

TRIP REPORT BLAINSPORT VALVE SITE – INFILTRATION TESTING

1.0 PURPOSE

This Trip Report presents the field data and results of double-ring soil infiltration tests conducted to support the design of a stormwater management system at the Blainsport site located in West Cocalico Township, Lancaster County, Pennsylvania, as part of the Pennsylvania Pipeline Project (PPP) for Sunoco Pipeline, LP. Three deep tests (IT-A through IT-C) were performed at the site. The test locations are listed by coordinates (latitude and longitude) in Table 1 and shown on the attached figure.

2.0 FIELD ACTIVITIES

The infiltration tests were conducted by Mark Mengel and Kevin Schwab of Tetra Tech, Inc., on October 5, 2016. The test locations were positioned in the field using a handheld, WAAS-enabled GPS unit. Table 1 provides the coordinates of the test locations. All tests were located in a relatively flat grassy area, located between an existing valve site and an agricultural field.

The infiltration tests were performed in accordance with the procedure specified in the 2006 Pennsylvania Stormwater Best Management Practices (BMP) Manual. The test locations were prepared with hand tools and a mini-excavator, and care was taken to minimize disturbance of the soil surface to be tested. Double-ring infiltrometers were used for testing and consisted of 10-inch diameter and 6-inch diameter sections of steel casing, each 10 inches in height. After digging to the target depth, the test surface was leveled, and loose soil and debris were removed. The rings were driven a minimum of 2 inches into the soil. The infiltration test depths are presented in Table 1.

Test locations were pre-soaked for 1 hour. The tests were then conducted with measurements at 10-minute or 30-minute intervals, based on the observed water level drops during the last half of the pre-soak period. Pre-soak and test information was recorded on infiltration test data sheets; copies of the test data sheets are attached to this report.

During the testing, the weather was sunny, approximately 70 degrees Fahrenheit, and no precipitation was observed during the time of testing. Additionally, less than 0.5 inches of precipitation was observed 24 hours prior to testing.

Test pits were excavated near each testing location to characterize the soil, determine the depth to bedrock, if encountered, and inspect for evidence of the seasonal high water table. The test pits were identified with the corresponding infiltration test name. The test pits were machine-excavated to 2 feet below the target infiltration test depth or refusal, whichever was encountered first. Descriptions of the soil were recorded on field logs, which were based on the form example in the BMP manual. Copies of the field soil logs are attached to this report.

3.0 RESULTS

3.1 Soil Description

Soils encountered generally consisted of a thin (approximately 7 inches) redeveloping A-horizon which was a dark reddish brown to brown (5YR 3/3 to 7.5YR 4/2) sandy loam with 10% small quartzite pebbles which were sub-rounded. Below this surface layer a deep (to roughly 33 inches bgs) fill layer was encountered which consisted primarily of a sandy loam that contained approximately 35-40% small pebble to small cobble sized quartzite fragments. Mottled colors for this layer ranged from reddish brown to light brown (2.5YR 4/2 to 7.5YR 6/4) which were lithochromatic in origin. Below this fill layer a more natural soil profile progressed from a brown (7.5YR 4/2) sandy loam to a brown (7.5YR 5/4) sandy loam with trace clay and finally to a brown (7.5YR 5/4) sandy clay loam. Bedrock was not observed.

Seasonal high water was not observed at the testing location, with mottling being observed only in the fill layer. This is likely due to the mixing of soil and not indicative of seasonal high water.

According to United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey data, the soil type for the test locations is mapped as follows:

- Bucks Silt Loam - (BuC soil symbol) with 8-15 percent slopes; with medium runoff and well drained.

3.2 Infiltration Tests Results

Table 1 summarizes the infiltration rates (inches per hour) calculated from the test data. Infiltration rates presented in Table 1 were calculated from the average water level drop of the last four stabilized readings measured in the inner ring.

The pre-soak test results for IT-A through IT-C indicated a very low infiltration rate, requiring 30 minute test cycles. Little to no infiltration occurred in any of the three test units.


Table 1
Summary of Infiltration Test Results
Blainsport
West Cocalico Township, Lancaster County, PA
Sunoco PPP

Test Location (IT-)	Location Data		Test Depth (inches)	Infiltration Test Result (inches/hour)
	LATITUDE	LONGITUDE		
IT-A (2')	40.2824315°	- 076.1405255°	24	0.00
IT-B (2')	40.2824211°	- 076.1407327°	24	0.00
IT-C (2')	40.2824119°	- 076.1408827°	24	0.00

Figure 1

Infiltration Testing Locations
Blainsport Valve
Soil Type: Bucks Silt Loam (BuC)
Lancaster County, PA

Legend

-  Infiltration Tests



Google Earth

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300 ft

ATTACHMENTS

SOIL LOGS



Soil Log

Tested By: KAS Kevin Schwab

Project: Blainesport Sunoco PPP Project No.: 1121C 05958

Test Pit: IT-A

Date: 10/5/16

Elevation: _____ Equipment Used _____

Geology: _____ Soil Type: _____

Land Use: flat field between valve and Ag field Weather: Sunny

Additional Comments

Horizon	Upper Boundary	Lower Boundary	Soil Textural Class	Type, Size, Coarse Fragments, etc.	Soil Color	Color Patterns	Pores, Roots, Rock Structure	Depth to Bedrock	Depth to Water	Comments
Re-developing A	0"	6"	Sandy clay loam	Fine-med granular	7.5YR 4/6	even	100% small to med pebbles (quartzite)			
Fill	6"	30"	Sandy loam	Fine-coarse granular-angular	2.5YR 4/3 7.5YR 5/4 7.5YR 6/4	60% 30% 10%	45% small pebbles to small cobbles			Very abrupt boundary at base of layer some sections of weathered parent material in logs consolidated matrix
B	30"	40"	Sandy clay loam	Fine-med sub angular blocky	2.5YR 4/3	even	25% small-med pebbles quartzite			
BC	40"	49"	Sandy loam	Fine-med sub angular granular	7.5YR 5/4	even	SAA			

Horizon:	USDA Definition	Soil Textural Class	Boundary	Notes:
O	Organic debris	Use ternary diagram from US Department of Agriculture Soil Conservation Service	Use depth and classification	
A	Dark colored, mixed mineral organic matter		Classification as Follows:	
B	Maximum accumulation of silicate clay minerals		Abrupt	
C	Weathered parent material		Clear	
R	Layer of consolidated rock beneath the soil		Gradual	
			Diffuse	



Soil Log

Tested By: KAS Kevin Schwab

Project: Blainsport Sunoco ^{PPP} Project No.: 112IC05958

Test Pit: IT-B Date: 10/5/16

Elevation: _____ Equipment Used: _____

Geology: _____ Soil Type: _____

Land Use: flat field between Sunoco valve & Ag field Weather: Sunny

Additional Comments

Horizon	Upper Boundary	Lower Boundary	Soil Textural Class	Type, Size, Coarse Fragments, etc.	Soil Color	Color Patterns	Pores, Roots, Rock Structure	Depth to Bedrock	Depth to Water	Comments
A	0"	7"	sandy clay loam	fine-med granular	7.5YR 9/2	even	10% small-med pebbles (rounded)			Redeveloping A Horizon
clean fill	7"	33"	sandy loam	fine-med granular to subangular	5YR 4/2 2.5YR 4/3 7.5YR 4/2	60% 20% 20%	mix sizes from small pebbles to med cobble			some pieces have perfect structure others loose, some small pieces of rope - 48cm logs
BC	33"	49"	sandy clay loam	fine-med subangular blocky	7.5YR 5/4	even				

Horizon:	USDA Definition	Soil Textural Class	Boundary	Notes:
O	Organic debris	Use ternary diagram from US Department of Agriculture Soil Conservation Service	Use depth and classification	
A	Dark colored, mixed mineral organic matter		Classification as Follows:	
B	Maximum accumulation of silicate clay minerals		Abrupt	
C	Weathered parent material		Clear	
R	Layer of consolidated rock beneath the soil		Gradual	
			Diffuse	

Table based on: Sample soil log located on page 12 of the Pennsylvania Stormwater Best Management Practices Manual
 USDA Definitions located from: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054308



Soil Log

Tested By: KAS Kevin Schwab

Project: Blainsport Sunoco PPP

Project No.: 1121C 05958

Test Pit: IT-C

Date: 10/5/16

Elevation: _____

Equipment Used: _____

Geology: _____

Soil Type: _____

Land Use: flat field between Sunoco valve and Ag field

Weather: Sunny

Additional Comments

Horizon	Upper Boundary	Lower Boundary	Soil Textural Class	Type, Size, Coarse Fragments, etc.	Soil Color	Color Patterns	Pores, Roots, Rock Structure	Depth to Bedrock	Depth to Water	Comments
<u>Re-developing A</u>	<u>0"</u>	<u>7"</u>	<u>Sandy loam</u>	<u>fine granular</u>	<u>5YR 9/3</u>	<u>even</u>	<u>10% small quartzite pebbles</u>			
<u>Fill</u>	<u>7"</u>	<u>20 1/2"</u>	<u>Sandy loam</u>	<u>fine-coarse granular-angular</u>	<u>5YR 8/6</u> <u>5YR 7/6</u>	<u>80% mott</u> <u>20%</u>	<u>35% small pebbles to small cobbles</u>			
<u>Buried A</u>	<u>20 1/2"</u>	<u>27 1/2"</u>	<u>Sandy loam</u>	<u>fine-med granular</u>	<u>7.5YR 4/6</u>	<u>even</u>	<u>5% small quartzite pebbles</u>			<u>Piece of corn stalk found 90' below logs</u>
<u>B</u>	<u>27 1/2"</u>	<u>36"</u>	<u>Sandy silt loam</u>	<u>fine-med subangular</u>	<u>7.5YR 5/6</u>	<u>even</u>	<u>10% small-med pebbles</u>			
<u>B2</u>	<u>36"</u>	<u>49"</u>	<u>Sandy clay loam</u>	<u>fine-med subangular blocky</u>	<u>5YR 5/6</u>	<u>even</u>	<u>SAA</u>			

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INFILTRATION TEST DATA SHEETS

