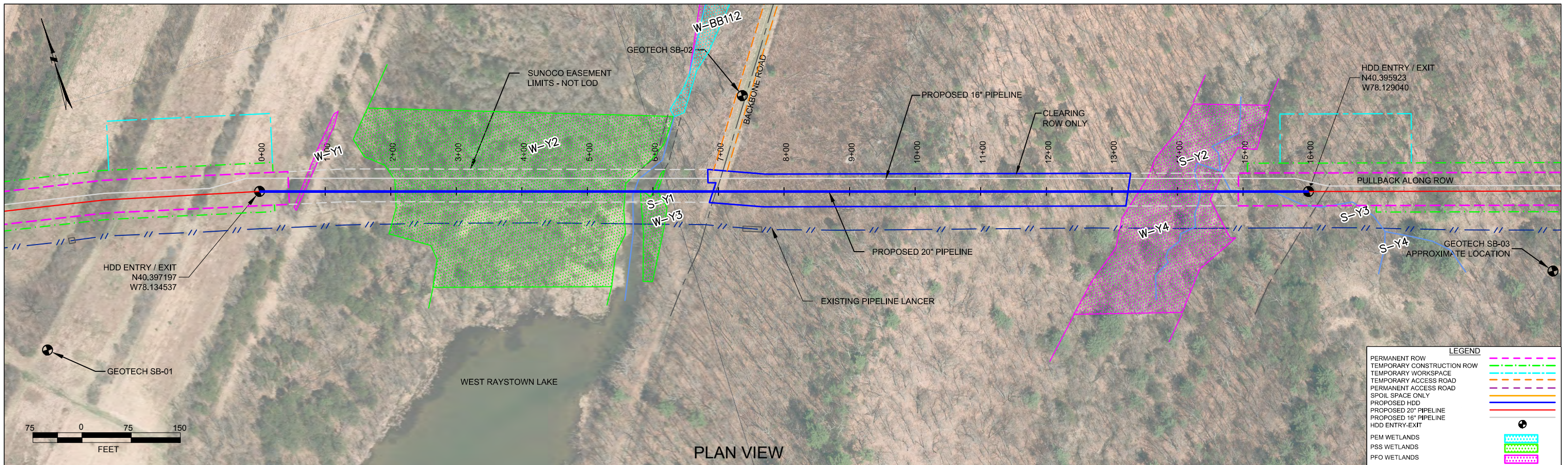


***HDD PA-HU-0020.0008-SS2 (W-Y1) (W-Y2) (S-Y1) (W-Y4) (S-Y2) (S-Y3)***

Given the design, the threat of inadvertent return has been reduced to the maximum extent practicable and in this case that threat is considered to be *low*. Implementing this design, along with adherence to the Pennsylvania Pipeline Project Inadvertent Return Contingency Plan will ensure inadvertent impacts, if they were to occur, are also minimized to the maximum extent.

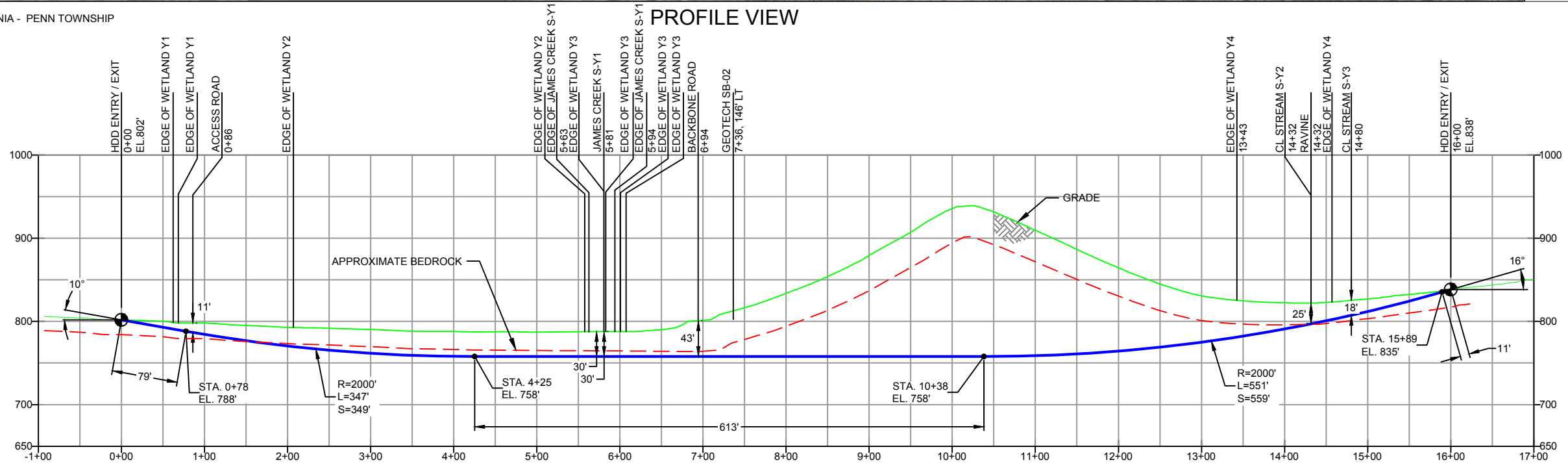
The drill will enter/exit 75 feet from the edge of the western most boundary of the wetland W-Y1. The drill will travel beneath wetland W-Y1 for 15 feet. Using the results of the geotechnical investigation, as well as several other data points, the entry/exit, angles, and depths have been configured to pass through the best substrates while maintaining pipe integrity (e.g., no large bends). The majority of the substrate that will be passed through is estimated to be fine sand or silt. The drill will continue beneath the eastern most boundary of the wetland W-Y1 and will travel 130 feet from the eastern most edge of wetland W-Y1 to the western most edge of wetland W-Y2. The drill will pass 400 feet under the wetland W-Y2 starting at the western most boundary. The drill will also reach stream S-Y1 350 feet from the western edge of W-Y2 and will pass under stream S-Y1 for 10 feet. The majority of the substrate that will be passed through is estimated to be weathered siltstone. The drill will continue beneath the eastern most boundary of the wetland W-Y2 and will travel 725 feet from the eastern most edge of wetland W-Y2 to the western most edge of wetland W-Y4. The drill will pass 115 feet under the wetland W-Y4 starting at the western most boundary. The drill will also reach stream S-Y2 80 feet from the western edge of wetland W-Y4 and will pass under stream S-Y2 for 5 feet. The majority of the substrate that will be passed through is estimated to be weathered siltstone. The drill will continue beneath the eastern most boundary of the wetland W-Y4 and will travel 25 feet from the eastern most edge of wetland W-Y2 to the western most edge of stream S-Y3 and will pass under stream S-Y3 for 10 feet. The majority of the substrate that will be passed through is estimated to be weathered and fractured siltstone. The drill will continue beneath stream S-Y3 and will enter/exit 80 feet from the eastern most edge of stream S-Y3.



HUNTINGDON COUNTY, PENNSYLVANIA - PENN TOWNSHIP  
S2-0147

GEOTECH SB-01	
-NG EL. 810'	-TOPSOIL (0' - 0.3')
-SM (0.3' - 9.6')	-GROUNDWATER (11.0')
-SILTSTONE (9.6' - 17.2')	-COMPLETION DEPTH EL. 793'
GEOTECH SB-02	
-NG EL. 803'	-SM/SC (0.0' - 23.5')
-GROUNDWATER (18.0')	-WEATHERED SILTSTONE (23.5' - 29.0')
-FRACTURED SILTSTONE (29.0' - 37.0')	-COMPLETION DEPTH EL. 866'
GEOTECH SB-03	
-NG EL. 1121'	-TOPSOIL (0' - 0.2')
-SM (0.2' - 6.0')	-WEATHERED SILTSTONE (6.0' - 10.1')
-COMPLETION DEPTH EL. 793'	

NOTE: REFER TO TEST BORING LOG S2-0147 FOR COMPLETE SOIL MATERIAL DESCRIPTION



DESIGN AND CONSTRUCTION:

- CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
- THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
- DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
- CROSSING PIPE SPECIFICATION:  
HDD HORZ. LENGTH (L=): 1600'  
HDD PIPE LENGTH (S=): 1611'  
20" x 0.456" W.T., X-65, API5L, PSL2, ERW, BFW  
COATING: 14-16 MILS FBE WITH 30-35 MIL ARO (POWERCRETE R95)
- INTERNAL DESIGN PRESSURE 1480 PSIG (SEAM FACTOR 1.0, DESIGN FACTOR 0.50).
- INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
- PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
- CARRIER PIPE NOT ENCASED.
- PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
- CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 1850 PSIG.
- SEE SUNOCO PENNSYLVANIA PIPELINE PROJECT ESRI WEBMAP FOR ACCESS ROAD ALIGNMENT.
- SUNOCO PIPELINE, L.P.'S HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN CONTINGENCY PLAN WILL BE IMPLEMENTED AT ALL TIMES.
- SUNOCO PIPELINE, L.P.'S EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED AT ALL TIMES.

NOTES

- ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
- STATIONING IS BASED ON HORIZONTAL DISTANCES.
- 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.
- CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
- SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING		REVISIONS		
ES-3.09	TO ES-3.10	EROSION & SEDIMENT PLAN	EP2 REVISED PER PADEP COMMENTS RECEIVED 09-06-16	
SHEET 6	TO SHEET 7	AERIAL SITE PLAN	EP1 REVISED PER PADEP COMMENTS	
			EP	
		C	ADDED GEOTECH INFO	
		B	ISSUED FOR BID	
		A	ISSUED FOR REVIEW	
DWG NO	DWG NO	DESCRIPTION	NO.	DESCRIPTION

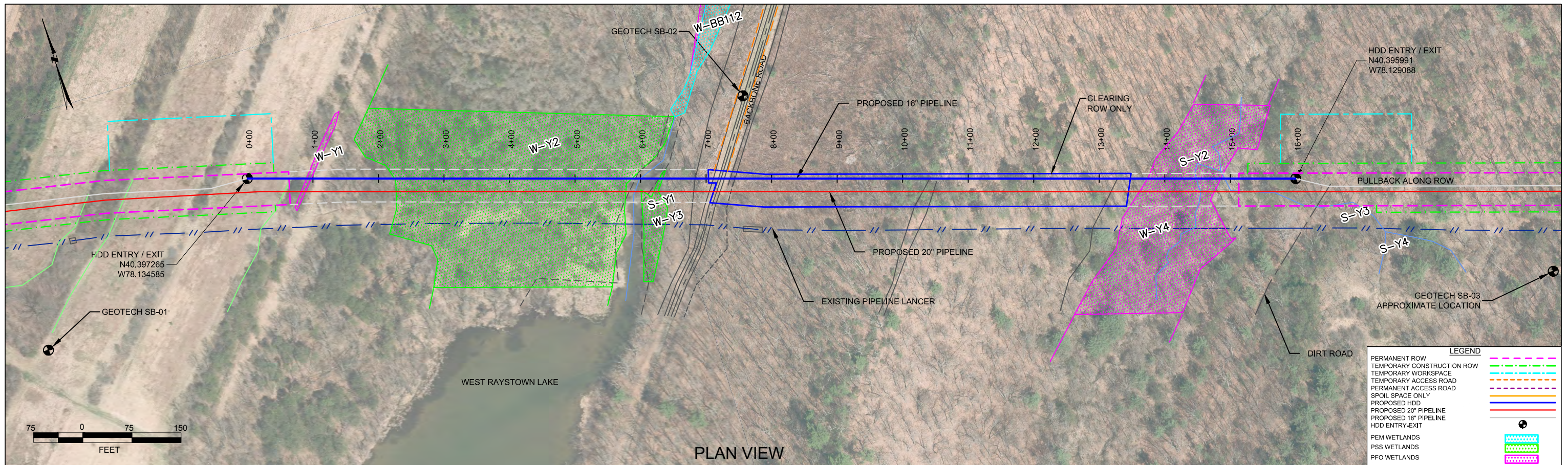
**Sunoco Logistics Partners L.P.**

**TETRA TECH ROONEY**  
(303) 792-5911

**SUNOCO PIPELINE, L.P.**

20-INCH HORIZONTAL DIRECTIONAL DRILL  
WEST RAYSTOWN LAKE  
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=150'    DWG. NO: PA-HU-0020.0008-SS2

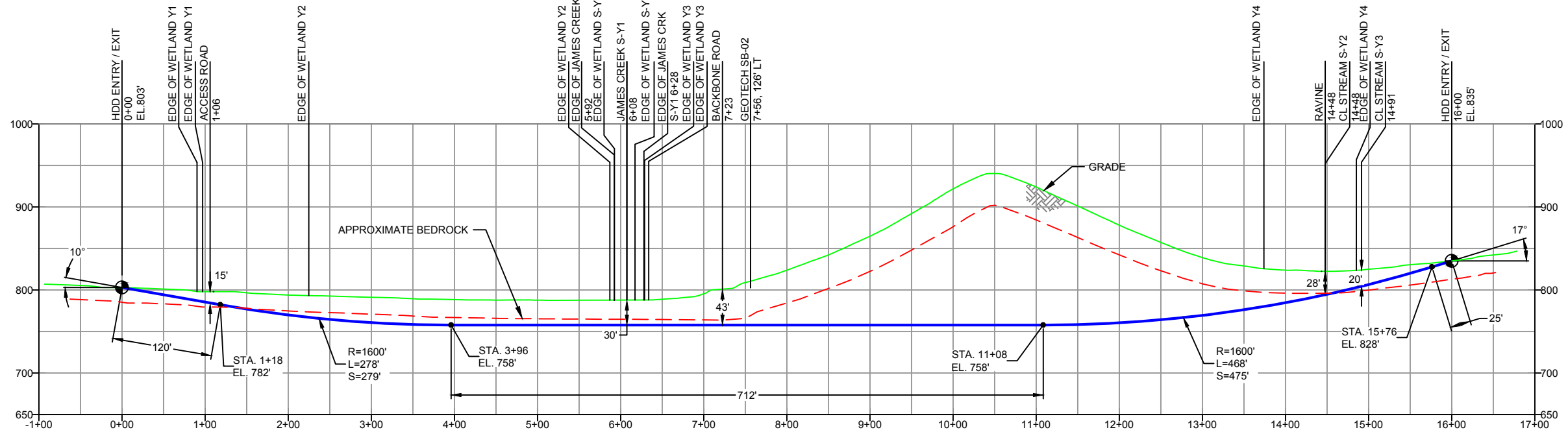


**LEGEND**

PERMANENT ROW	---
TEMPORARY CONSTRUCTION ROW	---
TEMPORARY WORKSPACE	---
TEMPORARY ACCESS ROAD	---
PERMANENT ACCESS ROAD	---
SPOIL SPACE ONLY	---
PROPOSED HDD	---
PROPOSED 20" PIPELINE	---
PROPOSED 16" PIPELINE	---
HDD ENTRY-EXIT	---
PEM WETLANDS	---
PSS WETLANDS	---
PFO WETLANDS	---

HUNTINGDON COUNTY, PENNSYLVANIA - PENN TOWNSHIP  
S2-0147-16

**PROFILE VIEW**



**GEOTECH SB-01**

- NG EL. 810'
- TOPSOIL (0' - 0.3')
- SM (0.3' - 9.6')
- GROUNDWATER (11.0')
- SILTSTONE (9.6' - 17.2')
- COMPLETION DEPTH EL. 793'

**GEOTECH SB-02**

- NG EL. 803'
- SM/SC (0.0' - 23.5')
- GROUNDWATER (18.0')
- WEATHERED SILTSTONE (23.5' - 29.0')
- FRACTURED SILTSTONE (29.0' - 37.0')
- COMPLETION DEPTH EL. 866'

**GEOTECH SB-03**

- NG EL. 1121'
- TOPSOIL (0' - 0.2')
- SM (0.2' - 6.0')
- WEATHERED SILTSTONE (6.0' - 10.1')
- COMPLETION DEPTH EL. 793'

- DESIGN AND CONSTRUCTION:**
- CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
  - THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
  - DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
  - CROSSING PIPE SPECIFICATION:  
HDD HORZ. LENGTH (L-): 1600'  
HDD PIPE LENGTH (S-): 1611'  
16" x 0.438" W.T., X-70, API5L, PSL2, ERW, BFW  
COATING: 14-16 MILS FBE WITH 30-35 MIL ARO (POWERCRETE R95)
  - INTERNAL DESIGN PRESSURE 1480 PSIG (SEAM FACTOR 1.0, DESIGN FACTOR 0.50).
  - INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
  - PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
  - CARRIER PIPE NOT ENCASED.
  - PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
  - CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 1850 PSIG.
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- SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING	NO.	DESCRIPTION	NO.	DESCRIPTION
ES-3.09	TO	ES-3.10	EROSION & SEDIMENT PLAN	
SHEET 6	TO	SHEET 7	AERIAL SITE PLAN	EP2
				EP1
				EP
				B
				A

**REVISIONS**

BY	DATE	CHK	DATE	APP	DATE
DLM	10/07/16	RMB	10/07/16	AAW	10/07/16
DLM	05/18/16	RMB	05/18/16	AAW	05/18/16
MRS	03/23/16	RMB	03/23/16	AAW	03/23/16
MRS	09/10/15	RMB	09/10/15	AAW	09/10/15
MRS	08/31/15	RMB	08/31/15	AAW	08/31/15

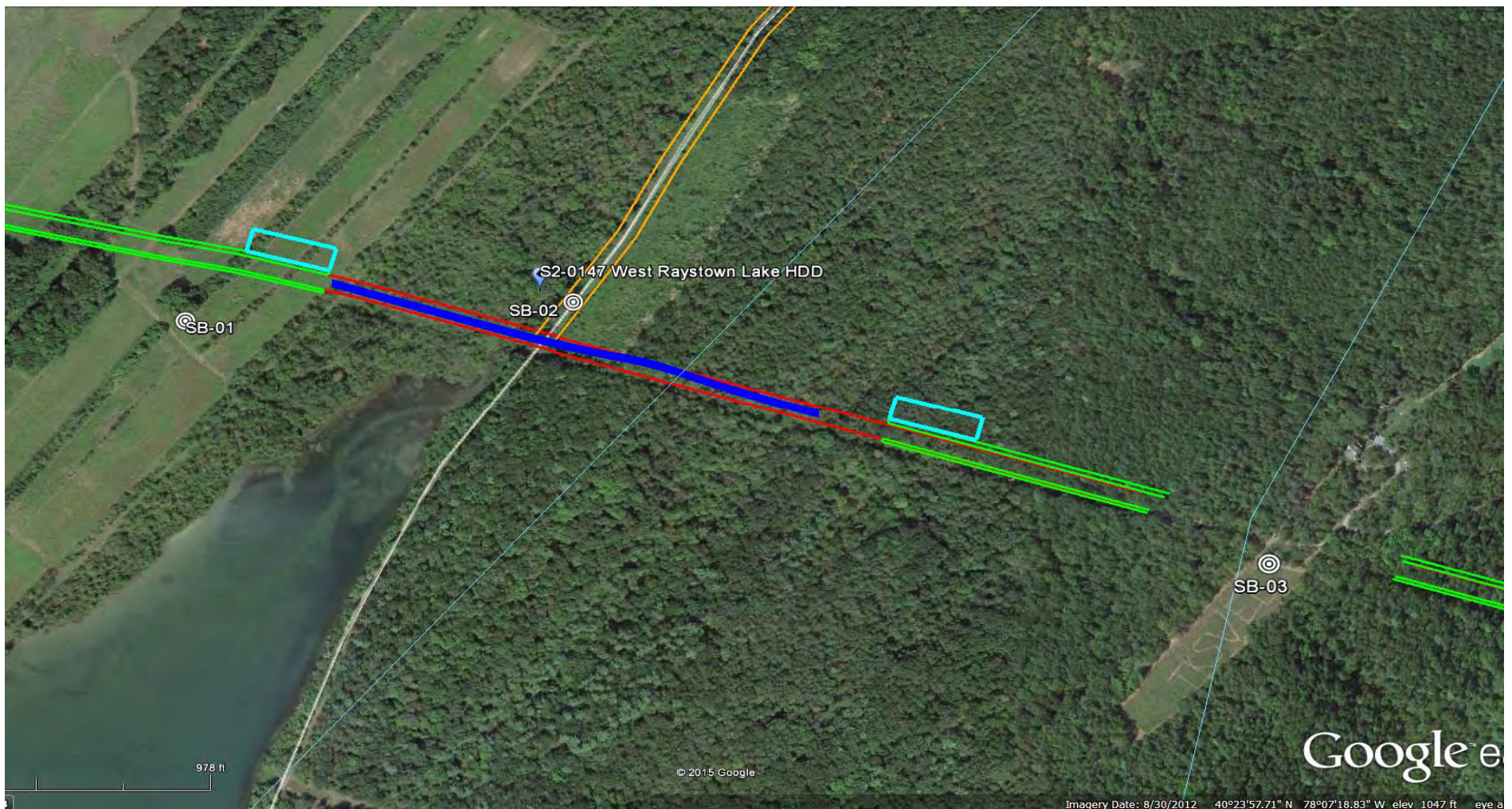
**Sunoco Logistics Partners L.P.**

**SUNOCO PIPELINE, L.P.**

16-INCH HORIZONTAL DIRECTIONAL DRILL  
WEST RAYSTOWN LAKE  
PENNSYLVANIA PIPELINE PROJECT

**TETRA TECH ROONEY**  
(303) 792-5911

SCALE: 1"=150' DWG. NO: PA-HU-0020.0008-SS2-16



**LEGEND:**

⊙ Geotechnical Soil Boring (SB) Locations



**TETRA TECH**

GEOTECHNICAL BORING LOCATIONS  
 HDD S2-0147  
 HUNTINGDON COUNTY, PENN TOWNSHIP, PA  
 SUNOCO PENNSYLVANIA PIPELINE PROJECT



**TETRA TECH**

240 Continental Drive, Suite 200  
 Newark, Delaware 19713  
 302.738.7551  
 fax: 302.454.5988

**TEST BORING LOG**

Project Name:	SUNOCO PENNSYLVANIA PIPELINE PROJECT	Project No.:	103IP3406
Project Location:	VALLEY VIEW CEMETARY ROAD, HESSTON, PA	Page 1 of 1	
HDD No.:	S2-0147	Dates(s) Drilled:	01-13-15
Boring No.:	SB-01	Inspector:	E. WATT
Drilling Contractor:	HAD DRILLING	Drilling Method:	SPT - ASTM D1586
		Driller:	S. HOFFER
		Groundwater Depth (ft):	11
		Total Depth (ft):	17.2

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.3			TOPSOIL (4").						
1	3.0	5.0	0.3		14	SM	MOTTLED LIGHT BROWN AND LIGHT GRAY FINE SAND AND SILT, TRACE FINE GRAVEL.	1	5	8	10	13	
2	8.0	10.0			24		MOTTLED LIGHT BROWN AND LIGHT GRAY FINE SAND AND SILT, TRACE FINE GRAVEL.	2	14	20	13	34	
				9.6		WEATHERED SILTSTONE	DARK GRAY WEATHERED SILTSTONE.	2	50/2"			>50	
3	13.0	13.7	9.6		11		DARK GRAY WEATHERED SILTSTONE.						
4	16.5	16.9			6		DARK GRAY WEATHERED SILTSTONE	50/5"				>50	
5	17.0	17.2		17.2	<2	DARK GRAY WEATHERED SILTSTONE.	50/2"				>50		
							AUGER REFUSAL AT 16.5'. AFTER SAMPLE 4 COLLECTED, OFF-SET BORING 15' NE AND CONTINUOUSLY AUGERED TO REFUSAL AT 17'. COLLECTED SAMPLE AT 17'.						
							BORING LOCATION ADJUSTED DUE TO GAS LINES.						
							WET ON SPOON AT 13'.						
							WATER LEVEL THROUGH AUGERS AT 11'.						
							CAVED AT 13.5', WATER LEVEL ON CAVE AT 6'.						

Notes/Comments:  
Pocket Pentrometer Testing DR: DECOMPOSED ROCK

Strata (USCS) Designations are approximated based on visual review, except where indicated in Description of Materials.

\* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.  
 N: Number of blows to drive spoon from 6" to 18" interval.



**TETRA TECH**

240 Continental Drive, Suite 200  
 Newark, Delaware 19713  
 302.738.7551  
 fax: 302.454.5988

**TEST BORING LOG**

Project Name: SUNOCO PENNSYLVANIA PIPELINE PROJECT			Project No.: 103IP3406		
Project Location: BACKBONE ROAD, HESSTON, PA			Page 1 of 1		
HDD No.: S2-0147		Dates(s) Drilled: 01-21-15		Inspector: E. WATT	
Boring No.: SB-02		Drilling Method: SPT - ASTM D1586		Driller: S. HOFFER	
Drilling Contractor: HAD DRILLING		Groundwater Depth (ft): 18.0		Total Depth (ft): 37.0	

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N
	From	To	From	To								
1	3.0	5.0	0.0		14	SC/SM	BROWN FINE SAND AND AND SILT/CLAY, TRACE FINE GRAVEL.	2	9	9	11	18
2	8.0	10.0			24		MOTTLED ORANGE BROWN AND GRAY FINE SAND AND SILT/CLAY, WITH A TRACE FINE GRAVEL. (USCS: SC/SM)	4	8	14	20	22
3	13.0	15.0			16		MOTTLED ORANGE BROWN AND GRAY FINE SAND AND SILT/CLAY, WITH TRACE OF FINE UNWEATHERED ROCK GRAVEL.	2	5	5	5	10
4	18.0	20.0			24		BROWN AND ORANGE FINE SAND WITH SOME SILT AN D CLAY, AND A LITTLE FINE GRAVEL SILTSTONE GRAVEL).	1	9	10	9	19
				23.5								
5	23.0	23.9	23.5			WEATHERED SILTSTONE	GRAY TO DARK GRAY WEATHERED SILTSTONE.	3	50/5"			>50
6	28.0	28.4		29.0	4	WEATHERED SILTSTONE	GRAY TO DARK GRAY WEATHERED SILTSTONE.	50/5"				
							AUGER REFUSAL AT 29'.					
							<u>ROCK CORING</u>					
RUN 1	29.0	32.5	29.00	29.74	42	WEATHERED AND FRACTURED SILTSTONE	DARK GRAY INTENSELY FRACTURED SILTSTONE.	TCR: 100%, SCR: 43%, RQD: 19%				
			29.74	30.05			DARK GRAY SILT AND CLAY.					
			30.05	31.48			DARK GRAY INTENSELY FRACTURED SILTSTONE.					
			31.48	31.80			DARK GRAY, VERY INTENSELY FRATURED SILTSTONE.					
			31.80	31.99			DARK GRAY INTENSELY FRACTURED SILTSTONE.					
RUN 2	32.5	37.0	31.99	32.77	54		DARK GRAY, VERY INTENSELY FRATURED SILTSTONE.	TCR: 100%, SCR: 54%, RQD: 41%				
			32.77	33.14			DARK GRAY INTENSELY FRACTURED SILTSTONE.					
			33.14	33.40			DARK GRAY, VERY INTENSELY FRATURED SILTSTONE.					
			33.40	34.21			DARK GRAY INTENSELY FRACTURED SILTSTONE.					
			34.21	34.70			DARK GRAY MODERATELY FRACTURED SILTSTONE.					
			34.70	35.88		DARK GRAY, VERY INTENSELY FRATURED SILTSTONE.						
			35.88	36.70		DARK GRAY MODERATELY FRACTURED SILTSTONE.						
			36.70	37.00		DARK GRAY INTENSELY FRACTURED SILTSTONE.						
							<u>CORE TESTING RESULTS (RUN 1 CORE):</u>					
							COMPRESSIVE STRENGTH: 4,200 PSI					
							UNIT WEIGHT: 176.7 PCF					
							<u>CORE TESTING RESULTS (RUN 2 CORE):</u>					
							COMPRESSIVE STRENGTH: 2,950 PSI					
							UNIT WEIGHT: 170.9 PCF					

Notes/Comments:  
Pocket Pentrometer Testing  
 S1: 3.5 TSF      S3: 2.75 TSF  
 S2: > 4 TSF  
 WET ON SPOON AT 18'.  
 WATER LEVEL THROUGH AUGERS AT 25'.  
 CAVED AT 27'.  
 Strata (USCS) Designations are approximated based on visual review, except where indicated in Description of Materials.  
 \* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.  
 N: Number of blows to drive spoon from 6" to 18" interval.



**TETRA TECH**  
 240 Continental Drive, Suite 200  
 Newark, Delaware 19713  
 302.738.7551  
 fax: 302.454.5988

**TEST BORING LOG**

Project Name:		SUNOCO PENNSYLVANIA PIPELINE PROJECT			Project No.: 103IP3406			
Project Location:		HOLLOW ROAD, HESSTON, PA			Page 1 of 1			
HDD No.:		S2-0147		Dates(s) Drilled:	01-20-15	Inspector:	E. WATT	
Boring No.:		SB-03		Drilling Method:	SPT - ASTM D1586	Driller:	S. HOFFER	
Drilling Contractor:		HAD DRILLING		Groundwater Depth (ft):		NOT ENCOUNTERED	Total Depth (ft):	10.1

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *			N
	From	To	From	To							
			0.0	0.2			TOPSOIL (2").				
1	3.0	3.5	0.2			SM	LIGHT BROWN WEATHERED SILTSTONE AND SILTY SAND.	50/6"			>50
				6.0							
2	8.0	9.3	6.0		10	WEATHERED SILTSTONE	LIGHT BROWN AND LIGHT GRAY WEATHERED SILTSTONE.	7	42	50/3"	>50
3	10.0	10.1		10.1	1		GRAY SILTSTONE.	50/1"			>50
							AUGER REFUSAL AT 10'. OFF-SET 18" SW AND CONTINUOUSLY				
							AUGERED TO REFUSAL AT 7'. OFF-SET BORING AGAIN AND				
							CONTINUOUSLY AUGERED TO AUGER REFUSAL A 8.4'.				
							CAVE IN INITIAL BOREHOLE AT 9'.				

Notes/Comments:  
Pocket Pentrometer Testing DR: DECOMPOSED ROCK

Strata (USCS) Designations are approximated based on visual review, except where indicated in Description of Materials.

\* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.  
 N: Number of blows to drive spoon from 6" to 18" interval.

**GEOTECHNICAL LABORATORY TESTING SUMMARY  
SUNOCO PENNSYLVANIA PIPELINE PROJECT  
HDD S2-0147**

HDD No.	Boring No.	Sample No.	Depth of Sample (ft.)		Water Content, %	Percent Silts/Clays, %	Atterburg Limits (ASTM D4318)			USCS Classif.
			From	To	(ASTM D2216)	(ASTM D1140)	Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	(ASTM D2487)
S2-0147	SB-01	1	3.0	5.0	19.0	44.1	36	26	10	SM
		2	8.0	10.0	11.2	36.3	-	-	-	-
		3	13.0	13.7	30.4	67.5	-	-	-	-
		5	17.0	17.2	7.2	16.3	-	-	-	-
	SB-02	1	3.0	5.0	11.6	43.0	-	-	-	-
		2	8.0	10.0	11.0	44.4	33	23	10	SC/SM
		3	13.0	15.0	12.7	48.1	-	-	-	-
		4	18.0	20.0	14.1	21.6	-	-	-	-
		5	23.0	23.9	7.8	24.9	-	-	-	-
	SB-03	2	8.0	9.3	7.5	30.2	-	-	-	-

Rock Core Testing Results				
Boring No.	Core Run	Approximate Depth (ft)	Compressive Strength (psi)	Unit Weight (pcf)
SB-02	1		4,200	176.7
SB-02	2		2,950	170.9

**Notes:**

- 1) Sample depths based on feet below grade at time of exploration.



**REGIONAL GEOLOGY SUMMARY  
SUNOCO PENNSYLVANIA PIPELINE PROJECT  
HDD S2-0147**

HDD No.	NAME	BORING NO.	REGIONAL GEOLOGY DESCRIPTION	GENERAL TOPOGRAPHIC SETTING	BEDROCK FORMATION	GENERAL ROCK TYPE	APPROX MAX FM THICKNESS (FT)	DEPTH TO ROCK (Ft bgs) based on nearby well drilling logs	NOTES / COMMENTS
S2-0147	West Raystown Lake	SB-01	<b>Hamilton Group</b> - The Mahantango Formation and the underlying Marcellus Formation make up the Hamilton Group. Devonian-age shale.	Ridge & Valley (Steep relief changes)	Mahantango/Marcellus	Black shale that may contain limestone beds and concentrations of iron pyrite and siderite, Its sedimentary structure, or bedding, is moderately well developed and fissile.	9,000	2-16	Lighter colored shales in the upper portion of the formation tend to split into small thin-edged fragments after exposure. These fragments may have rust stains from exposure of pyrite to air, and tiny gypsum crystals from the reaction between pyrite and limestone particles. Fresh exposures of the pyriteiferous shale may develop the secondary mineralization of orange limonite, and the pale yellow efflorescence or bloom of sulfur, associated with acid rock drainage. Well yields 6-15 gpm. Depth to bedrock varies considerably with topography
		SB-02							
		SB-03	<b>Brallier and Harrell Formations</b> (undivided) - composed of interbedded light-gray, graded, siliceous siltstone beds and light-gray, hard, silty shales, sparsely fossiliferous.		Brallier-Harrell	Interbedded subfissile shales, f-c. thinly bedded siltstone and sandstones	1,800		

*Note : Source of well log data - <http://www.dcnr.state.pa.us/topogeo/groundwater/pagwis/records/index.htm>. All other sources as referenced in comments section.*

**ROCK CORE DESCRIPTION SUMMARY  
SUNOCO PENNSYLVANIA PIPELINE PROJECT  
HDD S2-0147**

Location	Boring No.	Core Run	Core Depth (ft)		TCR (%)	SCR (%)	RQD (%)	Depth (ft)		Weathering	Classification	Bedding Thickness (ft)	Color	Discontinuity Data
			From	To				From	To					
S2-0147	SB-2	1	29	32.5	100	43	19	29	29.5	Moderate	Siltstone	Massive	Gray	Single mechanical fracture seen in section
								29.5	30	Heavily	Clay	Massive	Dark Gray	Highly chemically eroded siltstone and infilling with clay
								30	32.5	Moderate	Siltstone	Massive	Gray	Moderately fractured, ranging from 15° to 75°, Avg. 31°
		2	32.5	37	100	54	41	32.5	37	Moderate	Siltstone	Massive	Dark Gray	Moderately fractured, ranging from 0° to 80°, Avg. 26°