STABILIZATION CAN BE COMPLETED IN DRY CONDITIONS AND WITHIN TWENTY-FOUR (24) HOURS. STANDBY SANDBAG DAMS AND PUMPS SHALL BE LOCATED ON-SITE AND INSTALLED IN THE EVENT OF PRECIPITATION RESULTING IN CHANNEL FLOW.

KKK. THE PERMITTEE SHALL CROSS INTERMITTENT AND PERENNIAL STREAMS THROUGH THE USE OF TRENCHLESS METHODS (HDD OR DIRECT BORING [DB]) OR THROUGH THE USE OF STREAM FLOW BYPASS SYSTEMS. BYPASS SYSTEMS MUST STAY IN USE UNTIL STREAMBEDS AND BANKS ARE ADEQUATELY STABILIZED. DOWNSTREAM FLOW MUST BE MAINTAINED DURING THE CONSTRUCTION.

LLL. DEPTH OF PIPELINE IN STREAM BED: THE PERMITTEE SHALL LOCATE ALL PIPELINES UNDER STREAM BEDS SUCH THAT THERE WILL BE A MINIMUM OF THREE FEET OF COVER BETWEEN THE TOP OF THE PIPE OR ENCASEMENT AND THE LOWEST POINT IN THE STREAM BED, UNLESS THE PIPELINE IS IN ROCK, WHERE A MINIMUM COVER OF ONE FOOT SHALL BE PROVIDED.

MMM. AIDS TO NAVIGATION PLAN: THE PERMITTEE SHALL IMPLEMENT THE APPROVED AIDS TO NAVIGATION (ATON) PLAN AS RECEIVED UNDER THE FISH AND BOAT CODE, 30 PA C.S. §§5121-5124, AND 58 PA CODE CHAPTER 113.

NNN. THIS PERMIT AUTHORIZES SPECIFIC IMPACTS TO RWC THAT WERE SPECIFICALLY DESCRIBED IN THE PERMIT APPLICATIONS AND REVISIONS. ANY PROPOSED CHANGES REGARDING THE SPECIFIC IMPACTS WILL REQUIRE A PERMIT MODIFICATION.

OOO. ANY ADDITIONAL IMPACTS TO RWC, SUCH AS TEMPORARY ACCESS ROADS, LAY-DOWN AREAS, STAGING AREAS, OR TEMPORARY WORK SPACES THAT HAVE NOT BEEN SPECIFICALLY IDENTIFIED IN THE PERMIT APPLICATION ARE NOT AUTHORIZED BY THIS PERMIT.

PPP. NO DEVIATION IN THE CONSTRUCTION METHODOLOGY OR PROJECT DESIGN THAT IS SHOWN ON THE APPROVED DRAWINGS IS AUTHORIZED UNDER THIS PERMIT UNLESS APPROVED THROUGH AN AMENDMENT BY THE DEPARTMENT.

QQQ. THIS PERMIT DOES NOT RELIEVE THE PERMITTEE OF THE OBLIGATION OF COMPLYING WITH ALL FEDERAL, INTERSTATE COMPACT, STATE LAWS, REGULATIONS AND STANDARDS, AND LOCAL ORDINANCES APPLICABLE TO THE CONSTRUCTION, OPERATION OR MAINTENANCE OF THE WATER OBSTRUCTION OR ENCROACHMENT.

RRR. THE PERMITTEE SHALL FOLLOW THE MEASURES SPECIFIED IN THE PREPAREDNESS, PREVENTION, AND CONTINGENCY PLAN DURING CONSTRUCTION.

SSS. THE PERMITTEE SHALL MAINTAIN A COPY OF THE PREPAREDNESS, PREVENTION, AND CONTINGENCY PLAN IS ON- SITE AT ALL TIMES DURING CONSTRUCTION, TRAIN ALL STAFF TO USE AND IMPLEMENT THIS PLAN, AND HAVE THIS PLAN AVAILABLE TO PROVIDE AT THE REQUEST OF ANY DEPARTMENT INSPECTOR.

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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 PE050435-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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
CHAPTER 105 PERMIT SPECIAL CONDITIONS

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

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ES-0.03B
SHEET 0.03B OF 60

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

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)			NOTES
	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YDS.	
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 ANNUAL RYEGRASS (SPRING OR FALL), OR WINTER WHEAT (FALL), OR WINTER RYE (FALL)	64 10 90 56	96 15 120 112
2 (3)	~~TALL FESCUE~~ BIG BLUESTEM, OR 75 FINE FESCUE, OR 40 KENTUCKY BLUEGRASS, PLUS 25 30 REDTOP(4), OR PERENNIAL RYEGRASS	60 35 25 3 15	75 40 30 3 20
3	BIRDSFOOT TREFOIL, PLUS 6 10 ~~TALL FESCUE~~ BIG BLUESTEM,	6 30	10 35
4	BIRDSFOOT TREFOIL, PLUS ~~REED CANARYGRASS~~ CANADA WILDRYE	6 10	10 15
5 (5)	BIG BLUESTEM, ~~PLUS~~ ~~TALL FESCUE~~ , OR PERENNIAL RYEGRASS	10 20 20	15 25 25
6 (5,6)	BIG BLUESTEM, PLUS ANNUAL RYEGRASS	10 20	15 25
7 (5)	BIRDSFOOT TREFOIL, PLUS BIG BLUESTEM, ~~PLUS~~ ~~TALL FESCUE~~	20 20 20	30 30 25
8	FLATPEA, PLUS ~~TALL FESCUE~~ BIG BLUESTEM, , OR PERENNIAL RYEGRASS	20 20 20	30 30 25
9 (7)	~~SERECIA LESPEDEZA~~ ROUND–HEADED BUSH CLOVER, PLUS ~~TALL FESCUE~~ BIG BLUESTEM, PLUS REDTOP(4)	10 20 3	20 25 3
10	~~TALL FESCUE~~ BIG BLUESTEM, PLUS FINE FESCUE	40 10	60 15
11	DEERTONGUE, PLUS BIRDSFOOT TREFOIL	15 6	20 10
12(8)	SWITCHGRASS, OR BIG BLUESTEM, PLUS BIRDSFOOT TREFOIL	15 15 6	20 20 10
13	ORCHARDGRASS, OR SMOOTH BROMEGRASS, PLUS BIRDSFOOT TREFOIL	20 25 6	30 35 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 NONE	3 OR 13 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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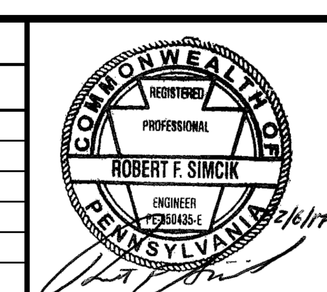
REVISIONS

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



SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE 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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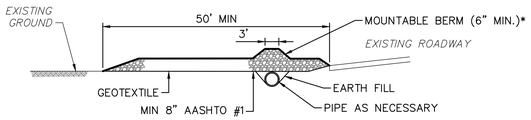
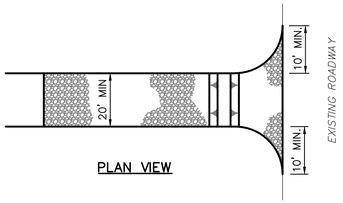


PROFILE



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

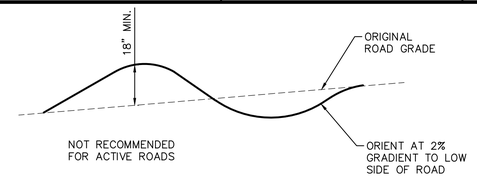
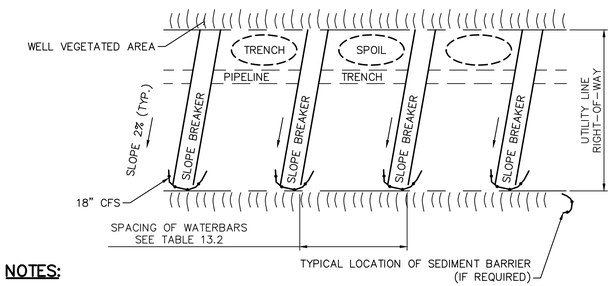


TABLE 13.2

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.

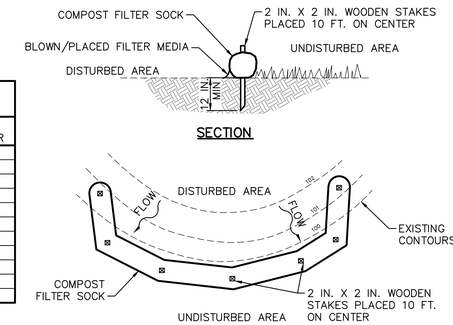
SEE TABLE 13.2 ABOVE FOR WATERBAR SPACING.

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.

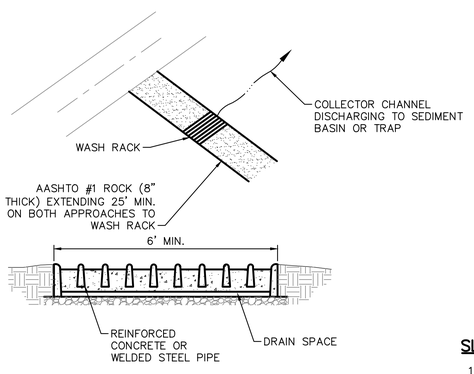
TABLE 4.1

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

COMPOST FILTER SOCK (5 / 0.05)
NOT TO SCALE



NOTES:

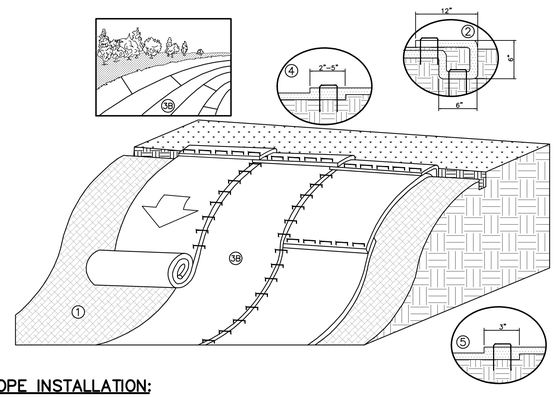
WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

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.

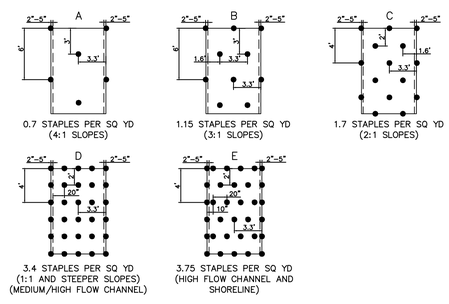
ROCK CONSTRUCTION ENTRANCE WITH WASH RACK (3 / 0.05)
NOT TO SCALE



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

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REVISIONS

NO.	BY	DATE	REMARKS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 2/9/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE 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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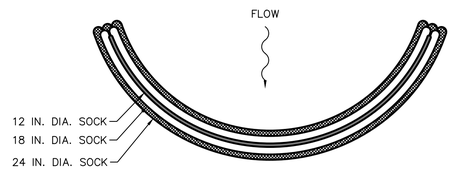
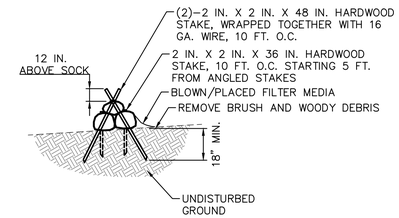


PLAN VIEW



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)
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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK

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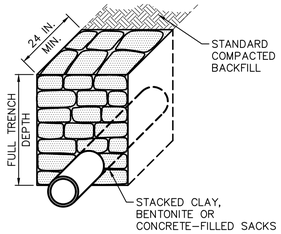
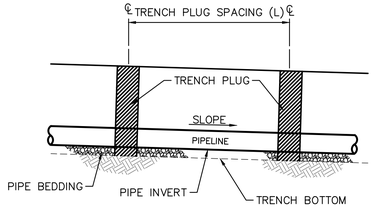


SECTION VIEW



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

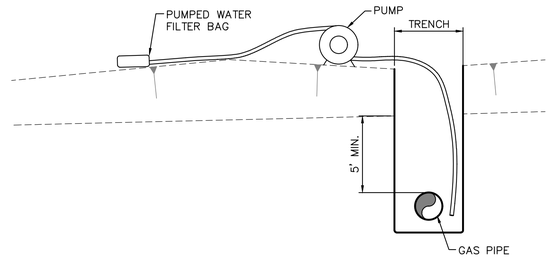
* TOP SOIL MAY NOT BE USED TO FILL SACKS

NOTES:

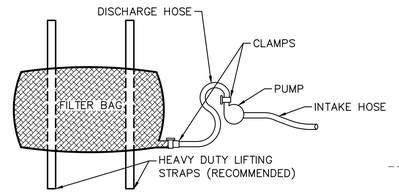
IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER WATERBODY CROSSINGS.

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)

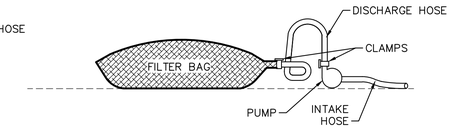
TRENCH PLUG INSTALLATION (10 / 0.07)
NOT TO SCALE



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.

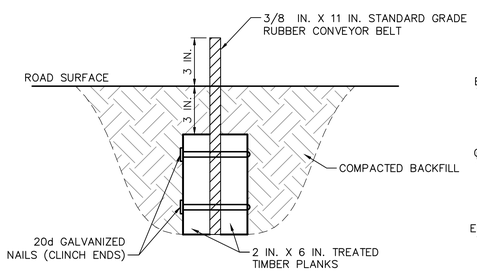
THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

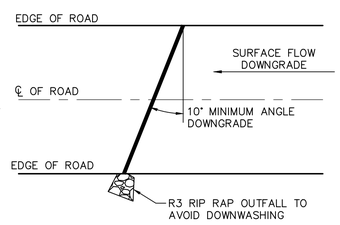
THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR ½ THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

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

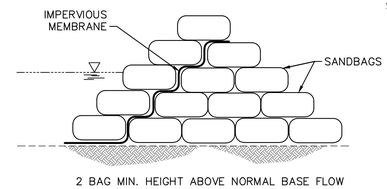




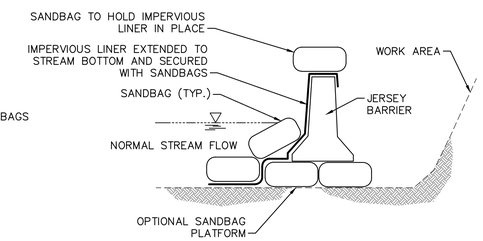
NOTE:
1. DEFLECTOR SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT.
2. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM DEFLECTOR WITHIN 24 HOURS OF INSPECTION.
3. BELT SHALL BE REPLACED WHEN WORN AND NO LONGER EFFECTIVE.
4. MAXIMUM SPACING OF DEFLECTORS SHALL BE AS SHOWN IN TABLE.

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

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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 — 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

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

DATE:	2/6/17
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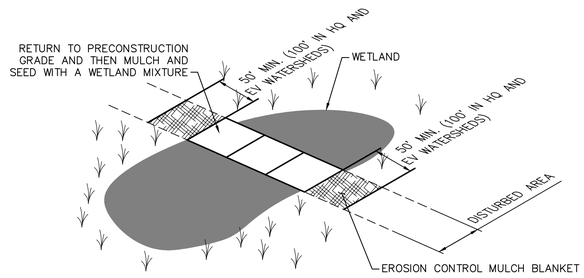
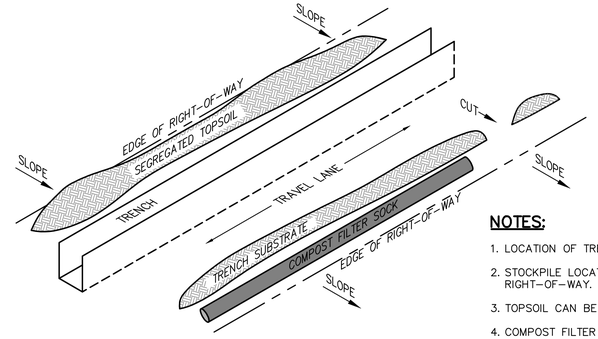


NOTES:

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-0.04 TO ALLOW RAPID STABILIZATION AND DETER INVASIVE SPECIES.
4. PERMANENTLY REVEGETATE IMPACTED PEM WETLANDS IN ACCORDANCE WITH PLAN SHEET ES-0.04 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

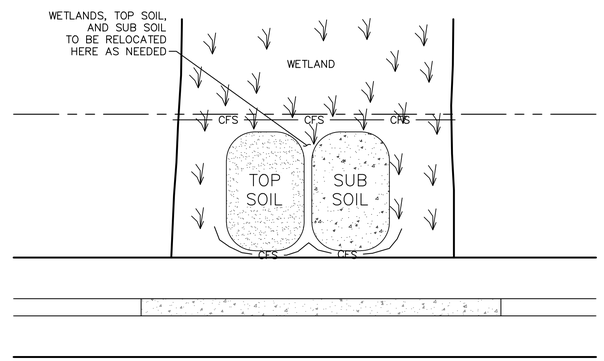


NOTES:

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

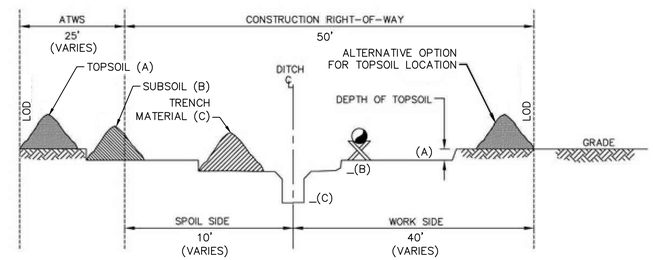


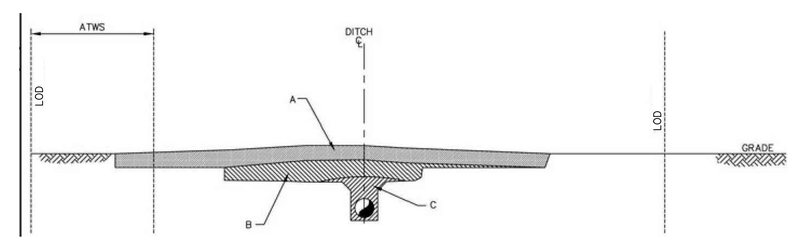
NOTES:

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

SPOIL STOCKPILE CONTAINMENT – WETLANDS

NOT TO SCALE



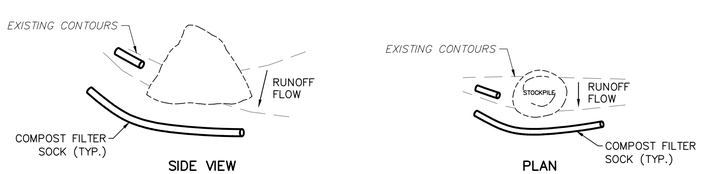


SPOIL STOCKPILE CONTAINMENT – TRIPLE DITCH

NOT TO SCALE

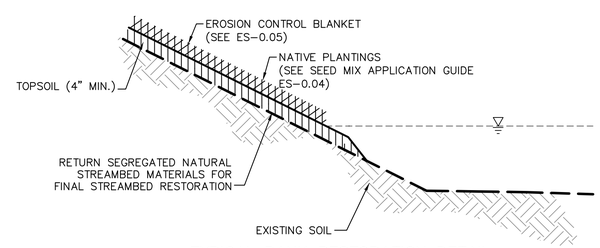
NOTES:

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

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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

DELAWARE 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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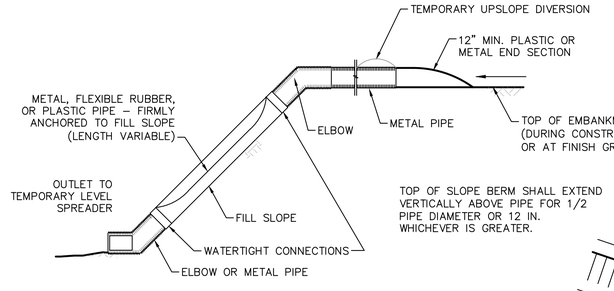
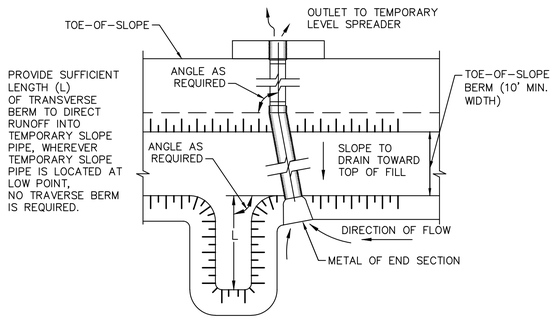
SHEET 0.08 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\18 – Delaware\E&S\5958ES000.08.dwg PIT JOY.SCABILLONI 2/8/2017 11:38:52 AM





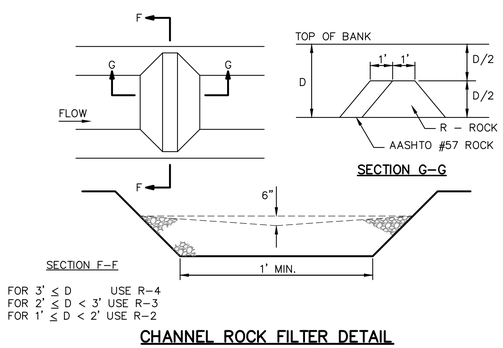
MINIMUM DIMENSIONS FOR TEMPORARY SLOPE PIPES		
DRAINAGE AREA (ACRES)	MINIMUM PIPE DIAMETER (IN.)	MINIMUM BERM HEIGHT (IN.)
<2	12	24
2–4	15	27
4–5	18	30

* 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:

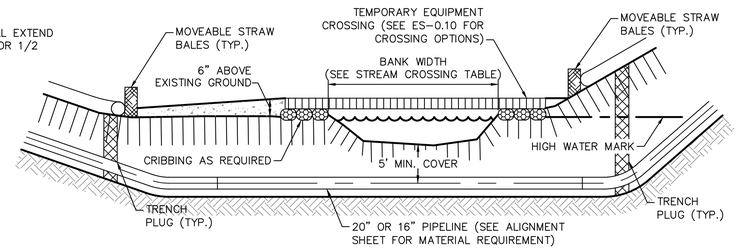
1. THE MAXIMUM DISTANCE BETWEEN ANCHOR STAKES SHALL BE 10 FEET.
2. TRANSVERSE BERM SHALL BE USED WHENEVER TEMPORARY SLOPE PIPE IS NOT LOCATED AT LOW POINT.
3. SLOPE PIPES SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE INLET IMMEDIATELY.
4. DAMAGED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

TEMPORARY SLOPE PIPE DETAIL
NOT TO SCALE

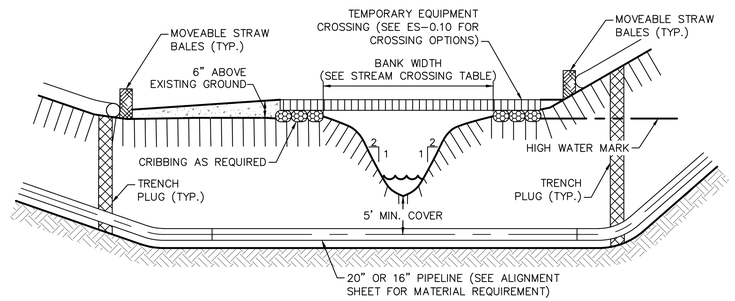


FOR 3' ≤ D USE R-4
FOR 2' ≤ D < 3' USE R-3
FOR 1' ≤ D < 2' USE R-2

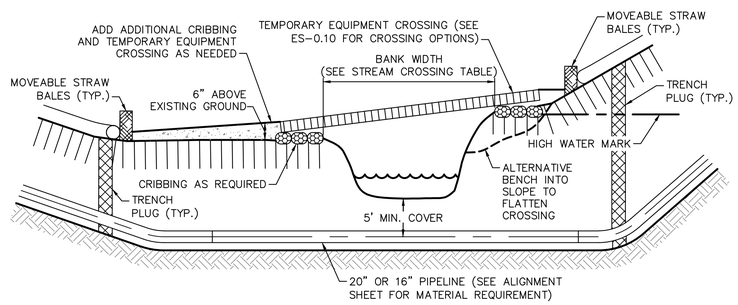
CHANNEL ROCK FILTER DETAIL
NOT TO SCALE



TYPICAL FLAT STREAM CROSSING



TYPICAL STEEP BANK STREAM CROSSING

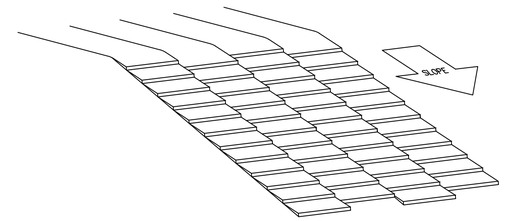


TYPICAL SLOPED STREAM CROSSING

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.

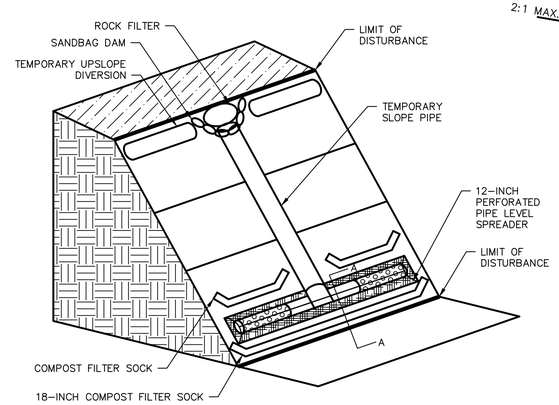
TYPICAL STREAM CROSSING DETAILS
NOT TO SCALE

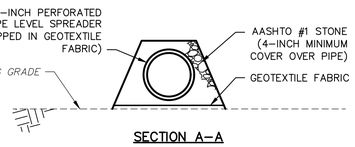


NOTES:

1. DOZER TREADS CREATE GROOVES PERPENDICULAR TO SLOPE.

SURFACE ROUGHENING DETAIL
NOT TO SCALE



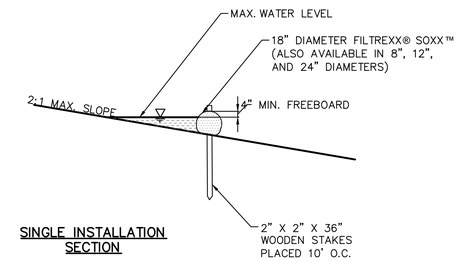


SECTION A–A

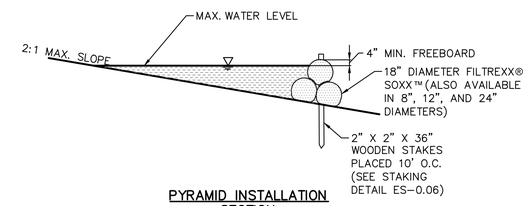
NOTES:

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

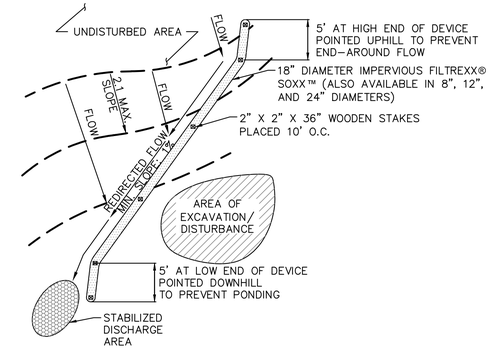


SINGLE INSTALLATION SECTION



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

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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 2/8/17

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE 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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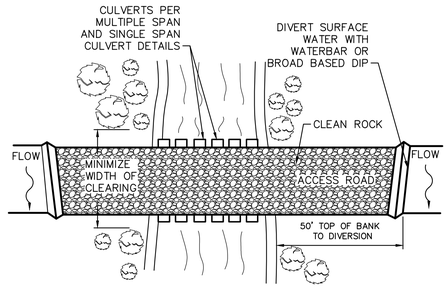


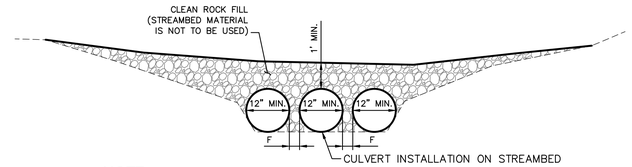
PLAN VIEW

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

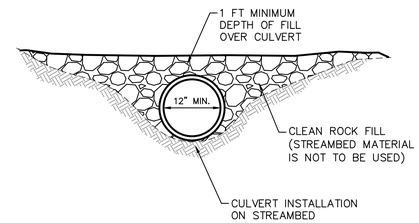


NOTE:

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

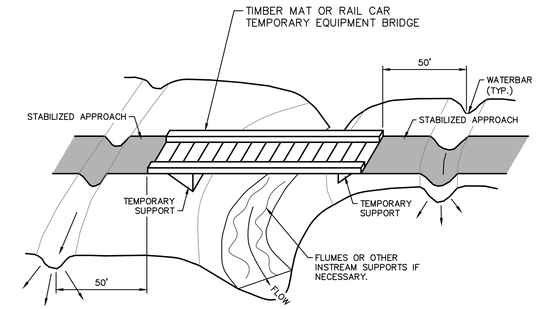
NOT TO SCALE

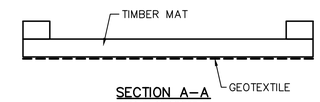
MAINTENANCE OF TEMPORARY EQUIPMENT CROSSING:

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 CROSSING SHALL BE IN PLACE FOR NO LONGER THAN 1 YEAR.

TEMPORARY EQUIPMENT CROSSING DETAILS (15 / 0.10)

NOT TO SCALE





SECTION A-A

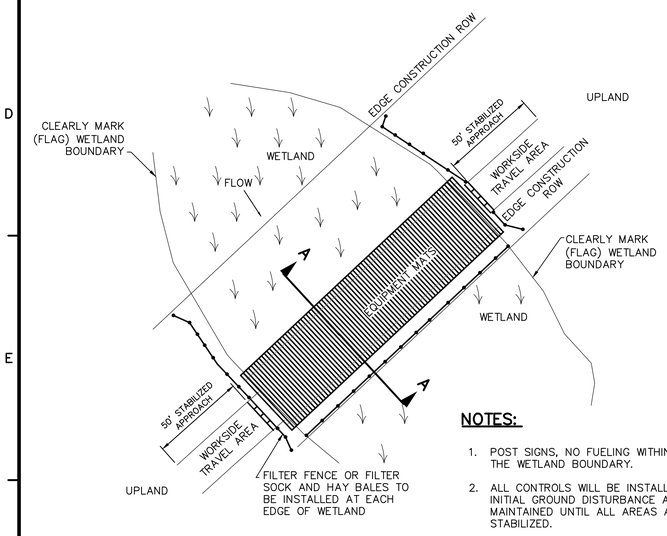
NOT TO SCALE

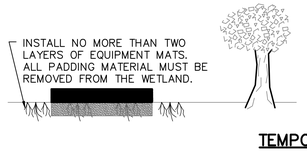
NOTES:

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



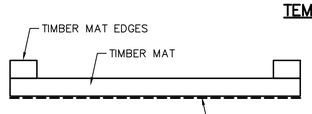


NOTES:

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.

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.

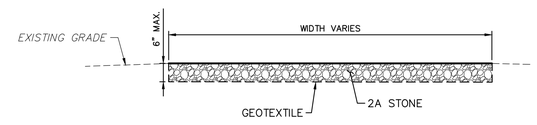


SECTION A-A

NOT TO SCALE

TEMPORARY TIMBER MAT WETLAND CROSSING (16 / 0.10)

NOT TO SCALE



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 075046XX-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

DELAWARE 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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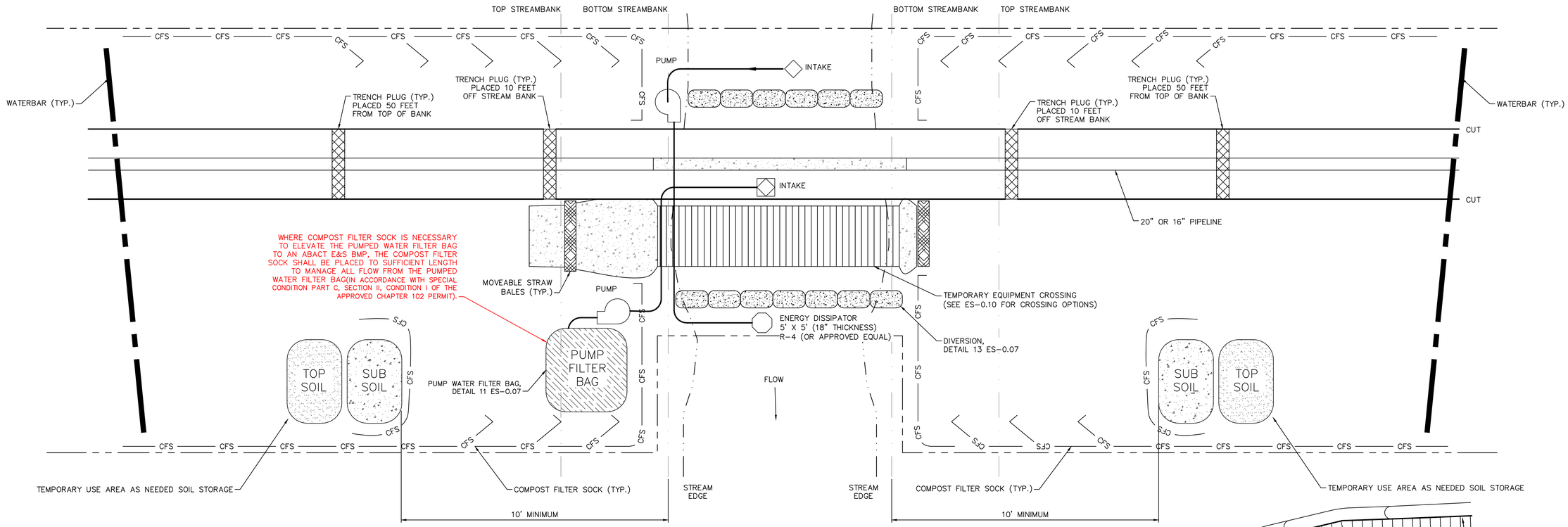
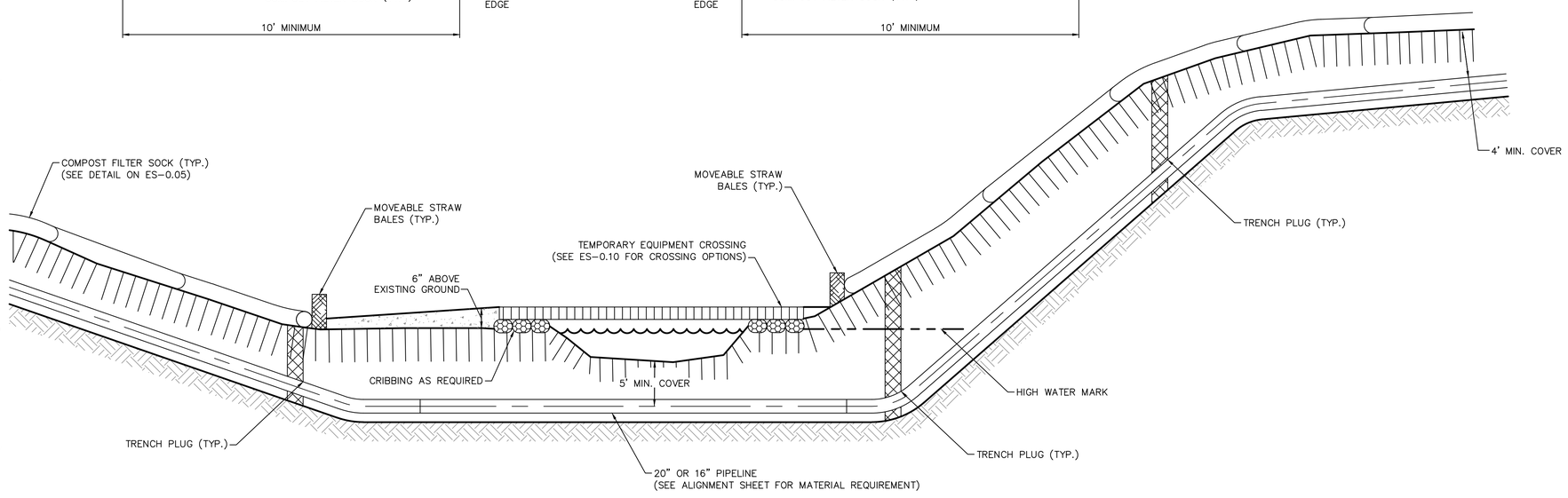


NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-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

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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 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

DELAWARE 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 0.11 OF 60

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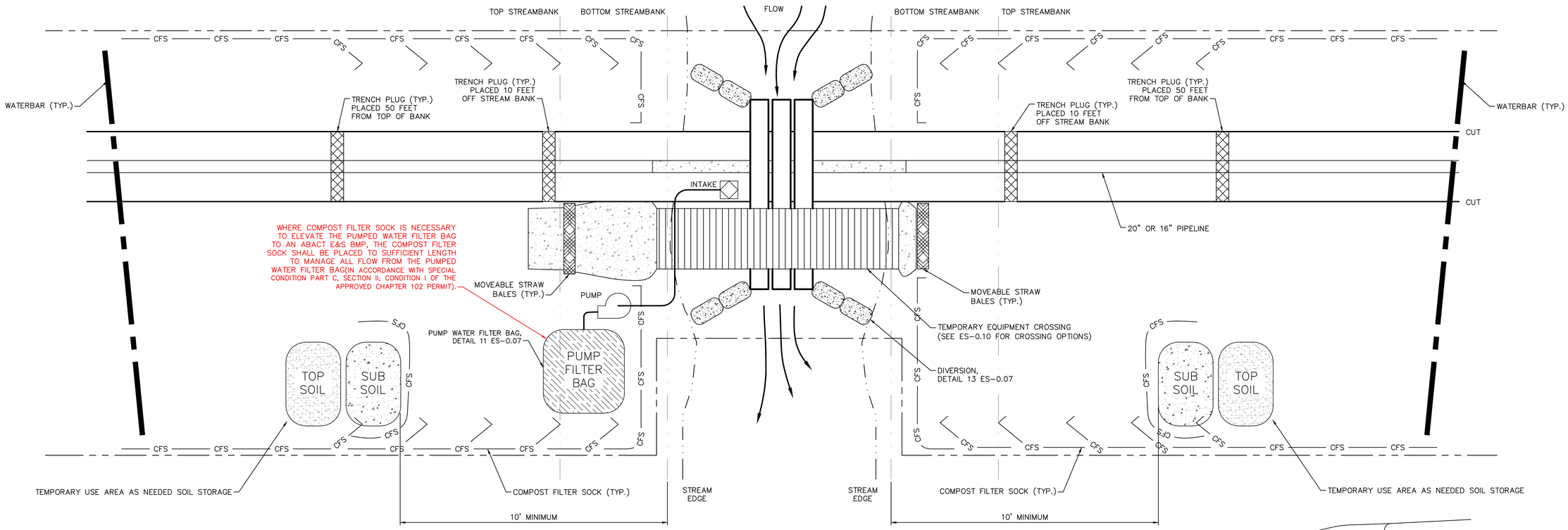
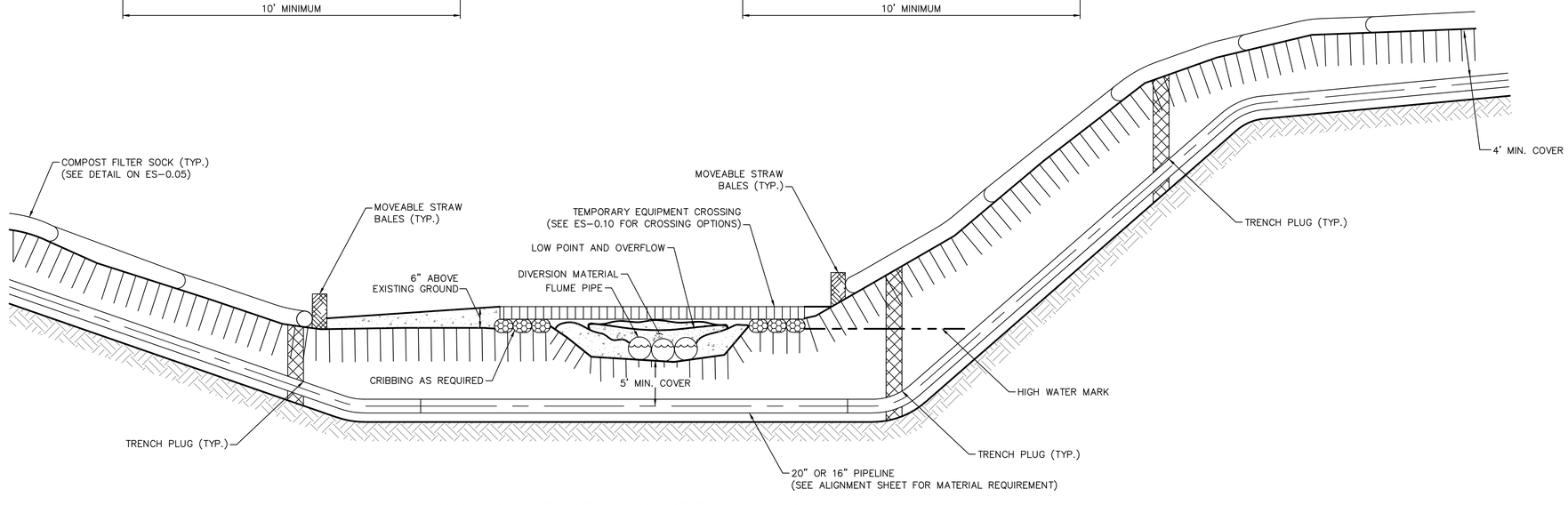


NOTES:

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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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER ROBERT F. SIMCIK 072364626-E 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

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

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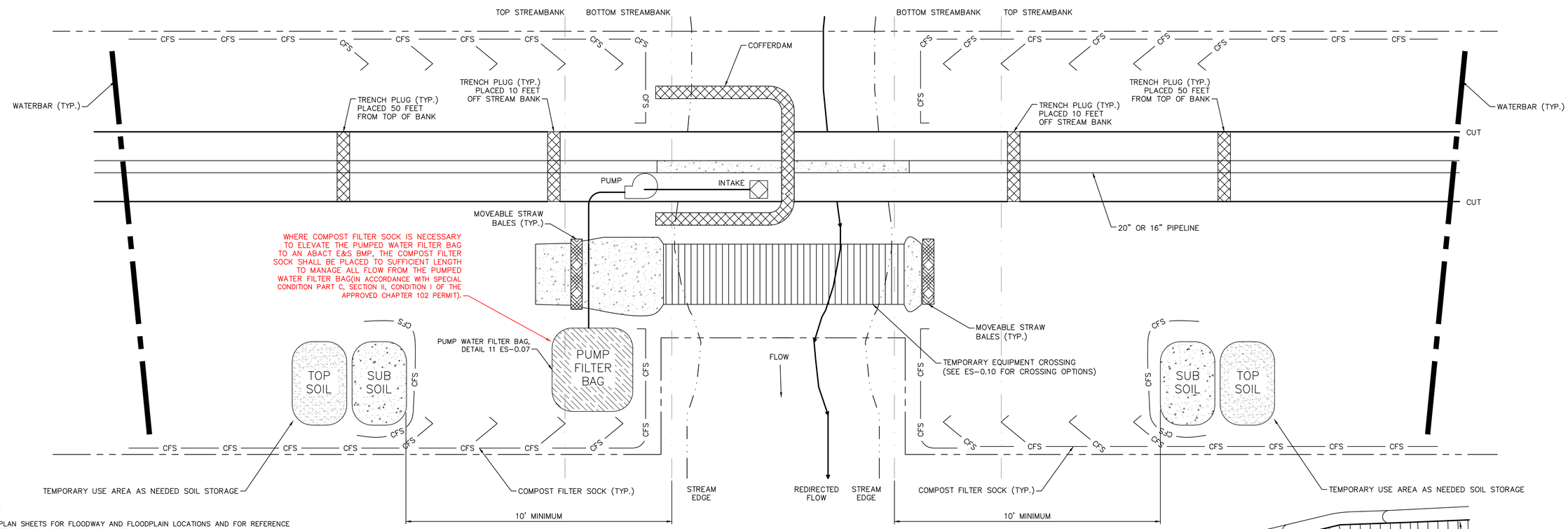

NOTES:

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;
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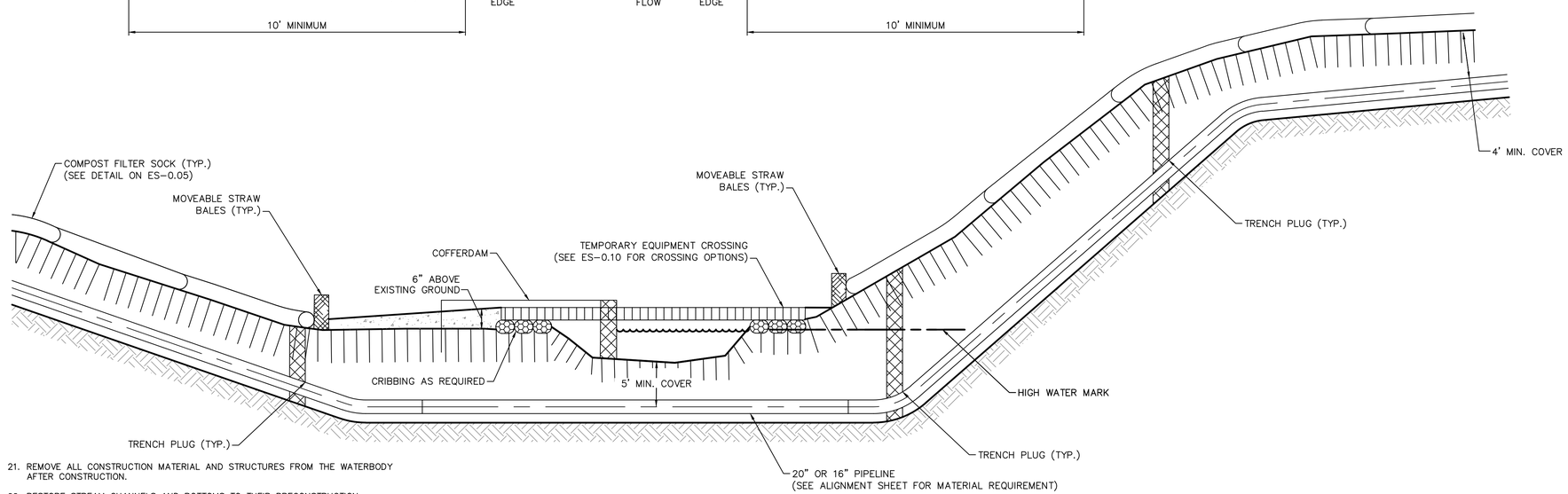
20. NATURAL STREAM BED MATERIAL TO BE STRIPPED AND SEGREGATED FROM SUBSURFACE MATERIAL FOR FINAL STREAMBED RESTORATION. EXCAVATION PORTION OF NATIVE STREAM BEDS COMPRISED OF ROCK, COBBLE, OR GRAVEL ARE TO BE STRIPPED AND SEGREGATED AND USED DURING STREAM RESTORATION.
21. REMOVE ALL CONSTRUCTION MATERIAL 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.



TYPICAL PIPELINE INSTALLATION STREAM CROSSING – COFFERDAM DETAIL

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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

DELAWARE 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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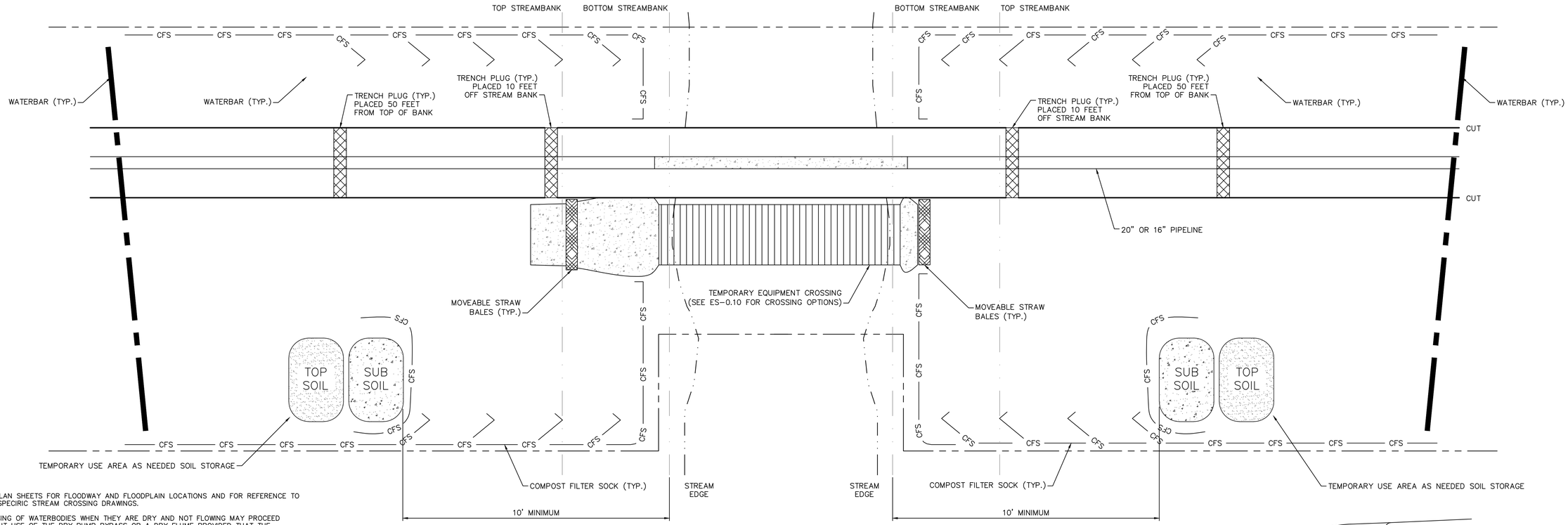

NOTES:

1. SEE PLAN SHEETS FOR FLOODWAY AND FLOODPLAIN LOCATIONS AND FOR REFERENCE TO SITE-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;
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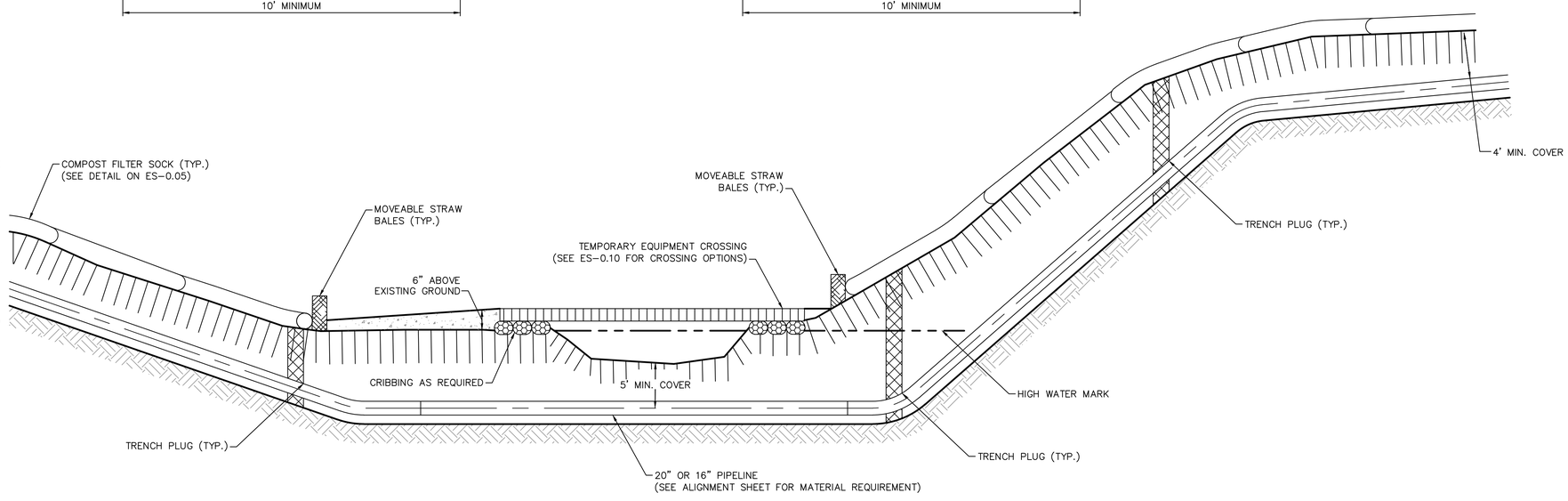

TYPICAL PIPELINE INSTALLATION STREAM CROSSING – DRY OPEN CUT DETAIL

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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

DELAWARE COUNTY CONSERVATION DISTRICT
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NOTES & DETAILS

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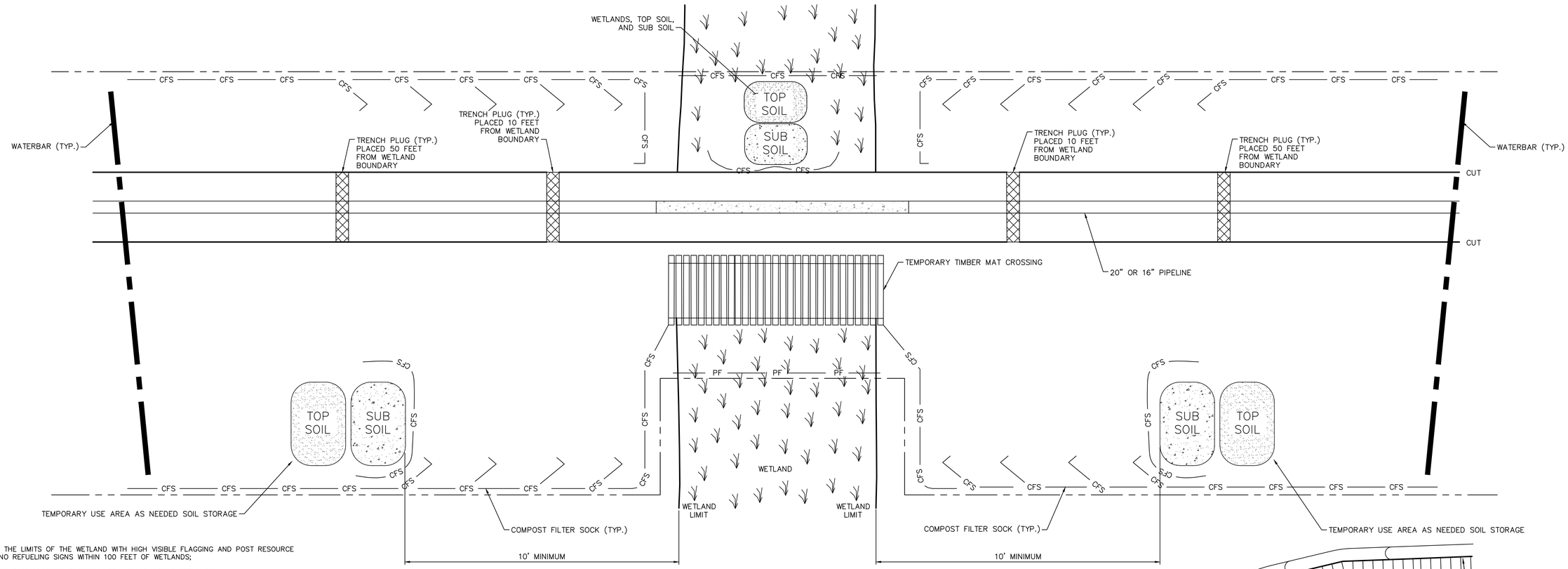
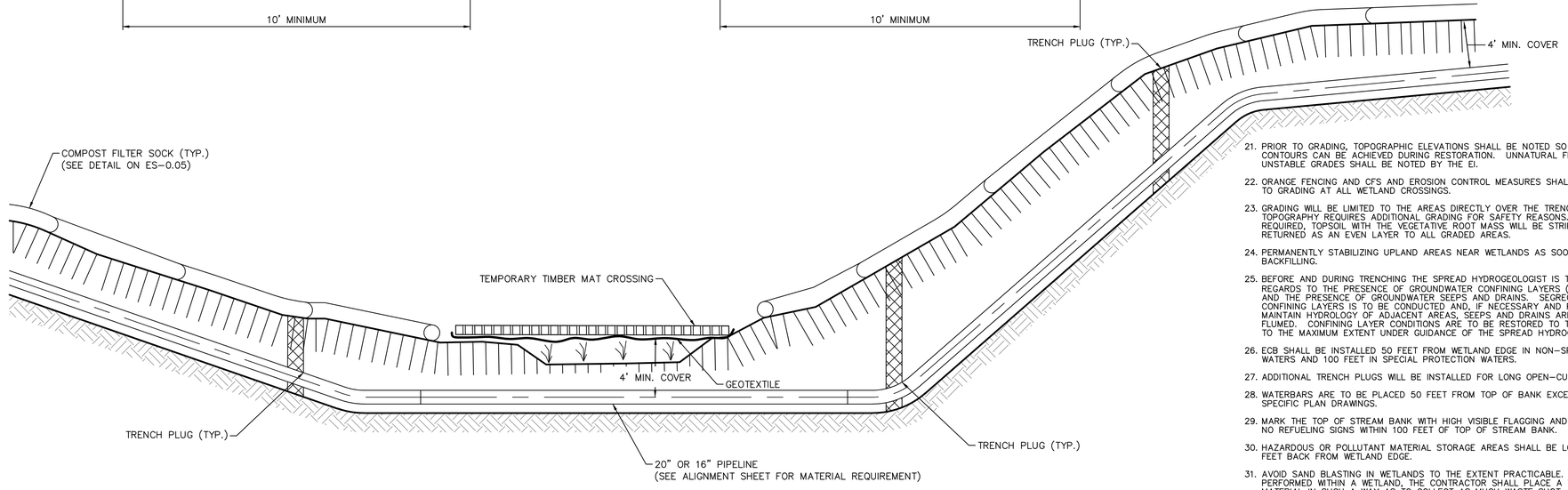


NOTES:

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

NOT TO SCALE

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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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

DELAWARE 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 0.15 OF 60

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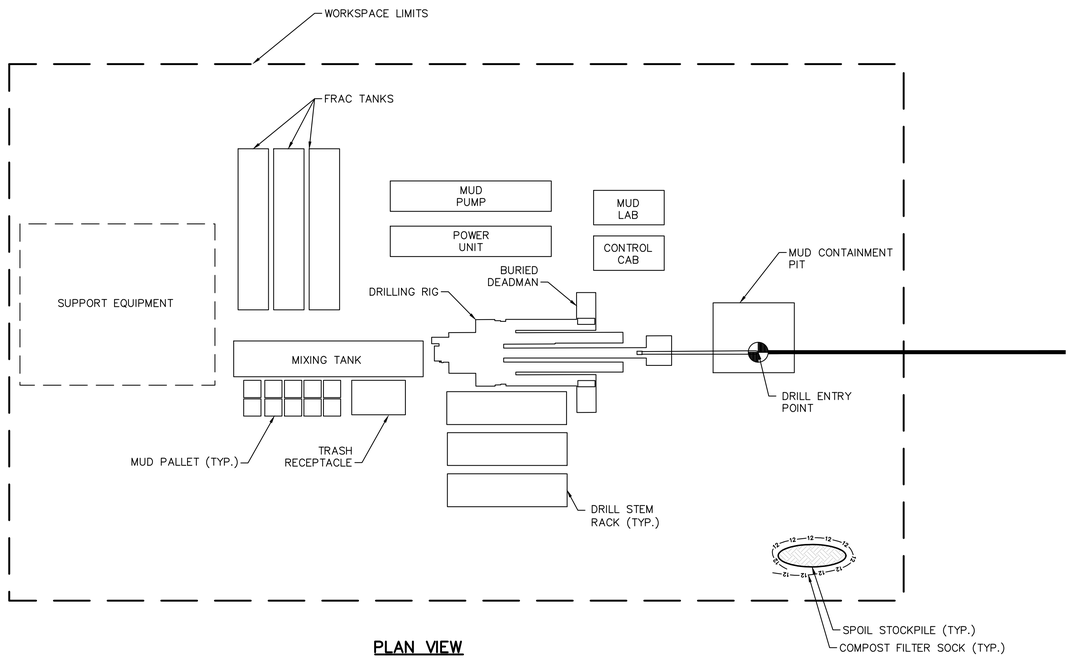
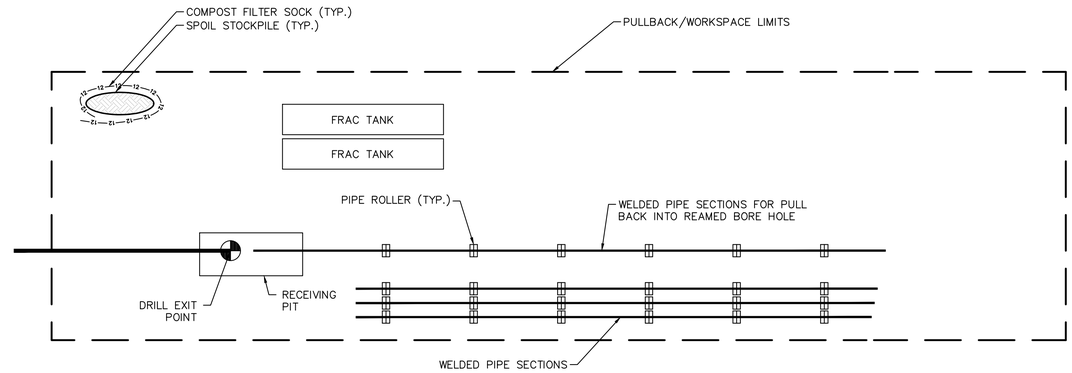


PLAN VIEW

ENTRY SIDE LAYOUT
NOT TO SCALE



PLAN VIEW

EXIT SIDE LAYOUT
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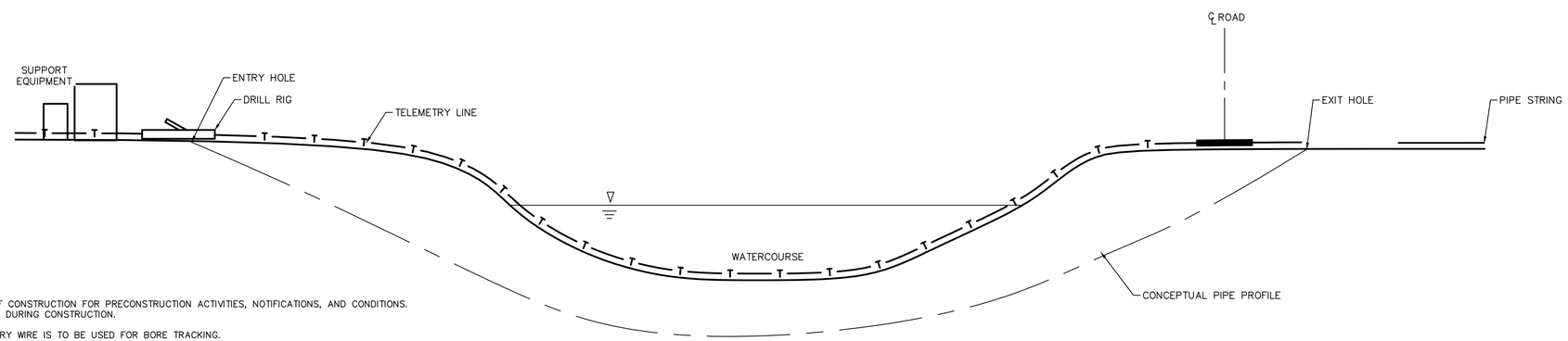

PROFILE VIEW

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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REVISIONS

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COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT F. SIMCIK
ENGINEER
PE-084435-E

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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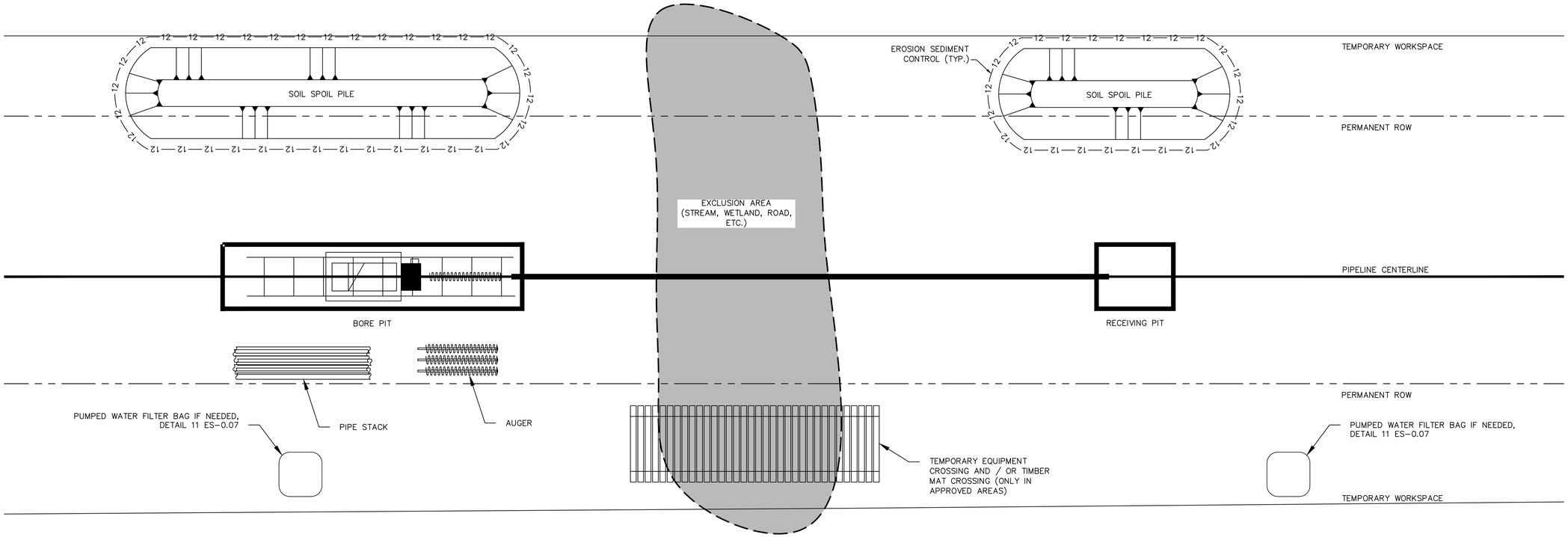
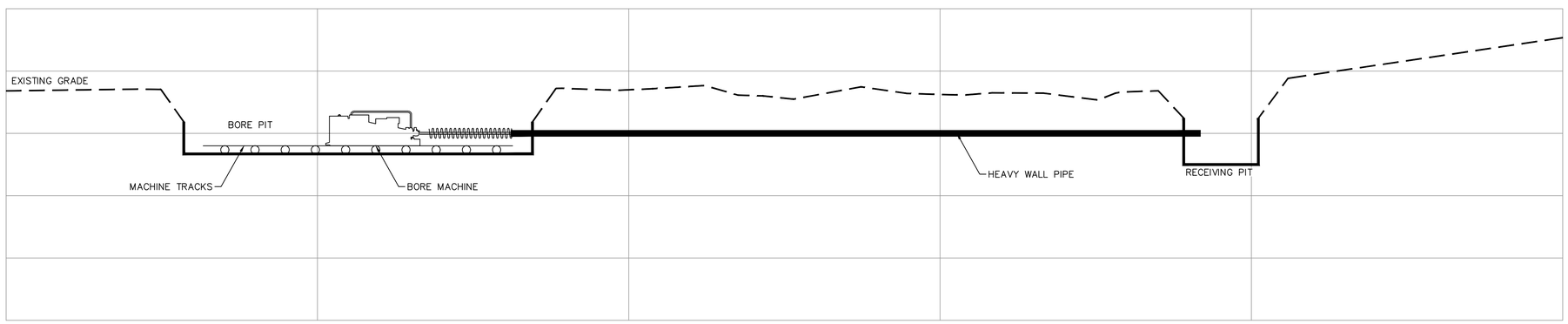


PLAN VIEW



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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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT F. SIMCIK ENGINEER 072364-E

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

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DETAIL NOT REQUIRED IN DELAWARE COUNTY

HYDROSTATIC TESTING WATER DIRECT DISCHARGE DETAIL (17 / 0.19)
NOT TO SCALE

DETAIL NOT REQUIRED IN DELAWARE COUNTY

DISCHARGE STRUCTURES TO BE USED FOR HYDROSTATIC TEST WATER (18 / 0.19)
NOT TO SCALE

DETAIL NOT REQUIRED IN DELAWARE COUNTY

DELAWARE COUNTY HDD TESTING DISCHARGE LOCATION INFORMATION (19 / 0.19)
NOT TO SCALE

DETAIL NOT REQUIRED IN DELAWARE COUNTY

DELAWARE COUNTY MAINLINE TESTING DISCHARGE LOCATION INFORMATION (20 / 0.19)
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HYDROSTATIC DISCHARGE DETAILS

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ROBERT F. SIMCIK
ENGINEER 075364-E

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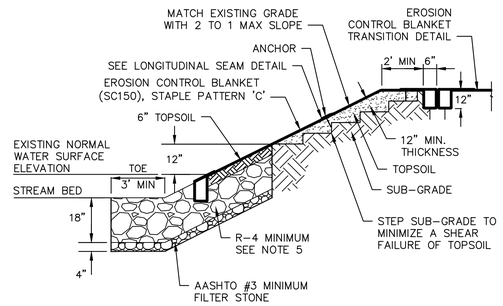
STREAMBANK STABILIZATION TABLE

	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
3	Delaware	S-C44	yes	1.57	0.005	2.53	0.49	no	yes	R-3 (1)	9	AASHTO #57
4	Delaware	S-H29	yes	2.42	0.005	3.37	0.76	no	yes	R-3 (1)	9	AASHTO #57
5	Delaware	S-H28	yes	1.95	0.021	5.91	2.56	no	yes	R-3 (1)	9	AASHTO #57
6	Delaware	S-H43		3.55	0.013	6.58	2.88	no	yes	R-4	18	AASHTO #3

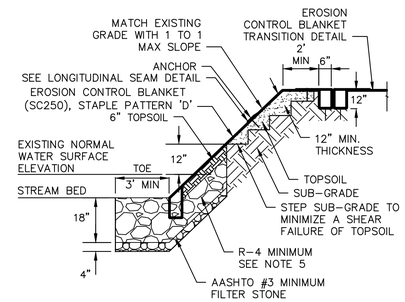
(1) R–4 IS MINIMUM RIPRAP SIZE TO BE USED. IF CALCULATIONS IDENTIFIED SMALLER STONE SIZE WILL BE INCREASED TO R–4



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
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SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

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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 DELAWARE 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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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

DELAWARE 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-0.20
SHEET 0.20 OF 60

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 FROM WWW.PASDA.PSU.EDU.
5. PIPELINE LOCATION AND RIGHT-OF-WAY FROM SUNOCO PIPELINE L.P.
6. USE COMPOST FILTER SOCK AS REQUIRED TO PREVENT RUNOFF FROM SPOIL AREA.
7. AT ALL STREAM CROSSINGS, RUNOFF MUST BE DIRECTED TO A SEDIMENT REMOVAL AREA (i.e. COMPOST FILTER SOCKS).
8. 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.
9. PAST AND PRESENT LAND USE CONSISTS OF AGRICULTURAL, FORESTED AND RESIDENTIAL AREAS. POST CONSTRUCTION LAND USE WILL BE A MAINTAINED, VEGETATED RIGHT-OF-WAY.
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

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

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

DATE:	2/6/17
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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 075843-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

DELAWARE 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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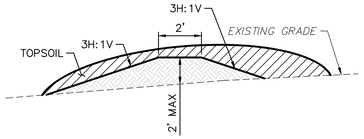
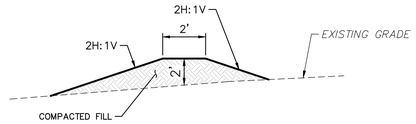


NOTES:

1. FILL WITH TOPSOIL TO ACHIEVE DESIRED SHAPE.

INFILTRATION BERM DETAIL
NOT TO SCALE



DIVERSION BERM DETAIL
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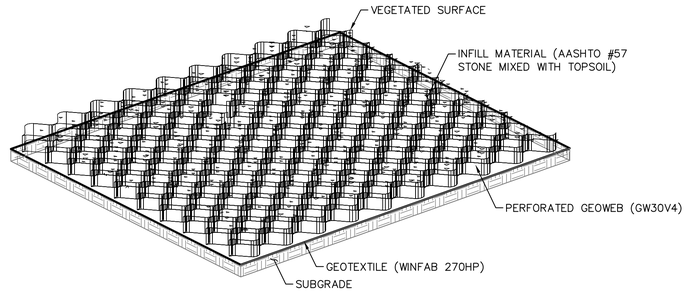

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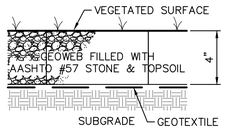
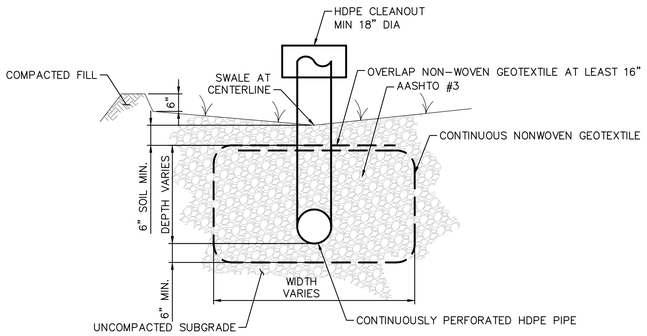


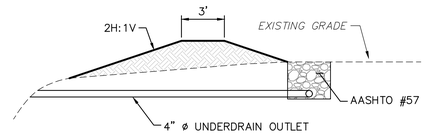
SECTION



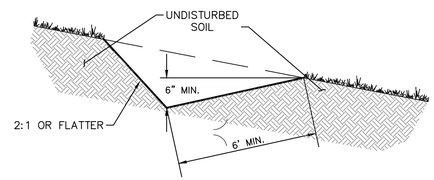
NOTES:

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



SLOW RELEASE TRENCH DETAIL
NOT TO SCALE

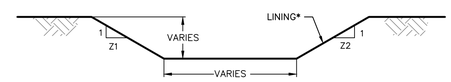


SECTION A–A

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.

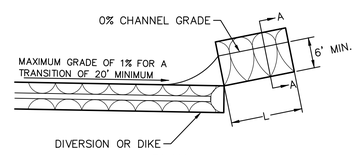
BLOCK VALVE GEOWEB DETAIL
NOT TO SCALE



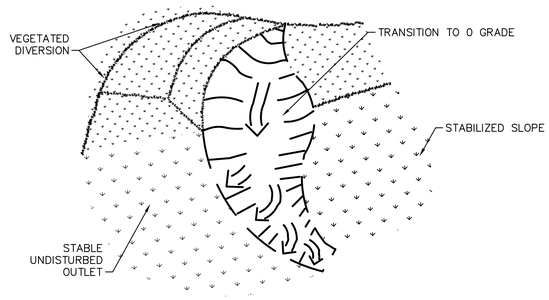
CHANNEL CROSS-SECTION

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

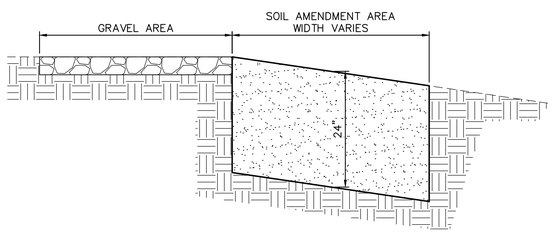


PLAN



ISOMETRIC VIEW – (NOT TO SCALE)

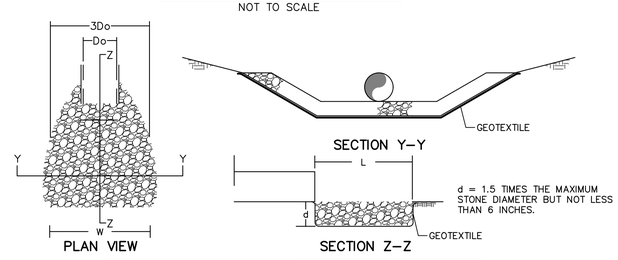
EARTHEN LEVEL SPREADER
NOT TO SCALE



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 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
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PCSM DETAILS

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REVISIONS

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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

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

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

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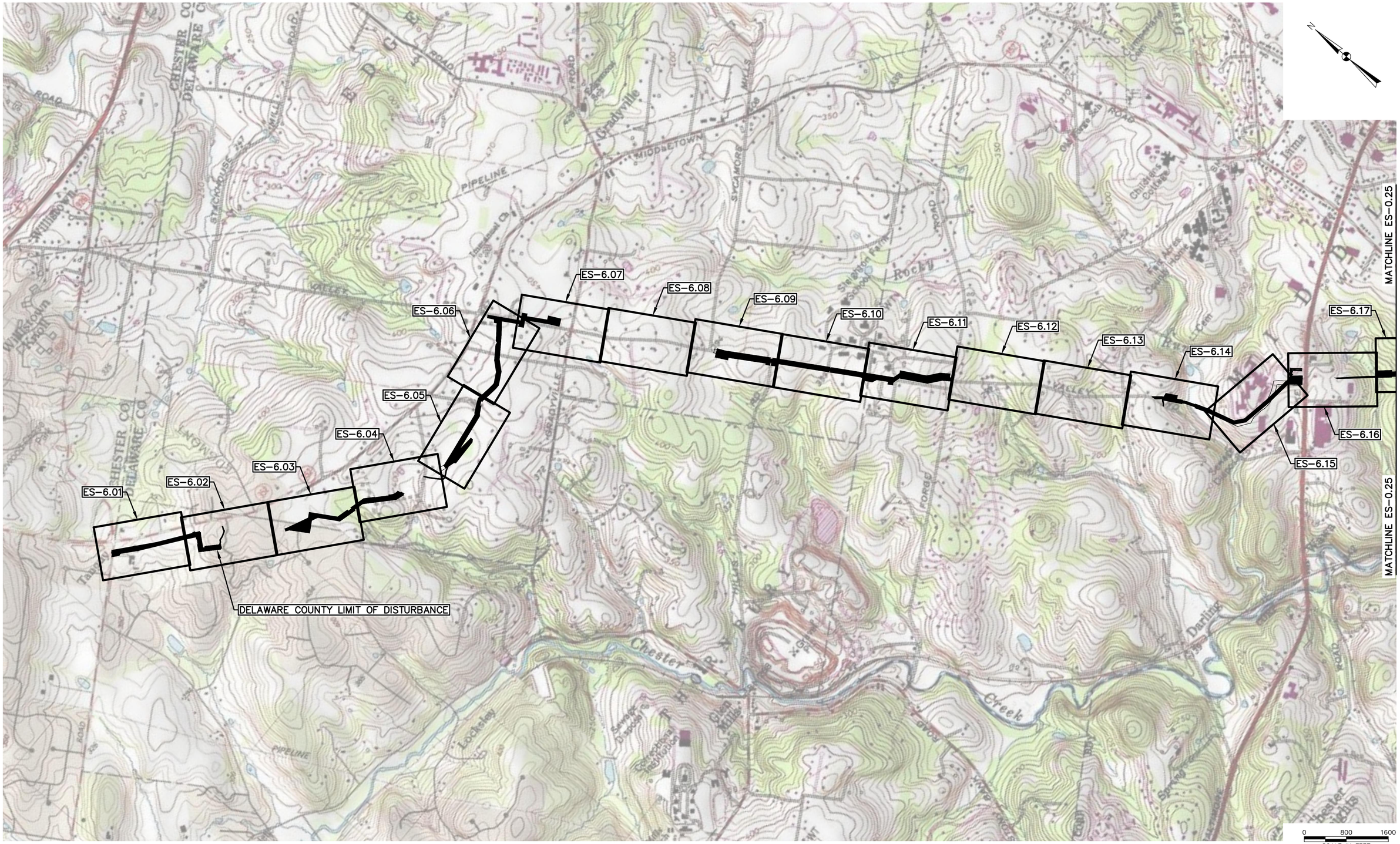

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ENGINEER
2/6/17

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EROSION AND SEDIMENT CONTROL &
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KEY PLAN (SHEET 1 OF 2)

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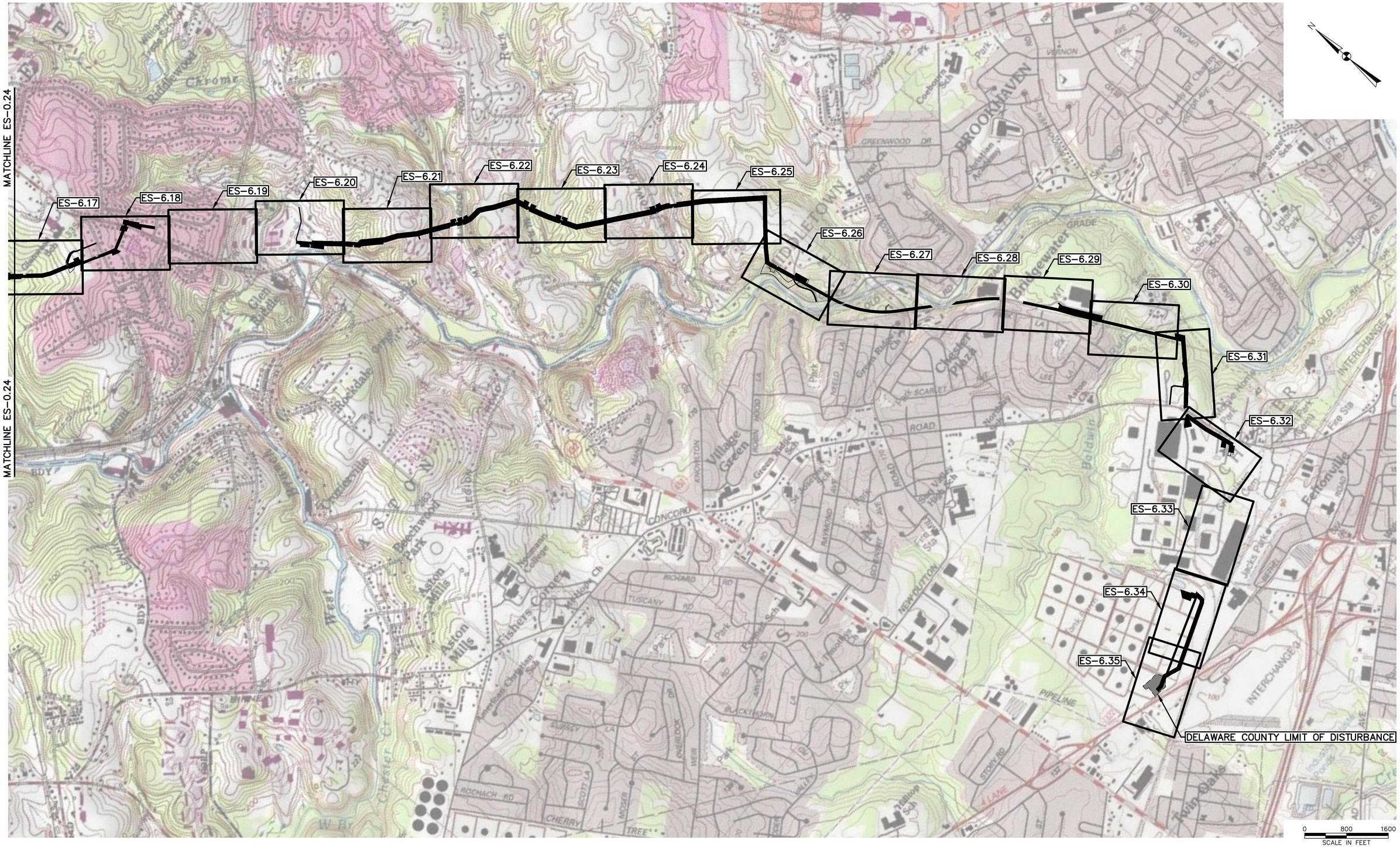

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COMMONWEALTH OF PENNSYLVANIA
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ROBERT F. SIMCIK
PE-075364-E
2/6/17

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SINKING SPRING, PENNSYLVANIA

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DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
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KEY PLAN (SHEET 2 OF 2)

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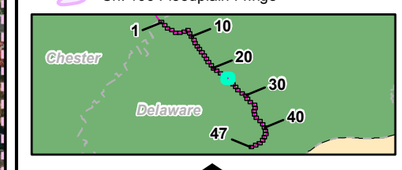
ATTACHMENT E

Updated Site Plan
Aquatic Resource Impact Table

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, Direct Pipe
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, Direct Pipe
- 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, Delaware County, PA.
Sheet 24 of 47

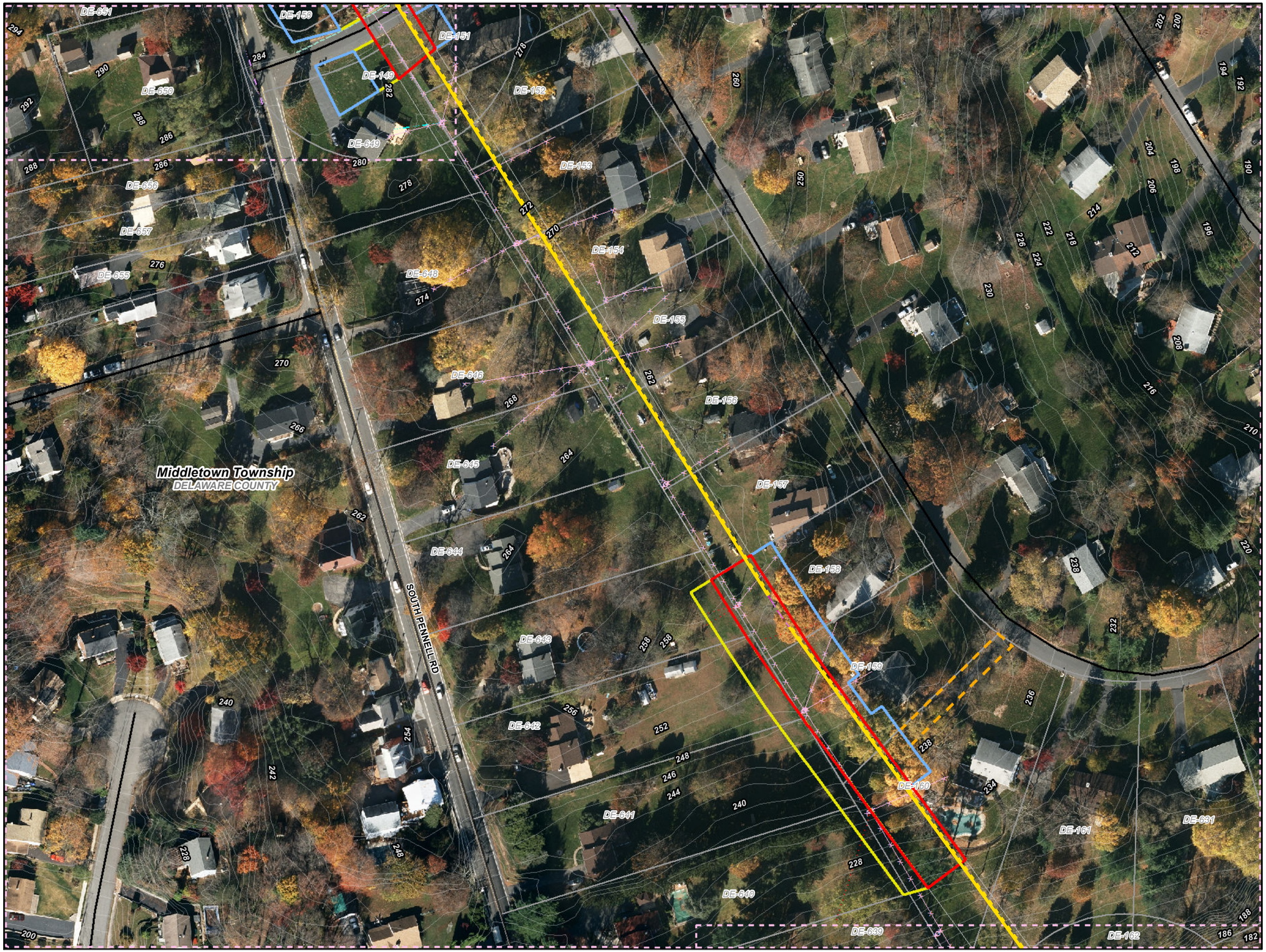
Prepared By: TETRA TECH

Date: 03/2019

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/112IC5958-PPP/MXD/Permits/CountyPermits/DelawareCountySitePlan_Rev8



Legend

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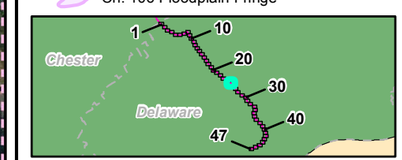
- Intermittent Stream
- Perennial Stream
- Chapter 105 Floodway
- Waived Floodway
- Ch. 106 Floodplain Fringe



N

0 25 50 100 150 200

1 inch = 100 feet

Site Plan for the Sunoco Pennsylvania Pipeline Project, Delaware County, PA.
Sheet 25 of 47

Prepared By: TETRA TECH

Date: 03/2019

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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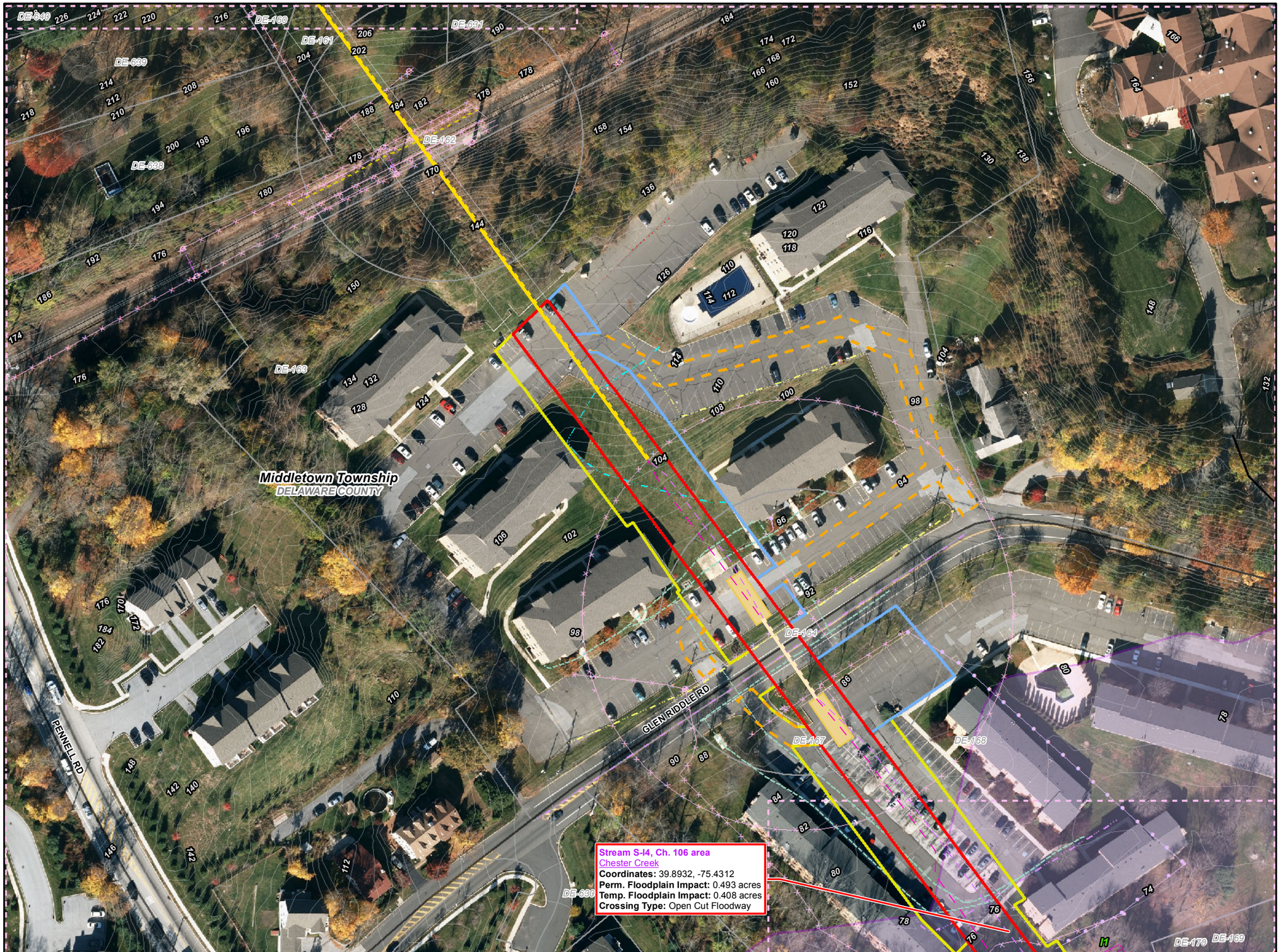

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 1, Direct Pipe
- PPP 2, Bore
- PPP 2, HDD
- PPP 2, Direct Pipe
- 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
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- Bore Pits
- PEM Wetland
- PFO Wetland
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- Pond
- Ephemeral Stream
- Intermittent Stream
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- Chapter 105 Floodway
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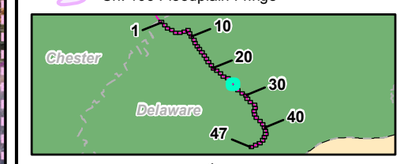

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Site Plan for the Sunoco Pennsylvania Pipeline Project, Delaware County, PA.
Sheet 26 of 47

Prepared By: TETRA TECH

Date: 03/2019

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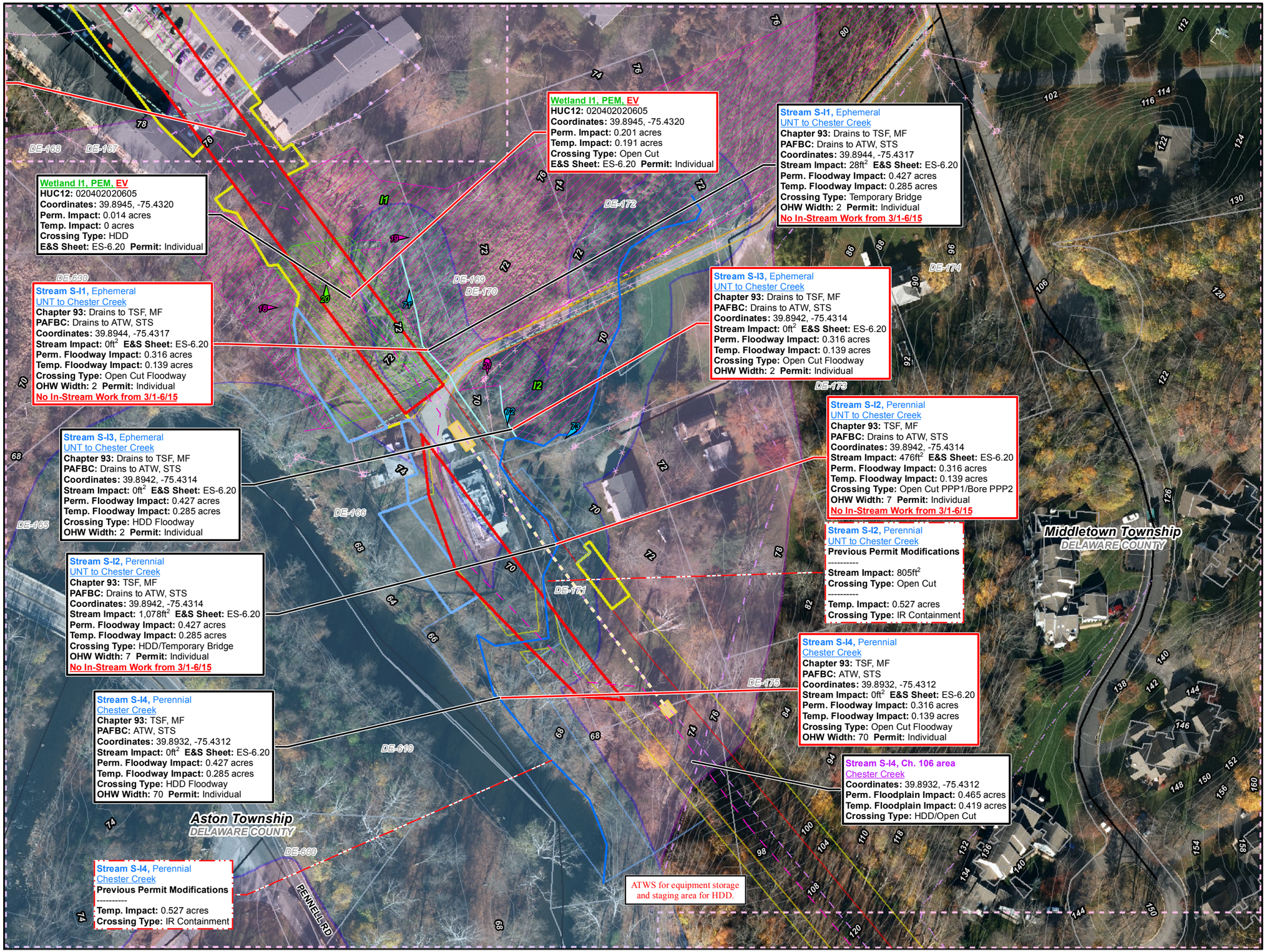

Legend

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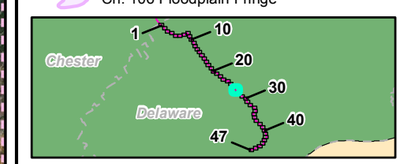

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Site Plan for the Sunoco Pennsylvania Pipeline Project, Delaware County, PA.
Sheet 27 of 47

Prepared By: TETRA TECH

Date: 03/2019

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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pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

Applicant's Name / Client Sunoco Pipeline LP

AQUATIC RESOURCE IMPACT TABLE
FOR PENNSYLVANIA CHAPTER 105 WATER OBSTRUCTION AND ENCROACHMENT APPLICATION / REGISTRATION

Project / Site Name: Pennsylvania Pipeline Project: Glen Riddle HDD #S3-0620 Modification Date: 03/21/2019

DEP USE ONLY			Project Information									PADEP / 105		
PADEP Permit Number	Single Complete Crossing No.	Crossing Number	Fee	Structure / Activity unique identifier	Aquatic Resource Type	Latitude dd nad83	Longitude dd nad83	Waters Name	PA Code Chapter 93 Designation	Work Proposed	DEP Impact Type temp / perm	Watercourse Impact Top of Bank to Top of Bank Length and Width in feet	Floodway Impact Top of Bank Landward Length and Width in feet	Wetland Impact Dimension Length and Width in feet
			see supporting tables	I1	PEM	39.9945	-75.4320	Wetland	EV	Excavation	Perm	N/A	N/A	199 - 50
			see supporting tables	I1	PEM	39.9945	-75.4320	Wetland	EV	Fill	Temp	N/A	N/A	199 - 64
			see supporting tables	S-I2	Perennial	39.8942	-75.4314	UNT to Chester Creek	TSF, MF	Excavation	Perm	68 - 7	N/A	N/A
			see supporting tables	S-I1, S-I2, S-I3, S-I4 Ch. 105 Area	Floodway	39.8942	-75.4314	UNT to Chester Creek; UNT to Chester Creek; UNT to Chester Creek; Chester Creek	Drains to TSF, MF; TSF-MF; Drains to TSF, MF; TSF, MF	Excavation	Perm	N/A	475 - 109	N/A
			see supporting tables	S-I1, S-I2, S-I3, S-I4 Ch. 105 Area	Floodway	39.8942	-75.4314	UNT to Chester Creek; UNT to Chester Creek; UNT to Chester Creek; Chester Creek	Drains to TSF, MF; TSF-MF; Drains to TSF, MF; TSF, MF	Fill	Temp	N/A	350 - 167	N/A

PADEP Impact Type: temporary or permanent.

Permanent Impacts are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water.

Temporary Impacts are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water (these are considered permanent impacts).

Table 1. Wetland Impact Summary for the Mariner East 2 Glen Riddle HDD Redesign – Delaware County – 03/21/2019

Wetland ID	Cover Class[1]	Coordinates	PADEP Permanent Impact (acre)[2]	PADEP Temporary Impact (acre)[2]
I1	PEM	39.9945, -75.4320	0.201	0.191
1 wetland			**0.201 acre**	**0.191 acre**

[1] Field classification based on Cowardin et al. 1979.

[2] Permanent and temporary impacts calculated in accordance with the PADEP impact calculation instructions. The presented acreage is the proposed impact for each resource calculated by GIS analysis, (rather than length x width) and provides a more accurate summation of impacts and therefore the fee calculation for Chapter 105 permitting.

Table 2. Waterbody Impact Summary for the Mariner East 2 Glen Riddle HDD Redesign – Delaware County – 03/21/2019

Stream ID	Stream Name	Coordinates	Stream Permanent Impact (sq. ft.)[1]	Stream Temporary Impact (sq. ft.)[1]	PADEP Permanent Floodway Disturbance (acre)[1, 2]	PADEP Temporary Floodway Disturbance (acre)[1, 2]
S-I1	UNT to Chester Creek	39.8944, -75.4317	-	-	0.316	0.139
S-I2	UNT to Chester Creek	39.8942, -75.4314	476	-		
S-I3	UNT to Chester Creek	39.8942, -75.4314	-	-		
S-I4	Chester Creek	39.8932, -75.4312	-	-		
3 streams			**476 sq. ft.**	**0 sq. ft.**	**0.316 acre**	**0.139 acre**

[1] Permanent and temporary impacts calculated in accordance with the PADEP impact calculation instructions. The presented acreage is the proposed impact for each resource calculated by GIS analysis, (rather than length x width) and provides a more accurate summation of impacts and therefore the fee calculation for Chapter 105 permitting.

[2] Floodway disturbance includes the stream impacts within the calculations, i.e. the floodway disturbance is the total proposed disturbance according to Chapter 105 regulations.

Table 3. Impact Fee Calculation for the Mariner East 2 Glen Riddle HDD Redesign – Delaware County – 03/21/2019

Component	Sum or Total (acre or dollars)
PADEP Permanent Impacts to Wetlands	0.201
PADEP Temporary Impacts to Wetlands	0.191
PADEP Permanent Impacts to Streams	0.316
PADEP Temporary Impacts to Streams	0.139
Total Proposed PADEP Permanent Impacts[1]	**0.517**
Total Proposed PADEP Temporary Impacts[1]	**0.330**
Permanent Impact Fee	$4,800
Temporary Impact Fee	$1,600
Chapter 105 Administrative Fee	$500
Total Chapter 105 Review Fee	**$6,900**

[1] This total is rounded up to the next tenth of an acre to calculate fees in accordance with PADEP guidance.

ATTACHMENT F

Proof of PHMC Coordination

Cultural Resources/PA SHPO Consultation

The Tetra Tech Cultural Resources Group has reviewed the proposed Glen Riddle modification and has determined the revised construction methodology may impact cultural resources or archaeological sites listed in or eligible for listing in the NRHP. Due to the initial HDD design, the majority of the area was not previously surveyed for cultural resources. Review of the proposed LOD indicates that the Area of Potential Effect (APE) includes an area encompassing approximately 6 acres. Based on preliminary field investigations, approximately 90 percent of the required workspace/Limit of Disturbance (LOD) or APE will require survey. The Tetra Tech Cultural Resources Group anticipates conducting the required field survey in the near future when field conditions are suitable. Once completed, the survey results will be documented in accordance with state guidelines and forwarded to the PA SHPO for review and comment via the online Cultural Resources Geographic Information System (CRGIS).

ATTACHMENT G

PNDI Update

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Gas Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

March 6, 2019

IN REPLY REFER TO
SIR# 50801

Tetra Tech
Kevin Berend
301 Ellicott Street
Buffalo, New York 14203

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 677014_1
HDD S3-0620 Conversion
DELAWARE County: Middletown Township

Dear Kevin Berend:

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 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*, PA threatened)

A field view by the Pennsylvania Fish and Boat Commission, along with a company representative, was conducted on February 27, 2019 to view current conditions following construction and restoration of the project area near the unnamed tributary to Chester Creek. To avoid potential conflicts with turtles a barrier should be maintained in between the project LOD and Chester Creek. Prior to construction in vicinity of the unnamed tributary to Chester Creek, the project area should be checked and cleared for turtles. Any turtle found on site should be photographed and relocated to the nearest aquatic habitat. Additionally, the PFBC must be contacted within 48 hours of the find.

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 # 50801. 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

TETRA TECH

February 13, 2019

Mr. Greg Lech, Fisheries Biologist
Pennsylvania Fish and Boat Commission
Division of Environmental Services
P.O. Box 356
Revere, PA 18953

RE: Additional Coordination on PNDI File Number 677014
Mariner East II: Pennsylvania Pipeline Project
Modification to Convert HDD to Open Cut Installation
Delaware County, Pennsylvania

Dear Mr. Lech:

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 677014) for the SPLP Pennsylvania Pipeline Project (Project). The PNDI indicated no impact anticipated from the Pennsylvania (PA) Game Commission, PA Department of Conservation and Natural Resources (PADCNR), and the U.S. Fish and Wildlife Service (USFWS), however, the PA Fish and Boat Commission (PAFBC) required further review to determine the potential impact to a sensitive species.

SPLP is requesting a major Chapter 105 permit modification from the Pennsylvania Department of Environmental Protection (PADEP) for a change in the installation method for the 20-inch and portions of the 16-inch diameter pipelines in Middletown Township, Delaware 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 under roads and railroads.

Project Description and Minimization Efforts

The new installation method will involve the open cut of wetland I1 to install both pipes and an open cut to install the 20-inch pipe across stream S-I2. Stream S-I2 will be crossed via an open trench method for the 20-inch pipeline 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. In order 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-I2. 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 wetland and stream are crossed to avoid soil compaction, allow for trench excavation, segregation of the wetland topsoil and 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 C.

Project Information Provided
The location of the Project site and scope of the proposed change to be reviewed is provided in the revised Chapter 105 aerial site plan (Attachment A). The PNDI receipt generated for this request is provided in Attachment B, and the proposed Erosion and Sediment control design and installation method is provided in Attachment C.

SPLP appreciates your timely review of this request for the PAFBC's clearance to change the installation method of the Project at this wetland/stream complex crossing. 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

Revised PADEP Chapter 105 Site Plan Sheets

Legend

- Sheet Boundary
- PPP 1
- PPP 2
- PPP 1, Bore
- PPP 1, HDD
- PPP 2, Bore
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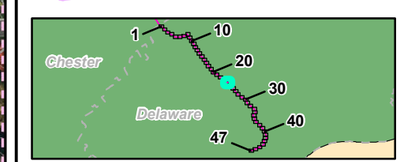

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Site Plan for the Sunoco Pennsylvania Pipeline Project, Delaware County, PA.
Sheet 24 of 47

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.

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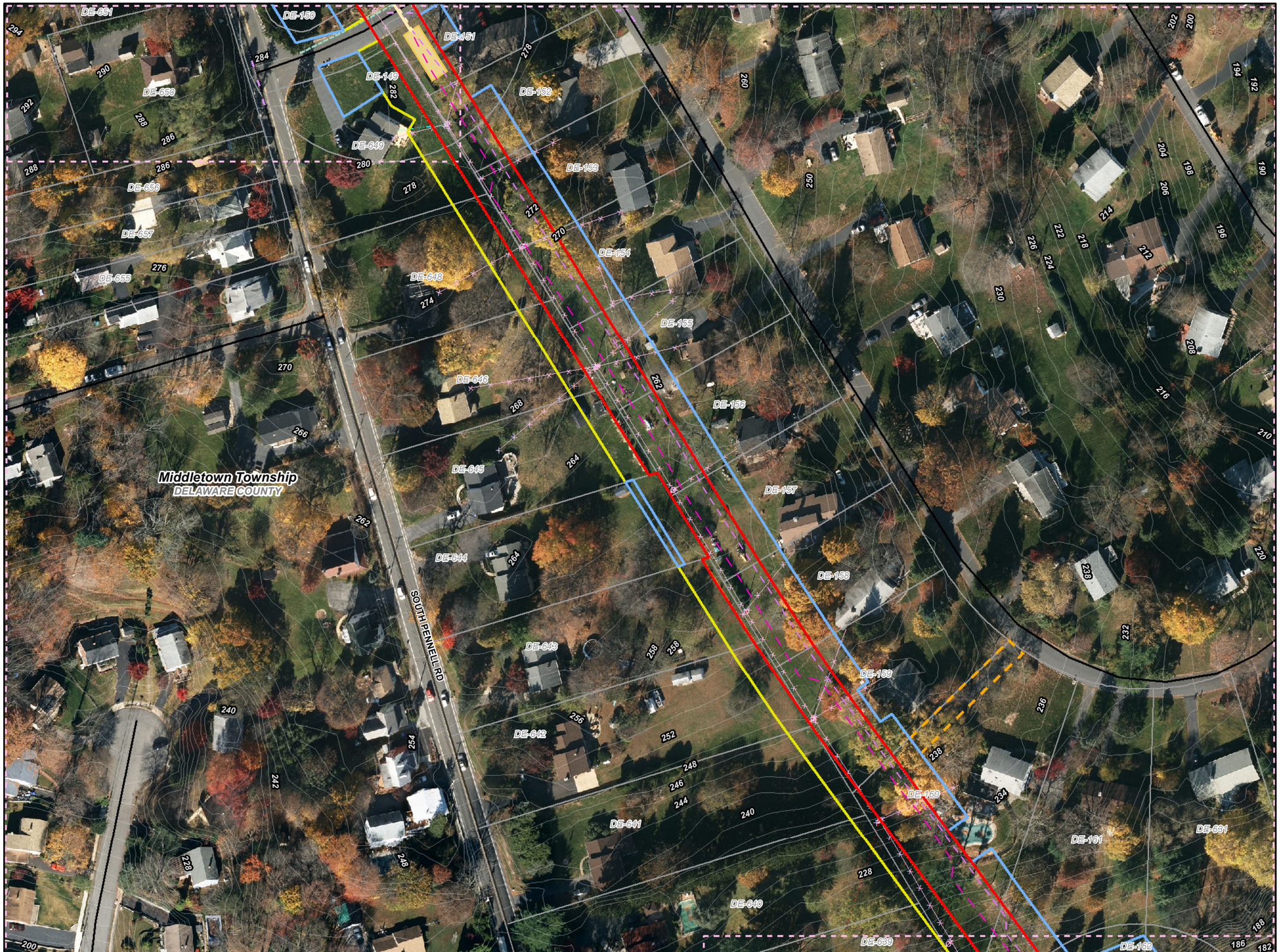

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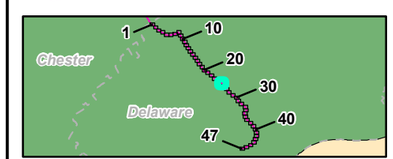

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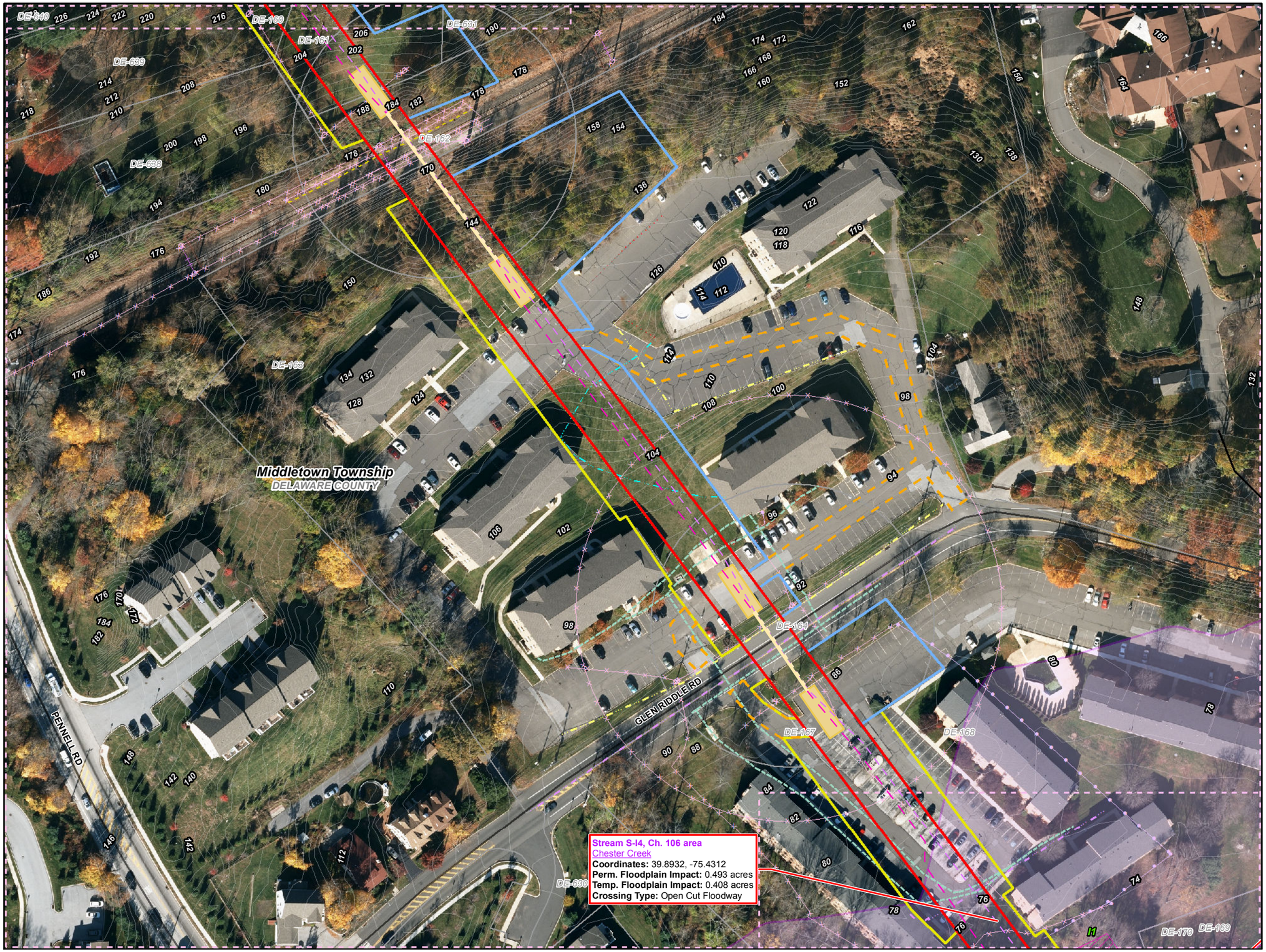

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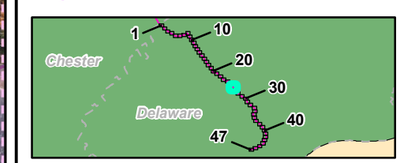

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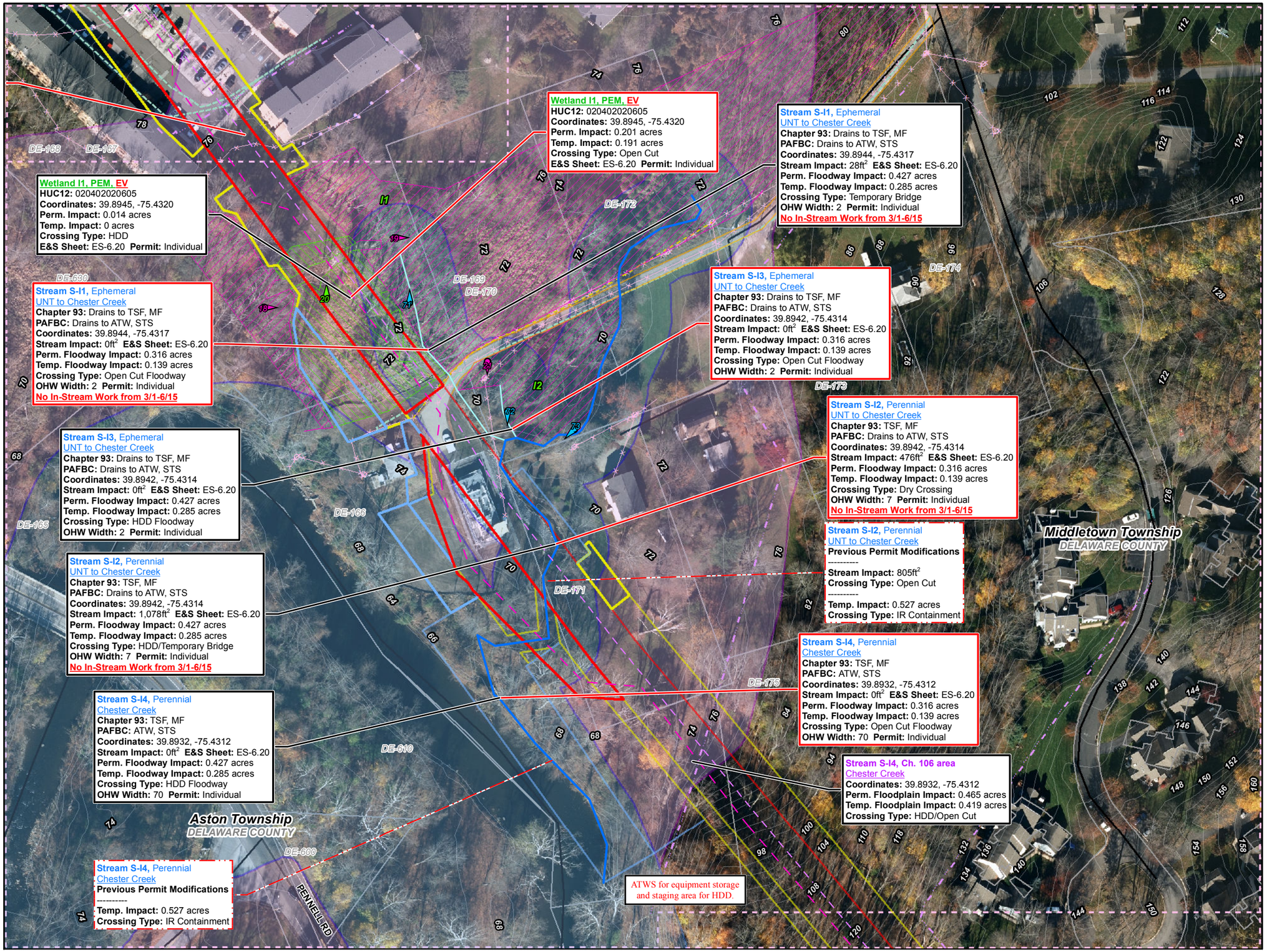

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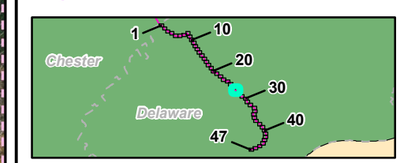

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Attachment B

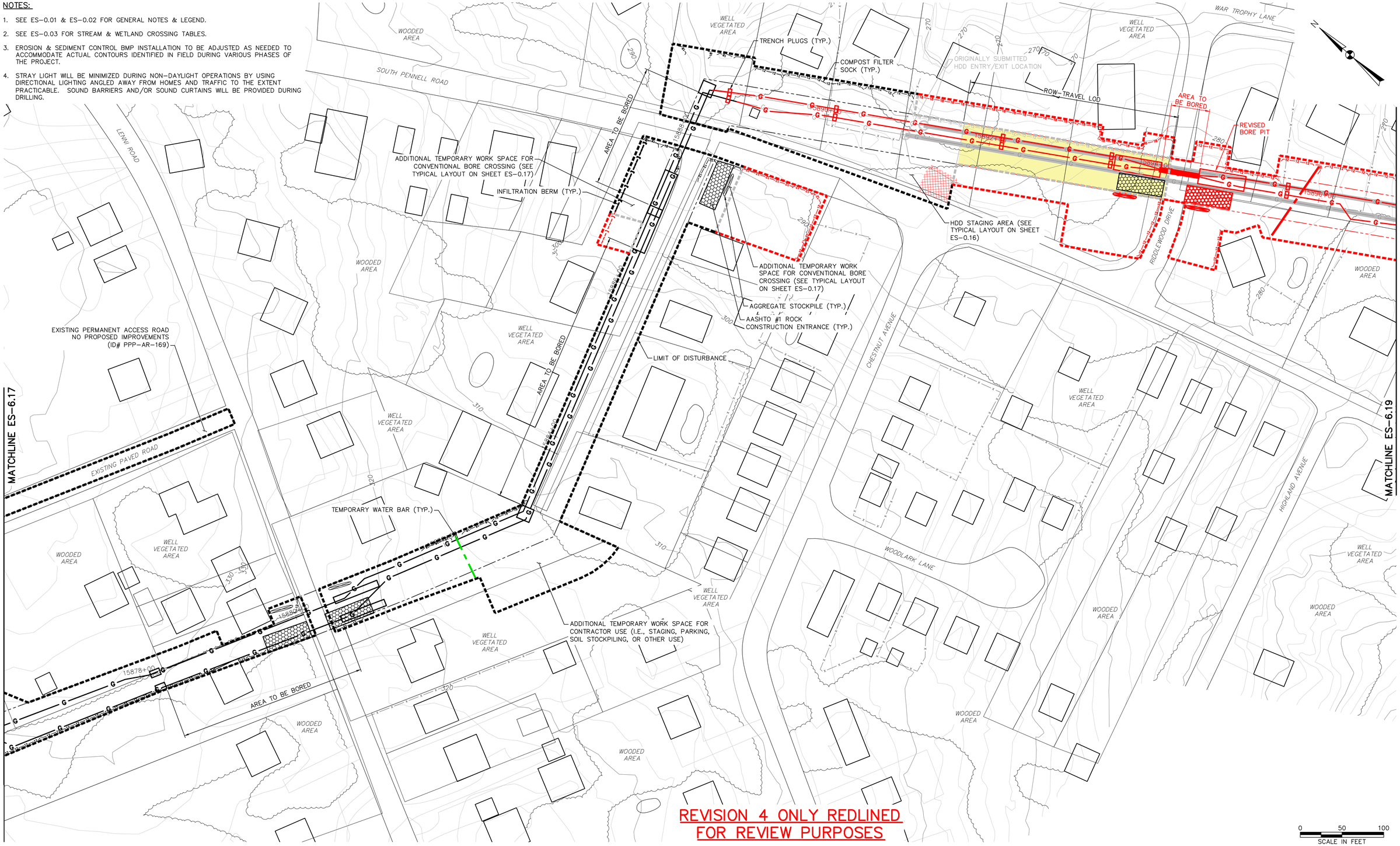
PNDI Receipt

Attachment C

Revised Erosion and Sediment Control Plan Sheets

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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.



REVISION 4 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	8/16/18	16" HDD MODIFICATION
4	RS	2/8/19	HDD CONVERTED TO CONVENTIONAL BORES. ADDITIONAL LOD ADDED

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 18 OF 35

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

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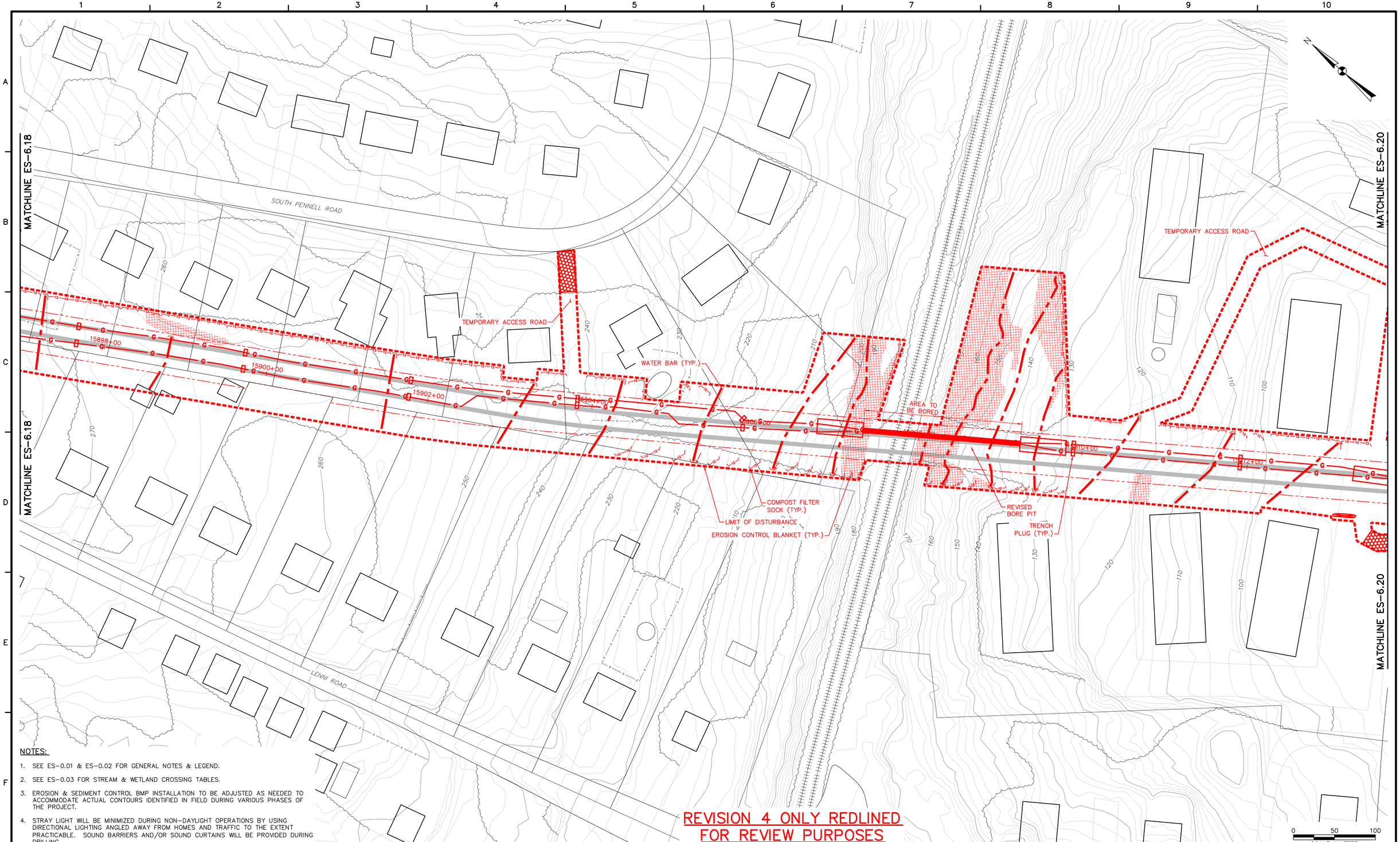
ES-6.18
SHEET 6.18 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\18 – Delaware\E&S\5958ES006.18.dwg PIT NICHOLE.NAJESKI 2/11/2019 12:21:37 PM



REVISION 4 ONLY REDLINED FOR REVIEW PURPOSES

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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.

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	8/16/18	16" HDD MODIFICATION
4	RS	2/8/19	HDD CONVERTED TO CONVENTIONAL BORES. ADDITIONAL LOD ADDED

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
ROBERT F. SIMCIK
2/8/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

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DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 19 OF 35

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

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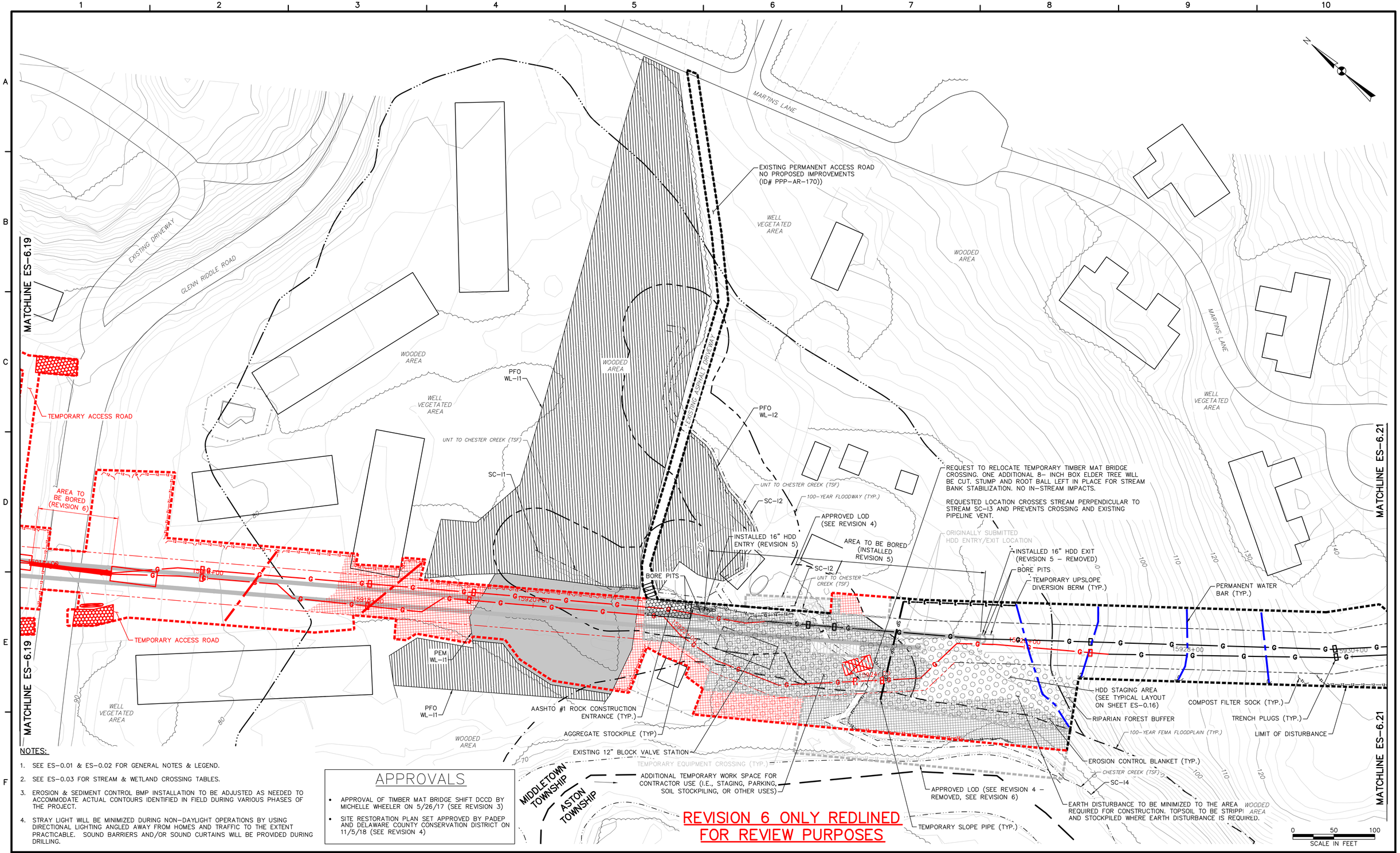
ES-6.19
SHEET 6.19 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\18 – Delaware\E&S\5958ES006.19.dwg PIT NICHOLE.NAJESKI 2/11/2019 2:34:09 PM



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.
4. STRAY LIGHT WILL BE MINIMIZED DURING NON-DAYLIGHT OPERATIONS BY USING DIRECTIONAL LIGHTING ANGLED AWAY FROM HOMES AND TRAFFIC TO THE EXTENT PRACTICABLE. SOUND BARRIERS AND/OR SOUND CURTAINS WILL BE PROVIDED DURING DRILLING.

APPROVALS

- APPROVAL OF TIMBER MAT BRIDGE SHIFT DCCD BY MICHELLE WHEELER ON 5/26/17 (SEE REVISION 3)
- SITE RESTORATION PLAN SET APPROVED BY PADEP AND DELAWARE COUNTY CONSERVATION DISTRICT ON 11/5/18 (SEE REVISION 4)

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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	5/26/17	TIMBER BRIDGE SHIFT
4	RS	1/31/18	ADDITIONAL LOD AND E&S CONTROLS ADDED-SEE SITE SPECIFIC DRAWING SET
5	RS	8/16/18	16" HDD MODIFICATION
6	RS	2/8/19	HDD CONVERTED TO CONVENTIONAL BORES. ADDITIONAL LOD ADDED

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
ROBERT F. SIMCIK
2/8/19

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

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

DELAWARE COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 20 OF 35

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

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ES-6.20
SHEET 6.20 OF 60

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\18 - Delaware\E&S\5958ES006.20.dwg PIT NICHOLE.NAJESKI 2/13/2019 11:39:57 AM

1. PROJECT INFORMATION

Project Name: **HDD S3-0620 Conversion**
Date of Review: **2/12/2019 09:33:49 AM**
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: **8.63 acres**
County(s): **Delaware**
Township/Municipality(s): **MIDDLETOWN**
ZIP Code: **19063**
Quadrangle Name(s): **MEDIA**
Watersheds HUC 8: **Lower Delaware**
Watersheds HUC 12: **Chester Creek**
Decimal Degrees: **39.897534, -75.434575**
Degrees Minutes Seconds: **39° 53' 51.1232" N, 75° 26' 4.4692" W**

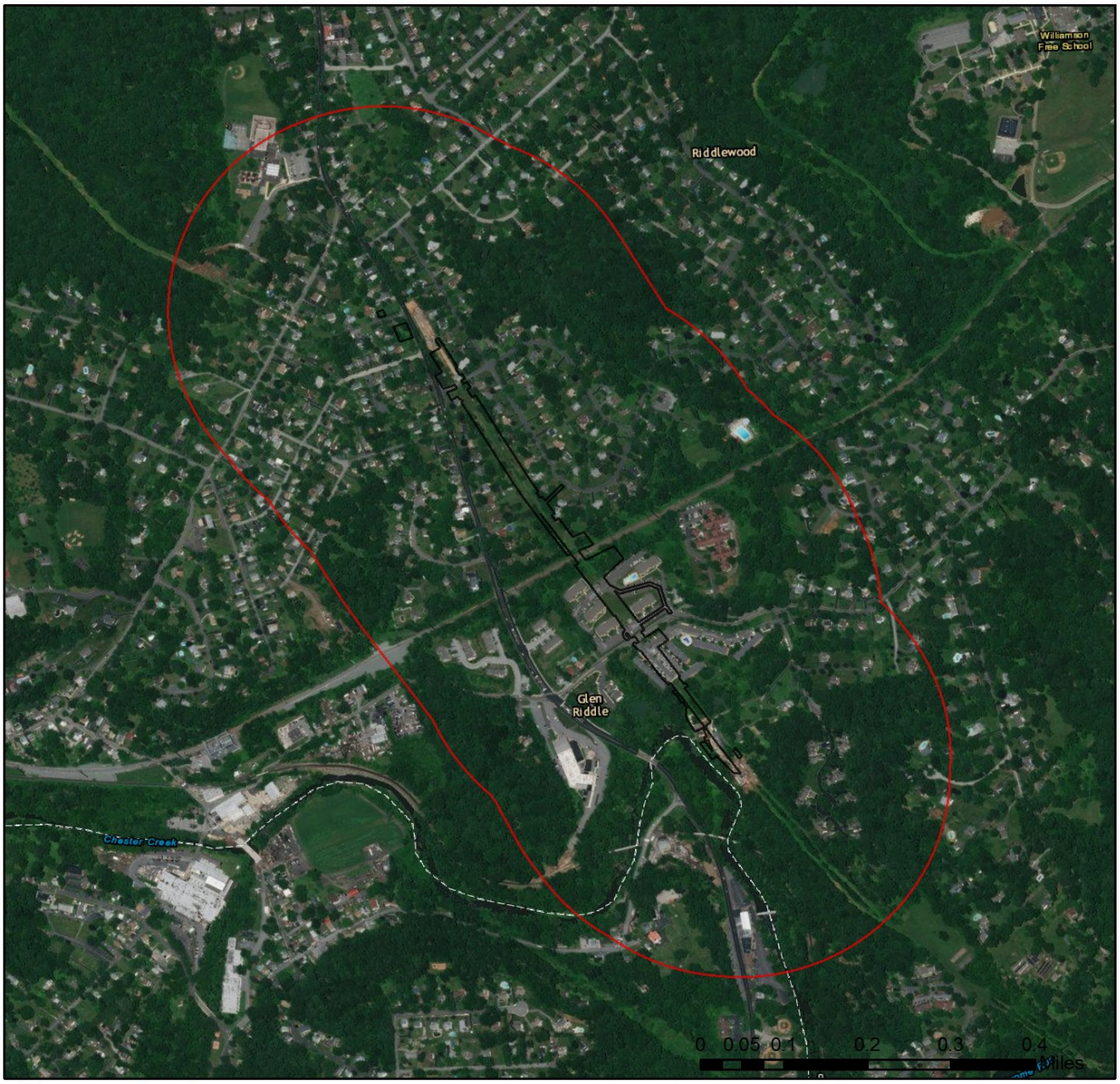
2. SEARCH RESULTS

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	No Known Impact	No Further Review Required

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.

HDD S3-0620 Conversion

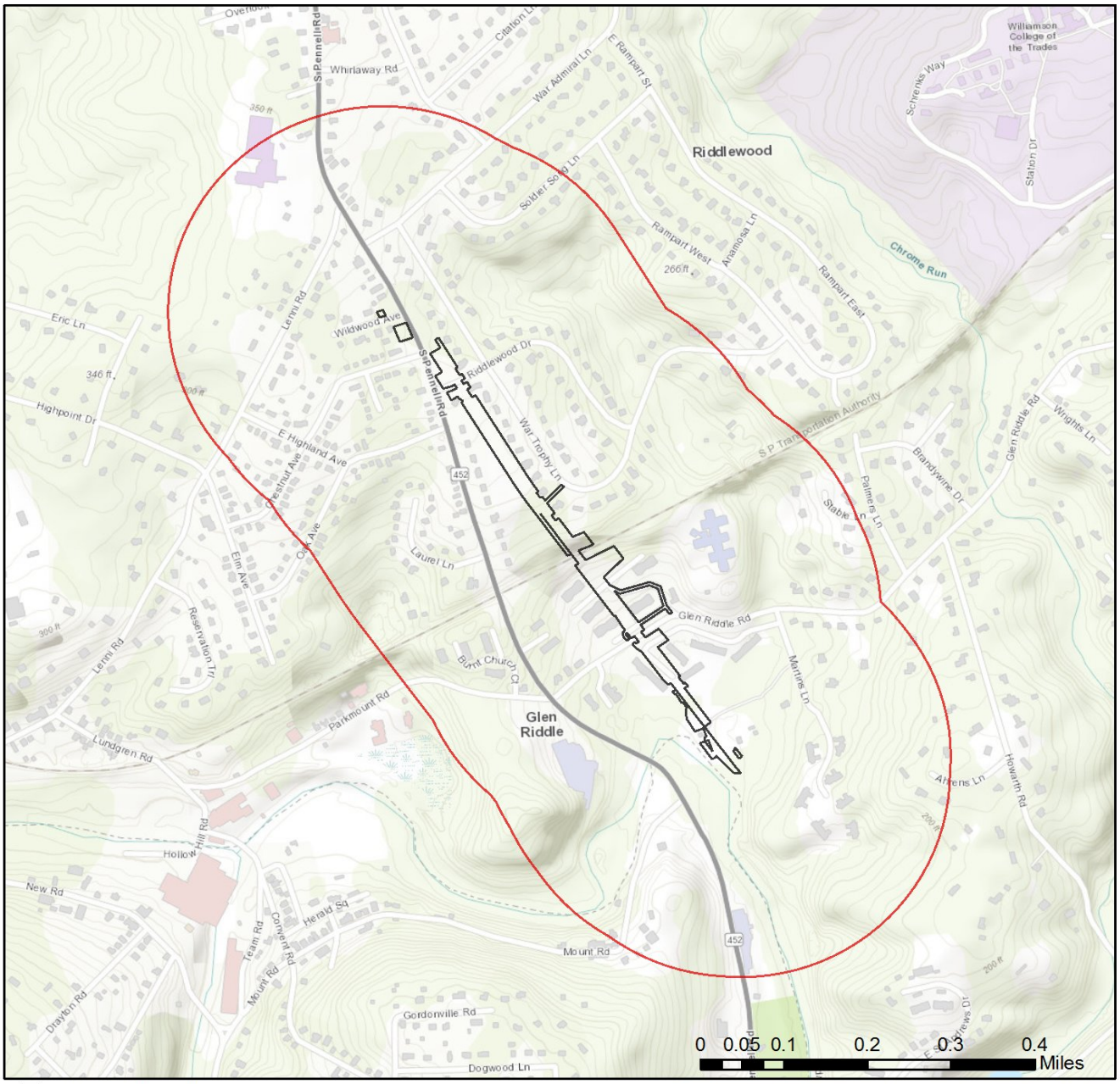


Project Boundary

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

HDD S3-0620 Conversion



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: 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.)

Q2: 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.

Q3: 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

Q4: 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:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* 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 Ellicott 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

2/12/19
date

ATTACHMENT H

Application Fee Calculation

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

CHAPTER 105 FEE(S) CALCULATION WORKSHEET

Additional information can be found at 25 PA Code §105.13 (relating to regulated activities – information and fees), the General Permit Registration (3150-PM-BWEW0500), the Joint Permit Application (3150-PM-BWEW0036) and the Dam Permit Application (3140-PM-BWEW0001)

Federal, State, county or municipal agencies or municipal authorities: ☐ **EXEMPT from fees**

These entities are exempt from these fees. If the applicant falls into one of these categories, please check the box above and provide only the first page of this worksheet with the project application or registration.

ALL OTHERS:

1. Please place an "X" in the box next to all authorizations that apply to the project and complete the fee information below those authorization(s). Projects may require multiple authorizations and fees, further clarification and examples are included below and at the end of this document.
2. Total each authorization, Section, and Part. Part One is for Water Obstructions and Encroachment authorizations, Part Two is for Dam Safety authorizations.
3. Please provide this completed worksheet (page 1 and page 2 and/or page 3, as is appropriate to the project) and a check for the applicable fee(s) with the project application or registration. The check should be made payable to the "**Commonwealth of Pennsylvania Clean Water Fund**" OR "**_____ Conservation District Clean Water Fund**", whichever is the reviewing entity.

NOTES:

Per *25 PA Code §105.13(c)(2)(iii)* Disturbance review fees are calculated by individually adding all of the permanent and temporary impacts to waterways, floodways, floodplains and bodies of water including wetlands to the next highest tenth acre and multiplying the permanent and temporary impacts by the respective fees and then these amounts are added to the other applicable fees.

Entities proposing structures or activities to occupy a Submerged Lands of the Commonwealth must obtain a Submerged Lands License Agreement (SLLA) and pay the appropriate annual charge. The applicant will be contacted if this charge applies to the project.

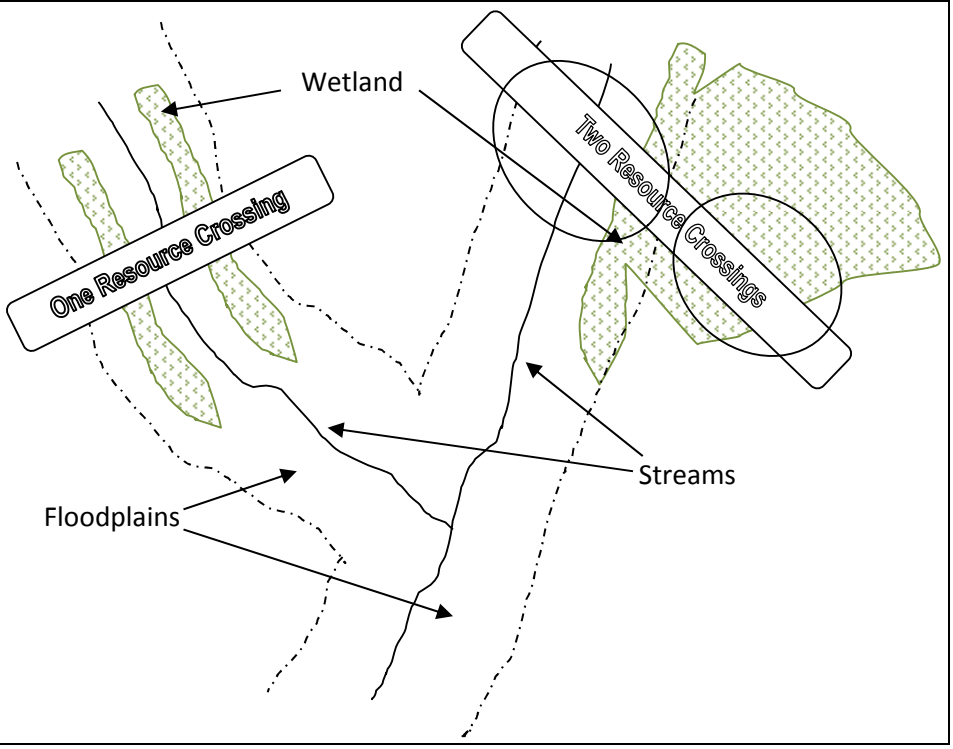
Floodway – The channel of the watercourse and portions of the adjoining floodplains which are reasonably required to carry and discharge the 100-year frequency flood. Unless otherwise specified, the boundary of the floodway is as indicated on maps and flood insurance studies provided by FEMA. In an area 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.

Wetland and Stream Clarification:

[1] In many instances, wetlands are located within the floodplain of a stream. These resources for the purposes of calculating disturbance fees are considered co-located or overlapping and the area of disturbance would only be used once.

[2] In the case of GP-5, GP-7 and GP-8 fees are charged per structure per resource crossing and the following also applies to the disturbance fees:

- A crossing of the stream and the floodplain with wetlands present within the floodplain is considered one resource crossing.
- When the crossing traverses a stream and the floodplain and a wetland that is located outside of the floodplain or a wetland that extends out beyond the floodplain, it is considered two resource crossings.



PART ONE: WATER OBSTRUCTIONS AND ENCROACHMENTS

SECTION A. APPLICATION FEES

☐ **WATER OBSTRUCTION AND ENCROACHMENT PERMIT** (Joint Permit Application)
Some activities or structures within a project may also qualify for an accumulation of General Permit fees, please mark the box above indicating an Individual Water Obstruction and Encroachment Permit AND the corresponding fee(s) in the General Permit section below those. Activities or structures not qualifying for a General Permit fee must include a disturbance fee.

☐ Administrative Filing Fee[1]		$ 1,750	+	
☐ Temporary Disturbance ($400/0.1ac)	_____.____ acres x $4,000 =	$ _____	+	
☐ Permanent Disturbance ($800/0.1ac)	_____.____ acres x $8,000 =	$ _____		= $ _____
	WO&E FEE subtotal (a)			$ _____

☐ **GENERAL PERMIT(S)** (select activity/structure(s) below, see page 4 for "#" explanation)
Some activities or structures within a project requiring an Individual Water Obstruction and Encroachment Permit may qualify for an accumulation of General Permit fees, please mark the corresponding fee(s) below but not the box above indicating a General Permit.

☐ GP-1 Fish Habitat Enhancement Structures		$ 50	= $ _____
☐ GP-2 Small Docks and Boat Launching Ramps	_____ (#) x	$ 175	= $ _____
☐ GP-3 Bank Rehabilitation, Bank Protection and Gravel Bar Removal	_____ (#) x	$ 250	= $ _____
☐ GP-4 Intake and Outfall Structures	_____ (#) x	$ 200	= $ _____
☐ GP-5 Utility Line Stream Crossings[2]	_____ (#) x _____ (#) x	$ 250	= $ _____
☐ GP-6 Agricultural Crossings and Ramps	_____ (#) x	$ 50	= $ _____
☐ GP-7 Minor Road Crossings[2]	_____ (#) x	$ 350	= $ _____
☐ GP-8 Temporary Road Crossings[2]	_____ (#) x	$ 175	= $ _____
☐ GP-9 Agricultural Activities		$ 50	= $ _____
☐ GP-10 Abandoned Mine Reclamation		$ 500	= $ _____
☐ GP-11 Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments[1]		$ 750	+
☐ Temporary Disturbance ($400/0.1ac)	_____.____ acres x $4,000 =	$ _____	+
☐ Permanent Disturbance ($800/0.1ac)	_____.____ acres x $8,000 =	$ _____	= $ _____
☐ GP-15 Private Residential Construction in Wetlands[1]		$ 750	+
☐ Temporary Disturbance ($400/0.1ac)	_____.____ acres x $4,000 =	$ _____	+
☐ Permanent Disturbance ($800/0.1ac)	_____.____ acres x $8,000 =	$ _____	= $ _____
	GP(s) FEE subtotal (b)		$ _____

PART ONE: SECTION A. APPLICATION FEE(S) subtotal (a+b=c) $ _____

SECTION B. OTHER FEES

☐ Environmental Assessment for Waived Activities (§105.13(c)(2)(iv))		$ 500		$ _____
☒ Amendment to Water Obstruction and Encroachment Permit				
☒ Major Amendment[1]		$ 500	+	
☒ Temporary Disturbance	0.4 acres x $4,000 =	$ 1,600	+	$ 2,100
☒ Permanent Disturbance	0.6 acres x $8,000 =	$ 4,800		= $ 6,900
☐ Minor Amendment		$ 250		$ _____

Transfer of Water Obstruction and Encroachment Permit *does not require submission of this form; see Application for Transfer of Permit / Submerged Lands License Agreement (3150-PM-BWEW-0016)*

PART ONE: SECTION B. OTHER FEE(S) subtotal (d) $ 6,900

PART ONE: FEE(S) TOTAL (c+d=e) $ 6,900

DEP USE ONLY			
FEE TOTAL:	_____	Permit / Authorization Number (s):	_____
Correct Amount:	_____	Check #: _____	_____
Check Amount:	_____	Payable to: _____	_____

PART TWO: DAM SAFETY (USE ONE FEE SHEET PER DAM)

SECTION A. APPLICATION FEES

☐ **DAM PERMIT APPLICATION – NEW DAM**

☐ Size A	☐ Hazard 1 $26,500	☐ Hazard 2 $26,500	☐ Hazard 3 $25,500	☐ Hazard 4 $23,500	$ _____
☐ Size B	☐ Hazard 1 $19,000	☐ Hazard 2 $19,000	☐ Hazard 3 $18,500	☐ Hazard 4 $17,000	$ _____
☐ Size C	☐ Hazard 1 $10,500	☐ Hazard 2 $10,500	☐ Hazard 3 $10,000	☐ Hazard 4 $ 8,000	$ _____

☐ **STAGED CONSTRUCTION**

NO. OF STAGES BEYOND INITIAL STAGE _____ X APPLICATION FEE _____ X 0.90 (90%) $ _____

☐ **DAM PERMIT APPLICATION – MODIFICATION OF DAM**

☐ Size A	☐ Hazard 1 $18,500	☐ Hazard 2 $18,500	☐ Hazard 3 $18,500	☐ Hazard 4 $18,000	$ _____
☐ Size B	☐ Hazard 1 $12,000	☐ Hazard 2 $12,000	☐ Hazard 3 $12,000	☐ Hazard 4 $11,500	$ _____
☐ Size C	☐ Hazard 1 $ 7,500	☐ Hazard 2 $ 7,500	☐ Hazard 3 $ 7,500	☐ Hazard 4 $ 7,500	$ _____

☐ **STAGED CONSTRUCTION**

NO. OF STAGES BEYOND INITIAL STAGE _____ X APPLICATION FEE _____ X 0.85 (85%) $ _____

☐ **DAM PERMIT APPLICATION – OPERATION & MAINTANANCE OF EXISTING DAM**

☐ Size A	☐ Hazard 1 $12,500	☐ Hazard 2 $12,500	☐ Hazard 3 $12,000	☐ Hazard 4 $10,000	$ _____
☐ Size B	☐ Hazard 1 $10,000	☐ Hazard 2 $10,000	☐ Hazard 3 $ 9,500	☐ Hazard 4 $ 8,500	$ _____
☐ Size C	☐ Hazard 1 $ 7,000	☐ Hazard 2 $ 7,000	☐ Hazard 3 $ 6,500	☐ Hazard 4 $ 6,000	$ _____

PART TWO: SECTION A. APPLICATION FEE(S) subtotal (a) $ _____

SECTION B. OTHER FEES

☐ Letter of Amendment or Authorization

☐ Major (≥$250,000)

☐ Size A $14,700 ☐ Size B $ 8,700 ☐ Size C $ 4,400 $ _____

☐ Minor (<$250,000)

☐ Size A $ 1,300 ☐ Size B $ 1,000 ☐ Size C $ 650 $ _____

☐ Major Dam Design Revision

☐ Size A $ 4,700 ☐ Size B $ 3,200 ☐ Size C $ 1,700 $ _____

☐ Environmental Assessment

☐ Environmental Assessment for Dam Removal (§105.12(a)(16)) $ 500 $ _____

☐ Non-Jurisdictional Dams $ 900 $ _____

☐ Letter of Amendment or Authorization

☐ Size A $ 1,400 ☐ Size B $ 1,000 ☐ Size C $ 900 $ _____

☐ Transfer of Dam Permit

☐ No Proof of Financial Responsibility $ 550 ☐ Proof of Financial Responsibility $300 $ _____

☐ Annual Registration

☐ Hazard 1 $ 1,500 ☐ Hazard 2 $ 1,500 ☐ Hazard 3 $ 800 $ _____

PART TWO: SECTION B. OTHER FEE(S) subtotal (b) $ _____

PART TWO: FEE(S) TOTAL (a+b=c) $ _____

DEP USE ONLY			
FEE TOTAL:	_____	Permit / Authorization Number (s):	_____
Correct Amount:	_____	Check #: _____	_____
Check amount:	_____	Payable to: _____	_____