TRIP REPORT
PLAINFIELD VALVE SITE – INFILTRATION TESTING

1.0 PURPOSE

This Trip Report presents the field data and results of a double-ring soil infiltration test conducted to support the design of a stormwater management system at the Plainfield Valve site located in Lower Frankford Township, Cumberland County, Pennsylvania, as part of the Pennsylvania Pipeline Project (PPP) for Sunoco Pipeline, LP. One shallow test (IT-A) was performed at the site. The test location is listed by coordinates (latitude and longitude) in Table 1 and shown on the attached figure.

2.0 FIELD ACTIVITIES

The infiltration test was conducted by Greg Ritson and Brendan O'Donnell of Rettew, on October 6, 2016. The test location was positioned in the field using a handheld, WAAS-enabled GPS unit. Table 1 provides the coordinates of the test location. The test was located adjacent to an existing valve site.

The infiltration test was performed in accordance with the procedure specified in the 2006 Pennsylvania Stormwater Best Management Practices (BMP) Manual. The test location was prepared with hand tools and care was taken to minimize disturbance of the soil surface to be tested. Double-ring infiltrometers were used for testing and consisted of 12-inch diameter and 6-inch diameter sections of steel casing, each 7 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.

The test location was pre-soaked for 1 hour. The test was 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.

The weather at the time of testing was sunny and approximately 65 degrees Fahrenheit. Additionally, 0.01 inches of precipitation was observed 24 hours prior to testing.

In addition to performing the infiltration test, a hand auger was utilized to characterize the soil, determine the depth to bedrock, if encountered, and inspect for evidence of the seasonal high water table near the test area. This was completed from the ground surface down to two feet below the target infiltration test depth. A description of the soil was documented on field logs, which was based on the form example in the BMP manual. A copies of the soil log is attached to this report.

3.0 RESULTS

3.1 Soil Description

Soils encountered generally consisted of a relatively deep (up to approximately 13 inches) yellowish brown (10YR 5/4) fill layer with lithochromatic mottles of strong brown (7.5YR 5/6) and light gray (7.5YR 7/1) as well as a layer of black (7.5YR 2.5/1) fabric liner and mulch. This fill layer contained roughly 50% gravels. Below this top fill layer a second fill layer down to 26 inches below ground surface was found. It was composed of a silt clay with roughly 45% gravels. Colors for this second fill layer included mottles of 5GY 5/2, 7.5YR 5/8, 6/6, and 10YR 6/8.

No seasonal high water table was noted, so it is believed that this mottling is due to mixing of soil before placement as fill. Bedrock was not encountered within the test area.

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

- Weikert Silt Loam - (WeC soil symbol) with 8-15 percent slopes; with low runoff and somewhat excessively 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 (shallow) indicated a low infiltration rate, requiring a 30 minute test cycle.

Table 1
Summary of Infiltration Test Results
Plainfield
Lower Frankford Township, Cumberland County, PA
Sunoco PPP

Test Location (IT-)	Location Data		Test Depth (inches)	Infiltration Test Result (inches/hour)
	LATITUDE	LONGITUDE		
IT-A (shallow)	40.2421914°	- 077.2909047°	6	3.13

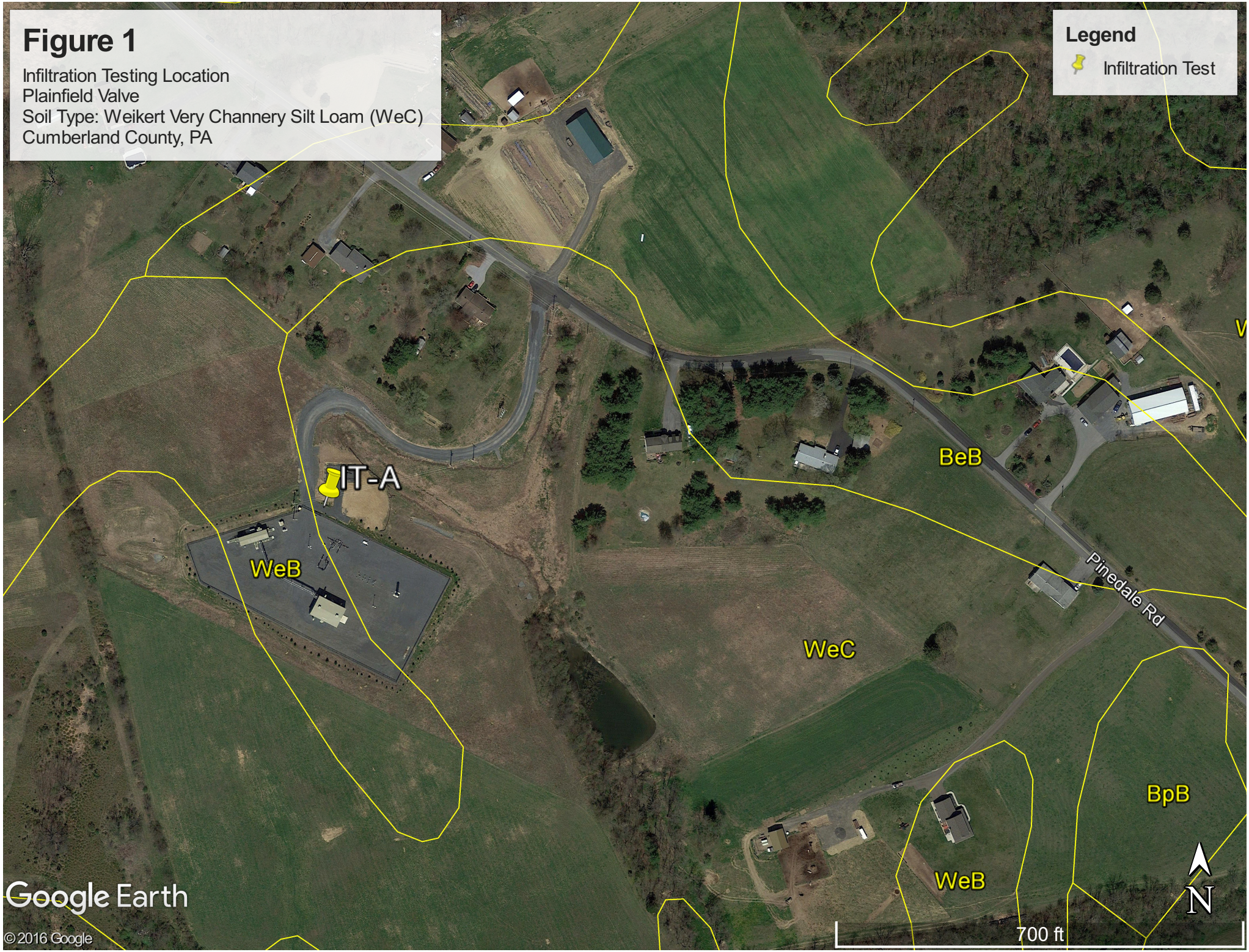
Figure 1
Infiltration Testing Location
Plainfield Valve
Soil Type: Weikert Very Channery Silt Loam (WeC)
Cumberland County, PA
Legend
Infiltration Test
IT-A
WeB
BeB
WeC
BpB
WeB
Pinedale Rd
N
700 ft
Google Earth
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ATTACHMENTS

SOIL LOGS

TETRA TECH

Soil Log

Tested By: Greg Ritson **Project:** Sunoco **Project No.:** 112C05958

Test Pit: Plainfield **Date:** 10/6/2016 **Elevation:** _____ **Equipment Used:** _____

Geology: _____ **Soil Type:** _____ **Land Use:** _____ **Weather:** _____

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"	2.5"	SiL	friable ~~weak~~ weak fine, SBK	7.5YR 4/3	—	common fine	—	—	fabric liner at lower boundary of A some clay pockets 7.5YR 5/6
B	2.5"	10.5"	CL	friable moderate medium SBK	10 YR 5/4	2.5YR 5/6 / 7.5YR 7/1	Very Gravelly 50%	—	—	
O	10.5"	13"	—	—	7.5YR 2.5/1	—	—	—	—	not mineral, appears to be mulch, fabric liner in horizon
B	13"	17"	SiCL	friable moderate medium SBK	5YR 4/2	5GY 5/2 / 10YR 6/8	Very Gravelly 45%	—	—	organic/sulfer smell
B	17"	26"+	SiC	friable moderate fine SBK	7.5 YR 6/6	7.5YR 5/8 / 7.5YR 7/1	Very Gravelly 45%	—	—	

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: Abrupt	
B	Maximum accumulation of silicate clay minerals		Clear	
C	Weathered parent material		Gradual	
R	Layer of consolidated rock beneath the soil		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

INFILTRATION TEST DATA SHEETS

INFILTRATION TEST DATA SHEET

Tetra Tech, Inc.

PROJECT NAME: Sunoco PPP
PROJECT NUMBER: 112IC05958
TEST AREA ID: Plainfield
PERSONNEL: Greg Ritson & Brendan O'Donnell (RETTEW)

TEST METHOD: (Double Ring Infiltrometer) Percolation
Single Ring Infiltrometer

Location Coordinates or Description:
40.2421914, -77.2909047

INNER RING INSIDE DIAMETER/HEIGHT: 6" / 7"
OUTER RING INSIDE DIAMETER/HEIGHT: 12" / 7"

PERCOLATION HOLE DIAMETER: _____ (If performing an open hole perc test)

DATE(s): 9/28/2016 Rainfall in past 24 hrs = 0.01"

Distance from the bottom of the inner ring/hole to measuring point (minimum water column of 6-8 inches):

MEASURING POINT: (Ring Rim) Indicator Mark

DEPTH OF TEST: surface (6")

TIME	ELAPSED TIME SINCE START OF TEST (minutes)	WATER LEVEL DROP, INNER RING OR PERCOLATION HOLE (inches)	VOLUME OF WATER ADDED AT EACH CYCLE, INNER RING (liters)	REMARKS
PRESOAK DATA				
	.	----------		(first two attempts too rapid)
8:58	0	- - -		10.2 L to fill inner & outer rings
9:28	30	1 1/16	0.7	
9:58	60	1 1/4	0.7	
TEST DATA				
9:58	0	----------	0.7	
10:28	30	1 1/2	0.8	
10:58	60	1 9/16	0.8	
11:28	90	1 5/8	0.8	
11:58	120	1 9/16		