



PITT-01-20-053

January 28, 2020

Via E-mail and overnight Fed Ex

Mr. Chris Smith
Construction Permits Section
Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania 19401

**Re: Sunoco Pipeline L.P. – Pennsylvania Pipeline Project (Mariner East II)
Chapter 102 Permit No. ESG0100015001 Major Modification – HDD S3-400 Lisa Drive
West Whiteland Township, Chester County, PA**

Dear Mr. Smith:

On behalf of Sunoco Pipeline L.P. (SPLP), please accept this letter and enclosed drawings and information as a response to Technical Deficiency Comments, dated January 9, 2020, from the Pennsylvania Department of Environmental Protection (Department) for a major modification to the above-referenced Chapter 102 permit.

Technical Deficiencies

- 1. Comment:** The slopes up from the Lisa Drive through Lyntree development to the existing tie in are steep and show signs of erosion. The Conservation District recommends utilizing a larger diameter sock along with additional sections to better capture site runoff. [102.11(a)(1) and 102.4(c)]

Response: *Drawing ES-6.50 has been revised to increase the Compost Filter Sock (CFS) sizing in this area and additional segments of CFS were added where needed. Note that the field crews and environmental staff have had project specific environmental training and are aware that the information contained on these drawings is the minimum required. Additional controls can and will be added based on field conditions and observations, and subsequently reflected as redline changes.*

- 2. Comment:** Cross Right-of-Way diversions discharging to E&S Outlet BMPs should be proposed for the work upslope of Lyntree Drive up to the existing tie in location. [102.11(a)(1)]

Response: *Drawing ES-6.50 has been updated to identify the installation of two additional waterbars near Station 15188+00. The waterbars will be installed in accordance with detail provided in the approved permit package Dwg # ES-0.05 and include the installation of outlet BMP [sump] as identified in detail notes.*

- 3. Comment:** Please illustrate the stormwater basin outlet piping the new pipe will be crossing just to the west of station 15184+00. [102.11(a)(1)]

Response: *Drawing ES-6.50 has been updated to include additional information to show the stormwater basin and associated outlet piping.*

4. **Comment:** Flows off of rock construction entrances should be directed to perimeter controls such as compost socks with sumps via diversion berms built into the entrances; please update plans as the entrances on these plans are in relatively steep slopes and have a high potential to concentrate and convey runoff from the project site. [102.11(a)(1)]

Response: *The rock construction entrances (RCEs) will be installed in accordance with the detail and notes which identify runoff control provided in the approved permit package Dwg # ES-0.05. Drawing ES-6.50 has been updated to show the diversion berm and sump for the RCEs sloped toward paved areas. CFS has been added where necessary.*

5. **Comment:** Please demonstrate in your response letter, the Post Construction Stormwater Management (PCSM) Narrative and the PCSM Plan Drawings how the permittee and/or co-permittee will address all of the components of Title 25 Pa. Code § 102.8(n) in the restoration or reclamation activities of the proposed earth disturbance activities for the areas of the Major Modification.

Response: *Section 3.7 of the Site Restoration and Post Construction Stormwater Management (PCSM) narrative for the proposed major modification has been updated to indicate how the permittee and co-permittee will comply with all requirements of Title 25 Pa. Code § 102.8(n) regarding the restoration of earth disturbance activities, including applicable subsections (b), (c), (e), (f), (h), (i), (l), and (m), consistent with the requirements and conditions presented in the Pennsylvania Pipeline Project's Chapter 102 Erosion and Sediment Control permit ESG0100015001 and Antidegradation Analysis. In addition, a note has been added to the Major Modification's drawings indicating compliance with Title 25 Pa. Code § 102.8(n).*

Enclosed are two (2) hard copies of the modification request provided to facilitate your review of the requested modification. Attachment A includes the revised E&S drawings. Attachment B contains the revised section of the Site Restoration and PCSM narrative.

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,

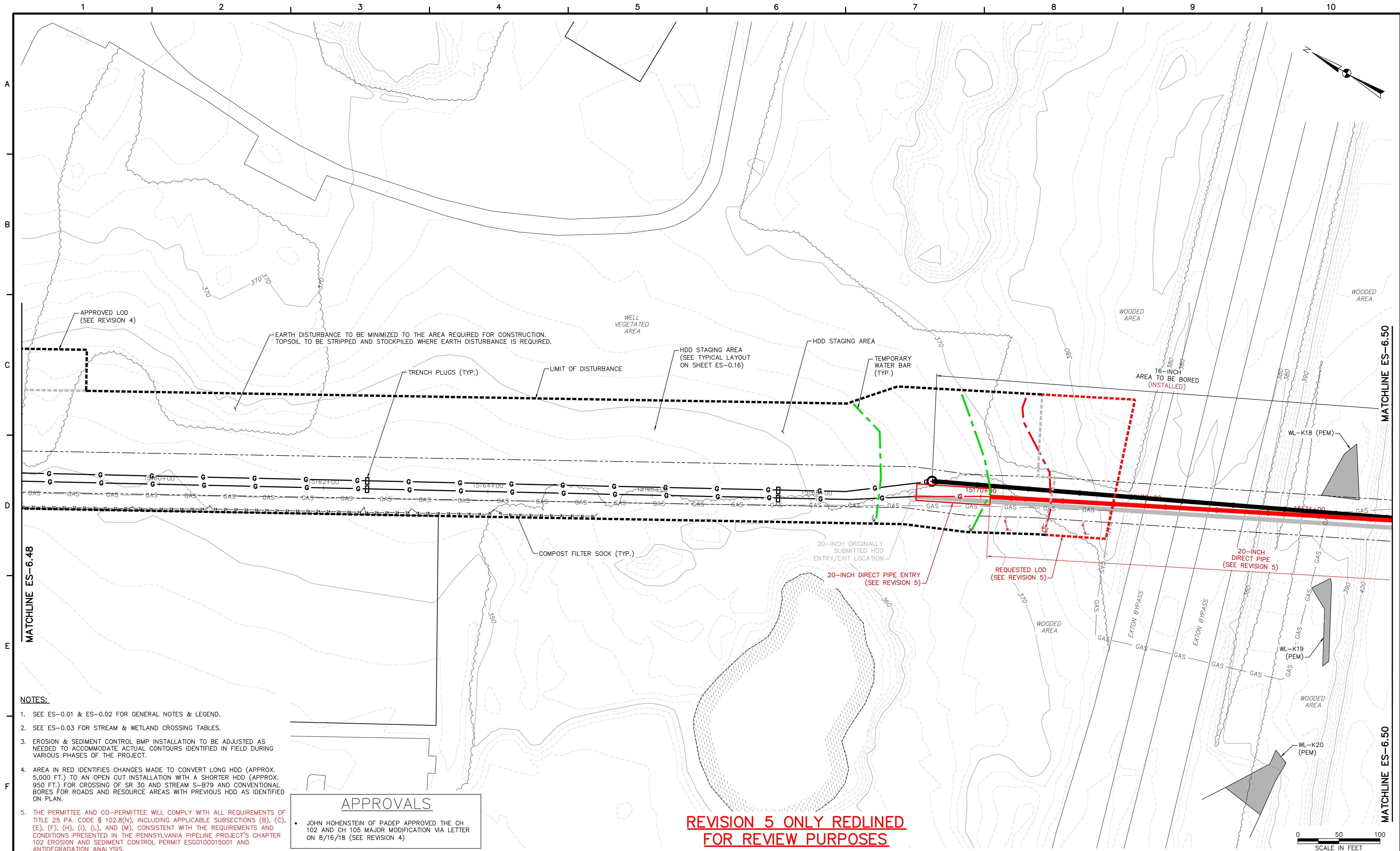


Robert F. Simcik, P.E.
Project Manager
Tetra Tech, Inc.

Enclosures: 1 original, 1 copy

cc: File 112IC05958
J. Sofranko, Chester County Conservation District
J. Hohenstein, SERO DEP
M. Gordon, Energy Transfer
M. Styles, Energy Transfer
C. Embry, Energy Transfer
B. Schaeffer, Tetra Tech
L. Gremminger, Energy Transfer

Attachment A



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. AREA IN RED IDENTIFIES CHANGES MADE TO CONVERT LONG HDD (APPROX. 5,000 FT.) TO AN OPEN CUT INSTALLATION WITH A SHORTER HDD (APPROX. 950 FT.) FOR CROSSING OF SR 30 AND STREAM S-B79 AND CONVENTIONAL BORES FOR ROADS AND RESOURCE AREAS WITH PREVIOUS HDD AS IDENTIFIED ON PLAN.
5. THE PERMITTEE AND CO-PERMITTEE WILL COMPLY WITH ALL REQUIREMENTS OF TITLE 25 PA. CODE § 102.8(N), INCLUDING APPLICABLE SUBSECTIONS (B), (C), (E), (F), (H), (I), (L), AND (M), CONSISTENT WITH THE REQUIREMENTS AND CONDITIONS PRESENTED IN THE PENNSYLVANIA PIPELINE PROJECT'S CHAPTER 102 EROSION AND SEDIMENT CONTROL PERMIT ESG0100015001 AND ANTI-DEGRADATION ANALYSIS.

APPROVALS

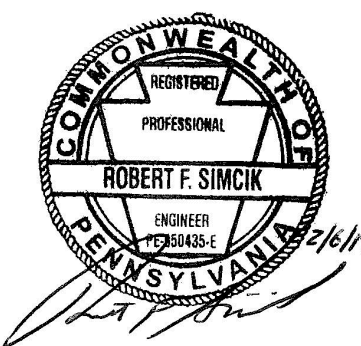
- JOHN HOHENSTEIN OF PADEP APPROVED THE CH 102 AND CH 105 MAJOR MODIFICATION VIA LETTER ON 8/16/18 (SEE REVISION 4)

REVISION 5 ONLY REDLINED FOR REVIEW PURPOSES



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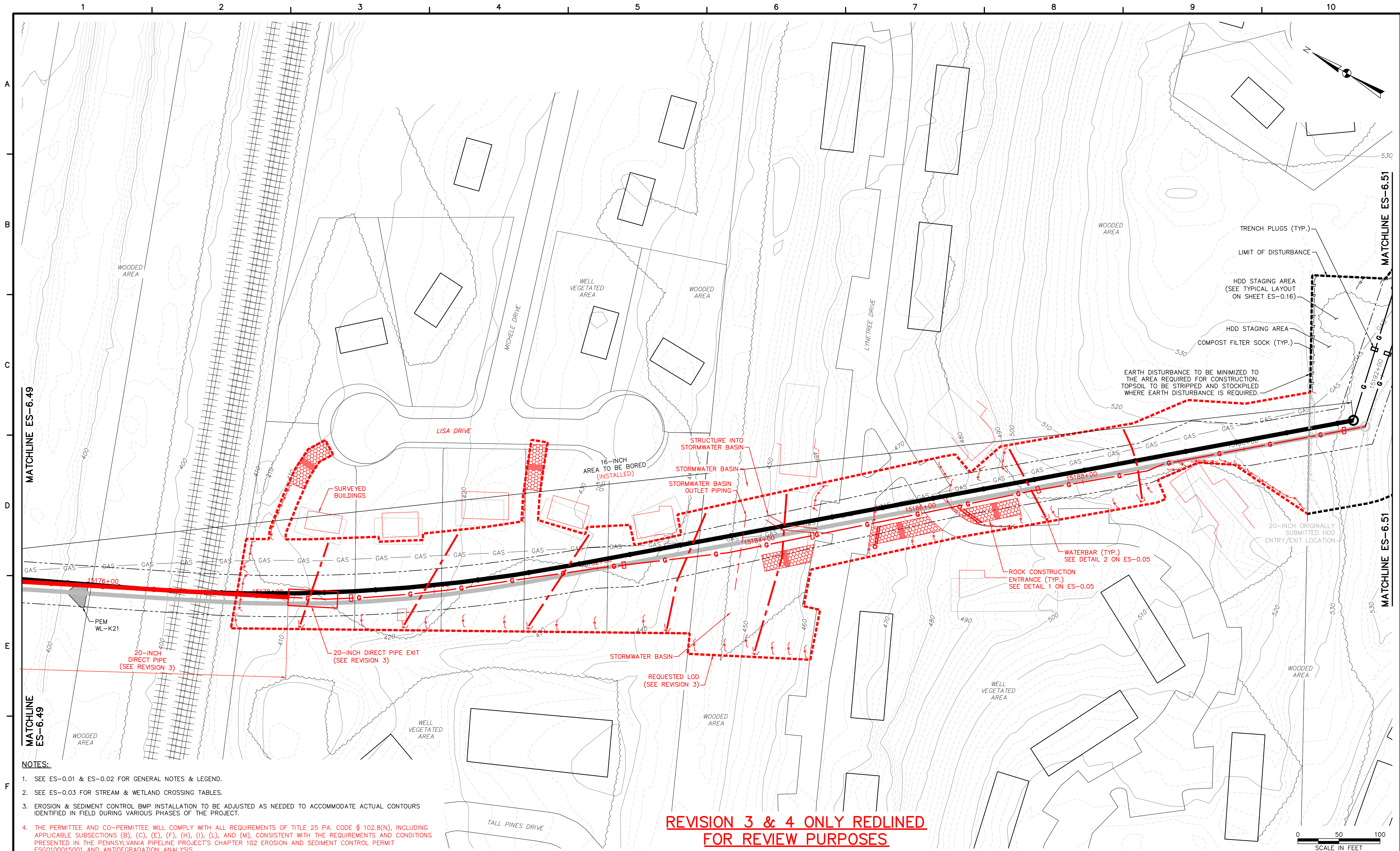
NO.		BY	DATE	REVISIONS	REMARKS
1	RS		3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS	
2	RS		5/25/17	DRAWINGS PROVIDED TO FIELD	
3	RS		8/18/17	CONVERT HDD TO OPEN CUT	
4	RS		1/25/18	FLEXBOR & LOD MODIFICATION	
5	RS		4/25/19	LOD MODIFICATION AND 20" BORE CHANGE	



SUNOCO PIPELINE LP
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6**

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES
CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 49 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS
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ES-6.49	
SHEET 6.49 OF 99	

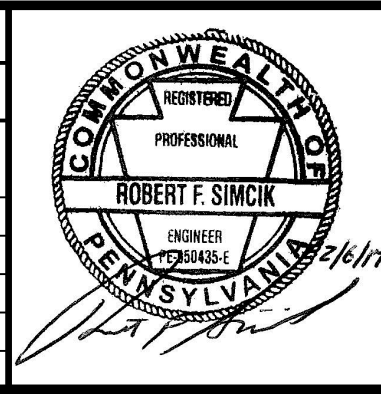


REVISION 3 & 4 ONLY REDLINED FOR REVIEW PURPOSES

- NOTES:**
- SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
 - SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
 - EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
 - THE PERMITTEE AND CO-PERMITTEE WILL COMPLY WITH ALL REQUIREMENTS OF TITLE 25 PA. CODE § 102.8(N), INCLUDING APPLICABLE SUBSECTIONS (B), (C), (E), (F), (H), (I), (L), AND (M), CONSISTENT WITH THE REQUIREMENTS AND CONDITIONS PRESENTED IN THE PENNSYLVANIA PIPELINE PROJECT'S CHAPTER 102 EROSION AND SEDIMENT CONTROL PERMIT ESG0100015001 AND ANTI-DEGRADATION ANALYSIS.

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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	4/25/19	LOD MODIFICATION, AR'S ADDED, AND 20" BORE CHANGE
4	RS	1/24/20	ADDED CULVERT AND EDGE OF DRAINAGE



SUNOCO PIPELINE LP
SINKING SPRING, PENNSYLVANIA
**PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6**

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES
CHESTER COUNTY CONSERVATION DISTRICT
**EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 50 OF 74**

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS
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ES-6.50	
SHEET 6.50 OF 99	

Attachment B

Site Restoration and Post-Construction Stormwater Management Plan

Pennsylvania Pipeline Project - South East Region: Spread 6 Major Modification-HDD S3-0400

January 2020

Prepared for:
Sunoco Logistics, L.P.
525 Fritztown Road
Sinking Spring, PA 19608



Prepared by:
Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, PA 15220



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Receiving Waters Table

Receiving Wetlands

Block Valve and Pump Station PCSM Design Standard Table

LIST OF ATTACHMENTS

- 1 [USGS Location Map](#)
- 2 [Soils Map](#), Soil Descriptions, [Geologic Formations Map](#), Sinkhole Repair Plan
- 3 Construction Details
- 4 Stormwater Calculations
- 5 Infiltration test results
6. PCSM Plan Drawings
- 7 Geosystems Correspondence

LIST OF ACRONYMS

ACRONYM	MEANING
% CCE	Calcium carbonate equivalent
% ENV	Effective neutralizing value
ABACT	Antidegradation Best Available Combination of Technologies
BMP	Best Management Practice
E&SC	Erosion and Sediment Control
EV	Exceptional value
HDD	Horizontal directional drilling
HDPE	High-density polyethylene

HQ	High quality
NGL	Natural gas liquids
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PASDA	Pennsylvania Spatial Data Access
PCSM	Post-Construction Stormwater Management
Pls	Pure live seed
ROW	Right of way
SPPP	Sunoco Pennsylvanian Pipeline Project
SR	Site Restoration
TSF	Trout stock fisheries
Tt	Tetra Tech, Inc.
UNT	Unnamed tributary
WWF	Warm water fisheries

1.0 INTRODUCTION

Tetra Tech, Inc. (Tt) has prepared this Site Restoration and Post-Construction Stormwater Management (PCSM) Plan (Plan) for Sunoco Pipeline, L.P. (SPLP) – Pennsylvania Pipeline Project, South East Region: Spread 6. The Plan addresses activities associated with the Sunoco Pennsylvania Pipeline Project (SPPP) installation. Spread 6 (South East Region) of this project is located in Chester and Delaware Counties, Pennsylvania (PA). The plan addresses activities associated with a major modification to the Sunoco Pennsylvania Pipeline Project (SPPP) installation. The HDD S3-0400 modification is located in West Whiteland, Chester County. Site location maps are provided in Attachment 1.

2.0 SITE DESCRIPTION

Sunoco Pipeline, L.P. (SPLP) proposes to construct and operate the Pennsylvania Pipeline Project that would expand existing pipeline systems to provide natural gas liquid (NGL). The project involves the installation of approximately two parallel pipelines within a 306.8-mile, 50-foot-wide right-of-way (ROW) from Houston, Washington County, Pennsylvania (PA) to SPLP's Marcus Hook facility in Delaware County. The 20-inch pipeline and 16-inch line will be installed in the same trench. Any temporary stabilization required will be implemented in accordance with this Erosion and Sediment (E&S) Plan. Construction activities will involve tree removal, clearing and grubbing within the ROW, trenching, pipe installation, and site restoration. **The additional LOD for this Amendment in Chester County is 3.99 Acres.**

The HDD S3-0400 Major Modification consists of a change in installation method for the 20-inch diameter pipeline. This permit modification is being requested for a change in installation method for the 20-inch diameter pipeline from an HDD to a Direct Pipe Bore and open trench installation. The direct pipe bore will go under the Exton Bypass (State Route 30), the AMTRAK (America Track National Railroad Passenger Corporation), Norfolk Southern Railroad, and wetland WL-K21. The remaining 1269 feet will be installed via open trench installation. There will be no additional Limits of Disturbance (LOD) requested within the wetland and the change in installation method will not result in any loss of wetland area impacts are considered minor and temporary. The change in installation method does require additional temporary work space therefore includes a request for an additional 3.99 acres of LOD in upland areas. This E&S plan specifically relates to impacts associated with the proposed HDD S3-0400 Major Modification.

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

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

2.1 TOPOGRAPHY

The work zone is located on ground of varying elevations. Site elevations vary from 364 feet (Station 15169+00) to 530 feet (Station 15190+00) above mean sea level based on the Pennsylvania Spatial Data Access (PASDA). The construction plans show the topography of the site and the surrounding area.

2.2 GEOLOGY AND SOILS

The soils and geologic formations surrounding the site are shown on the figures provided in Attachment 2. Attachment 2 also provides soil descriptions and properties of the soils found at the site. In general, the following actions will be taken to counteract soil limitations:

1. Erodible Soils - Prompt stabilization practices will be implemented to minimize the risk of erosion. PCSM facilities have been designed to minimize point-source discharges which increase the likelihood of downstream erosion.
2. Cut Banks Caves - Almost all Pennsylvania soils are susceptible to caving of cut banks. Cut slopes will be stabilized as soon as possible with seed and mulch to prevent sliding. Slopes are designed to not exceed 2H:1V.
3. Corrosive to Concrete or Steel Pipe - Pipes to be used on site shall be either HDPE or coated steel.
4. High Water Table - A seasonal high groundwater determination was conducted at the proposed block valve sites. PCSM facilities that infiltrate have been designed to maintain a 20" separation from the seasonal high groundwater table.
5. Low Strength - Most of Pennsylvania soils (73%) have relatively low strength. Precautions will be taken to prevent slope failures due to improper construction practices. Soils will be evaluated during construction of block valve sites and PCSM facilities to determine whether additional measures will need to be taken.
6. Piping Tendencies -Piping is the erosion by percolating waters or seepage in layer of subsoil resulting in caving and the formation of tunnels or pipes thorough which the soluble or granular material is removed. Where necessary, anti-seep collars will be used to prevent piping.
7. Poor Topsoil -Soil amendments will be added to site soils to promote vegetative growth.
8. Potentially Hydric -A wetland delineation has been performed to determine the presence of wetlands.
9. Potential Sinkhole - Should a sinkhole be encountered during construction, repair should be done under the direct observation and supervision of a professional geologist or licensed geotechnical engineer. Site specific sinkhole repairs should be developed on a case by case basis. Block valves located within karst topography have been identified, and infiltration practices have been designed to minimize the risk of sinkholes.

To prevent sediment from leaving the site, stabilization practices will be implemented in disturbed areas as soon as practical. Geologic formations or soil conditions that may have the potential to cause pollution after

earth disturbance were not observed during field activities. Infiltration tests are being performed and results are being evaluated for the design of the proposed post construction stormwater BMPs.

2.3 SURFACE WATER HYDROLOGY

The receiving waters for the HDD S3-0400 Major Modification LOD are UNTs to Valley Creek, which is designated as CWF in Pa. Code 25 Chapter 93. Descriptions of the Primary Receiving Waters can be found in Table 1.

The plan contains Antidegradation Best Available Combination of Technologies (ABACT) BMPs to maintain the designated use of the receiving waters and prevent additional siltation from polluting the streams. The locations of the receiving waters relative to the project area can be seen on the USGS location map in Attachment 1.

3.0 SITE RESTORATION PRACTICES

Section 3.0 addresses restoration of the mainline pipeline, temporary workspaces, temporary access roads for the HDD S3-0400 Major Modification. Following completion of pipeline installation and trench backfilling, the pipeline ROW, associated workspaces, and temporary access roads shall be returned to the general grade present prior to pipeline installation in order to maintain preconstruction drainage patterns. After completion of major construction work, topsoil that was stockpiled during construction will be placed along the ROW. Grounds disturbed by any of the operations necessary to complete the work for this project within the ROW are to be permanently seeded, or if specified, sodded, unless occupied by structures, paved, or designated as a permanent access road. Disturbed areas, which are at final grade, shall be seeded and mulched once final grades are achieved. The permanent seed mixtures will restore disturbed areas to existing conditions or better. If seeding cannot be completed within a 4 day period due to weather conditions, the disturbed area will be mulched with straw at the rate of 3 tons per acre. This straw will be anchored using a method described in Section 3.1.

3.1 BMP DESCRIPTION AND CONSTRUCTION SEQUENCE

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

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

General Construction Sequence

1. Grade surface to finished grade elevations as soon as practicable following completion of pipe installation.
2. Surface roughening will be utilized to rough the soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces

within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are recommended. Surface roughening shall be accomplished using dozers affixed with grouser tracked equipment. Dozers shall run up and down the slopes leaving horizontal grooves perpendicular to the slope. Dozer blades shall be raised and not used during surface roughening. Where compaction does occur, contractor shall scarify the soil or provide additional roughening such as deep ripping or chisel ripping to restore the area to a minimal compacted state. In areas of proposed infiltration, soils shall be amended to 2' below grade. See Soil Amendment and Restoration construction sequence below.

3. Place topsoil from topsoil stockpiles as the upper layer of backfill. Topsoil shall not be placed when the subgrade is frozen or when it is excessively wet or dry and shall not be handled when in a frozen or muddy condition.
4. Remove gravel and geotextile from the temporary access roads and scarify the soil. Refer to step 2 of this sequence to address compaction at access roads. After addressing compaction concerns, place topsoil that was stripped prior to installation of the access roads.
5. Immediately seed and mulch disturbed areas in accordance with the permanent seeding schedule once final grade is established and topsoil is placed.
6. Maintain erosion and sedimentation control devices until site work is complete and a uniform 70-percent perennial vegetative cover is established. Regrade and revegetate areas disturbed during the removal of the erosion and sediment controls.

Permanent Seeding

Site preparation and establishment of permanent cover in areas other than lawns will be conducted according to the following guidelines:

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SLOPES AND BANKS (NOT MOWED) WELL-DRAINED VARIABLE DRAINAGE	1 PLUS 1 PLUS	3, 5, 8, OR 12 (1) 3 OR 7
SLOPES AND BANKS (MOWED) WELL-DRAINED	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 DRAINAGE DITCHES	1 PLUS	2, 3, OR 4

SITE CONDITIONS	NURSE CROP	SEED MIXTURE (SELECT ONE MIXTURE)
SHALLOW, LESS THAN THREE FEET DEEP DEEP, NOT MOWED POND BANKS, DIKES, LEVEES, DAMS, DIVERSION CHANNELS, AND OCCASIONAL WATER FLOW AREAS	1 PLUS 1 PLUS	2, 3, OR 4 5 OR 7
MOWED AREAS NON-MOWED AREAS FOR HAY OR SILAGE ON DIVERSION CHANNELS AND OCCASIONAL WATER FLOW AREAS	1 PLUS 1 PLUS 1 PLUS	2 OR 3 5 OR 7 3 OR 13
HIGHWAYS NON-MOWED AREAS WELL-DRAINED VARIABLE DRAINED POORLY DRAINED AREAS MOWED SEVERAL TIMES PER YEAR	1 PLUS 1 PLUS 1 PLUS 1 PLUS	5, 7, 8, OR 10 3 OR 7 3 2, 3, OR 10
UTILITY ROW WELL-DRAINED VARIABLE DRAINED WELL-DRAINED AREAS FOR GRAZING/HAY	1 PLUS 1 PLUS 1 PLUS	5, 8, OR 12 (1) 3 OR 7 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) SEVERELY DISTURBED AREAS FOR GRAZING/HAY	1 PLUS 1 PLUS	3, 4, 5, 7, 8, 11 (1) OR 12(1) 3 OR 13
LAWN	1 PLUS	PENNDOT Formula B

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
1 (2)	spring oats (spring), or 64 96	64	96
	annual ryegrass (spring or fall), or	10	15
	winter wheat (fall), or	90	120
	winter rye (fall)	56	112
2 (3)	tall fescue, or 75	60	75
	fine fescue, or 40	35	40
	kentucky bluegrass, plus 25 30	25	30
	redtop(4), or	3	3
	perennial ryegrass	15	20
3	birdsfoot trefoil, plus 6 10	6	10
	tall fescue	30	35
4	birdsfoot trefoil, plus	6	10
	reed canarygrass	10	15
5 (5)	Big Bluestem, plus	10	15
	tall fescue, or	20	25
	perennial ryegrass	20	25

RECOMMENDED SEED MIXTURES			
MIXTURE NO.	SPECIES	SEEDING RATES – PLS (1)	
		MOST SITES	ADVERSE SITES (8)
6 (5,6)	Big Bluestem, plus 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, or perennial ryegrass	20 20 20	30 30 25
9	Not applicable to project	N/A	N/A
10	tall fescue, plus fine fescue	40 10	60 15
11	deertongue, plus birdsfoot trefoil	15 6	20 10
12(7)	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

1. Pure live seed (pls) is the product of the percentage of pure seed times percentage germination divided by 100. For example, to secure the actual planting rate for switchgrass, divide 12 pounds pls shown on the seed tag. Thus, if the pls content of a given seed lot is 35 percent, divide 12 pls by 0.35 to obtain 34.3 pounds of seed required to plant one-acre. All mixtures in this table are shown in terms of pls.
2. If high-quality seed is used, for most sites seed spring oats at a rate of two bushels per acre, winter wheat at 11.5 bushels per acre, and winter rye at one bushel per acre. If germination is below 90 percent, increase these suggested seeding rates by 0.5 bushel per acre.
3. This mixture is suitable for frequent mowing. Do not cut shorter than 4 inches.
4. Keep seeding rate to that recommended in table. These species have many seeds per pound and are very competitive. To seed small quantities of small seeds such as weeping lovegrass and redtop, dilute with dry sawdust, sand, rice hulls, buckwheat hulls, etc.
5. Use for highway slopes and similar sites where the desired species after establishment is Big Bluestem.
6. Use only in extreme southeastern or extreme southwestern PA. Serecia lepedeza is not well adapted to most of PA.
7. Do not mow shorter than 9 to 10 inches.

8. If liming, fertilization, and preparation of seedbed are properly done and if care is taken to drill and cover the seed (or mulch applied), the rate for “most sites” should suffice. However, on eroded or coarse and poorly prepared seedbeds, particularly if the soil is very acidic or infertile, the rate for “adverse sites” should be used.
9. For seed mixtures 11 and 12, only use spring oats or weeping lovegrass (included in mix) as nurse crop.

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

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

Liming Rates

Minimum 6 tons per acre at 100% effective neutralizing value (% ENV), unless the soil test determines that a lesser amount is needed. To determine the actual amount of regular lime to apply, divide the amount called for by the soil test by the % ENV for the product used. For example, if 6 tons per acre is needed and the %ENV for the lime used is 88%, divide 6 by 0.88 resulting in 6.8 tons needing to be applied. For dolomitic lime, which has a significant amount of magnesium in it, divide the amount called for by the soil test by the % calcium carbonate equivalent (% CCE) listed for the product instead of the % ENV. The % CCE may be above 100% which accounts for the fact that magnesium has a greater effect per pound than the calcium in regular lime. Note: When a soil test requires more than 8,000 pounds of lime per acre, the lime must be mixed into the top 6 inches of soil.

Fertilization Rates

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

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

Temporary Seeding

Temporary grass cover will be established in the following areas where soil stockpiles are exposed for a period greater than 4 days. The seed mixture for temporary cover will consist of 100% annual ryegrass. Seed will be applied at the rate of 40 pounds per acre or as recommended by a local recognized seed supplier approved by the Owner’s representative. Prior to seeding, apply 1 ton of agricultural grade limestone per acre plus 10-10-10 fertilizer at the rate of 500 pounds per acre and work into the soil.

Mulching

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

1. Straw mulch will be applied at the rate of 3 tons per acre. Chemically treated or salted straw is not acceptable as mulch.
2. Straw mulch will be anchored immediately after application by at least one of the following methods:
 - A. “Crimped” into the soil using tractor-drawn equipment (straight-bladed coulter or similar).

 This method is limited to slopes no steeper than 3:1. Machinery should be operated on the contour. (Crimping of hay or straw by running it over with tracked machinery is not recommended.)
 - B. Asphalt, either emulsified or cut-back, containing no solvents or other diluting agents toxic to plant or animal life, uniformly applied at the rate of 31 gallons per 1,000 square feet.

- C. Synthetic binders (chemical binders) may be used as recommended by the manufacturer to anchor mulch provided that sufficient documentation is provided to show that it is non-toxic to native plant and animal species.
- D. Lightweight plastic, fiber, or paper nets may be stapled over the mulch according to the manufacturer's recommendations.

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

3.2 MATERIAL RECYCLING AND DISPOSAL

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

3.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

Thermal impacts have been minimized by limiting the disturbed area to the maximum extent practicable. By minimizing the extent of the disturbed area, vegetative clearing, including forested areas, has been minimized. Vegetated block valve sites will be restored to a meadow in good condition or better, and no impervious surface will be created at those sites. Following installation of the pipelines, existing grades along the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored, permanent seeding will

occur as soon as practicable to facilitate vegetative growth during germinating months, and the addition/creation of impervious surfaces in riparian areas has been avoided. By returning these areas to their existing grades, stormwater is unlikely to pond in these locations therefore minimizing the potential for ponded water to result in significant contributions to thermal impacts in receiving waters. In addition, thermal impacts will be minimized during site restoration by facilitating permanent seeding as soon as practicable to encourage vegetative growth. Although shade cover will be reduced in areas that were previously forested, there is no anticipated adverse effect to the receiving watersheds because the project will only clear a narrow corridor of vegetation within each respective watershed. The Project does not have thermal impacts. Specifically, thermal impacts will be avoided by implementing the following:

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

3.4 RIPARIAN FOREST BUFFERS

There are no Riparian Forest buffers located within the HDD S3-0400 Major Modification LOD.

3.5 INSPECTION AND MAINTENANCE PROCEDURES

Seeded areas will be inspected weekly and after each runoff event for bare spots, washouts, and healthy growth. Necessary repairs will be made immediately. Mulched areas will be checked periodically and after severe storms for damage until the desired purpose of the mulching is achieved. Damaged portions of the mulch or tie-down material will be repaired upon discovery.

All sedimentation control measures will remain in place until the disturbed areas are stabilized and a uniform 70-percent perennial vegetative cover is established. Any area not achieving a 70-percent vegetative cover will be reseeded and mulched within 24 hours of detection. If BMPs are found to be inoperative or ineffective during an inspection, PADEP should be contacted within 24 hours, followed by submission of a written noncompliance report to PADEP within 5 days of the initial contact.

Long-Term Maintenance

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

3.6 ANTIDegradation Requirements

The HDD S3-0400 Major Modification is located within an Siltation Impaired watershed. A combination of non-discharge alternatives and the use of ABACT BMPs will be implemented during construction to protect and maintain the existing water quality of the receiving waters. For special protection watersheds 25 Code §§102.8 (h) was followed, and for all the special protection watersheds listed in Table 1 non-discharge alternatives were evaluated and included, when possible. For areas where non-discharge alternatives were not available the ABACT site restoration BMPs were incorporated. Due to the linear nature of this project all of the HQ/EV special protection watersheds received the same incorporation of ABACT site restoration BMPs throughout the pipeline.

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

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

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

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

3.7 STORMWATER RUNOFF ANALYSIS

The pre-construction drainage patterns surrounding the project will be maintained. All disturbed areas within the HDD S3-0400 Major Modification LOD will be restored to existing conditions or better. As a result of restoring the pipeline ROW and associated workspaces associated with the Major Modification to existing conditions or better and maintaining pre-construction drainage patterns, there will be no increase in stormwater runoff rate or volume attributed to those areas. There are no proposed permanent access roads or block valves associated with this Major Modification.

All disturbed areas within the pipeline right of way, additional temporary workspaces, and temporary access roads will be restored to a meadow in good condition or better or a lawn condition. The pre-construction drainage patterns surrounding the project will be maintained for the areas of the project covered under this section. As a result of restoring the pipeline right of way, additional temporary workspaces, and temporary access roads to a meadow condition and maintaining pre-construction drainage patterns in accordance with 25 Pa Code § 102.8(n), there will be no increase in stormwater runoff rate or volume attributed to these locations, and a quantitative stormwater analysis is not required.

Consistent with Chapter 102 permit Number ESG0100015001, the proposed Major Modification LOD will be restored in accordance with 102.8(n) and meet the requirements outlined in §§ 102.8(b), (c), (e), (f), (h), (i), (l), and (m).

In accordance with § 102.8(b), the following principles have been incorporated into the Major Modification design in accordance with the numbering in § 102.8(b): (1) The integrity of stream channels and the physical, biological, and chemical qualities of the receiving waters will remain unchanged. The site restoration principles will protect the existing and designated uses of the receiving waters. BMPs will be maintained until the site achieves stabilization during site restoration to ensure that runoff which leaves the project site will have no short-term adverse effects on the physical, biological, or chemical qualities of downstream receiving waters. The permanent seed mixture will restore the majority of the right of way to a meadow condition. Those areas which are not restored to a meadow condition will be restored to a lawn condition or forest. As a result of restoring the pipeline right of way as specified in the restoration plan, there will be no long-term effects to the physical, biological, or chemical qualities of downstream receiving waters. (2) The mainline pipeline will be restored to original grade so flow paths will not be altered. The right of way will be restored to achieve a meadow

in good condition or better, with the exception of areas that will be returned to lawn or forest. In addition, the pipeline right of way accounts for only a narrow corridor of development within each drainage area to the nearest receiving water. As a result, post-development runoff rates to the nearest receiving water will not increase. (3) The right of way will be restored to a meadow in good condition or better in most areas, with the exception of specified locations where the right of way will be restored to the equivalent of its predevelopment land cover (lawn or forest). As a result, any potential increase in stormwater runoff volume has been minimized to the maximum extent practicable. (4) There are no proposed, permanent impervious features associated with the mainline pipeline. Temporary access roads will be restored to a vegetated condition following installation of the pipeline. (5) Existing drainage features and vegetation will be protected by restoring the project area back to its original grade. As a result, drainage features and existing vegetation surrounding the project area will be preserved. (6) Land clearing and grading will be minimized because the project area has been limited to the area required to safely install the natural gas pipelines. The pipeline right of way will be returned to original grade following installation of the pipelines. (7) Soil compaction will be minimized by utilizing travel lanes within the pipeline right of way. Following construction, areas that have been compacted will be scarified or ripped, or soil amendments will be incorporated prior to backfilling topsoil and seeding. After initiating restoration, vehicular traffic will be restricted to prevent soil compaction. (8) As demonstrated in 102.8(2) and 102.8(3), potential increases in post development stormwater runoff has been minimized to the maximum extent practicable utilizing nonstructural restoration BMPs.

In accordance with § 102.8(c), the mainline Site Restoration and Post Construction Stormwater Management Plan for the Major Modification has been planned and designed and will be implemented in consistency with the E&S Plan.

In accordance with § 102.8(e), the Site Restoration and Post Construction Stormwater Management Plan for the Major Modification has been prepared by Robert F. Simcik, P.E. who is trained and experienced in PCSM design methods and techniques applicable to the size and scope of the proposed pipeline project.

In accordance with § 102.8(f), the Site Restoration and Post Construction Stormwater Management Plan for the Major Modification contains drawings and a narrative consistent with the requirements of Chapter 102. The Plan has been designed to minimize the threat to human health, safety, and the environment to the greatest extent practicable. The Plan includes the required information as outlined in § 102.8(f)(1) through § 102.8(f)(15).

In accordance with § 102.8(h), nondischarge alternatives for Special Protection waters are evaluated in the Antidegradation section of the Site Restoration and Post Construction Stormwater Management Plan. The Plan includes ABACT BMPs where nondischarge alternatives do not exist for the project.

In accordance with § 102.8(i), the applicant has submitted the Site Restoration and Post Construction Stormwater Management Plan to the applicable county conservation districts and Department of Environmental

Protection for review and approval. Upon complaint or site inspection, the Plan will be available for subsequent review and inspection by the reviewing agencies.

In accordance with § 102.8(l), the permittee will include with the notice of termination "Record Drawings" with a final certification statement from a licensed professional, which reads as follows:

"I (name) do hereby certify pursuant to the penalties of 18 Pa.C.S.A. § 4904 to the best of my knowledge, information and belief, that the accompanying record drawings accurately reflect the as-built conditions, are true and correct, and are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection and that the project site was constructed in accordance with the approved PCSM Plan, all approved plan changes and accepted construction practices."

In accordance with § 102.8(m), the Site Restoration and Post Construction Stormwater Management Plan identifies that the permittee shall be responsible for long-term operation and maintenance of PCSM BMPs associated with permanent surface sites. However, there are no PCSM BMPs proposed as part of the mainline pipeline.

There are no proposed permanent gravel access roads and block valve pads in the Major Modification LOD.

4.0 POST-CONSTRUCTION STORMWATER MANAGEMENT ANALYSIS

The construction and restoration practices for the proposed major modification have been designed to meet the provisions PADEP Chapter 102 regulations. No new impervious area is proposed with the Major Modification. In general, the pre-construction drainage patterns surrounding the project will be maintained, and all disturbed areas within the pipeline ROW will be restored to existing conditions or better. As a result of restoring all disturbed areas within the pipeline ROW to existing conditions or better, the project will not result in increased stormwater runoff rate or volume.

4.1 BMP DESCRIPTION NARRATIVE AND CONSTRUCTION SEQUENCE

There are no proposed PCSM BMPs for the HDD S3-0400 Major Modification.

4.2 MATERIAL RECYCLING AND DISPOSAL

The operator will remove from the site, recycle, or dispose of all building materials and wastes in accordance with PADEP's solid waste management regulations at 25 Pennsylvania Code 260.1 et seq., 271.1 et seq., and 287.1 et seq. The contractor will not illegally bury, dump, or discharge building material or wastes at the site. Excess material brought into the site areas to facilitate construction access will be completely removed prior to rough grading and final surface stabilization. In cases where disposal is necessary, waste materials will be disposed of at an approved PADEP waste site.

4.3 THERMAL IMPACTS

Thermal impacts are most commonly associated with urbanization (i.e., increased impervious surfaces) that results in heated stormwater runoff flowing into receiving waters where it mixes, and potentially increases the base temperature of the surface water in streams. However, another contributing factor for stream temperature is solar exposure (radiant energy input) to the surface water, typically ponded, standing waters. The amount of heat transferred, and the degree of thermal pollution is of importance for fisheries management and the ecological integrity of receiving waters. Among the attributes that determine the contribution of solar energy to thermal impacts are the presence of riparian vegetation, as well as stream width, depth, flow regime (perennial, intermittent, ephemeral), and orientation.

4.4 RIPARIAN FOREST BUFFERS

There are no Riparian Forest buffers located within the HDD S3-0400 Major Modification LOD.

4.5 INSPECTION AND MAINTENANCE PROCEDURES

Long-term maintenance of the pipeline ROW will include periodic visual inspections for sufficient vegetative growth and cover. Insufficient vegetative cover is defined as any area not achieving a uniform 70-percent perennial vegetative cover. Bare spots and areas with insufficient vegetative cover will be reseeded and

mulched within 24 hours of discovery. The ROW will be inspected for signs of erosion, especially on steep slopes. Corrective measures will be taken, as needed. If there is evidence of trench settling, the area will be regraded to maintain pre-construction drainage patterns, mulched, and seeded. A written report is required for each inspection and for each repair or maintenance activity, and the report should specify how to access the site. SPLP is responsible for maintaining the ROW under the provisions of this permit.

Inspection and maintenance procedures for permanent post-construction stormwater management facilities and stormwater conveyance BMPs are summarized below. If any post-construction stormwater management facilities are constructed prior to stabilization of upslope contributory drainage areas, inspections shall occur weekly and after runoff events until the surrounding area achieves stabilization. Sites located within karst terrain require more frequent long-term inspections, as specified in the Sinkhole Repair Plan in Attachment 2.

4.6 ANTIDEGRADATION REQUIREMENTS

The HDD S3-0400 Major Modification is located within an Siltation Impaired watershed. A combination of non-discharge alternatives and the use of ABACT BMPs will be implemented during construction to protect and maintain the existing water quality of the receiving waters. For special protection watersheds 25 Code §§102.8 (h) was followed, and for all the special protection watersheds listed in Table 1 non-discharge alternatives were evaluated and included, when possible. For areas where non-discharge alternatives were not available the ABACT site restoration BMPs were incorporated. Due to the linear nature of this project all of the HQ/EV special protection watersheds received the same incorporation of ABACT site restoration BMPs throughout the pipeline.

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

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4.7 STORMWATER RUNOFF ANALYSIS

The pre-construction drainage patterns surrounding the project will be maintained. All disturbed areas within the HDD S3-0400 Major Modification LOD will be restored to existing conditions or better. As a result of restoring the pipeline ROW and associated workspaces associated with the Major Modification to existing conditions or better and maintaining pre-construction drainage patterns, there will be no increase in stormwater runoff rate or volume attributed to those areas.

5.0 REFERENCES

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

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

Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection, Bureau of Watershed Management, December 2006.

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