

TEST PIT DESCRIPTION

Soil Scientist: D. Fenske-Machner Signature: David Fenske-Machner
 Field Assistant: Devin Galka

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: R-160511-0900-MPC-15 R-015-160511-0900-MPC
 Date: 5/11/10
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Craigsville (27)
 Soil Series: Craigsville fine sandy loam

Topographic Position: Footslope/Floodplain
 % Slope / Aspect: 4% / 200°
 Drainage Class: A1
 Depth to Refusal: Moderately Well Drained
 Bedrock Type and Dip Slope: N/A
 Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
O:	0-15	10YR 3/1	—	—	—	—	—	—	—	—	A W	—	—	—
A	1.5-4	10YR 3/1	15% CH	4 1/8"	SIL	15	8	Po	2MGR	VFC	CW	—	—	—
B ₁ En	4-8.5	10YR 6/6	25% CH	4 1/8"	SIL	10	14	Po	2MGR	VFC	CW	—	—	—
B ₂ ud	8.5-10	10YR 6/6	45% CH	1/2-7"	SIL	10	18	SP	1MGR	FR	CS	—	—	—
B ₃ u3	10-35	10YR 5/6	60% CH	1/2-8"	SIL	25	15	SP	1MGR	FR	CW	—	—	—
B ₄ u4	35-50	10YR 5/6	55% CH-Flags	1/2-12"	SIL	10	24	MP	1MGR	FR	—	—	—	—

Notes observed

Bedrock Notes: None observed
 Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: White fine wood, Ironwood, Dogwood
 Dominant Vegetation: Sugar maple
 Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Jessie W. ...

Signature: [Signature]

RETTEW Associates, Inc.
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Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-016-160511-0910-MPC
 Date: 5/11/16
 Job Name: Domion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Berks (8E)
 Soil Series: Berks channery silt loam, 25-45% slopes

Topographic Position: UPPER BACKSLOPE
 % Slope / Aspect: 20%
 Drainage Class: W
 Depth to Refusal: 20
 Bedrock Type and Dip Slope: Not clearly defined
 Mineralogy: Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
O	0-1	5YR 2/1												
A	1-2.5	10YR 2/1	10	<0.5	S/L	30	11	PO	1MSBK	FR	CS			M-F (M, C)
B ₁	2.5-7	10YR 2/4	25	1-2	SL	30	14	PO	1MSBK	FR	CS			M-F (M, C-N)
B ₂	7-20	10YR 2/4	80	2-4	SL	32	15	PO	0WA	FR	CS			C-F
R	-	-	-	-	-	-	-	-	-	-	-			

Bedrock Notes: Siltstone, no clear bedding planes

Water Table? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: MIXED DECIDUOUS, PRESENTLY CUT - MAPLE, CHESTNUT OAK, VA PINE, WHITE PINE, BLUEBERRY, YUPEL, LIGUIN, PENNY

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker
 Field Assistant: Sam Galbraith

Signature: Sam Galbraith

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Test Pit ID:	R-105511-1000-MPC-17 R-017-160511-1000-MPC	Topographic Position:	Balkline
Date:	5/11/10	% Slope / Aspect:	25-45% 270°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Somewhat excessively drained
RETTEW Job #:	089962000	Depth to Refusal:	20"
NRCS Soil Unit:	Berks (8E)	Bedrock Type and Dip Slope:	10° shale
Soil Series:	Berks channery silt loam, 25-45% slopes	Mineralogy:	Mixed

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
Qe	0-0.85	Syn 25/11	-	-	-	-	-	SP0 D50	Mbr	Vfr	AW			
A	0.85-1.04	4/3	30% CH	1/8-2	S.L	25	12	SP 80	1F5Bk	Vfr	AW			Many fine med
Bw	1.04-1.13	105H	40% CH	1/8-2	S.L	20	14	SP 55	1F5Bk	Fr	CW			Many fine med
Bw	1.13-1.75	104K 6/14	48% Cr	1/8-3	S.L	20	14	SP 95	1M5Bk	Fr	CW			Common fine few med
Cr	1.75-1.90	104K 6/14	98% CH	1/2-3"	-	-	-	-	photo red on rock	-	CW			Few fine
R	1.90+	no fine	fractures	fractures	as	-	-	-	fractures	-	-			None

Bedrock Notes: Shale dipping to East 10° down strike of 300° E. 10" fractures 1/2" thick 3-8" pieces

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: Cambic
 Special Features? Y/N Description: _____
 Dominant Vegetation: _____

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: DEF, J9

Signature: David J. Sturman

Field Assistant:

RETTEW Associates, Inc.
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Fax: 717-394-1063

Test Pit ID: R-160511-1145-MPC-18R-018-160511-1145-MPC
 Date: 5/11/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCSS Soil Unit: Craigsville (27)
 Soil Series: Craigsville fine sandy loam

Horizon	Depth in Inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (Inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-2.5	10YR 2/2	2	<0.25	gIL	15	12	SP SS	1F3BK	FR	CW	-	-	M-F, M, Co
Bm1	2.5-8.5	10YR 2/1	5	<0.5	gIL	5	15	PM SM	1M3BK	FR	CS	-	-	M-F, Co
Bm2	8.5-10	10YR 2/1	15	<1	gR	5	18	SP PS	1M3BK	FR	CS	-	-	C-F, M F-Co
Bm3	10-30	10YR 2/1	45	<1	L	45	14	PS SD	1M3BK	FR	CS	-	-	C-F
pc	30-80	10YR 5/2	80	>1	gIL	35	14	SO PD	DM3A	VFR	-	C: C2E D: -	10YR 5/6	F-F

Bedrock Notes:

Water Table? N Description: 32"

Indications of slips or slope failures? N Description:

Special Features? N Description:

Dominant Vegetation: White Redwoods - Beech, Oak, Maple, Hickory, White Pine

Other Notes: V. IN ORGANIC HORLTON, <0.25' VEGETICAL, CONCRETE SIGN

TEST PIT DESCRIPTION

Soil Scientist: **DAN FEUSTEL** Signature: *Dan Feustel*

Field Assistant: *Talyn Sipe*

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Phone: 717-394-3721
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Test Pit ID: **R-160512-1020-MPC** *1020-19*
 Date: **5-12-16**
 Job Name: **1020-19**
 RETTEW Job #: **089962000**
 NRCS Soil Unit: **Paddy Knob (PAME)**
 Soil Series: **Paddyknob-Madsheep Complex, 15-35% slopes, very stony**
 Topographic Position: **SUMMIT**
 % Slope / Aspect: **1/0° 340°**
 Drainage Class: **WFCU DRAINED**
 Depth to Refusal: **42"**
 Bedrock Type and Dip Slope: **M/A**
 Mineralogy: **Mixed**
 USDA: **GRAV SAND STONE (MEDIUM GRAINED)**

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	ROOTS
Oe	0-2	2.5 YR 2.5/1	-	-	-	-	-	-	WE GR	VER	A-W	-	-	-
A	2-5	2.5 YR 2.5/1	15% CB	4-6	CB SAL	65	12	PO SO	WE SBR	VER	A-W	-	-	M-C
AB	5-9	2.5 YR 2.5/1	25% CO	3-8	CB SAL	65	12	PO SO	WM SOX	VER	A-W	-	-	M-C
Bw1	9-22	2.5 YR 2.5/1	45% CB	0.5-6	VCB SAL	65	13	SO SP	WM SOX	VFR	C-W	-	-	M-C
Bw2	22-30	2.5 YR 2.5/1	65% CB	1-5	XGR SAL	55	14	SS SP	M SOX	VFR	C-W	-	-	M-C
Bw3	30-38	2.5 YR 2.5/1	80% CB	4-8	XEB L	50	16	SO SP	W VC SBR	F	C-W	-	-	M-C
C	38-45	2.5 YR 2.5/1	90% STONES	12-24	XST SAL	55	14	SO SP	OMA	VFR	A-W	-	-	F-C

Bedrock Notes: *Not observed - highly fractured competent sandstone at bottom w/ fissure fractures*

Water Table? Description: *90% Rock w/ stones*

Indications of slips or slope failures? Description: *MIXED DECIDUOUS - WICKONN / W/ASH / SKYPIE*

Special Features? Y/N

Dominant Vegetation: *MIXED DECIDUOUS - WICKONN / W/ASH / SKYPIE*

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker Signature: David Fenstermaker
 Field Assistant: Adam S. Geyer

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Test Pit ID: R-160512-1040-MPC-20 R-020-160512-1040-MPC
 Date: 5/19/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Paddy Knob (Panne)
 Soil Series: Paddy Knob-Madsheep Complex, 15-35% slopes, very stony

USDA
 Topographic Position: Backslope 30 below shoulder
 % Slope / Aspect: 47% 399°
 Drainage Class: W Well Drained
 Depth to Refusal: 41
 Bedrock Type and Dip Slope: g222 SS
 Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0e	0-2	grey	-	-	-	-	-	-	-	-	cm	-	-	g222
A	2-4	grey	30	<0.5	vr	50	12	po	vr	vr	cm	-	-	M-F, M
														B-Co
Bw1	4-11	grey	30	<0.25	vr	48	12	po	vr	vr	cm	-	-	M-F, M
														E-Co
														M-F, M
1.25	11-20	grey	45	<1	vr	40	13	ss	vr	vr	cm	-	-	M-F, M
														E-Co
1.25	20-31	grey	65	<1	vr	25	15	ss	vr	vr	cm	-	-	F-P
														F-P
1.0	31-41	grey	65	1-4	vr	25	14	ss	vr	vr	as	-	-	F-P
														F-P
														F-P

Bedrock Notes:

Water Table? Y(N) Description: _____
 Indications of slips or slope failures? Y(N) Description: _____
 Special Features? Y/N Description: _____
 Dominant Vegetation: Mixed grass trees - oak - white oak striped maple
 Other Notes: _____

Pocket Penetrometer

g222 sandstone
 several fragments
 5/19/16

TEST PIT DESCRIPTION

Soil Scientist: John A. ...

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
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Phone: 717-394-3721
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Test Pit ID: R-160512-110-MPC Topographic Position: 1447' 228'

Date: 5/2/16 % Slope / Aspect: W Well Drained

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: W Well Drained

RETTEW Job #: 089962000 Depth to Refusal: 23"

NRCS Soil Unit: Paddyknob-Madshoop Complex (PamE) Bedrock Type and Dip Slope: None Observed N100W 34°

Soil Series: Paddyknob-Madshoop Complex, 15-35% slopes, very stony Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0	0-10	8YR 2/1	—	—	—	—	—	—	—	—	as	—	—	—
1-3	10-20	10YR 2/1	20	1	SL	80	8	PO	1.5YR 6/3	UFR	as	—	—	3.5 3.5 3.5
1-2.5	20-30	10YR 2/1	30	2-3	SL	65	10	PO	1.5YR 6/3	UFR	as	—	—	3.5 3.5 3.5
1-5	30-40	10YR 2/1	85	3-5	SL	65	10	PO	1.5YR 6/3	UFR	as	—	—	3.5 3.5 3.5

Bedrock Notes: Water Table? Y/N Description: Y/N

Indications of slips or slope failures? Y/N Description: Y/N

Special Features? Y/N Description: None Observed

Dominant Vegetation: None Observed

Other Notes: None Observed

TEST PIT DESCRIPTION

Soil Scientist: **DAN FEINSTEIN** Signature: *Dan Feinstein*

Field Assistant: **R160512-1155-MRC-22**
Dan Feinstein & John Walsh

mid back

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Test Pit ID: **R-160512-1155-MRC-22** R-022-160512-1155-MPC
 Date: **5-12-16**
 Job Name: **Dominion - Atlantic Coast Pipeline Soil Survey**
 RETTEW Job #: **089962000**
 NRCS Soil Unit: **PADDY KNOB (PAME)**
 Soil Series: **Paddyknob-Madsheep Complex, 15-35% slopes, very stony**

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Roots Lab Sample ID
De	0-0.5	5/10 25/10	—	—	—	—	—	—	—	—	AW	—	—	—
AR	0.5-2.5	5/10 3/10	20% CH	2 1/8"	L	40	12	NP NS	1 MGR	VFC	AW	—	—	Moist Field, many ped. Redox coarse
Bw1	2.5-11	25/10 3/10	34% S	2 1/8"	SLL	30	14	SP SP	1 SGR	VFC	CS	—	—	Many fine, many ped. Redox coarse
Bw2	11-22	25/10 3/10	45% S	2 1/8"	S.L	10	13	SP SP	1 MGR	FC	CW	—	—	Common fine
Cc	22-36	25/10 10/10	99% Gr	2 1/8"	—	—	—	—	OM Rock exposed	—	GS	—	—	Redox fine. Soft CoF-break soft
R	36+	—	—	—	—	—	—	—	—	—	—	—	—	Redox out as gravel SILTSTONE

Redox siltstone - no clear planes - breaks out as gravel.

Bedrock Notes: **Y** Description: **Y**
 Water Table? **Y** Description: **Y**
 Indications of slips or slope failures? **Y** Description: **Y**

Special Features? **Y/N** Description: **Y**
 Dominant Vegetation: **MIXED DECIDUOUS - Hickory - white ash - sugar maple - Red oak**

Other Notes: **Available bit of column in reference on surface horizon**

Chestnut oak

TEST PIT DESCRIPTION

Soil Scientist: David West

Signature: [Signature]

Field Assistant: _____

RETTEW Associates, Inc.
3020 Columbia Avenue
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Phone: 717-394-3721
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Test Pit ID: R-023-160512-1310-MPC

Date: 7/12/12

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 089962000

NRCS Soil Unit: Berks (BfC)

Soil Series: Berks channery silt loam, 3-15% slopes, very stony

Topographic Position: SUMMIT

% Slope / Aspect: 37 95°

Drainage Class: Well Drained

Depth to Refusal: 24"

Bedrock Type and Dip Slope: FR 55

Mineralogy: Mixed

USDA														
Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
	0-1.5	gray/1	-	-	-	-	-	-	-	-	a-s	-	-	3E
	1.5-3	gray/1	5	20.5	SIL	12	12	50	145BK	VRL	a-s	-	-	3E
	3-4	gray/1	25	20.5	GR SIL	15	15	55	145BK	FR	cm	-	-	3E
	4-15	gray/1	36	21	VRL SIL	16	14	55	145BK	FR	cm	-	-	3E
	15-25	gray/1	90	2-4	VRL SIL	15	15	55	145BK	FR	cm	-	-	2F
	25-34	gray/1	100	4-24	VRL SIL	15	15	55	145BK	FR	cm	-	-	

Bedrock Notes: _____

Water Table? Y N Description: _____

Indications of slips or slope failures? Y N Description: _____

Special Features? Y N Description: _____

Dominant Vegetation: WOODLAND - OAK, MAPLE, SWEETGUM, BEECH

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: DEF Signature: David S. Suter
 Field Assistant: Shm Wark

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 Fax: 717-394-1063

Test Pit ID: R-024-160512-1320-MPC
 Date: 7/22/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Berks - New Shady (BIE)
 Soil Series: Berks channery siltloam, 15-35% slopes, very stony

USDA														
Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-0.5	grey/1	—	—	SL	12	15	10 P6	1F5BK	VF	CW	—	—	—
BB	0.5-3.5	10YR 2/3	38% CH	4 1/2"	SIL	15	18	5P	1F5BK	FR	CW	—	—	3P 1M 1C
BW	3.5-10	10YR 5M	65% CH	LD"	SZ	13	18	5P	1M5BK	FR	AS	—	—	3P 2M 1C
C _r	10-24	soft shale	shale	digable by hand	sub-breakable	soft	level bedded w/c	CS	—	—	—	—	—	2C
R	24-26	shale	bedrock	—	—	—	—	—	—	—	—	—	—	—

Bedrock Notes: Shale - rios to 1/2-1" thick pieces

Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____
 Dominant Vegetation: Red maple white oak chestnut oak blueberry

Other Notes: all the bits & columns influence on surface horizon

29 2"

Sandstone
 Cap
 shale cap

TEST PIT DESCRIPTION

Soil Scientist: Don Fennell Signature: David Swartzman
 Field Assistant: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1053

Test Pit ID: R-160512-1430-MPL-25 R-025-160512-1420-MPC
 Date: 5/18/10
 Job Name: Domion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 083962000
 NRCS Soil Unit: Berks (BE)
 Soil Series: Berks channely silt loam, 15-35% slopes, very stony
 Topographic Position: Backbone
 % Slope / Aspect: 50% 300°
 Drainage Class: Well Drained
 Depth to Refusal: 36"
 Bedrock Type and Dip Slope: N/S
 Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
<u>0-3</u>	<u>SVR 25/0</u>	<u>25/0</u>	<u>few surface clags</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1/2 AgR</u>	<u>ufr</u>	<u>AW</u>	<u>Y</u>	<u>Y</u>	<u>many fine sand med</u>
<u>3-5</u>	<u>10YR 7/2</u>	<u>7/2</u>	<u>25% ch</u>	<u>2 1"</u>	<u>S.L</u>	<u>18</u>	<u>12</u>	<u>SD</u>	<u>1/2 AgR</u>	<u>ufr</u>	<u>AW</u>	<u>Y</u>	<u>Y</u>	<u>many fine med med coarse</u>
<u>5-10.5</u>	<u>10YR 5/4</u>	<u>5/4</u>	<u>25% ch</u>	<u>2 1"</u>	<u>S.L</u>	<u>12</u>	<u>14</u>	<u>SD</u>	<u>1/2 AgR</u>	<u>Fr</u>	<u>CU</u>	<u>Y</u>	<u>Y</u>	<u>Common fine common med</u>
<u>10.5-25</u>	<u>10YR 5/4</u>	<u>5/4</u>	<u>25% ch</u>	<u>1/2-8"</u>	<u>S.L</u>	<u>14</u>	<u>14</u>	<u>SP</u>	<u>1/2 AgR</u>	<u>Fr</u>	<u>AW</u>	<u>Y</u>	<u>Y</u>	<u>Common fine common med</u>
<u>25-36+</u>	<u>10YR 5/3</u>	<u>5/3</u>	<u>99% OH</u>	<u>1/2-5"</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>om</u>	<u>-</u>	<u>CS</u>	<u>Y</u>	<u>Y</u>	<u>Red med soft shale</u>
<u>36+</u>	<u>10YR 3/6+</u>	<u>3/6+</u>	<u>Siltstone</u>	<u>Bedrock</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>Y</u>	<u>Y</u>	<u>Bedrock</u>

Bedrock Notes: Siltstone brecciated gray - not clearly bedded - (boidal) structure - appears to dip down

Water Table? Y Description: spacers of mag. siltstone Cr. shale - R. siltstone in the side

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: chestnut oak, white pine, Red oak, 3 Red maple, white pine, blueberry

Other Notes: Residuum

Bedrock by hand - 2-3' from top of soil
Bedrock by hand - 30"
Bedrock by hand - 30"

TEST PIT DESCRIPTION

Soil Scientist: Richard W. Smith

Signature: [Signature]

Field Assistant: _____

R-026-160513-1000-MPC

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Fax: 717-394-1063

Test Pit ID: R-160513-1000-MPC-26

Date: 5/13/16

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey

RETTEW Job #: 089962000

NRCS Soil Unit: Elliber (EIF)

Soil Series: Elliber extremely channery silt loam, 35-55% slopes

Topographic Position: _____

% Slope / Aspect: _____

Drainage Class: W Well Drained

Depth to Refusal: _____

Bedrock Type and Dip Slope: _____

Mineralogy: _____

USDA: _____

Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
00	0-3	5YR 5/1	-	-	-	-	-	-	-	-	CS	-	-	-
A	3-6	10YR 5/2	SO	<1	VR	30	10	PO	CFBRK	VR	CS	-	-	3E 3M 1000
BA	6-10	10YR 5/2	60	<1	VR	45	10	PO	1M5BR	FR	CM	-	-	3E 3M
01	10-15	10YR 5/2	75	1	VR	25	16	SP	1M5BR	FR	QS	-	-	3E 3M 1000
02	15-20	10YR 5/2	80	<3	VR	50	8	PO	1M5BR	FR	-	-	-	2E 2M

Bedrock Notes:

Water Table? Y/N

Description: _____

Indications of slips or slope failures? Y/N

Description: _____

Special Features? Y/N

Description: _____

Dominant Vegetation:

Mixed woods - oak, maple, white pine, laurel

Other Notes:

Area of soil, sand and gravel is present in channels

Pocket Penetrometer

0.75
1.25
1.0
1.0

TEST PIT DESCRIPTION

Soil Scientist: Don Fenslermacher Signature: David Fenslermacher
 Field Assistant: _____

Test Pit ID: ~~R-027-160513-1000-MPC~~ R-027-160513-1000-MPC
 Date: 5/13/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Elizabet (EIF)
 Soil Series: Elizabet extremely channery silt loam, 35-55% slopes

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
D	0-0.5	5YR 2/1	-	-	-	-	-	-	1-2mm	-	AW	-	-	Very fine, med. clay
A	0.5-2	10YR 3/2	10YR CH	4-1/2"	Sic	10	15	SP	1f SBK	VF	AW	-	-	Very fine, med. clay
B _{1E}	2-6	10YR 5/8+	10YR CH	2-1"	Sic	12	15	SP	1f SBK	F ₁	CW	-	-	Many fine med common loam
B ₁	6-11	7.5YR 5/3	20YR CH	<1"	SicL	15	29	SP	2f SBK	F ₁	CS	-	-	Many fine, common med clay
B ₁₂	11-22	7.5YR 5/4	4.5YR CH	<1.5"	SicL	16	35	MP	2MSBK	F ₁	AW	-	-	Common fine clay films
C	22-26	10YR 5/3	9.5YR CH	<3"	-	-	-	-	Rec. hor. OM	-	GW	-	-	Low fine clay films
R	26-30+	Bedded fractured shale bedrock	Shale bedrock	-	-	-	-	-	High carbon	-	-	-	-	Very soft shale bedrock

Bedrock Notes: Fractured shale bedrock-high carbon pipes with slope

Water Table? Y/N Description: 33" Thru lign CR + R

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: White pine, white oak, red maple, blueberry

Dominant Vegetation: residual - rain showers over night in AM

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: James West
Field Assistant: _____

Signature: _____

RETTEW Associates, Inc.
3020 Columbia Avenue
Langaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: R-160513-1210-MPC-28 R-028-160513-1210-MPC
Date: 5/13/16
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
RETTEW Job #: 089962000
MRCS Soil Unit: Calvin-Dekalb-Berks Complex (CDF)
Soil Series: Calvin-Dekalb-Berks Complex, 35-55% slopes, very stony

USDA
Topographic Position: _____
% Slope / Aspect: _____
Drainage Class: N Well Drained
Depth to Refusal: _____
Bedrock Type and Dip Slope: _____
Mineralogy: Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
0a	0-3	gray	-	-	-	-	-	-	-	-	CS	-	-	-
As	3-4	gray	S	<2	SL	10	10	SP	2-4 R	VER	CS	-	-	3F 3M
BA	4-8	gray	15	1-2	SL	25	15	SP	1 M, 1 B, 1 R	PR	CS	-	-	3F 3M
Bw	8-16	gray	10	1-2	SL	30	16	SP	2-4 R	PR	CS	-	-	3F 3M
2B1	16-30	gray	10	1-2	SL	18	32	SP	2-4 R	FR	CS	-	-	3F 3M
2B2	30-50	gray	0	-	SL	10	37	MS	2-4 R	F1	CS	-	-	2E
2B3	50-50	gray	0	-	SL	5	41	MS	2-4 R	F1	-	-	-	1E

Bedrock Notes: Thin, concave, shale

Water Table? Y/N Description: _____

Indications of slips or slope failures? Y/N Description: _____

Special Features? Y/N Description: _____

Dominant Vegetation: Maple, Deciduous, Sp. Maple, Oak, Chestnut Oak, White Oak, Buckeye

Other Notes: 20 M to E 15 M SW. Berks nod. stones on surface. 0.25 N2.5 M; white gravel nodules; concave over residuum

Curry
Skans
Curry
Skans
Curry
Skans

TEST PIT DESCRIPTION

Soil Scientist: DEREK STEINBUCK Signature: David Steinbuck
 Field Assistant: _____

RETTEW/Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-160513-1300-MPC-09 R-029-160513-1300-MPC	Topographic Position:	Backslope
Date:	5/13/16	% Slope / Aspect:	19% ESE
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well Drained
RETTEW Job #:	089962000	Depth to Refusal:	50"
NRCS Soil Unit:	Calvin-Dekalb-Berks Complex, 15-35% slopes, very stony	Bedrock Type and Dip Slope:	N/A
Soil Series:	Calvin-Dekalb-Berks Complex, 15-35% slopes, very stony	Mineralogy:	Mixed

Horizon	Depth in inches	Matrix Color	Rock Fragment Type and %	Rock Fragment Size (inches)	Texture Class	% sand	% clay	Plasticity / Stickiness	Structure Type, Grade, and Size	Moist Consistency	Horizon Boundary Topography and Distinctness	Redox Feature Color	Redox Feature Description	Lab Sample ID
A	0-4.5	5YR 2.5/1.9	15.9%	4.3"	LS	85	8	S6 DD	1F5gk	VFr	A W			
				few cob 6"										
BE	4.5-13	2.5YR 3/3	20%	9.1"	LS	86	8	S0 PD	1F5gk	VFr	CS			
Bw	13-29	2.5YR 2.5/3	35%	9.1"	LS	88	8	S0 PD	1M5gk	VFr	CS			
2Bd	29-39	5YR 4/4	5%	5.1"	SL	78	14	S5 PD	1F5gk	Fr	RES			
2Bc	39-39	7.5YR 5/6	20%	6-18"	SL	62	24	S5 SP	1M5gk	Fr	AS			
C	39-50x	2.5YR 2.5/4.8	0%	—	SIC	5	43	M5 VP	OM	Fp	—			

Bedrock Notes: None observed
 Water Table? Y/N Description: _____
 Indications of slips or slope failures? Y/N Description: _____

Dominant Vegetation? Y/N Description: chestnut oak white pine hickory blueberry
 Other Notes: very thin O horizon LO, 2.5"
Calvinium over residuum with Oa Bw being a mixed transitional horizon

Very thin O horizon LO, 2.5"

Calvinium over residuum with Oa Bw being a mixed transitional horizon

Pit ed

Many fine roots

Col have rounded edges

Redox band SS

Mixing of ped with common fine cement

Redox band in Bw

Redox band in Bw

Redox band - 1.1% chromic

Attachment 4
Soil Survey Test Pit Logs

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Maraca

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residuum	Lab Sample ID	Notes	
						Backslope	36%	MUD	50"	Siltstone	Maples									
	6/20/2010	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CFE	Mixed						USDA									
0a	3	5YR2.5/1																		
Bw	10	5YR2.5/1	SIL 20	3	ST 50%	1/4"	MP NS	F2SBK	FR	CS								0	S1	
Bt	24	2.5YR2.5/1	SIL 20	3	CN 25%	1/2" x 2	SP NS	F1SBK	FR	GS								2.5	S2	
Cr	50	2.5YR2.5/1	SIL 20	3	ST 60%	1/2" x 1	SP MS	DM	F1									4.5+		
R	50+																	5.0		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Lab Sample ID	Notes	
P007-16062D-1020RLL	6/20/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CEP	Mixed	Da	3	50R2:5/1						F1GR	FR	CLS		2F, 1M	0		
						Bt ₁	15	7.5YR5/4	S:DL	30	5	5% ST	1/4"	F8SBK	FR	GS		3F, 1M	4.5		
						Bt ₂	24	10YR6/4	S:L	28	6	50% ST	1/4"	F1SBK	FR	CLB		1F	4.5		
						C _r	38	10YR6/3 10YR6/1	S:IL	18	20	50% ST	1/2 - 3/4"	OM	FR			1F	4.5+		
						R	38+														

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Lasco
 Field Assistant: Steph Morara

Signature: _____

RETTEW/Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063


Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residual	Lab Sample ID	Notes	
P003-160620-1025-RL	6/20/2016	Domination - Atlantic Coast Pipeline Soil Survey	089962000	CFE	Mixed	Backslope	58%	W/S	50"	Sitesong	Red Hard & Beach	USDA	286	32"						
Da	2	50R25/1																0	S1	
A	6	250R ^{25/12}																0	S2	
Bw	17	250R ^{4H}																1.75	S3	
Bt	32	250R ^{5/16}																4.54	S4	
Cc	50	250R ^{5/16}																3.5		
																		5.25		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Horco
 Field Assistant: Steph Maraca

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P004-160620-1035-KLL</u>	Topographic Position:	<u>Backslope</u>	Parent material:	<u>Residuum</u>
Date:	<u>4/20/2016</u>	% Slope:	<u>60%</u>	Slope Aspect:	<u>180</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>W1</u>	Depth to Water Table:	<u>50+''</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>50''</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>CTE</u>	Bedrock Type:	<u>Siltstone & Beach</u>	Dip Slope & Direction:	
Mineralogy:	<u>Mixed</u>	Vegetation:	<u>Red Maple & Beech</u>	Strike:	

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary	Redox Feature Color	Moisture Description	Roots	Moisture Potential/ pH	Lab Sample ID	Notes
0a	2	5YR2.5/1	—	—	—	—	—	—	FR	FR	CS	—	—	3F, 2M	0		
A	6	2.5YR2.5/2	SiL	22	3	10% ST	1/2 x 1"	SP MS	FR	FR	CS	—	—	3F, 1c	0.25		
Bw1	14	2.5YR3.1/4	Sil	20	3	20% ST	1/2 x 1"	SR CS	FR	FR	CS	—	—	2F	1.75		
Bw2	19	2.5YR4/4	Sil	18	3	45% ST	1/2 x 1"	PO SO	FR	FR	DS	—	—	2F, 1M	2.5		
Cr	50	5YR4/3	S ₁ V	12	16	90% ST	1/2 - 1/4 x 1"	PO SS	FR	FR	—	—	—	—	4.5		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Rosco
 Field Assistant: Steph Horara

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
P005-160620-1425 RLL	6/20/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CTF	Mixed	Backslope 42% 40% 50"	Residuum 3520 50+ "								
						Vegetation: <u>Maple & Beech</u>	Dip Slope & Direction:	Strike:							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Temperature & Direction	Redox Feature Color	Native Feature Description	Roots	Water Potential/ pH	Lab Sample ID
Oa	3	gray sll	—	—	—	—	—	F1GR	FR	CKS	—	—	3F, 1M	4.5	
Bw	22	gray sll	S1L	18	6	20% ST	1/2"	F1GR	FR	g/s	—	—	3F, 1M	2.0 5.25	
Bx	50	gray sll	S1L	23	9	40% ST	3/4-1"	MISBR	FR	—	—	—	—	3.75 5.0	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: David A. Tamm

Field Assistant: Taylor M. Miller

Signature: 

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragment Size (inches)	Rock Fragment Type & %	% clay	% sand	Texture Class	Matrix Color	Depth in Inches	Horizon
2B10-100620-1509-DAT	03-20-20	03-20-20	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Latouche Newark Milk Run	Silt loam	Rock	38%	Medium Well Drained	N/A	N/A	Sugar Maple - No other trees	Yellowish sandstone	N/A	N/A	N/A	N/A	2.0-2.5	2.0-2.5	XFL	-	-	-	5YR 2.5/1	0-1	De
2B11	8-16	5/4	5/4	5/4	5/4	5/4	0.25-0.5	PS	SRK	FR	SA	-	-	-	-	-	-	2.0	0.4	OH	15	11	4/3	2.5YR	2-8	AB
2B12	16-25	5/4	5/4	5/4	5/4	5/4	0.25-0.5	PS	SRK	FR	SA	-	-	-	-	-	-	2.0	0.4	OH	25	13	5/4	10R	8-16	2B11
2B13	25-34	5/4	5/4	5/4	5/4	5/4	0.25-0.5	PS	SRK	FR	SA	-	-	-	-	-	-	2.0	0.4	OH	44	8	5/4	10R	25-34	2B12
2B14	34-50	5/4	5/4	5/4	5/4	5/4	0.25-0.5	PS	SRK	FR	SA	-	-	-	-	-	-	2.0	0.4	OH	58	10	5/4	10R	34-50	2B13

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dwaine A. Thayer
 Field Assistant: Taylor Walker

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Lab Sample ID	Notes
P007-160620-1245-DNA	06-20-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Catawba Chemung silt loam	Siltstone	SAVINGS ROCK (BENCH)	13%	Sandy silt	N/A	N/A	Superior, Northern Red Oak, Ash	Savannah/Redwood	N/A	N/A	N/A	N/A	N/A	S-1A	Very hard at 0.25"
A	0-3	5 ^{1/2} L	SIL	11	16	0.25-8.10	PS	SR	1.1	VFR	SA	-	-	2.5 F	2.5	4.5	S-1A		
Bt1	3-9	2.5 ^{1/2} L	SICL	31	11	0.25-4.0	PS	SR	1.3	FR	SA	-	-	2.5 F	2.5	4.5	S-2A		
Bt2	9-17	2.5 ^{1/2} L	SICL	38	8	0.25-0.5	PS	SR	2.2	FR	SA	-	-	1.5 F	3.0	4.5	S-3A		
Bt3	17-28	10 ^{1/2} L	SIC	43	11	0.25-0.5	PS	SR	2.3	FR	SA	-	-	1.5 F	3.5	4.5	S-4A		
Bt4	28-44	10 ^{1/2} L	SIC	40	15	0.25-0.5	PS	SR	1.3	FR	SA	-	-	1.5 F	4.5	4.7	S-5B	Roots only along primary	
Bt5	44-50	2.5 ^{1/2} L	SICL	33	21	0.25-2.0	PS	SR	1.2	FR	-	-	-	2.5 F	4.5	4.5	S-6B		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Tuane A. Trax
 Field Assistant: Taylor Walter

Signature: 

RETFW Associates, Inc.
 3020 Calloway Avenue
 Lancaster, PA 17603
 Phone: 717-394-5721
 Fax: 717-394-1063

Test Pit ID:	Topographic Position:										Parent material:						
Date:	% Slope:										Slope Aspect:						
Job Name:	Drainage Class:										Depth to Water Table:						
RETFW Job #:	Depth to Refusal:										Slope Failure or slip:						
NFCS Soil Unit:	Bedrock Type:										Dip Slope & Direction:						
Mineralogy:	Vegetation:																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Particle Size	Structure Type, Grade, and Size	Moist. Consistence	Horiz. Boundary Description	Redox Feature Color	Substr. Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
A	0-3	5YR 4/2	SIL	8	15	WGR 40%	0.25-3.0	PO SO	GR 1/2	MR	WA	-	-	2. F 2. M	0.25 4.5	S-14 S-13	10YR 2/1 DoC 20.25"
Bw1	3-12	2.5YR 4/4	SIL	11	25	WGR 55%	0.25-4.0	PO SO	SBK 1/2	MR	SA	-	-	1. F 2. M	0.5 4.2	S-2A S-2B	
Bw2	12-26	5YR 5/4	L	13	42	XOL 65%	0.25-6.0	PO SS	SBK 1/3	FR	SA	-	-	1. F 1. M	1.0 4.7	S-2A S-2B	
ZC	26-31	2.5YR 5/4	L	16	38	XOL 85%	0.25-10.0	PO SS	SBK 1/3	MR	SA	-	-	1. M	6.8 4.7	S-4A S-4B	
ZR	31+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sandstone 30 ft

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD J. GALBRAITH
 Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	009-110620-115-MGW	Topographic Position:	SUMMIT	Parent material:	RESIDUUM												
Date:	6/20/16	% Slope:	1	Slope Aspect:	200												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	7.32												
RETTEW Job #:	08996200	Depth to Refusal:	3.2	Slope Failure or slip:	-												
NRCS Soil Unit:	CATEACATE	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	22° W												
Mineralogy:	ATXCD	Vegetation:	RED MAPLE, STRIPED, SUSAN, BEECH, BL. CHERRY	USDA	338 (N 22 W)												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistence	Natural Boundary Topography & Discontinuity	Redox Feature Color	Soil Features Description	Roots	Root Penetration/Depth	Lab Sample ID	Notes
De	0+1	5NR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3F-VF 3M-10	4.6	-	
A	1-6	7.5 YR 2.5/1	GA SIL	10	10	GR 30	< 6"	PO SB	1VF GR	VFR	CW	-	-	3F-VF 3M-10	0.25 4.4	-	
AB	6-13	7.5 YR 2.5/2	VEL SIL	8	15	GR 35	< 6"	PO SS	1M SBR-GR	FR	CS	-	-	3F-VF 2M-10 1VC	0.25 4.4	-	
Bw1	13-25	7.5 YR 5/6	VEL SIL	12	15	GR 40	< 12"	PO SS	1M SBK	FR	CW	-	-	3F-VF 1M-10 1VC	1.25 5.5	-	
Bw2	25-32	7.5 YR 5/6	VEL SIL	16	20	GR 45	< 12"	PS SS	1M SBL	FI	CW	-	-	2F-VF 1M-10	1.75 5.2	-	
Cp	32+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD, J. GAUBRATH
 Field Assistant: M. DWIGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	POID-160620-1315-MGW	Topographic Position:	SUMMIT	Parent material:	RESIDUUM	Notes										
Date:	6/20/16	% Slope:	2	Slope Aspect:	210											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	MWD	Depth to Water Table:	31											
RETTEW Job #:	089962000	Depth to Refusal:	4v	Slope Failure or Slip:	-											
NRCS Soil Unit:	CATAWACHE	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	19° ENE	Strike: 211										
Mineralogy:	MIXED	Vegetation:	See notes below													
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mollic Consistence	Moist Bulk Density (g/cm³)	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability (mm)	Lab Sample ID	Notes
De	0-1	5YR 3/2	-	-	-	-	-	-	-	AS	-	-	3+ VF 2 CO-M	4.5	S1	
A	0-4	5YR 2.5/1	S1	14	8	GR 20	< 2"	PO 1 VF SD GN	VFR	CS	-	-	3F-VF 2 CO-M	4.6	S2	
AE	4-8	7.5YR 3/2	S1	14	8	GR 15	2-2"	PO 5D SD SBK-GC	VHL	CW	-	-	3F-VF 1 CG-M	4.8	S3	
Bt1	8-13	7.5YR 4/3	S1	19	12	GR 8	< 3"	SP 1 VF MS SBK	FR	CW	-	-	1F-VF	5.1	S4	
Bt2	13-23	7.5YR 4/6	S1	23	15	GR 8	< 3"	SP 2.1F MS SBK	FR	CW	-	-	1F-VF 1 CG-M	5.2	S5	
Bt3	23-31	7.5YR 5/4	S1	25	13	GR 8	< 5"	SP 2F MS SBK	FI	CW	-	-	1F-VF	5.1	S6	
Bt4	31-37	7.5YR 5/4	S1	26	10	GR 10%	< 5"	MP 1 M SS SBK	FI	CW	+1d	1F-VF	3.5	S7	LITTLE ROCK SAND	
Bt5	37-44	7.5YR 5/6	S1	35	15	GR 10%	< 5"	MP 1 M MS SBK	FI	CW	+1d	-	3.5 4.8	S8	LITTLE ROCK	

Other Notes: FA + Cr

SUGAR MAPLE, BLUE OAK, RED OAK, RED MAPLE

TEST PIT DESCRIPTION

Soil Scientist: M. Wood J. GAUBERTH
 Field Assistant: M. DUGAN

Signature: M. Wood

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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P011-160620-1140-M&W		Topographic Position:	SUMMIT		Parent material:	RESIDUUM										
Date:	6/20/16		% Slope:	2%		Slope Aspect:	330°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WP		Depth to Water Table:	7.28										
RETTEW Job #:	089962000		Depth to Refusal:	29		Slope Failure or Slip:	-										
NRCS Soil Unit:	CATEACHE		Bedrock Type:	SANDSTONE		Dip Slope & Direction:	1% 196										
Mineralogy:	MIXED		Vegetation:	BLAKE CHESTNUT, STRIPED MAPLE, MAGNOLIA, BEECH, RED MAPLE,		Strike:	300										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rock Fragment Stability Index	Structure Type, Grade, and Size	Mohr Constraints	Moisture Boundary Topography & Disturbance	Redox Feature Color	Moist Feature Description	Roots	Moist Resistance/PI	Lab Sample ID	Notes
DH	0e	5YR 3/2	-	-	-	-	-	-	-	-	AB	-	-	3F-VF 2 CO-M	4.9	-	
1-3	A	7.5YR 2.5/2	GN 5.2	15	10	GN 30	< 5"	PS SS	1VF GR	VFA	CS	-	-	3F-VF 2 CO-M	0.25 4.3	-	
3-10	Bw ₁	7.5YR 3/3	GR 5.2	15	18	GL 30	< 5"	PS SS	1F SBV	FR	CI	-	-	2F-VF 1 CO-M	0.25 4.5	-	
10-24	Bw ₂	7.5YR 5/4	GR 5.2	15	18	GN 55	4.8-11"	PS SS	1M SBV	FR	CS	-	-	2F-VF 1 CO-M 1 VF	0.5 5.5	-	
24-28	C _r	7.5YR 5/4	GR 5.2	11	4	GR	< 12"	-	-	-	-	-	-	-	-	-	
28+	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Beech, Black Cherry, Sugar Maple, Cucumber Magnolia, Striped Maple, Fern, no varnish
Elderberry, False nettle, jewelweed

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD J. GALBRAITH
 Field Assistant: M. DULAN

Signature: _____

M. Wood

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Test Pit ID:	PD12-11062D-1115-MGW	Topographic Position:	SOMMIT	Parent material:	COLUVIUM / RESIDUUM									
Date:	6/20/16	% Slope:	1%	Slope Aspect:	12D									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WD	Depth to Water Table:	27									
RETTEW Job #:	089962000	Depth to Refusal:	27	Slope Failure or Slip:	-									
NRCS Soil Unit:	CATEAChE	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	15.5° -									
Mineralogy:	MIXED	Vegetation:	SEE CR UV		Strike: 194 (S14W)									
USDA														
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Orientation	Redox Feature Color	Roots	Lab Sample ID	Notes
0-2	De	7.5YR 3/2	-	-	-	-	-	-	AS	-	-	3 F-VF 3 C0-M	S1	
2-7	A ¹	7.5YR 2/1	UGR S1R	8	10	GR 60	< 1/2"	1 VF GR	VHR	CW	-	3 F-VF 3 C0-M	S2	
7-10	Bhs	5YR 3/1	UGR S1R	10	10	GR 60	< 10"	1 F SBK-GA	FR	CW	-	3 F-VF 2 C0-M 1 VC	S3	COMMON ADJUSTED ortsteins
10-17	Bs	5YR 3/3	UGR S1R	10	10	GR 50	< 12"	1 M SBK	FR	CW	-	2 F-VF 2 C0-M 1 VC	S4	
17-24	BC	7.5YR 4/4	UGR S1R	8	11	GR 50	< 12"	1 M SBK	FR	CW	-	1 F-VF 1 C0-M	S5	
24-27	Cr	7.5YR 4/4	-	-	-	-	-	-	-	-	-	-		
27	R													

Other Notes: VEG: BLACK CHERRY, STRIPED MAPLE, WITOL/HAZEL, BEECH

TEST PIT DESCRIPTION

Soil Scientist: John Van
 Field Assistant: MIGUEL RODRIGUEZ

Signature: [Signature]

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Test Pit ID:	P-022-160614-1050-15M					Topographic Position:	BACKSLOPE										
Date:	6/14/16					% Slope:	38%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL										
RETTEW Job #:	089962000					Depth to Refusal:	80"										
NRCS Soil Unit:	COWID-DEKAR-BERKS					Bedrock Type:	SILTSTONE										
Mineralogy:	MIXED					Vegetation:	PICKNEY CHESTNUT OAK, MAPLE, LAUREL, BLUEBERRY										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number/Inches	Structure Type, Grade, and Size	Moist Consistence	Hydrophobicity in Disturbance	Redox Feature Color	Water Feature Description	Roots	Product Development/pt	Lab Sample ID	Notes
0e	0-3	5R2.5/1	-	-	-	-	-	-	-	-	AW	-	-	3-VF, F	-	S1	
0a	3-5	2.5FRS/1	-	-	-	-	-	-	-	-	AW	-	-	3-VF, F	-	S2	
E	5-8	5FR2.5/2	GR LS	4	85	15 GR	0.5-2	PO	1M SBK	VF	AW	-	-	2-F, M	0.25	S3	
Bs	8-14	5FR3/4	SL	6	75	5 GR	0.5-2	PO	1M SBK	VF	AW	-	-	2-F, M	0.5	S4	
Bk1	14-21	5FR4/6	CH SL	16	68	25 CH	<0.5	PO	2M SBK	FR	CM	-	-	1-F, M, C	0.5	S5	SANDSTONE COE CLAY SKINS
2B2L	21-36	10FR5/6	SICL	34	10	Ø	-	MP	2M SBK	FR	CS	-	-	1-F	1.25	S6	LITRATED LOM 10 CLAY SKINS
2BC	36-55	16FR5/6	SICL	29	12	1	<0.5	SP	Ø MB	FR	-	-	-	Ø	2.75	S7	LITRATED LOM 10 UNDERLIES TM (CLAY STRUCTURE)
2Cr	55-80	-	-	-	-	-	-	SS	-	-	-	-	-	-	4.7	A/B	SOFT GRAY SILTSTONE W/ DECAHYD

Other Notes: AVG DEED BELOW 50" FIRM SILTSTONE BEDROCK AT 80"

TEST PIT DESCRIPTION

Soil Scientist: JENNIFER WEAVER
 Field Assistant: MIGUEL PARRALES

Signature: [Signature]

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Test Pit ID:	P-0223-160614-1150-35N					Topographic Position:	BACKSCOPE										
Date:	6/14/18					% Slope:	40%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELU										
RETTEW Job #:	089962000					Depth to Refusal:	56"										
NRCS Soil Unit:	CAVUID DEARB-BRKS					Bedrock Type:	SILTSTONE										
Mineralogy:	MIXED					Vegetation:	HICKORY MAPLE, CUSTARD OAK, WHITE PINE, BLUEBERRY										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooted/Stubbed	Structure Type, Grade, and Size	Mold Consistence	Natural Boundary Topography & Disturbance	Redox Feature Color	Root Pattern Description	Roots	Root Penetration/pt	Lab Sample ID	Notes
De	0-1	5-10/5/1	-	-	-	-	-	-	-	as	-	-	3-VT, F ₁	-	-	-	↑ VFS
BE	1-5	7.5/10/5/10	GR L	14	40	15 GR	< 1	PO	1M/SBK	FR	CS	-	3-F ₁ M	1.0	-	-	SANDSTONE COF CLAY SKINS
DE1	5-3	7.5/10/5/10	CH SILCL	28	20	20 CH	1-3	SP	2M/SBK	FR	CS	-	2-F ₁ M	1.0	-	-	SANDSTONE COF CLAY SKINS
BE2	3-13	7.5/10/5/10	CH SILCL	36	18	25 CH	2-4	MP	2M/SBK	FR	CM	-	2-F ₁ M	2.5	-	-	SANDSTONE COF CLAY SKINS
2C5	20-50	-	-	-	-	-	-	SS	-	-	-	-	-	-	-	-	-
2R	Sbt	SILTSTONE	BE DRUCK	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: SANDSTONE CLAYS AND STONES 36" ON SURFACE; AUGERED BELOW 50";

TEST PIT DESCRIPTION

Soil Scientist: JOHN NAW

Signature: [Signature]

Field Assistant: MAYRA PARSONS

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Fax: 717-394-1053

Test Pit ID:	<u>T-024-160614-1440-15M</u>	Topographic Position:	<u>BUCK/NOSE</u>	Parent material:	<u>RESIDUUM</u>
Date:	<u>6/14/16</u>	% Slope:	<u>9%</u>	Slope Aspect:	<u>190°</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WELL</u>	Depth to Water Table:	<u>-</u>
RETTW Job #:	<u>089962000</u>	Depth to Refusal:	<u>-</u>	Slope Failure or slip:	<u>-</u>
NRCS Soil Unit:	<u>CAUVIN - DEKALB - BERK2</u>	Bedrock Type:	<u>SILTSTONE</u>	Dip Slope & Direction:	<u>-</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>HARLE WHITE OAK, DEWLOCK, WHITE PINE</u>	Strike:	<u>-</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	USDA		Moist Consistence	Mottling & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
								Structure Type, Grade, and Size	Moist Consistence								
0e	0-2	Spr2s/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	2-3	10f2s/2	SIL	14	20	S CH	< 1	PO	FR	FR	CM	-	-	3-VF	0.25	-	-
								SD	FR	FR	CM	-	-	2-F	-	-	-
Bt1	4-11	10f2s/6	SIL	38	10	qR	< 1	MP	FR	FR	CM	-	-	2-F,M	1.25	-	-
								SS	FR	FR	CM	-	-	1-C	-	-	-
Bt2	11-18	10f2s/3	SIL	42	10	qR	< 1	MP	FR	FR	CM	-	-	2-F,M	1.75	-	-
								SS	FR	FR	CM	-	-	2-F,M	4.5	-	-
Bc	18-36	MF S/R3/X	SIL	50	5	CH	< 0.5	MP	F1	F1	CM	-	-	-	3.25	-	-
								SS	F1	F1	CM	-	-	-	-	-	-
C1	36-57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: SOME CAUVIN INDICATED IN SURFACE; AUGER BELOW 50"; S/R3/3 VE3 LENSES BEGINNING AT 64"-DECAYED INTERBEDDED SANDSTONE?

WITH OCCASIONAL
DECAYING SILTSTONE
LOF

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor W. Potter

Signature: John C Roberts

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moist Residue/pt	Lab Sample ID	Notes	
P-023-160617-0942-5CR	6-17-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DkKa1b - Hazelton	Mixed	Lower first back slope	10%	W0	30		Midstom level white pine, Short leaf pine, Red maple, Red oak white oak	Colluvium over residuum	ZS/p								
De	0.5	5YR2.5/1			GR 5	GR 1F						Aw					Zvf 1F	4.2			
A	3	10YR4/1			GR 10	GR 1F						Aw					2cc 1M	0.25			
E	7	2.5Y 4/4			GR 10	SPK 1F						CW					1f.vt 2m	1.5			
Bw1	15	10YR5/6			GR 10	SPK 1M						CW					1cc 1M 2X.vt	0.75			
Bw2	19	10YR5/6			GR 20	SPK 1M						CW					1f 2F	1.25			
C	32	10YR6/6			GR 5	SPK 0M						GW						4.5			
R	32+																				

Other Notes: Horizon consists of indurated colluvium (0.25-0.5 chert & siltstone gravel)

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

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Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Rock Fragmentation/Type & %:	Rock Fragment Size (Inches):	Structure Type, Grade, and Size:	Molt Consistency:	Moisture Boundary Description:	Redox Feature Color:	Redox Feature Description:	Notes:	
P-028-160617-1100-5CR	6-17-2016	Dornton - Atlantic Coast Pipeline Soil Survey	089952000	DeKalb-Hazelton	Mixed	Shallow slope	22%	W0	45	Sand stone	Mountain land, Barber Maple, Black Gum, White Pine	Colluvium / Residuum	24°													
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragmentation Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistency	Moisture Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/Type & %	Lab Sample ID	Notes									
De	3	5YR 2.5/1	L	15	40	GR CH 10/5	GR CH 0.5-1.0	PO	GR 1, F	VFR	AW			2 ft	4.3											
A	5	10YR 4/1	L	15	40	GR CH 10/5	GR CH 0.5-1.0	PO	GR 1, F	VFR	AW			2m	0.25											
E	10	10YR 5/6	L	18	40	GR 10	0.5-1.0	PO	SEK 1, F	VFA	CW			1.5 ft	0.5											
Bw1	20	7.5YR 5/6	L	20	45	GR 40	0.5-3.0	SP	SBK 1, m	FR	CW			2 ft	1.50											
Bw2	32	7.5YR 5/6	L	22	45	GR 50	0.5-4.0	SP	SBK 1, m	FR	CW			2.5 m	0.75											
C	45	7.5YR 5/6	SL	18	65			SP	OM	F1	GW				4.4											
ZR	45+																									

Other Notes:

Dip Strike could not be estimated; colluvium over residuum @ 45
 Fine ground Sand Stone PM

TEST PIT DESCRIPTION

Soil Scientist: John W. Wain
 Field Assistant: Leah G. Kereciti

Signature: [Signature]

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Test Pit ID:	P-031-160615-1222-33W		Topographic Position:	BARKSLOPE		Parent material:	COLUVIUM OVER RESIDUUM									
Date:	6/15/16		% Slope:	46%		Slope Aspect:	350°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WELL		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	32"		Slope Failure or slip:	-									
NRCS Soil Unit:	MICKERT		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	75°SE (30°) Strike: 220°									
Mineralogy:	MIXED		Vegetation:	WHITE OAK, WHITE PINE, HICKORY, HEMLOCK		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Uniform Boundary Description	Redox Feature Color	Median Feature Description	Roots	Parent Fragmentation/ in	Lab Sample ID	Notes
Oe	0-2	5-R2.5/1	-	-	-	-	-	-	-	-	-	-	3-VF 2-F	4.2	-	
A	2-5	5-SFR2.5/1	SIL	12	18	5 gr	< 0.5	1-FR	VER	CM	-	-	2-VF, F 1-M	4.3	-	
BA	5-5	5-SFR2.5/1	SIL	14	15	10 CH	< 1	1-M, 50K	VER	CM	-	-	3-F 2-M, C	4.5	-	
Bw	5-10	5-SFR5/4	SIL	17	15	40 CH	1-3	2-M, 50K	FER	CM	-	-	2-F, M 1-C, M, C	4.5	-	
Bc	10-19	5-SFR5/4	SIL	22	17	70 CH	2-4	4-50K	FER	CM	-	-	1-F, M	1.0	-	
2C1	20-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LITHOCHROMIC
2R	32+	SILTSTONE	BEDROCK													

Other Notes:

DECKSCORE - LINEAR UNWEAR

TEST PIT DESCRIPTION

Soil Scientist: David W. H.
 Field Assistant: David G. B.

Signature: [Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-032-160V15-1215-01W						Topographic Position:	BARKS CREEK/NOISE									
Date:	6/15/16						% Slope:	22%									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey						Drainage Class:	WEL									
RETTW Job #:	089962000						Depth to Refusal:	34"									
NRCS Soil Unit:	WELKEET						Bedrock Type:	Siltstone									
Mineralogy:	MIXED						Vegetation:	White pine, white oak, hop hornbeam, hickory, red maple									
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number/ Substr.	Structure Type, Grade, and Size	Mollic Condition	Hydric Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Field Penetration/ M _d	Lab Sample ID	Notes
0e	0-1.5	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF	4.5	-	
A	1.5-2	10YR3/1	SIL	12	15	10 GR	< 1	po	1FBR	NFR	am	-	-	3-VF, F	0.25	-	
Bw	2-10	10YR5/6	CH SIL	17	10	15 CH	0.5-2	sp	1M5BK	FR	cm	-	-	3-VF, F 1-C, VC	1.0 4.5	-	
Bc	10-14	10YR5/4	SIL	15	15	5S CH	1-2	po	1F5BK	FR	cm	-	-	2-VF 1-C	4.5	-	LITNDSCHERMIC
2Bc	14-20	2.5Y5/4	XCH SIL	23	10	60 CH	1-2	sp	1F5BK	FR	cm	-	-	2-F 1-C	-	-	
2Cr	20-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2R	34+	SILTSTONE	-	-	-	-	BED ROCK	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WELLS
 Field Assistant: JOHN GERRARD

Signature: [Signature]

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 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Profil Temperature/ft	Lab Sample ID	Notes	
P-033-160615-1041-JSW	6/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	NEIKSET	MIXED	BACKSLOPE - CEDX	18%	MODERATELY WELL	-	SILTSTONE	WATERPIECE, RED MARL, MORGANSON, WHITE SANDS, WICKERY WITH HARBOR	COLLUVIUM OVER RESIDUUM	1620	31"	-	-	2-VF, F	0.5	-	-	
A	1-3	10/PR3/1	SIL	12	25	10	GR	<1	PO	1	VER	2-F, M	0.25	4.5	-	-	2-F, M	4.5	-	SANDSTONE COG	
AB	3-5	10/PR3/1A	SIL	12	20	10	GR	<1	PO	1	VER	2-F, M	0.5	4.5	-	-	1-C	4.5	-	SANDSTONE COG	
Bt1	5-10	2.5/RS/10	CH	20	20	15	CH	1	SP	2	FR	CM	1.0	4.5	-	-	1-M	4.5	-	CLAY SILT SANDSTONE COG	
Bt2	10-31	2.5/RS/10	SIL	20	18	30	CH	1-3	SP	2	FR	gW	1.5	-	-	2-E	-	-	-	CLAY SILT SANDSTONE COG	
Bt3C	5-50	10/RS/16	SIL	18	25	50	CH	1-3	SP	1	FR	-	-	-	-	-	-	-	-	-	CLAY SILT SANDSTONE COG

Other Notes: UNDER COVERAGE - JOHN EVIDENCE

TEST PIT DESCRIPTION

Soil Scientist: Jared Ward
 Field Assistant: Scott Gervasio

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-034-160615-1019-35W Topographic Position: Backslope Parent material: Colluvium over Residuum
 Date: 6/15/16 % Slope: 20% Slope Aspect: 250°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: well Depth to Water Table: 244"
 RETTEW Job #: 089962000 Depth to Refusal: 44" Slope Failure or slip: -
 NCRS Soil Unit: WE1KCT Bedrock Type: Siltstone Dip Slope & Direction: 62° 110° Strike: 20°
 Mineralogy: Mixed Vegetation: Scarlet oak, Chestnut oak, White Hazel, White Pine

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	USDA		Moist Consistence	Mollic Boundary Topography & Disposition	Redox Feature Color	Major Feature Description	Roots	Pocket Penetration/ pH	Lab Sample ID	Notes	
								Stability/ Substrata	Structure Type, Grade, and Size									
De	0-3	5R2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A	3-5	10R2.5/1	SIL	13	15	12 CH	<2	Po	1EPR	V-R	aw	-	-	3vf-vc	4.5	-	-	
								so	1EPR	aw	-	-	3vf-vc	0.25	-	-		
BE	5-15	10R2.5/6	SIL	16	18	17 CH	<3	Po	1EPR	V-R	aw	-	-	2vf-f	0.5	-	-	-
								so	1EPR	V-R	aw	-	-	3m-vc	4.5	-	-	
2Bt	15-31	10R2.5/6	SIL	32	10	2S CU 15 GR	1-4 <1	MP	2M1BK	FR	aw	-	-	2vf-m	0.5	-	-	-
								so	2M1BK	FR	aw	-	-	2vf-m	4.5	-	-	
2C	31-38	10R2.5/6	SIL	20	12	8S CH	0.5-5	-	0ND	FR	aw	-	-	2f-m	-	-	-	-
								-	0ND	FR	aw	-	-	2f-m	-	-	-	
2Cr	38-44	-	-	-	-	-	-	-	-	-	-	-	-	1f-m	-	-	-	-
								-	-	-	-	-	-	1f-m	-	-	-	
2R	44+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								-	-	-	-	-	-	-	-	-	-	

Other Notes: SOME EVIDENCE OF BURDING ON SURFACE

CLAY SKINS
 LITUAUROMIC
 M PL STRUCTURE
 FEW ROCK
 LITUAUROMIC

TEST PIT DESCRIPTION

Soil Scientist: Dierk Haeber
 Field Assistant: Scott Davis

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Dip Slope & Direction:	Moisture/Temp/Pressure/ pH	Lab Sample ID	Notes	
R-035-160(015-1011-DEF	10/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	W01W01F (W01D)	Alxkd	Ridge top over Shale	3.1%	11 / 150 HEMLOCK EXCESS	23	Shale - Tan	Chert cat, white pine, white oak, red maple, hop horn beam	residuum	218°	360° E	-	-	-	
D	0-1	shale	sh	sh	sh	-	-	-	-	-	-	-	-	-	-	-	-	-
A	1-2	shale	sh	sh	sh	<1	70	IFGR	VER	RM	-	-	-	3-VE	4.5	-	-	
BW	2-10	shale	sh	sh	sh	1	SP	1M1BK	FR	CM	-	-	-	3-E	0.5	-	-	
C	10-14	-	-	-	-	<0.5	SS	-	-	-	-	-	-	2-M	4.3	-	-	
R	14-23	shale	sh	sh	sh	-	-	-	-	-	-	-	-	F-F,M	-	-	-	-

Other Notes: SUMMIT, NARROW RIDGE CREST

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

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 Fax: 717-394-1063

Test Pit ID:	P-036-160615-1557-02R				Topographic Position:	Back slope		Parent material:	Coll / Road								
Date:	6-15-2016				% Slope:	220/0		Slope Aspect:	3190								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD		Depth to Water Table:	-								
RETTEW Job #:	089962000				Depth to Refusal:	28		Slope Failure or slip:	-								
NRCS Soil Unit:	Wetshub				Bedrock Type:	Silt Stone		Dip Slope & Direction:	10°								
Mineralogy:	Mixed				Vegetation:	Wich Hazel, White Pine, White Oak, Red Maple		Strike:	131								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistence	Nation Boundary (Temperature & Distances)	Redox Feature Color	Parent Feature Description	Roots	Rocker Resistance/ pH	Lab Sample ID	Notes
0e	1	5YR 2.5/1	—	—	—	10	0.5-1.0	—	GC 1P	vf	Aw	—	—	Zvf, f	4.2	—	
A	2	10YR 4/2	S1	10	12	20 CH	0.5-2.0	PB SP	GR 1A	vfr	Aw	—	—	1vf, f 2v	0.25 4.5	—	
Bw1	12	10YR 6/6	S1C	15	14	30 CH	0.5-3	SP 3S	SOK 1M	FR	CW	—	—	1m, vvf 2D	1.5 4.6	—	
Bw2	23	10YR 5/6	S1C	17	12	VCH 6S	1-3	SP 5S	SOK 1M	FR	CW	—	—	2cm 1vf	2.25 4.5	—	
2R	23+																

Other Notes:

Horizon diagnostic to 28"
 Coll / Residium @ 23"

221

TEST PIT DESCRIPTION

Soil Scientist: John Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

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 Fax: 717-394-1063

Test Pit ID:	P-037-160615-1532-5CR				Topographic Position:	Summit				Parent material:	Residuum						
Date:	10/13/16				% Slope:	WD				Slope Aspect:	-						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	11				Depth to Water Table:	-						
RETTEW Job #:	089962000				Depth to Refusal:	Siltstone				Slope Failure or slip:	-						
MRCs Soil Unit:	Wellert				Bedrock Type:	White Pine, Black Gum, White Oak, Stripe Maple, Vaccinium sp				Dip Slope & Direction:	250						
Mineralogy:	M.xcd				Vegetation:	USDA				Strike:	410						
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Stubness	Structure Type, Grade, and Size	Moist Consistence	Organic Binding (Bonding)	Redox Feature Color	Notes	Roots	Moisture Retention/ pH	Lab Sample ID	Notes
De	1	5YR2.5/1	—	—	—	CH 10	0.25-1.0	—	GR 1F	WDP	AW	—		Zvff	—	—	
A	2	10YR 3/2	SIL	14	12	CH 10	0.25-1.0	Pg 50	GR 1F	FR	CW	—		Zvff	0.75	—	
Bw	11	10YR 5/6	VCH SIL	14	13	CH 40	1-3.0	SP 95	SGR 1F	FR	AW	—		Zm,f	2.0	—	
R-	11+																
R																	

Other Notes: Redrock fractures into flags

TEST PIT DESCRIPTION
 Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
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 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Soil Reaction/ pH	Lab Sample ID	Notes	
P-038-160615-1455-5CR	6-15-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wickert	Mixed	Lower Backslope	44	W0	30	Silt stone	White Pine, Chestnut oak, Red Maple	Coll / Residuum	121°			125° SE				
											USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number of stones	Structure Type, Grade, and Size	Molt Condition	Nation Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Soil Reaction/ pH	Lab Sample ID	Notes			
Oe	2	5YR2.5/1	—	—	—	CH 15	0.5-1.0	—	Gr Ff	VFR	Aw	—	—	Zwf	—	5.0	—			
A	4	10YR 3/2	CH SIL	14	10	CH 15	0.5-2.0	Pb SD	GR 1m	VFR	CW	—	—	Vf Ff	0.25 4.8	—				
Bw1	12	7.5YR 5/6	VCH SIL	17	15	CH 60	0.5-3.0	SP SP	GBK 1m	FR	CW	—	—	2f,m 1c	0.75 4.6	—				
Bw2	16	7.5YR 5/6	VCH	22	20	CH 65	1-4.0	SP SS	SBK 1m	FR	GW	—	—	1f,m,c	1.75 4.5	—				
1CF	26	7.5YR 5/6	—	—	—	CH 95	1-8	—	—	—	CW	—	—	1vf	—	—			7.5YR 5/6	
2R	26+																			

Other Notes: Coll / Residuum breaks @ 16

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: John C Roberts



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Fax: 717-394-1063

Test Pit ID:	<u>0-039-160615-1344-500</u>	Topographic Position:	<u>Shoulder</u>	Parent material:	<u>Cell Res</u>
Date:	<u>6-15-2010</u>	% Slope:	<u>24</u>	Slope Aspect:	<u>280°</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>40</u>	Depth to Water Table:	<u>-</u>
RETTEW Job #:	<u>08996200</u>	Depth to Refusal:	<u>40</u>	Slope Failure or slip:	<u>-</u>
NRCS Soil Unit:	<u>Wdkrt</u>	Bedrock Type:	<u>Sandstone</u>	Dip Slope & Direction:	<u>20° 119</u>
Mineralogy:	<u>Mixed</u>	Vegetation:	<u>White Pine Black gum Vaccinium sp. Chestnut Oak</u>	Strike:	<u>9</u>

Horizon	Depth in inches	Matrix color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure/ Substrata	Structure Type, Grade, and Size	Molar Consistency	Medium Boundary Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture Content/ pH	Lab Sample ID	Notes
A	3	10YR 3/2	S1	11	8	GR 10 CH 15	0.5-1.0	RD SP SS	GR 1F	WR	CU	-	-	Zuf	4.2	-	
Bw1	11	10YR 6/6	S1L	13	10	CH 25	0.5-2.0	SP SS	SOK 1m	FR	CU	-	-	Zuf 1m	4.3	-	
Bw2	19	10YR 5/6	S1L	15	12	CH 50	0.5-4.0	SP SS	SOK 1m	FR	CU	-	-	Zuf 25m	5.3	-	
2CR	40																
2R	40+																

Other Notes: Columbus / Residuum @ 170

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

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 Fax: 717-394-1063

Test Pit ID: P-040-1601015-119-5CR Topographic Position: Concave Backslope
 Date: 6-15-2016 % Slope: 2 to 6%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD
 RETTEW Job #: 089962000 Depth to Refusal: 5 ft Stone
 NRCS Soil Unit: Wekivets Bedrock Type: Red Maple White Pine, Chestnut Oak, Hog Pennington
 Mineralogy: Mixed Vegetation: USA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Conductivity	Redox Feature Color	Redox Feature Description	Roots	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Lab Sample ID	Notes	
Ae	1	T5YR 7/2	7/2	—	—	GR 10	0.25-1.0	GR 1.0	FR	AW	—	—	2vf	Coll / Res	35%	25	—	—	S1		
A	3	10YR 8/2	10	11	—	GR 10	0.25-1.0	GR 1.0	VFR	AW	—	—	2vf	—	4.5	—	—	—	S2		
Bw1	10	10YR 6/10	8/10	16	10	GR 15	0.5-1.0	GR 1.5	FR	CW	—	—	2m	—	5.2	—	—	—	S3		
Bw2	17	10YR 5/6	GR 8/10	19	11	GR 15	0.5-2.0	GR 1.5	FR	CW	—	—	2m	—	1.75	—	—	—	S4		
Bw3	25	10YR 5/6	SIL	20	12	GR 35	0.5-2.0	GR 1.0	FR	GW	—	—	1.5m, 1.0m	—	1.75	—	—	—	S5		
Bc	42	10YR 5/8	SIL	17	10	GR 40	2-6	GR 2.0	FI	GW	—	—	1.5m, 1.0m, 2m	—	4.7	—	—	—	—		
Cr	50"	Cr																			

Other Notes:

Large gravel + stones 22-37" Cr mostly soft silt stone with some voids
Dip + strike could not be estimated
Make 10% bypass so BC w/ trace properties

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: John C Roberts

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Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Resistance/ pH	Lab Sample ID	Notes
P-041-160614-1453-5CR	6-14-2016	Dornton - Atlantic Coast Pipeline Soil Survey	089962000	Wetzel	Wetzel	Summit	18	W0	23+	4	Red Maple, White Pine, Hop hounsbaw, Hickory	Red stone Residuum	32/0	—	—	250 SE	Strike: 540	—	—	7.5 YR 5/8 + 10 YR 7/1 Silt Stone
De	0.5	5 YR 2.5/1	—	GR	10	0.25-1.0	—	GR	1F	—	AW	—	—	—	3vF	4/5	—	—	—	
A	1.0	10 YR 4/2	—	GR	10	0.25-1.0	—	GR	1M	—	FR CW	—	—	—	3F	4/5	—	—	—	
BA	7	10 YR 6/6	—	GR	20	0.5-1.5	—	SBK	1M	—	FR CW	—	—	—	2f,m	4/5	—	—	—	
BA	14	10 YR 5/8	—	VEH	40	0.5-3.0	—	SBK	2M	—	FI CW	—	—	—	2f,m	2.0	—	—	—	
2CR	23	10 YR 7/8	—	VEH	85	1-6.0	—	SP	—	—	GW	—	—	—	1vF	4.2	—	—	—	
2R	23+	—	—	—	—	—	—	SP	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Sohne Roberts
 Field Assistant: Taylor Walter

Signature: [Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes											
P-042-160614-1355-5CR	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	Concave head slope	Billie Residuum												
					% Slope: 34	Slope Aspect: 227°												
					Drainage Class: WD	Depth to Water Table:												
					Depth to Refusal: 39	Slope Failure or slip:												
					Bedrock Type: Red silt stone	Dip Slope & Direction: 15° S												
					Vegetation: White Pine, Black Gum, Hickory, White Oak	Strike: 50°												
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/ Stability	Structure Type, Grade, and Size	Moist Consistence	Hydrophobic Potential	Redox Feature Color	Root Features Description	Roots	Rock Fragmentation/ pit	Lab Sample ID	Notes	
0e	1	5YR 2.5/2				15 GR	0.5-2.0	-	GR 1F	-				ZvF	4.2	-		
A	3	10YR 4/2	S1	12	10	20 GR	0.5-2.0	PO 50	GR 1M	VFR				2vF 2m,F 1vF	0.1 4.8	-		
BE	7	10YR 6/6	S1L	15	15	20 GR	0.25-2.0	SP 50	SBK 1M	FR				2m,F	0.1 4.5	-		
Bu1	13	10YR 5/6	S1L	18	16	20 GR	0.25-1.0	SP 55	SBK 1M	FR				2m,F	0.5 4.5	-		
Bu2	18	10YR 5/6	S1L	18	16	45 VGR	0.5-2.0	SP 55	SBK 1m	FR				ZF	0.75 4.5	-		
ZB1	26	10YR 5/6	S1L	24	14	60 VCH	1-4.0	SP 55	SBK 2m	F1	CW			1m,vf	1.25 4.6	-	Soft silt stone 10YR 7/1, clay R/lms	
ZC1	39	10YR 5/6	S1L	20	15	85 VCH	1-6.0	-	Rock cont. illud	-	GW			lvf	-	-	End between rock	
ZR	39+																	

Other Notes: Siltstone parent material, 75% R 5/6 + 10YR 7/1

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor WALTER

Signature: _____

John C Roberts

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Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Equivalent/ pH	Lab Sample ID	Notes
P-043-160614-1317-50R	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Welker	Mixed	Back slope	5%	WD	30	Silt stone	White Pine, Red Oak, White	40° Residuals	4°	-	-	420 NE	2vf	4.5	-	-
A	4	10YR 3/3	SIL	14	12	25 GR	0.25-1.0	PO	50	GR 1M	VFR	CW	2vf	2m	0.25	4.75	-	-	-	
Be	9	10YR 6/6	SIL	10	14	25 GR	0.25-1.0	SD	55	Silt 1M	FR	CW	2vf	2m	1.25	4.75	-	-	-	
Bw1	15	10YR 5/6	SIL	17	15	15 GR	0.25-0.75	SP	55	Silt 1M	FR	CW	100	2vf, f, m	1.25	4.75	-	-	-	
2Bt	20	10YR 7/8	SIL	21	14	35 GR	1.0	SD	55	Silt 2m	FR	CW	1m	2f	2.25	4.5	-	-	-	
2Cr	30	10YR 5/8	SIL	20	15	95 WD	2-8	-	-	Rock controlled	-	CW	1vf	-	-	-	-	-	-	Silt stone
2R	30+																			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____



RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Soil / Rock:	Notes:								
P-044-100614-1214-5LR	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wichert	Mixed	concave / hard slope	27	coll / Rock									
						% Slope:	Slope Aspect:	25°									
						Drainage Class:	Depth to Water Table:										
						Depth to Refusal:	Slope Failure or slip:										
						Bedrock Type:	Dip Slope & Direction:	30° SE									
						Vegetation:		Strike:	26°								
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture / Shrinkage	Structure Type, Grade, and Size	Moist Consistency	Moisture Boundary Temperature & Distribution	Redox Feature Color	Moisture Distribution	Roots	Productive / Nonproductive	Lab Sample ID	Notes
Oe	05	5YR2.5/1				GR 10	0.5-1.0		GR 1F	—	AW	—		1 v f, f	4.2	S1	
A	1.0	10YR4/1	S1L	15	10	S GR	0.25-0.5		GR 1F	FR	AW	—		1 v f	0.25	S2	
															4.5		
															4.7	S3	
BE	7	10YR6/6	S1L	15	10	GR	0.25-1.0		S BK 1F	FR	CW	—		2f	0.5	S4	
															4.7		
Bw1	15	10YR5/6	S1L	19	12	GR 20	0.5-2.0		S BK 2F	FR	CW	—		1 v f	0.5	S4	
															4.7		
Bw2	25	10YR5/6	S1L	19	12	GR 35	0.5-3.0		S BK 2F	FR	CW	—		2m	0.7	S5	
															4.7		
															0.7		
Z Bt1	36	10YR5/8	S1L	28	18	GR 50	1-3.0		S BK 2m	FR	CW	—		f	1.25	S6	clay films
															4.8		
															1.25		
															4.8		
Z Bt2	42	10YR5/8	S1L	27	16	CH 40	2-3.0		S BK 2m	FR	CW	—		1 f	1.0	S7	clay films
															4.6		
															1.0		
															4.6		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____

John C Roberts

RETEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist. Consistence	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
P-045-160614-1019-TCR	6-14-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	4p1kert	Mixed	Servey / Ridge Top	22%	SED			Silt Stone	Coll / Res				150 E	3F	CH	0.5-1.0	GR	-	-		S1	
A	2.5	10YR3/3															2F	CH	0.5-1.25	GR	WFR	CW		S2	
BA	6	10YR5/4															3F	VEH	0.5-4.0	SBK	FR	CW		S3	
Bw	10	10YR5/6															2m	MCA	1-4.0	SBK	FR	CW		S4	
Cr	50	10YR5/6															10F	ECH	2-8	Rock	-	-			Silt stone few fines

Other Notes:

Silt stone in Cr, situated nearly horizontal; very few roots

TEST PIT DESCRIPTION

Soil Scientist: D. Fenderson/MLW
 Field Assistant: Max Dugan

Signature: Dennis Fenderson

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0410-1056-DEF		Topographic Position:		Bladder		Parent material:		Po Sidum							
Date:	10/14/16		% Slope:		25		Slope Aspect:		259°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		well		Depth to Water Table:		-							
RETTEW Job #:	089962000		Depth to Refusal:		27"		Slope Failure or slip:		-							
NRCS Soil Unit:	Vertic (CWD)		Bedrock Type:		fine grained sandstone		Dip Slope & Direction:		17° E							
Mineralogy:	Mixed		Vegetation:		chestnut oak, hickory, blueberry, white pine, Red maple		Strike:		40							
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime	Redox Feature Color	Root Feature Description	Roots	Root Penetration/ft	Lab Sample ID	Notes
0a	0-1	5-12 2-5.1	-	-	-	-	-	-	-	AW	-	-	3+	-	-	-
A	1-1.25	10YR 2.5R	S. L	16	25	20% CN	2-2"	2Mgn	VFr	AW	-	-	3+	0.5	-	-
AB	1.25-1.0	10YR 4.5R	S. L	16	25	80% GM	2-2"	Po	VF-	CW	-	-	3+	0.75	-	-
								So					4.8	-	-	
BCw	1.0-1.3	10YR 6.5Y	S. L	18	20	40% CN	2-3"	SP	FR	CW	-	-	3+	1.25	-	-
								SS					15.9M	26M	-	-
Bwd	1.3-1.9	10YR 6.5Y	S. L	18	10	75% CN	1/2-4"	SP	FR	CW	-	-	26M	2.25	-	-
								SS					1/15.9M	10	4.10	-
CR	1.9-2.7	-	Soft shale	-	-	-	-	-	-	AW	-	-	-	-	-	-
DR	2.7+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: *D. Fendley-Machner*

Field Assistant: *Max Dugan*

Signature: *Daniel Beck*

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3020 Columbia Avenue
Lancaster, PA 17603
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Fax: 717-394-1063

Test Pit ID:	P-047-160614-1045-DEF		Topographic Position:	Headstone Bully		Parent material:	Colluvium									
Date:	10/14/16		% Slope:	37%		Slope Aspect:	050									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Well Drained		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	-		Slope Failure or slip:	-									
NRCS Soil Unit:	<i>PsuK(BSF)</i>		Bedrock Type:	-		Dip Slope & Direction:	-									
Mitinerary:	<i>Mixed</i>		Vegetation:	<i>Stripping of soil, 15% material</i>		USDA										
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Union Boundary Topography & Distances	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
<i>De</i>	<i>0-1</i>	<i>5YR 2.5/1</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>A</i>	<i>1-5.5</i>	<i>10YR 7/3</i>	<i>SIL 23</i>	<i>18</i>	<i>40% GR</i>	<i>2 1/2"</i>	<i>RB</i>	<i>2M GR</i>	<i>VF</i>	<i>CW</i>	<i>-</i>	<i>3E 2M</i>	<i>0.2</i>	<i>S2</i>		
																<i>50</i>
<i>Bw1</i>	<i>5.5-17</i>	<i>7.5YR 5/3</i>	<i>SIL 23</i>	<i>18</i>	<i>40% CN</i>	<i>2 1/2"</i>	<i>SP</i>	<i>1.5 BK</i>	<i>Fr</i>	<i>CW</i>	<i>-</i>	<i>3E 2M</i>	<i>2.25</i>	<i>S3</i>		
																<i>SS</i>
<i>Bw2</i>	<i>17-25</i>	<i>7.5YR 5/4</i>	<i>SIL 24</i>	<i>18</i>	<i>38% GR</i>	<i>2 1/2"</i>	<i>SP</i>	<i>1M BK</i>	<i>Fr</i>	<i>CW</i>	<i>-</i>	<i>2F 1M</i>	<i>3.25</i>	<i>S4</i>		
																<i>SS</i>
<i>Bw3</i>	<i>25-44</i>	<i>7.5YR 5/3</i>	<i>SIL 25</i>	<i>18</i>	<i>40% GR</i>	<i>2 1/4"</i>	<i>SP</i>	<i>1.6 BK</i>	<i>Fr</i>	<i>CW</i>	<i>-</i>	<i>1M 1F</i>	<i>8.25</i>	<i>S5</i>		
																<i>SS</i>
<i>Bw4</i>	<i>44-50+</i>	<i>7.5YR 5/4</i>	<i>SIL 26</i>	<i>12</i>	<i>15% GR</i>	<i>2 1/2"</i>	<i>SP</i>	<i>1.0 BK</i>	<i>Fr</i>	<i>-</i>	<i>7.5YR 5/0</i>	<i>CD</i>	<i>3.75</i>	<i>S6</i>		
																<i>SS</i>

Other Notes: *Several different colluvial deposits*

TEST PIT DESCRIPTION

Soil Scientist: D. Ferknermacher
 Field Assistant: Max Dungen

Signature: _____



RETTEW Associates, Inc.
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 Fax: 717-394-1063

Test Pit ID:	PO48-1000014-1035-DEF		Topographic Position:		Bare slope (mid)		Parent material:		Colluvium over residual								
Date:	6/14/10		% Slope:		37%		Slope Aspect:		180°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:										
RETTEW Job #:	089952000		Depth to Refusal:		21"		Slope Failure or slip:										
NRCS Soil Unit:	Be1E4 GFD		Bedrock Type:		Sand grain Sandstone		Dip Slope & Direction:		20° SE								
Mineralogy:	Mixed		Vegetation:		Chestnut Oak hophornbeam, Striped maple		Strike:		90°								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Reaction/soiliness	Structure Type, Grade, and Size	Mohr Consistence	National Boundary Topography & Slope Class	Redox Feature Color	Moist Feature Description	Roots	Rock Fragmentation at	Lab Sample ID	Notes
OR	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3E 2m	4.9	-	
A	2-10.25	10YR 2/1	Sil	16	18	30% CN	2.7"	2	2E5BK	Vr	CW	-	-	3Fm 1Co	0.1 4.7	-	Mixed col frags
AB	10.5-10.5	10YR 3/3	S.L	10	16	40% GR	2.7"	P0 50	1E5BK	Vr	CW	-	-	3Mf 2Mf 2Co	0.1 4.9	-	Mixed col frags
Bw	10.5-18	10YR 5/3	S.L	18	14	40% GR	2.7"	50 95	1M5BK	Fr	CW	-	-	2Mf 1Co	0.5 5.0	-	Random coarse round frags highly rounded colluvium
BCL	18-21	10YR 4/3	S.L	18	12	30% CN	4.4"	9P 95	1G5BK	Fr	AW	-	-	1F	2.75 4.8	-	Angular GFD - Residual
BR	21+																

Other Notes: PM1-Colluvium

PM2+3 Residual

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant:

Signature:

David Fenstermaker

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 Fax: 717-394-1063

Test Pit ID:	P-049-1001014-1025-DEF		Topographic Position:		low backslope		Parent material:	colluvium over residual									
Date:	10/14/10		% Slope:	45°		Slope Aspect:	SE		210°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	well		Depth to Water Table:											
RETTEW Job #:	089962000		Depth to Refusal:	4'		Slope Failure or Slip:											
NRCS Soil Unit:	BRLS (BSE)		Bedrock Type:	Shale & siltstone		Dip Slope & Direction:	19° E										
Mineralogy:	BRLS mixed		Vegetation:	Decid. white oak, sugar maple, Christmas tree.		Strike:	281°										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt. Consistence	Moisture Boundary Conditions	Redox Feature Color	Redox Feature Description	Roots	Moist. Permeability/porosity	Lab Sample ID	Notes	
De	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	35	-	-	S1	few sub-stones
A	2-4	10YR 2/2	SIL	15	20	25 GR	4"	PO	145 BR	VF	AW	-	35M 200	0.25 4.5	S2		
Bu	4-20	7.5YR 5/3	SIL	18	23	50.1 GR	4.1"	SP SS	1M5 BR	FR	CW	-	24M 100	0.75 5.7	S3		
Bu	20-32	10YR 4/4	SIL	18	23	43.1 GR	1/8-3"	PO	105 BR	FR	CW	-	24 1M	1.00 5.6	S4	Asciated and rounded Calcium	
2Cr	32-35	2.5Y 5/1 10YR 5/1 10YR 5/1 10YR 5/1	SIL	18	12	55.1 CW	24"	PO PO	0M	FR	AW	-	-	-	-		Soft weathering Shale Calcium weathering position
2R1	35-39	-	-	-	-	-	-	-	-	-	AW	-	-	-	-		
3R2	39+	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

S.11stene BR: does not have a consistent bedding plane, Dip measured off overlying shale BR
 R1 = shale 3R2 = s.11stene

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Field Assistant:

Signature:



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Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-050-1100014-1015-DEF		Topographic Position:		M.D. Backslope		Parent material:											
Date:	01/11/16		% Slope:		55%		Colluvium over Residuum											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Slope Aspect:											
RETTEW Job #:	089962000		Depth to Refusal:		35"		Depth to Water Table:											
NRCS Soil Unit:	Bekks (BFD)		Bedrock Type:		S. HS krk - tan		Slope Failure or slip:											
Mineralogy:	Micaeol		Vegetation:		h. i. ke y. wh. do oak, Rod oak, CHASTNUT oak, blueberry, wh. pine		Dip Slope & Direction:											
USDA																		
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	moisture/soil	Structure Type, Grade, and Size	Moist Consistence	Hydrophobicity & Distribution	Redox Feature Color	Moist Feature Description	Roots	Moist Resistance/pt	Lab Sample ID	Notes	
Op	0-125	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3f 2m	-	-	-	
A	125-2.5	10YR 1/2	L	18	35	cu	< 3"	po so	2M GR	VFAW	-	-	-	3f 2m	0.1 4.5	-	-	
Bw	2.5-10	10YR 5/4	S.L	18	25	38% GR	2-2"	sp ss	1.5B VFAW	CU	-	-	-	2f, m 1c	0.25 -	-	-	Round edges of m. xed. of f. y. res. colluvium
Bw2	10-22	10YR 6/4	S.L	20	25	45% GR	1/8-3"	sp ss	1M GR	FR CU	-	-	-	3M 2f, 1c	0.5 5.3	-	-	
Bw	22-28	10YR 8/4	S.L	22	18	85% CN	3-5"	sp ss	1M GR	FR CU	-	-	-	2M, f 1c	0.1 4.8	-	-	too soft held together panning cu for sink holes few stones 1/4" long
Bw	28-31	10YR 5/4	S.L	22	18	58% CN	< 6"	sp ss	1C SRK	FC ALU	-	-	-	1M, f	1.5 5.5	-	-	Residuum
Bw	31-35	10YR 5/4	S.L	24	12	-	-	sp ss	1C SRK	FC ALU	-	-	-	-	-	-	-	-
Bw	35+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Pasco
 Field Assistant: Rachel Hill

Signature: Russell Pasco

RETTEW Associates, Inc.
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 Fax: 717-394-1063

Test Pit ID:	POS 140613-1105 RLL	Topographic Position:	Head slope - Sid slope	Parent material:	Siltstone Residua													
Date:	6/13/2016	% Slope:	26%	Slope Aspect:	60°													
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	3'+													
RETTEW Job #:	089962000	Depth to Refusal:	3'+	Slope Failure or slip:														
MRCS Soil Unit:	GFe	Bedrock Type:	Siltstone	Dip Slope & Direction:	100° E													
Mineralogy:	Mixed	Vegetation:	Hard woods															
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Stability/soiliness	Structure Type, Grade, and Size	Moist Consistence	Medium-Bearing Temperature & Consistence	Redox Feature Color	Redox Feature Description	Roots	Field Penetration/PI	Lab Sample ID	Notes	
A	3	10YR2/1	S/L	10	25	5	CN	Po So	FGR	FR	CS	-	-	2F, M	5.9	-		
Bt1	15	10YR2/6	SIL	17	10	25	CN	SP	F2SBR	FR	GS	-	-	120 2F	-	-		
								SS							4.9	-		
Bt2	24	10YR5/6	SIL	17	10	40	CN	SP	F2SBR	FR	GS	-	-	1F	-	-		
								SS							4.6	-		
Cr	34	10YR5/6	SIL	12	18	80	CN	Po	OH	FR		-	-	-	-	-		
								So										
R	34+																	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	POS3A162613-1402-RL					Topographic Position:	Head slope		Parent material:	Siltstone Residuum							
Date:	10/13/2016					% Slope:	31%		Slope Aspect:	NA							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	U2		Depth to Water Table:	NA							
RETTEW Job #:	089962000					Depth to Refusal:	42"		Slope Failure or slip:	NA							
NRCS Soil Unit:	BFE Mixed					Bedrock Type:	Siltstone		Dip Slope & Direction:	Hardwood St							
Mineralogy:						Vegetation:	USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Mineralogy/Soiliness	Structure Type, Grade, and Size	Moist Consistence	Bedrock Boundary Thickness & Orientation	Redox Feature Color	Bedrock Feature Description	Roots	Rocker Resistance/ pH	Lab Sample ID	Notes
A	41	10YR3/2	SIL	15	15	S	ST	SP SS	F1GR	FR	cls	—	—	3VF	0.25	-	
Bw	19	10YR5/6	SIL	15	10	20	ST	SS SP	F2Slt	FR	GS	—	—	ZF ZM	0.5 5.3	-	
Cr	38	10YR5/8	SIL	18	10	80	CN	SS	F2SAR	FR	CW	—	—	IF	1.0 4.6	-	
R	42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: PO 54 1606 13:10:55 RW Topographic Position: Head slope Parent material: Siltstone - Residuum
 Date: 6/13/2016 % Slope: 29% Slope Aspect: D
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: MUD Depth to Water Table: 32'
 RETTEW Job #: 089962000 Depth to Refusal: 39 Slope Failure or slip: N/A
 NRCS Soil Unit: BfC Bedrock Type: Siltstone Dip Slope & Direction: 5' 89°N 11°E Strike: N110E
 Mineralogy: Mixed Vegetation: Hardwoods USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Solids	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Moisture/ Solids	Lab Sample ID	Notes
<u>OK</u>	<u>3</u>	<u>7.5YR2.5/1</u>	<u>SIL</u>	<u>15</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>PD</u>	<u>fly</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>3f/m</u>	<u>0</u>	<u>-</u>	
<u>Bw1</u>	<u>13</u>	<u>10YR5/6</u>	<u>SIL</u>	<u>18</u>	<u>8</u>	<u>5</u>	<u>CV</u>	<u>SR</u>	<u>fine silt</u>	<u>FR</u>	<u>GS</u>	<u>-</u>	<u>-</u>	<u>3m</u>	<u>1.0</u>	<u>-</u>	
<u>Bw2</u>	<u>32</u>	<u>10YR5/1</u>	<u>SIL</u>	<u>18</u>	<u>12</u>	<u>25</u>	<u>CV</u>	<u>SR</u>	<u>msbk</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>2 m/c</u>	<u>2.6</u>	<u>-</u>	
<u>C</u>	<u>39</u>	<u>10YR5/6</u>	<u>SIL</u>	<u>15</u>	<u>15</u>	<u>40</u>	<u>CN</u>	<u>RD</u>	<u>DM</u>	<u>FR</u>	<u>-</u>	<u>5YR5/6</u>	<u>7.5YR8/1</u>	<u>1 m</u>	<u>3.0</u>	<u>-</u>	
<u>R</u>	<u>39+</u>							<u>SD</u>							<u>4.2</u>		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____

Russell Losco

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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P055160613-1110-RLZ					Topographic Position:	Backslope Summit					Parent material:	Siltstone Residuum				
Date:	8.13.16					% Slope:	10%					Slope Aspect:	3450				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W/D					Depth to Water Table:	NA				
RETTEW Job #:	089962000					Depth to Refusal:	24"					Slope Failure or slip:	N/A				
NRCS Soil Unit:	Bfe Mixed					Bedrock Type:	Siltstone					Dip Slope & Direction:	320 S/E				
Mineralogy:						Vegetation:	Hardwoods					Strike:	N100W				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Direction	Redox Feature Color	Rooting Description	Roots	Proctor Firmness/ pH	Lab Sample ID	Notes
R	3	5YR 2.5/1	Silt	20	20	-	-	RO	E258L	KR	CS	-	-	2UF	4.4	-	-
Bu1	9	2.5Y 6/6	SIL	25	10	10	CN	SR SS	M258L	FR	GS	-	-	2m 2F	2.5 4.2	-	-
Bu2	16	10YR 6/6	SIL	25	8	40	CN	SR SS	V258L	FR	CS	-	-	2F	1.5 4.5	-	-
R	24	-	-	-	-	-	CN	SR SS SO	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
Field Assistant: Rachel Hill

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Post 160613.1117: RLL	Topographic Position:	Ridge top Saddle	Parent material:	Siltstone Residual												
Date:	4/13/16	% Slope:	11%	Slope Aspect:	130°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	UD	Depth to Water Table:	30"												
RETTEW Job #:	089962000	Depth to Refusal:	30"	Slope Failure or slip:	NA												
NRCS Soil Unit:	Sp Sp	Bedrock Type:	Siltstone	Dip Slope & Direction:	57°SE 18° Strike: N15°E												
Mineralogy:	Sp Sp	Vegetation:	Forest	USDA													
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock Notation	Structure Type, Grade, and Size	Molt Consistence	Horizon Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ in	Lab Sample ID	Notes
Oa	1	5YR3/2	SIL	10				PO	M2dR	ER	c/s			3.5F	0.5	4.6	
A	4	10YR4/3	SIL	25	10			SS	M2GR	FR	CS			3.5F	0.5	4.9	
B _h 1	10	10YR5/6	SIL	25	8	10%		SP	F2sBR	FR	GS			3.5F	0.75		
B _h 2	16	7.5YR5/6	SIL	25	20	40	1/2 x 2"	SP	VF2sBR	FR	GS			1.5F	1.5		
C1	21	Next 7.5YR/6 10YR5/6	SIL	20	20	50	CN	SD	DM	FR	CS			1.5F			Li. Hachromic Matrix color
R	30	10YR5/6	-	-	-		CN	-	-	-	-			-	-	-	
R	30	10YR5/6	-	-	-		-	-	-	-	-			-	-	-	
R	30	10YR5/6	-	-	-		-	-	-	-	-			-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: **JAMES FISHER**
 Field Assistant: **MAX DUBAN + DAN FENSTERMAKER**

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: **P-057-1003-1041-JDF**
 Date: **06-13**
 Job Name: **Dominion - Atlantic Coast Pipeline Soil Survey**
 RETTEW Job #: **089963000**
 NCRS Soil Unit: **BFE**
 Mineralogy: **Mixed**

Topographic Position: **SH**
 % Slope: **33%**
 Drainage Class: **well-drained**
 Depth to Refusal: **32"**
 Bedrock Type: **five grained sandstone**
 Vegetation: **< host oak, red oak, striped maple, bay maple, white holly**

Parent material: **colluvium - var residuum**
 Slope Aspect: **-**
 Depth to Water Table: **-**
 Slope Failure or Slip: **-**
 Dip Slope & Direction: **90° E**
 Strike: **345°**

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moist Consistence	Redox Feature Color	Roots	Notes
DE	2	2.5YR 2.5/1	-	-	-	SN 8	< 1"	-	L	AS	ash	3MT 3FT	siltstone
Bw1	12	10YR 5/6	SIL	22	20	CN 35% GR 45%	1"	SP LF BRK	VR	CS	-	3MT 2M	shale
2Bw	20	10YR 5/6	SIL	20	20	GR 45% SN 45%	2"	2M 5BK	VR	CS	-	2MT 2M	shale
2C	20	10YR 5/6	SIL	21	20	GR 45% SN 45%	3"	LF 5BK	VR	-	-	OF 1M DC	shale & loosely sandstone
BR	32+	-	-	-	-	-	-	-	-	-	-	-	bedded fine grained sandstone

Other Notes:

Parent material 1 is colluvium
 2+3 is residuum

TEST PIT DESCRIPTION

Soil Scientist: JAMES FISHER
 Field Assistant: MAX DUGAN & D. SEMEREMAKIS

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
<u>P-058-160613-1B57-IDF</u>	<u>06/17/16</u>		<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	<u>089962000</u>	<u>BFE</u>	<u>M Red</u>	<u>Noise Slope</u>	<u>Residual</u>								
							<u>% Slope:</u>	<u>Slope Aspect:</u>								
							<u>Drainage Class:</u>	<u>Depth to Water Table:</u>								
							<u>Depth to Refusal:</u>	<u>Slope Failure or Slip:</u>								
							<u>Bedrock Type:</u>	<u>Dip Slope & Direction:</u>								
							<u>Vegetation:</u>	<u>USDA</u>								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Confidence	Nature Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moisture Content / at	Lab Sample ID	Notes
<u>De</u>	<u>1</u>	<u>5YR 2.5/2</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>GR 10%</u>	<u>2 1/4"</u>	<u>-</u>	<u>VR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>3F 2M DC</u>	<u>5.5</u>	<u>51</u>	<u>MINDR COLLUVIAL INFLUENCE</u>
<u>A</u>	<u>2</u>	<u>10YR 4/3</u>	<u>Si</u>	<u>8</u>	<u>4</u>	<u>GR 10%</u>	<u>2 1/4"</u>	<u>ZM 5R</u>	<u>HR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>3F 1M</u>	<u>4.5</u>	<u>52</u>	
<u>Bt1</u>	<u>12</u>	<u>2.5YR 5/6</u>	<u>SIL</u>	<u>18</u>	<u>20</u>	<u>CN 25%</u>	<u>2"</u>	<u>ZM 5R</u>	<u>FR</u>	<u>CS</u>	<u>-</u>	<u>-</u>	<u>2F 2M DC</u>	<u>2.6</u>	<u>53</u>	
<u>Bt2</u>	<u>20</u>	<u>10YR 4/4</u>	<u>SIL</u>	<u>24</u>	<u>18</u>	<u>CN 25%</u>	<u>1-3 1/4"</u>	<u>ZM 5R</u>	<u>FR</u>	<u>AS</u>	<u>-</u>	<u>-</u>	<u>1F 1M DC</u>	<u>3.3</u>	<u>34</u>	
<u>C</u>	<u>26</u>	<u>10YR 4/4</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>CN 95%</u>	<u>4"</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>12% MANGANESE ON ROCK SURFACES WITH SILTSTONE</u>
<u>R</u>	<u>26+</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	

Horizon 5 labeled with of finer is between

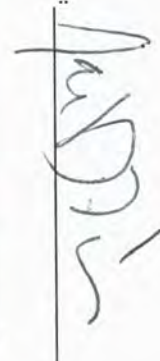
Other Notes:

TEST PIT DESCRIPTION

Soil Scientist:

James Fisher

Signature:



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: P-059-160613-1107-50F
 Date: 6/13/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: BTE
 Mineralogy: Mixed
 Topographic Position: % Slope: 49
 Drainage Class: well-drained
 Depth to Refusal: 18"
 Bedrock Type: fine-grained sandstone
 Vegetation: RFB
 Parent material: SU/ridgetop
 Slope Aspect: 296
 Depth to Water Table: Residual
 Slope Failure or Slip: fine-grained sandstone
 Dip Slope & Direction: 15° E
 Strike: 342

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Swell/shrink	Structure Type, Grade, and Size	Moldboard Condition	Horizon Boundary Topography & Description	Redox Feature Color	Redox Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
De 2	10YR 2/1	-	-	-	-	9F 5%	<1/2"	-	-	-	CS	-	-	3F 2M OC	5.6		fine-grained sandstone
A 6	10YR 3/3	S:L	18	20	9F 20%	1"	SP 3P 5S	2M 5BK	VFR AS	CS	-	-	2F 3M DC	1.2 4.5		fine-grained sandstone	
Bw1 1/2	10YR 6/4	S:L	72	22	9F 20%	1"	MP 5S	2M 5BK	FR CS	CS	-	-	0F 2M OC	2.0 4.6			
Bw2 1/8	7.5YR 6/4	S:L	24	22	9F 45%	3"	VR 4S	2M 5BK	F1 AS	AS	-	-	2M 1E	2.5 4.8		fine-grained sandstone	
R 18+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hall

Signature: 

REITW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P060160613-1535-R2L Topographic Position: Back slope Parent material: Residual
 Date: 6/13/16 % Slope: 41% Slope Aspect: ---
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: U3 Depth to Water Table: ---
 RETTEW Job #: 089962000 Depth to Refusal: 12" on slab Slope Failure or slip: ---
 NRCS Soil Unit: Bf1e Bedrock Type: Sandstone Dip Slope & Direction: S 40° E 30° S Strike: N 50° E
 Mineralogy: Bf1e Vegetation: Hard woods

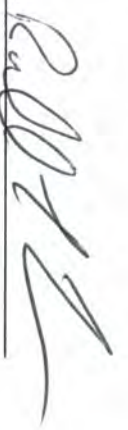
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Saturation	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Temperature & Dispersion	Redox Feature Color	Redox Feature Description	Roots	Parent Temperature/ pH	Lab Sample ID	Notes
<u>A</u>	<u>4</u>	<u>7.5yR2.5/</u>	<u>SIL</u>	<u>10</u>	<u>12</u>			<u>PO</u>	<u>F2GR</u>	<u>FR</u>	<u>CS</u>	<u>---</u>	<u>---</u>	<u>3FVF</u>	<u>4.6</u>	<u>---</u>	
<u>Bw</u>	<u>12</u>	<u>10yR5/6</u>	<u>SIL</u>	<u>10</u>	<u>15</u>	<u>10</u>	<u>ST</u>	<u>PO</u>	<u>F1SBL</u>	<u>FR</u>	<u>CS</u>	<u>---</u>	<u>---</u>	<u>3F</u>	<u>5.2</u>	<u>---</u>	
<u>R</u>	<u>12+</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>SO</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>Possible boulder slab - dip is steeper than Rock outcrop nearby</u>

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	POLD-1100619-1000-RLU					Topographic Position:	Shoulder - Nose		Parent material:	Colluvium over Residuum						
Date:	4/14/2016					% Slope:	34%		Slope Aspect:	220°						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	UD		Depth to Water Table:	38"						
RETTEW Job #:	089962000					Depth to Refusal:	38"		Slope Failure or slip:	-						
NRCS Soil Unit:	Pans E BFF					Bedrock Type:	Fine Sandstone		Dip Slope & Direction:	57°E / 150						
Mineralogy:	Mixed					Vegetation:	Maple-Hickory		USDA							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Molt Consistency	Soil Boundary Description	Redox Feature Color	Bedrock Feature Description	Roots	Soil Temperature/pH	Lab Sample ID	Notes
D _a	1.5	5YR2.5/1	-	-	-	-	-	PO SD	FIGR	FR	CS	-	3F, 2M	0.25 4.5	-	-
A	4	7.5YR4/4	L	5	30	10	1/2	PO SD	FIGR	FR	CS	-	3M, 1E	0.75 5.3	-	-
B _w	16	10YR5/6	L ^{GR}	15	40	20	1/2"	SP SS	F2SBR	FR	CS	-	2M	3.0 5.4	-	-
C _r	30	10YR6/4	L ^{NGR}	10	40	50	1/2-1"	SP SS	ΦSG	FR	CS	-	-	2.5 4.7	-	-
R	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Loser
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residuum	Lab Sample ID	Notes	
	06/16/2016	Atlantic Coast Pipeline Soil Survey	089962000	Sam BIF	Mixd	Shoulder	35%	WD	39'	Ear Sandstone	Sugar Maple forest						110°			
Da	1	5p2s/1																0		
A	3	1.5p2s/1																0		
Bu	13	1.5p2s/1																0.25		
Cr	32	1.5p2s/1																1.0		
R	39																	5.3		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: 2068-1601019-0950-RLI
 Date: 6/14/2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTW Job #: 089962000
 NRCs Soil Unit: PaME
 Mineralogy: Mixed

Topographic Position: Saddle
 % Slope: 5%
 Drainage Class: SPD
 Depth to Refusal: 50±"
 Bedrock Type: NA
 Vegetation: Vetch, Goldensrod

Parent material: colluvium - Possible HTM
 Slope Aspect: 305°
 Depth to Water Table: 16"
 Slope Failure or slip: NA
 Dip Slope & Direction: NA
 Strike: NA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/Soilness	Structure Type, Grade, and Size	Moist Consistence	Median Bulk Density Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture Content/ pH	Lab Sample ID	Notes
Ap	6	10YR5/1	SIL	15	10	—	—	SS	M2GR	FR	CS	—	—	IF	7.9		
Bt	16	10YR6/10	SIL	20	5	—	—	MS	M1SBT	F1	GS	—	—	✓	6.9		
								MS									
Bg	50	N8/1 7.5YR4/0	SIL	20	6	—	—	MS	M1SBT	F1		N8/1 20P 7.5YR5/6 con	MCP	—	4.5x		Small water seep at 29"
								MS									

Other Notes:

Old log staging area, open field with logging roads on both ends, loading pit in the northwest corner.

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Russell Hill

Signature: Russell Losco

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P-064-140614-1020-RLC Topographic Position: Shoulder
 Date: 2/11/2014 % Slope: 22%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Somewhat Poorly Drained
 RETTEW Job #: 089952000 Depth to Refusal: 30"
 NRCS Soil Unit: Paw F Bedrock Type: Fine Sandstone
 Mineralogy: Mixed Vegetation: Sugar Maple - Sassafras
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Reactivity/Structure	Structure Type, Grade, and Size	Moist Consistence	Unconsolidated Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/Depth (in)	Lab Sample ID	Notes
O ₀	1	5YR2.5/1	—	—	—	—	—	SP	F1gR	FR	CS	—	—	ZFM	0	—	—
A	4	7.5YR2.5/1	SIL	18	5	10% ST	1/2"	SP	F2LGR	FR	CS	—	—	ZFM	0	—	—
B _{un1}	19	10YR6/3	SIL	18	5	25% ST	1/2"	SP	F2SBR	FR	CS	—	—	ZF 1M	1.75	—	—
B _{un2}	30	10YR6/4	SIL	15	5	20% ST	1/2"	SP	F1SBR	F1	AW	10YR7/2	CD	ZVF	3.75	—	—
R	30+	—	—	—	—	—	—	SS	—	—	—	—	—	—	—	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-0610-110414-1040-RLR Topographic Position: Backslope Parent material: HMT over colluvium
 Date: 6/11/16 % Slope: 70% Slope Aspect: -160°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD Depth to Water Table: 50+
 RETTEW Job #: 089962000 Depth to Refusal: 50+ Slope Failure or slip: NA
 NRCS Soil Unit: Pan E Bedrock Type: Fine Sandstone Dip Slope & Direction: NA
 Mineralogy: Mixed Vegetation: Sugar Maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Particle Size	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/Depth (in)	Lab Sample ID	Notes
A ⁿ	7	15YR5/10	SL	3	70	30% CN1	1/2 x 3"	PO SS	FISBR	FR	CW	—	—	3F, 2M	0	6.1	
B ^w	18	15YR3/2	SL	5	60	70% CN	1/2 x 4"	PO SO	FISBR	VR	CW	—	—	2VF, 2M	0	6.4	
2A _b	28	5YR3/3	SL	5	60	30% CN	1/2 x 3"	PO SO	FISBR	VR	CW	—	—	2F, 1M	0.75	5.4	
2B _{wh}	40	15YR10/1	SL	5	70	30% CN	1/2 x 2"	PO SO	FISBR	FR	GS	—	—	1M	2.0	5.3	
2C _h	50	15YR4/3	SL	5	55	70% CN	1/2 x 3"	PO SO	DM	RL		—	—		3.5	5.1	

Other Notes:

Located downslope from a logging road, human transported material overlying colluvium is the result of the road cut.

TEST PIT DESCRIPTION

Soil Scientist: Steve Padlo
 Field Assistant: Stephanie Moraca

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes					
067-160614-1441-5dd	06/14/16		Dominion - Atlantic Coast Pipeline Soil Survey	089952000			backslope	col/res						
							Slope Aspect: 20	145						
							Drainage Class: WD							
							Depth to Water Table: N/A							
							Slope Failure or slip: Sandstone							
							Bedrock Type: red maple, sugar maple, catalpa, iron wood							
							Dip Slope & Direction: USDA							
							Vegetation:							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moist Consistency	Major Boundary Temperature & Distribution	Redox Feature Color	Roots	Product Temperature/ pH	Lab Sample ID	Notes
0e	3	5YR2.5/1	-	-	-	Ch 20	1.5-2	-	aw	-	CF	<.25	-	
A	7	5YR3/2	sil	16	15	Ch 20	.5-2	-	aw	-	CF	.25	-	
						SS		-			CM	4.75	-	
BA	10	5YR6/4	sil	18	12	Ch 25	.5-2	-	aw	-	FM	2.25	-	
						SS		-			CC	4.5	-	
BS	30	5YR4/6	sil	30	15	Ch 30	1.5-2	-	aw	-	CF	3.25	-	
						SS		-			CM	4.5	-	
2BC	50	7.5YR4/6	sil	20	14	Ch 65	.5-1	-	aw	-	FF	4.0	-	
						SS		-			FF	4.5	-	
								-						
								-						

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Padro
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: <u>P-065-160614-1338-sdd</u>		Date: <u>06/14/16</u>		Topographic Position: <u>summit</u>		Parent material: <u>coll/res</u>																													
Job Name: <u>Domination - Atlantic Coast Pipeline Soil Survey</u>		RETEW Job #: <u>089962000</u>		% Slope: <u>5</u>		Slope Aspect: <u>WD</u>																													
NRCS Soil Unit: <u>paduknol - madsheep</u>		Mineralogy: <u>minerals Mixed</u>		Drainage Class: <u>30</u>		Depth to Water Table: <u>N/A</u>																													
Horizon		Depth in Inches		Matrix Color		Texture Class		% clay		% sand		Rock Fragment Type & %		Rock Fragment Size (inches)		Muller/ Stokes		Structure Type, Grade, and Size		Moist Consistence		Hydrous Secondary Clay Minerals		Redox Feature Color		Redox Feature Description		Roots		Rock Fragmentation/ %		Lab Sample ID		Notes	
<u>Oe</u>	<u>2</u>	<u>5YR 2.5/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>ch</u>	<u>25</u>	<u>1-4</u>	<u>-</u>	<u>-</u>	<u>ch</u>	<u>25</u>	<u>1-4</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		
<u>A</u>	<u>4</u>	<u>5YR 3/2</u>	<u>sil</u>	<u>15</u>	<u>25</u>	<u>ch</u>	<u>25</u>	<u>1-4</u>	<u>ps</u>	<u>1</u>	<u>fgt</u>	<u>vf</u>	<u>aw</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		
<u>Bw</u>	<u>18</u>	<u>5YR 5/4</u>	<u>1</u>	<u>17</u>	<u>35</u>	<u>ch</u>	<u>40</u>	<u>1-4</u>	<u>ps</u>	<u>1</u>	<u>msbk</u>	<u>fr</u>	<u>cw</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		
<u>Zc</u>	<u>30</u>	<u>5YR 5/6</u>	<u>1</u>	<u>17</u>	<u>35</u>	<u>f1</u>	<u>70</u>	<u>2-8</u>	<u>ps</u>	<u>1</u>	<u>0n</u>	<u>fr</u>	<u>aw</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>1, thachromic colors</u>
<u>Zr</u>	<u>30+</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>		

Other Notes:

first red soil I've seen
1st 3 horizons are frost-churned - not a pm choice
* some faint 5YR 6/3 colors right above the R, could be lithochromic or artifact of compaction from the log landing.

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
Field Assistant: Stephanie Noraca

Signature: *B Dadio*

RETTEW Associates, Inc.
3070 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P069-1606W-1158-sdd	Topographic Position:	barkslope	Parent material:	collines												
Date:	06/14/16	% Slope:	17	Slope Aspect:	294												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WD	Depth to Water Table:	N/A												
RETTEW Job #:	089962000	Depth to Refusal:	48	Slope Failure or slip:	N/A												
NRCS soil Unit:	Paddyknob - Prodsheep	Bedrock Type:	sandstone	Dip Slope & Direction:	10 NW												
Mineralogy:	Mixed	Vegetation:	shagbark hickory, Sugar maple, ash, red maple	Strike:	44												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/ Stability	Structure Type, Grade, and Size	Molt Confidence	Moisture Regime & Distribution	Redox Feature Color	Water Feature Description	Roots	Acid Potential/ pH	Lab Sample ID	Notes
Oc	2	7.5YR 2.5/1	-	-	-	ch 30	.5-2	-	-	-	aw	-	-	CF MM FC	<.25 5.25	S1	
A	6	7.5YR 3/2	s.i.l	12	10	ch 30	.5-2	PS	1mgr	vfr	Cw	-	-	CF CM CC	1.25 4.75	S2	
									PS								
AB	9	7.5YR 4/3	s.i.l	13	15	ch 25	.5-2	SD	1mgr	fr	aw	-	-	FF CM CC	1.75 4.75	S3	
									PS								
B+	30	10YR 6/6	s.i.l	18	25	ch 25	.5-2	SD	2msbk	fr	Cw	-	-	FF CM	2.0 4.9	S4	
									PS								
2Bc	48	10YR 5/6	s.l	9	65	ch 40	1-4	PO	1msbk	fr	aw	-	-	FF	5.0	S5	
									SD								
2R	48+	-	-	-	-	-	-	-									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: _____

Steve Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
P070-160614-1102-sbd	06/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Paddyknob - madsheep	M:xeq	Summit	res								
						% Slope: 2%	Slope Aspect: 79								
						Drainage Class: WD	Depth to Water Table: N/A								
						Depth to Refusal: 31	Slope Failure or slip: N/A								
						Bedrock Type: sandstone	Dip Slope & Direction: 5 NW								
						Vegetation: sugar maple, hickory	Strike: 50								
						USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist Consistence	Redox Boundary Topography & Outcrops	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
De	3	5YR2.5/1	-	-	-	Ch 40	1-4	-	-	aw	-	M F	<.25	-	
A	8	7.5YR3.1	1	15	35	Ch 40	1-4	PS	vfr	aw	-	CF CM CC	.75	-	high OM content
Bw	18	10YR5/6	1	15	40	Ch 55	2-4	PS	fr	cw	-	FF FM FC	1.25	-	
C	31	10YR5/6	1	13	42	Cl 70	2-8	PS	fr	aw	-	FW	1.5	-	
R	31+	-	-	-	-	-	-	PS	-	-	-	-	5.25	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio

Signature: Steve Dadio

Field Assistant: Stephanie Moraca

RETTW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Soil Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist. Consistence	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
P071-16064-1001-SDD	06/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	paddyknob - madsheep	Mixed	Shoulder	10-15	WD	30	sandstone	sugar maple, red maple, shagbark hickory	USDA	40	1-2	1 fgr	vfr	aw	-	coll/res	
A	9	7.5YR 2.5/2	5:1	12	15	ch	40	1-2	ps	1 fgr	vfr	aw	-	-	-	-	-	1.25	very high OM nearly an Oe
Bv	18	7.5YR 4/6	5:1	13	13	ch	60	1-6	ps	1 fgr	fr	aw	-	-	-	-	-	5.1	
2C	30	10YR 4/4	1	16	30	ch	90	1-6	ps	0 m	fr	aw	-	-	-	-	-	5.25	
2R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio

Field Assistant: Stephanie Moraco

Signature: _____

S. Dadio

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	p072-160616-1447-5dd				Topographic Position:	mild backslope				Parent material:	collines						
Date:	06/16/16				% Slope:	WD				Slope Aspect:	225						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD				Depth to Water Table:	N/A						
RETTEW Job #:	089962000				Depth to Refusal:	32				Slope Failure or Slip:	-						
NRCS Soil Unit:	Paddyknob - mad				Bedrock Type:	sandstone				Dip Slope & Direction:	12 NE						
Mineralogy:	K.Xed				Vegetation:	sugar maple, black cherry, striped maple				Strike:	322						
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	rocking/stratification	Structure Type, Grade, and Size	Molt Confidence	Moisture Regime	Redox Feature Color	Moisture Regime Description	Roots	Rocking/Stratification	Lab Sample ID	Notes
Do	2	7.5R 2.5/1	-	-	-	9f 55	.5-2	-	-	-	-	-	-	MF CM	5.75	-	
A	4	10YR 7/2	1	12	50	9f 55	.5-2	-	1 fgr	Vfr	aw	-	-	CF CM	.25	-	
Bw1	18	10YR 5/6	51	12	60	40 ch	1-4	-	2msbk fr	fr	gw	-	-	CF CM	5.25	-	
Bw2	30	10YR 5/6	51	12	60	60 ch	1-6	-	1msbk fr	fr	aw	-	-	FF	2.25	-	
2R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Didio
 Field Assistant: Stephanie Moraco

Signature: _____

S. Didio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1069

Test Pit ID: PO73-160616-1402-sdd Topographic Position: Backslope Parent material: Colluvium
 Date: 06/16/16 % Slope: 27 Slope Aspect: 318
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: SED Depth to Water Table: N/A
 RETTEW Job #: 089962000 Depth to Refusal: N/A Slope Failure or slip: N/A
 NRCS Soil Unit: paddyknob - midsheep Bedrock Type: N/A Dip Slope & Direction: N/A
 Mineralogy: Mixed Vegetation: black cherry saplings, red maple saplings, locust saplings
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Roots/ tubers	Structure Type, Grade, and Size	Mold Condensence	Moisture Boundary Characteristics	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentation/ M	Lab Sample ID	Notes							
A	2	7.5YR ^{2.5} /1	-	-	-	6.5 ch	5-3	-	-	-	CW	-	-	CF CM FC	-	-	-							
																		PS	1fgf	vfr	ow	CF CM CC	5.0	-
																		SS			ow	CF CM CC		
Bw	14	7.5YR ⁵ /6	s.	16	41	7.5 ch	2-6	-	1fsbk	fr	ow	-	-	WF CM CC	-	5.25	-	-						
																			PS			ow	WF CM CC	
C	50	7.5YR ⁵ /6	s.	15	42	9.5 ch	2-6	-	0sg	lo	-	-	-	-	-	5.25	-	-						
																			PS SS					

Other Notes: test pit did get to 50, but collapsed at 42 during investigation due to ↑ rock content
pocket penetrometer readings, unable to be obtained due to ↑ rock content

TEST PIT DESCRIPTION

Soil Scientist: Steve Dodio
 Field Assistant: Stephanie Moraco

Signature: B. Dodio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Proctor Test(s) or ρ_d	Lab Sample ID	Notes		
P074-160616-1238-5dd	06/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000		Mixed	Summit	0.5%	WD	26	fine-grained sandstone	sugar maple, hickory, shagbark hickory										residuum	
Oe	2	7.5YR 2.5/1	-	-	-	40 ch	2-4	-	-	ow	-	ow	-	-	-	-	ow	CF CH	5.25	-		
A	4	7.5YR 3/2	-	-	-	40 ch	2-4	-	-	ow	-	ow	-	-	-	-	ow	CF CH CC	5.1	-		
Bw	24	7.5YR 5/6	-	-	-	60 fl	2-12	-	-	ow	-	ow	-	-	-	-	ow	CH CC	4.75	-		
R	24 ⁺	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadi's
 Field Assistant: Stephanie Moraca

Signature: _____

[Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	Mineralogy:	Topographic Position:	Parent material:	Notes									
P075-160616-1140-sdd	06/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Madsheep - Paddy Knob	Shoulder/lupper bs	coll fines										
					% Slope: 16	Slope Aspect: 18										
					Drainage Class: WD	Depth to Water Table: N/A										
					Depth to Refusal: 26	Slope Failure or slip: N/A										
					Bedrock Type: Sugar maple, red maple, northern red oak	Dip Slope & Direction: 26° E/NE										
					Vegetation: USDA	Strike: 310										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rockiness (soilless)	Structure Type, Grade, and Size	Molt Confidence	Moisture Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture Boundary/pt	Lab Sample ID
Oe	3	5YR 2.5/1	-	-	-	40 gr	.5-2	-	-	-	ow	-	-	HF NH	<.25	-
A	5	7.5YR 3/2	1	9	42	40 gr	.5-2	PO	1f gr	vfr	ow	-	-	CF CM CC	.25	-
Bw	14	10YR 5/6	1	10	45	45 Ch	2-4	PS	1m sil	fr	cw	-	-	CF CM CC	.75	-
ZC	24	10YR 5/6	1	10	50	70 F=1	2-4	PS SS	O m	fr	ow	-	-	CM FC	.75	-
ZR	26+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Stephanie Moraca

Signature: _____

[Handwritten Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P076 - 160616 - 1055 - Sdd					Topographic Position:	backslope					Parent material:	callines				
Date:	06/16/16					% Slope:	19					Slope Aspect:	306				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W0					Depth to Water Table:	N/A				
RETTW Job #:	089962000					Depth to Refusal:	45					Slope Failure or slip:	N/A				
NCS Soil Unit:	Mad Sheep - Paddy Knob					Bedrock Type:	sandstone					Dip Slope & Direction:	30 SSE				
Mineralogy:	Mixed					Vegetation:	sugar maple, striped maple, northern red oak					Strike:	235				
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Swollen	Structure Type, Grade, and Size	Moist Consistence	Moisture Tenacity & Dispersive	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ ft	Lab Sample ID	Notes
Oa	2	7.5YR 2.5/1	-	-	-	9f 30	.5-2	-	-	-	aw	-	-	CF	<.25	-	
A	4	10YR 2/1	5:1	10	40	9f 30	.5-2	P0	1f 9f	fr	aw	-	-	CF	.25	-	
BA	10	10YR 4/6	1	10	50	9f 35	.5-2	P0	1f sbk	fr	aw	-	-	CF	.75	-	
BW	20	10YR 6/6	1	10	55	ch 40	.5-2	P5	1m sbk	fr	aw	-	-	CF	1.25	-	
2C	38	10YR 6/6	1	8	58	f1 85	1-6	P5	0 m	fr	aw	-	-	CF	1.0	-	
2Cr	45	-	-	-	-	-	-	SO	-	-	aw	-	-	-	-	-	
2R	45+	-	-	-	-	-	-	SO	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraco

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P077-160617-1035-5dd</u>	Topographic Position:	<u>footslope</u>	Parent material:	<u>colluvium</u>
Date:	<u>06/17/16</u>	% Slope:	<u>13</u>	Slope Aspect:	<u>236</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>MW</u>	Depth to Water Table:	<u>28</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>N/A</u>	Slope Failure or slip:	<u>N/A</u>
NRCS Soil Unit:	<u>paddy knob mad sheep</u>	Bedrock Type:	<u>sandstone?</u>	Dip Slope & Direction:	<u>N/A</u>
Mineralogy:	<u>M, mixed mad sheep</u>	Vegetation:	<u>sugar maple, hickory, northern red oak</u>	Strike:	<u>—</u>

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture		Redox Feature Color	Mottled Features Description	Roots	pH	Lab Sample ID	Notes
								Structure Type, Grade, and Size	Condition						
De	2	7.5YR 2/1	—	—	—	60 ch	1-14	—	—	—	aw	MF	4.25	S1	
								PS	—						
								SS	—						
A	8	7.5YR 2.5/2	S11	18	20	60 ch	1-14	PS	VF	—	aw	MF, MM, CC	5.5	S2	
								SS	—						
								PS	—						
B+1	21	10YR 6/6	S11	25	16	30 ch	2-4	PS	FW	—	cw	CF, CM	4.75	S3	
								SM	—						
								SM	—						
B+2	28	10YR 5/6	S11	35	14	20 ch	2-4	PS	FR	—	cw	CF, CM	5.0	S4	
								SM	—						
								SM	—						
B+3	50	10YR 5/6	S11	43	12	15 ch	2-4	PS	FI	—	cw	FH	5.25	S5	
								SM	—						
								SM	—						

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Rock Fragmentation/ M ³	Lab Sample ID	Notes	
POT8-160617-1201-5dd	06/17/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000			backslope	27	WD				collins	27%	N/A	N/A						
Oe	2	7.5YR 2.5/1																			
A	6	7.5YR 2.5/2																			
AB	12	2.5YR 4/4																			
2B+	26	5YR 4/6																			
3BC	44	2.5YR 4/4																			
3G	50+																				

Other Notes: 2 colluvial events

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTW Associates, Inc.
 3030 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: PO79-160617-1251-5db
 Date: 06/17/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTW Job #: 089962000
 NCS Soil Unit: Paddyknob - madsheep
 Mineralogy: Mixed

Topographic Position: 5% bench
 % Slope: 11/5
 Drainage Class: W/D
 Depth to Refusal: 32
 Bedrock Type: Sandstone
 Vegetation: sugar maple, red maple

Parent material: res
 Slope Aspect: N/A
 Depth to Water Table: N/A
 Slope Failure or slip: N/A
 Dip Slope & Direction: 10 N
 Strike: 65

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	USDA		Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
								psch/1/10	ss									
De	2	5YR 2.5/1	-	-	-	ch 20	.5-1	-	-	-	-	aw	-	-	CF CM	6.25 2.25	-	
A	4	7.5YR 3/2	si 1	14	15	ch	.5-1	ps ss	1 fgr	vfr	-	aw	-	-	CF CM	.25 5.5	-	
Bw	6	7.5YR 4/2	si 1	16	16	ch	.5-2	ps ss	1 fsk	fr	-	aw	-	-	CM CC	5.25 5.1	-	
Bt	24	7.5YR 4/6	si 1	30	18	ch 30	.5-2	ps ss	2msk	fr	-	aw	-	-	CM CC	3.75 5.1	-	
Cr	32	-	-	-	-	-	-	-	-	-	-	aw	-	-	-	-	-	
R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermaker
 Field Assistant: Karla Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	R-080-100017-1000-DEF		Topographic Position:		lower back slope		Parent material:		Yellowish over redsiltstone							
Date:	6/17/10		% Slope:		8.1%		Slope Aspect:		346°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:		-							
RETTEW Job #:	089962000		Depth to Refusal:		40"		Slope Failure or slip:		-							
NRCS Soil Unit:	Paddy Knob - Mad Sheep Complex (P&E)		Bedrock Type:		Sandstone		Dip Slope & Direction:		-							
Mineralogy:	Mixed		Vegetation:		Red oak, Sugar maple, Whitesnake root		USDA		-							
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Type/Strength & Consistence	Redox Feature Color	Redox Feature Description	Roots	Moist. Resistance/ pH	Lab Sample ID	Notes
O _i	0-5	7.5K311	-	-	-	-	-	-	-	-	-	-	3F	-	S1	Few 5yr roots
O _a	0.5-2	5.42.5/1	-	-	-	-	-	-	-	-	-	-	af, m	4.5	S6	minor colluvial in elevences sent to sandstone/clay.
A	2-6.5	7.5 ^{sup} R 2.5/1	SL	60	10	45% GR	2-3"	af50k	Frcw	-	-	-	af	0.5	S2	
BA	4.5-14	7.5 ^{sup} R 4/3	SL	68	10	35% GR	2-2"	PO	1450k	IFr	CW	-	af	0.75	S3	
								SO								
2B _{ws}	14-34	7.5 ^{sup} R 5/3	SL	65	12	30% GR	1-4"	PO	1450k	IFr	CW	-	af	1.25	S4	
								SS								
2C	34-40	7.5 ^{sup} R 4/4	SL	67	8	45% CoB	2-8"	PO	1650k	Ff	AW	-	af	0.75	S5	
								SO								
2R	40+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								-	-	-	-	-	-	-	-	-

Other Notes: No clear bedding plane - rock surface is way w 4" - No Dpt strike.

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant: Rachel Hill

Signature: David [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-081-1001017-1010-DEF	Topographic Position:	Upper Backslope from Summit	Parent material:	Callium over Residuum											
Date:	4/17/10	% Slope:	10%	Slope Aspect:	240°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well	Depth to Water Table:	-											
RETTEW Job #:	089962000	Depth to Refusal:	36	Slope Failure or slip:	-											
NRCS Soil Unit:	Paddywood-Mudspur complex (Bawd)	Bedrock Type:	Sandstone - Conglomerate	Dig Slope & Direction:	-											
Mineralogy:	Mixed	Vegetation:	Sugar maple (85%), Shrub: st. red maple, white Ash, (H) Kerns + grass	Strike:	-											
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Hydrog Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Root Measurements/pt	Lab Sample ID	Notes
O:	0-1.5	7.5YR 3/1	-	-	-	-	-	-	-	-	-	-	3f	-	-	
A	1.5-5	7.5YR 2.5/1	SL	12	57	40% CB	1/2-8"	1500K	Vfr	Cw	-	-	3f 2m	0.25	-	
PB	5-8.5	7.5YR 4/3	SL	12	68	40% CB	1/2-7"	1450K	Vfr	Cw	-	-	3f 2m 1c	4.7	-	
																PO
PBw	8.5-20	10YR 5/4	SL	14	66	20% GR	L 3"	1450K	Vfr	Cw	-	-	2f 1m	0.75	-	
																PO
2BL	20-36	7.5YR 5/4	SL	14	58	60% STONES	4-20"	1650K	Fr	Aw	-	-	1f	1.5	-	
																PO
2R	36+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Undulating bedrock in bottom of pit. No clear bed for dip strike. Rock is fight with few fines in fractures in between and too hard to break up for dig through.

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAY
 Field Assistant: MIGUEL PARAVES

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Rock Fragmentation/PI	Lab Sample ID	Notes
P-082-160617-1070-SSW	6/12/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	PADDYKNOB-MADSHED	SILICIOUS	SUMMIT	1%	WELL	31"	SANDSTONE	MAPLE, FERN, BLACKBERRY	RESIDUAL						0.25		
0a	0'-1	S-1025/1															3-4F	4.5		
D	1'-2	101R2/1	F5V	8	60	10	CH	0.5-2									2-F 1-M	0.25		
BA	2'-5	2.51R2/1M	F5V	12	65	10	CU	1-2									2-F 1-C	0.25		
BW1	5'-12	101R5/1b	SL	13	65	12	CH	1-2									1-M, F	0.5		
BW2	12'-24	101R5/1a	SL	13	72	55	CH	2-5									1-M, F	0.5		
CU	24'-31	-	-	-	-	-	-	-									-	-		
R	31x	SANDSTONE				BEDROCK														

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DEBRA WILK
 Field Assistant: MIGUEL TABARES

Signature: 

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-083-160612-1011-25W	Topographic Position:	Backslope	Parent material:	colluvium over residuum
Date:	6/17/16	% Slope:	34%	Slope Aspect:	147°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	well	Depth to Water Table:	-
RETTW Job #:	089962000	Depth to Refusal:	36"	Slope Failure or slip:	-
NRCS Soil Unit:	PADDYK00B - MAD SHEEP	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	180SE (137°) Strike: 47°
Mineralogy:	SLICE003	Vegetation:	MARLE, WICKEROY, STRIPING MARLE		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistency	Moist Consistency	Redox Feature Color	Moisture Description	Roots	Moisture Description	Lab Sample ID	Notes
0e	0-5	5YR2/5/1	-	-	-	-	-	-	-	-	-	-	-	3-VF, 2-F, M	-	SL	
A	5-9	10YR2/1	SL	11	65	10 CH	1-3	PO	10YR2/1	AM	AM	-	-	3-VF, 2-M, C	-	S2	
BA	9-11	10YR2/1X	SL	7	80	12 CH	1-3	PO	10YR2/1	AM	AM	-	-	2-VF, 3-F, M, C	-	S3	
Bx	11-21	10YR2/1b	CH SL	16	70	20 CH	2-5	PO	10YR2/1	AM	AM	-	-	3-VF, 2-F, M, 1-VF	-	S4	CLAY NODULES
2C1	21-30	-	-	-	-	-	-	SO	-	-	-	-	-	-	-	-	-
2R	30x	SAND	STONE														

Other Notes: LINEAR CONCREX BACKSLOPE (NOSE)

TEST PIT DESCRIPTION

Soil Scientist: Dr. JOHN WAH

Field Assistant: MIGUEL PAARMES

Signature:



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3020 Columbia Avenue
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Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-084-160617-1005-15W	Topographic Position:	BACKSLOPE	Parent material:	COCCURVA OVER RESIDUUM											
Date:	06-17-2016	% Slope:	8%	Slope Aspect:	177°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-											
RETTEW Job #:	089962000	Depth to Refusal:	31"	Slope Failure or Slip:	-											
NRCS Soil Unit:	TADPY KNOB-HAD SHEET	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	-											
Mineralogy:	MIXED	Vegetation:	HAPLE		Striker: -											
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Molt Conductance	Moist Bulk Density (g/cm³)	Redox Feature Color	Moist Feature Description	Roots	Field Penetration/psi	Lab Sample ID	Notes
De	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	-	-	3VEF 2H	4.5	-	-
A	2-5	7.5YR3/2	SIL	10	15	5% GR	<1	PSBK	WR	AW	-	-	3VEF 1M 2C	0.25	-	SHAD STONE COF
Be1	5-11	7.5YR4/6	SIL	16	20	12% CH	0.5-2	2MSBK	FR	CW	-	-	3VF 1M	0.5	-	CLAY SKINS SAND STONE COF
Be2	11-21	7.5YR5/6	SIL	21	18	10% CH	0.5-2	2MSBK	FR	CW	-	-	2F 1C	1.0 4.5	-	CLAY SKINS SAND STONE COF
2Cr	21-31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2R	31+	SILT STONE	BEDROCK	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: ROAD BACKSLOPE ON RIDGE NOSE; STEEPLY SLOPING OFF SIDES

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: John C Roberts

[Handwritten Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Soil Texture Description:	Roots:	Roots Functional/Inch	Lab Sample ID	Notes	
P-085-160610-1031-BCK	6-16-2016	Dormition - Atlantic Coast Pipeline Soil Survey	089962000	Paddyknob. Mad Sheep	Mixed	Shoulder Slope	10%	WD	37	Sand stone	Wich Hazel, Red Maple, White Oak	Coll / Residuum	3210					2uf	4.3			
A	4	10YR 2/2	VGR SIL	12	15	GR	0.5-1.5	35	GR	0.5-1.5	PO	GR	1m	AW	AW	—	—	2uf, f	1m	0.25	4.3	
BA	9	10YR 4/4	VGR SIL	14	18	GR	0.5-2.0	40	GR	0.5-2.0	PO	SBK	1m	CW	CW	—	—	3m 2uf, f, co	4.5			
Bud	24	10YR 4/6	VGR SIL	16	18	GR	1-3.0	50	GR	1-3.0	SP	SBK	1m	GW	GW	—	—	2f 1m	0.5	4.5		
ZB1	37	10YR 5/6	VCH	21	12	VCH	2-6.0	65	VCH	2-6.0	SP	SBK	2m	AW	AW	—	—	f	1.5	4.8		
ZR	37+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Sand stone	

Other Notes:

Coll / Residuum @ 24
Pit + stave could not be recorded

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walters

Signature: John C Roberts

346
20

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0816-160610-1149-5CR		Topographic Position:		Shadyside / Saddle		Parent material:		Coll / Residuum					
Date:	6-16-2016		% Slope:		25%		Slope Aspect:		176°					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Water Table:		-					
RETTEW Job #:	089962000		Depth to Refusal:		42		Slope Failure or slip:		-					
NRCS Soil Unit:	Paddyknob - Mad sheep		Bedrock Type:		Sandstone		Dip Slope & Direction:		150 N					
Mineralogy:	MIXED		Vegetation:		Strip Maple, Red Maple, White Oak		Strike:		2560					
USDA														
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Distribution	Redox Feature Color	Roots	Notes	
A	5	7.5YR 3/2	SIL	15	18	GR 10	0.25-1.0	GR 1F	MR	CW	-	2f, m	0.25 4.6	
BA	9	7.5YR 4/4	SIL	15	20	GR 20	0.25-2.0	SBR 1F	VFR	CW	-	1f, 2m	0.5 5.0	
Bw1	17	7.5YR 5/6	SIL	17	28	GR 30	0.5-2.0	SBR 1M	FR	CW	-	2m, 1f	1.0 5.0	
Bw2	26	7.5YR 5/6	SIL	18	30	GR 20	0.5-1.0	SBR 1M	FR	CW	-	1f, 1m	0.75 4.5	fine sand sandstone
ZC	42	7.5YR 5/6	-	-	-	CH 88	1-4	Rock cont'd	-	CW	-	1f	-	very fine sandstone
ZR	42+	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walker

Signature: _____

John C Roberts

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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	D-087-160616-1416-3R		Topographic Position:	Concave hood slope		Parent material:	Colluvium									
Date:	8-16-2016		% Slope:	13%		Slope Aspect:	-									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	-									
RETTW Job #:	089962000		Depth to Refusal:	-		Slope Failure or slip:	-									
NRCS Soil Unit:	Paddyknob - Mod shap		Bedrock Type:	Sandstone		Dip Slope & Direction:	-									
Mineralogy:	Mixed		Vegetation:	Hop hornbeam, Red Maple, Stripe Maple		Sinks:	-									
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Medium Bulk Density (g/cm ³)	Redox Feature Color	Water Feature Description	Roots	Rock Fragmentary (%)	Lab Sample ID	Notes
0e	1	5YR 2.5/1	—	—	—	GR 10	0.25-1.0	GR 1/F	—	—	—	—	Zf,F	—	—	—
A	3	7.5YR 3/2	L	15	40	GR 10	0.5-1.0	GR 1/F	VR	CW	—	—	1c 2f, f	0.5 4.3	—	—
Bw1	17	7.5YR 4/4	SL	15	55	GR 25	0.5-2.0	SBK 1/M	FR	CW	—	—	Zm,f	0.25 4.3	—	—
Bw2	32	7.5YR 4/4	SL	15	55	GR 40	1.0-3.0	SBK 1/M	FR	CW	—	—	Zf 1m	1.0 4.4	—	—
C	50	7.5YR 4/4	SL	2	75	GR 60	1-4	OM	F1	—	—	—	1f	—	—	—

Other Notes: More chromatic below A - Colluvium material; no wetness w/in 50"
Sandstone flags

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor WALTER

Signature: John C Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-089-160615-1506-5CR
 Date: 6-16-2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Paddy Knob - Mod Shoop
 Mineralogy: Mixed

Topographic Position: Back slope
 % Slope: 16%
 Drainage Class: WD
 Depth to Refusal: 38"
 Bedrock Type: Sandstone
 Vegetation: Striped Maple, Red Maple, White Oak

Parent material: Colluvium over Residium
 Slope Aspect: ---
 Depth to Water Table: ---
 Slope Failure or slip: ---
 Dip Slope & Direction: 25° N
 Strike: 210

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/Structure	Structure Type, Grade, and Size	Mold Consistence	Moisture Regime & Distribution	Redox Feature Color	Moist Feature Description	Roots	Root Penetration/In	Lab Sample ID	Notes
Do	1	5YR2/1	---	---	---	GR	0.5-1.0	---	GR 1F	---	Aw	---	---	3yf 2f	4.5	---	---
A	2	7.5YR3/3	GR SIL	15	22	15 GR	0.5-1.5	PO SD	GR 1m	VFR	Aw	---	---	1f 2m	0.75 4.2	---	---
AB	4	7.5YR3/4	GR L	18	38	30 GR	0.5-2.0	PO SS	SBL 1m	VFR	Cw	---	---	1f 2f 4.4	0.75 4.4	---	---
Bw1	14	7.5YR4/4	GR L	20	38	65 GR	1-4.0	SP SS	SBL 1m	FR	Cw	---	---	1f 2f	1.25 4.4	---	---
Bw2	20	7.5YR4/4	VGR L	22	40	65 GR	1-4.0	SP SS	SBL 1m	FR	Cw	---	---	1f	0.5 4.5	---	---
BC	38	7.5YR5/4	VGR SL	15	55	65 GR	1-4.0	PO SD	0.1m → SBL 1.0	VFR	Bw	---	---	1m	2.0	---	Fin Prayed Sand Stone
R	38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: John C Roberts

RETTEW Associates, Inc.
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-0899-160616-1550-5CR		Topographic Position:		Ridge / Back slope		Parent material:		Slope Aspect:		Slope Failure or slip:		Dip Slope & Direction:		25° W		Strike:		181°	
Date:	6-16-2016		% Slope:		WD		Depth to Water Table:		—		Slope Failure or slip:		Dip Slope & Direction: <td colspan="2">25° W</td> <th colspan="2">Strike:</th> <td colspan="2">181°</td>		25° W		Strike:		181°	
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Refusal:		20		Bedrock Type:		Vegetation: <td colspan="2">Sandstone - fine grain</td> <td colspan="2">Striped Maple with Hazel, Red Maple, Cherry</td> <td colspan="2"></td>		Sandstone - fine grain		Striped Maple with Hazel, Red Maple, Cherry			
RETTEW Job #:	089962000		Bedrock Type:				Vegetation:				USDA									
NRCS Soil Unit:	Paddy Knaps - Mad Shredp		Mineralogy:		Mixed															
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mott	Moist Consistence	Moist Consistence	Redox Feature Color	Moist Consistence	Roots	Roots	Roots	Roots	Notes		
De	1.5	5YR2.5/1	—	—	—	GR 40	1-4	GR 1F	—	AW	—	—	—	3vF 2m	—	—	—	—	—	
A	2.5	10YR2/2	VGR SL	15	60	GR	1-4	GR 1F	VFR	AW	—	—	—	2m, f	0.25	4.5	—	—	—	
AB	5	10YR 3/3	VGR SL	15	65	GR 60	1-3.0	SBK 1m	VFR	AW	—	—	—	2m, f	0.125	4.4	—	—	—	
Bw	20	10YR 5/8	VGR SL	18	65	GR 65	1-3.0	SBK 1m	FR	CW	—	—	—	2.00, m	0.75	4.4	—	—	—	
R	20+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes: Sandstone parent material

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippa

Signature: B. Oakes

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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Material/ pH	Lab Sample ID	Notes	
P 090-160609-1005-5d	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Raddyknob - mad sheep	silt, ceds	summit	13	WD	38	sandstone	northern red oak, hickory, black oak, witch hazel, red maple + chestnut spreading		8-15%				MVF	<.25	S1		
De	.5	7.5R ^{2.5} /1	-	-	gr	1-2	-	-	aw	-							MVF	4.25	S2		
A	3	10YR ³ /2	1	10	gr	1-2	-	-	aw	-							MVF	4.25	S3		
BE	6	10YR ⁴ /4	sil	14	gr	1-2	-	-	aw	-							MVF	4.25	S4		
Bw1	17	10YR ⁵ /4	sil	15	ch	2-4	-	-	aw	-							MVF	4.75	S5		
Bw2	29	10YR ⁵ /6	sil	15	ch	2-10	-	-	aw	-							MVF	4.75	S6		
2C	38	10YR ⁵ /6	sil	14	f1	6-12	-	-	aw	-							MVF	4.75			
2R	38																				

Other Notes: siliceous

TEST PIT DESCRIPTION

Soil Scientist: Steve Dedio
 Field Assistant: Dave Skippon

Signature: _____

[Handwritten Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: POA1-160609-1225-5dd Topographic Position: backslope Parent material: coll/les
 Date: 06/09/16 % Slope: 57 Slope Aspect: linear convex
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well Drained Depth to Water Table: N/A
 RETTEW Job #: 089962000 Depth to Refusal: 50" Slope Failure or slip: N/A
 NCRS Soil Unit: Mashup (B2G) Bedrock Type: Siltstone Dip Slope & Direction: Sugar maple, hickory, black oak, moosewood, striped maple
 Mineralogy: Mixed Vegetation: USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Condition	Hydroboundary Temperature & Distance	Redox Feature Color	Redox Feature Description	Roots	Moisture/Structure pH	Lab Sample ID	Notes
0e	2	7.5YR 2/2	-	-	-	ch 30	1-3	-	-	-	aw	-	-	M VF	4.75	S1	
A	6	7.5YR 3/2	Sil	15	35	ch 30	1-3	SP SS	1 fgr	nr	aw	-	-	CF CM	4.25	S2	
BA	10	7.5YR 4/3	1	15	40	ch 30	1-3	SP SS	1 f sbk	fr	aw	-	-	CF CM	4.25	S3	
Bw1	26	7.5YR 4/4	1	15	45	ch 40	2-8	SP SS	1 m sbk	fr	aw	-	-	CF FM	4.5	S4	
2Bw2	38	7.5YR 5/4	1	15	45	ch 60	1-4	SD SS	1 m sbk	fr	aw	-	-	CF F	1.5 4.75	S5	
3R	50																

Other Notes:

Strike/dip unable to be measured

with hazel

TEST PIT DESCRIPTION

Soil Scientist: Steve Dodio
 Field Assistant: Dave Skippin

Signature: *S. Dodio*

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Moisture Regime	Redox Feature Color	Soil Temp Description	Lab Sample ID	Notes
PD92-160609-1432-Sdd	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	backslope	WD	38	siltstone/sapstone	northern red oaks, sugar maple, ash, white oak	horizon		N/A	N/A		M VF	40	2-6	1 fgr	vr	aw	-			
															M VF	45	2-6	1 fgr	vr	aw	-			
															M VF	60	1-4	1 msbk	fr	aw	-			
															M VF					aw	-			
															M VF					aw	-			
															M VF									
															M VF									
															M VF									
															M VF									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Strippon

Signature: _____

B. Dadio

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 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent Material:	Notes									
p093-160609-1531-sdd	06/09/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Waikaiti-Bairds Complex (535)	Mixed	Shoulder	coll/res										
						% Slope: 13	Slope Aspect: 180										
						Drainage Class: WD / SCD	Depth to Water Table: N/A										
						Depth to Refusal: 2 ft	Slope Failure or slip: N/A										
						Bedrock Type: sandstone	Dip Slope & Direction: 8 West										
						Vegetation: hickory	Strike: 220										
						USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	mineralogy	Structure Type, Grade, and Size	Moist Consistence	Median Bulk Density	Redox Feature Color	Median Feature Description	Roots	Product Neutron/100g	Lab Sample ID	Notes
Oa	2	7.5YR ^{2.5} /1	-	-	-	Ch 40	2-4	-	-	-	EW	-	-	M V F M F M C	<.25 4.25	-	
A	4	7.5YR ^{2.5} /2	S:1	16	10	Ch 40	2-4	PS	1f sbk	vfr	ow	-	-	M F C M	0.5 4.5	-	
Bw	19	7.5YR ⁵ /6	S:1	20	10	Ch 45	2-6	PS SS	1msbk	fr	ow	-	-	C M C C C VC	1.0 4.5	-	
R	19+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Duane Trax
 Field Assistant: Jaylen Walter

Signature: _____

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Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistency	Moisture Regency Temperature & Observations	Redox Feature Color	Moisture Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
P004-100609-1541-11T	0-1	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	many fragments on surface
A	1-25	7.5YR 4/2	Sil	13	20	Cl 25%	0.25-	Gn 1.3	Vfr	SA	-	-	3F 1.1m	0.25	-	-
Be	2.5-10	10YR 6/4	Sil	16	18	VCl 50%	2.0	SB 1.1	Vfr	SC	-	-	2.1F 2.1m	0.75	-	-
Bt1	10-18	10YR 6/6	Sil	23	21	VCl 100%	6.25-	SB 1.3	Fr	SA	-	-	3m 1.1c	1.75	-	-
Bt2	18-28	10YR 5/6	Sil	29	18	VCl 75%	8.0	SB 1.2	Fr	SA	-	-	2.1m 2.1c	2.25	-	-
2C	28-34	10YR 5/6	-	22	30	XCl 85%	0.25-12.0	SB 1.2	Fr	IA	-	-	1.1m	1.75	-	-
2R	34+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	sandstone below

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Juane Taylor
 Field Assistant: Taylor Walker

Signature: 

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 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Redox Feature Color:	Redox Feature Description:	Roots:	Parent Material/PT	Lab Sample ID	Notes	
0095-160609-1357-DAT	06-09-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089952000	WolKert-Berks Complex, V. Stony	Mixed	Shoalica (bony)	36%	Well Drained	30"	Sandstone	Rod Maple, Red Oak, Hawthorn, Black Oak	20° NE	N/A	N/A	19° N	N	51° E						
0e	0-1	5 ^{yr} 3/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	S-1A		
0a	1-2	5 ^{yr} 3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	S-2A		
AE	2-4	5 ^{yr} 4/3	Si	B	10	VClt 40%	0.25- 2.0	So	SQR 1,1	NVAL	UOA	-	-	2, F 2, M	-	-	-	-	0.25 4.3	S-3A S-3B			
Bw1	4-10	10 ^{yr} 6/4	SiL	13	22	VClt 50%	0.25- 4.0	So	SQR 1,1	FR	SA	-	-	2, F 3, M	-	-	-	-	1.75 4.7	S-4A S-4B			
Bw2	10-19	10 ^{yr} 6/6	L	15	41	XcH 65%	0.25- 8.0	So	SQR 1,1	FR	SA	-	-	3, M 1, C	-	-	-	-	2.0 4.8	S-5A S-5B			
C	19-30	10 ^{yr} 6/6	L	18	50	XcL 85%	0.5- 12.0	So	SQR 1,2	FR	IA	-	-	2, M 1, C	-	-	-	-	1.5 4.7			Sandstone Bedrock	
FR	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Diane Trux
 Field Assistant: Taylor Walter

Signature: _____



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Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Redox Feature Color:	Redox Feature Description:	Rock Fragment Type & %:	Rock Fragment Size (inches):	Rock Fragment Structure/Status:	Structure Type, Grade, and Size:	Moist Consistence:	Region Boundary Description:	Redox Feature Color:	Redox Feature Description:	Roots:	Rock Fragmentation/ pH:	Lab Sample ID:	Notes:		
P090-1601009-1223-DAT	06-09-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wellvent-Berkes Complex, Very stony	Mixed	SHOULDER / TOP OF TERRACE	Some what extremely hard	40"	Sandstone	Red Bed, White Bed, Red & Red Purple, Quartz Bed	1860 SW	N/A	N/A	N/A	12°	3F 2.1m, 1.6	-	-	44	5-1A	5-1A	Some flagstones on the surface										
A	0.5-3	10YR 4/3	Sil	11	26	Qtz 25%	0.25-2.0	P0 S0	ln	1.2	Wn	SA	-	-	3F 2.1m, 1.6	0.5	5-24															
Be	3-9	10YR 5/4	Sil	18	42	Velk 35%	0.25-4.0	P0 S0	SBK	1.1	Fn	SA	-	-	2F 2.1m, 1.6	1.5	5-34															
B+1	9F5	10YR 5/4	Sil	24	45	Xclt 60%	0.25-8.0	P5 S5	SBK	1.2	Fn	SA	-	-	2.1m, 1.6	2.25	5-44															
ZB+2	15-29	10YR 5/4	dl	33	25	XFT 80%	0.25-12.0	P5 S5	SBK	2.3	Fn	IA	-	-	1.1m, 1.6	2.5	5-54															
ZBCT	29-40	10YR 5/4	Sil	36	15	XFT 95%	0.25-16.0	P5 S0	SBK	1.2	Fn	IA	-	-	1.1m	4.2	5-58															
ZR	40'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Diane Truax
 Field Assistant: Taylor Walter

Signature: _____

RETTEW Associates, Inc.
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-097-100609-1039-DAT										Topographic Position:	Summit		Parent material:	Residuum		
Date:	06-09-2016										% Slope:	10%		Slope Aspect:	110° E		
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	Well drained		Depth to Water Table:	N/A		
RETTEW Job #:	089962000										Depth to Refusal:	27"		Slope Failure or slip:	N/A		
NRCS Soil Unit:	Weikert-Ricks Complex, v. stony										Bedrock Type:	Sandstone		Dip Slope & Direction:	18°		
Mineralogy:	Mixed										Vegetation:	Red Oak, walnut, Hawthorn, White Oak		Strike:	200° S		
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Suckness	Structure Type, Grade, and Size	Moist Consistence	Roots Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture/ Suckness/ pH	Lab Sample ID	Notes
De	0-15	5YR 3/1	-	-	-	-	-	-	-	-	-	-	-	3, F 2, M	4.2	S-1A	
A	1.5-3.0	7.5YR 4/2	Sil	14	14	Clk 15%	0.25-1.5	P0 50	GR 1, 3	VH	SA	-	-	2, M 1, C	4.4	S-2A S-2B	
BE	3-6	10YR 6/6	Sil	18	25	VH 30%	0.25-3.0	P0 50	SR 1, 1	FR	SA	-	-	2, M 1, C	4.6	S-3A S-3B	
BE	6-14	7.5YR 5/6	Cl	29	23	XFL 65%	0.25-8.0	P5 50	SR 2, 2	FR	SA	-	-	1, M 1, C	3.5 4.5	S-4A S-4B	Clay shins
C	14-27	7.5YR 6/6	S	17	45	XFL 95%	0.25-10.0	P0 50	SR 1, 1	FR	IA	-	-	1, M	3.0 4.5	S-5A S-5B	
	27+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sandstone Bedrock

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: D. Fingstemaker
 Field Assistant: Kathleen Harrison

Signature: Bruce J. Fingstemaker

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 Fax: 717-394-1053

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soil	Structure Type, Grade, and Size	Mott. Consistence	Native Boundary Disturbance	Redox Feature Color	Native Feature Disturbance	Roots	Parent Material/Soil	Lab Sample ID	Notes
P-098-160609-1040-DEF	0-2	5YR 2.5-11	-	-	-	80% Shales	2-8	-	-	-	-	-	-	3T 2M 1C	Calverium	S1	Numerous surface gravel to boulder slabs
	2-6.5	10YR 3/1	XGR SL	10	55	75% CB	2-8	Po	2M GR	VFR CW	-	-	-	3T 2M 1C	-	S2	
	6.5-12	7.5YR 5/14	XGR SL	12	55	75% GR	1/4-8	Po	1.65 GR	VFR CW	-	-	-	3T 2M 1C	-	S3	
	12-36	10YR 5/14	VGR L	16	40	40% GR	1/4-6"	Po	1M 5 GR	FR GW	-	-	-	2M 1C	-	S4	
	36-39+	10YR 5/14	VST L	16	43	58% Stones	1/4"->20"	Po	1W 5 GR	FR -	-	-	-	1F 1M	-	S5	

Other Notes:

Rocks in Bottom of hole are somewhat bedded and dip 30° NW and have 2" of fines between sparser beds. Rock outcrops on ridge are dipping 10° NW, rock in bottom refusal on boulder slabs. Sandstone coarse fragments throughout, ~~fine~~ medium grained in upper, slightly fine grained in lower beds.

TEST PIT DESCRIPTION

Soil Scientist: D Henskemacher
 Field Assistant: Max Dugan

Signature: [Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-099-160609-1055-DET				Topographic Position:	Wad slope		Parent material:	Colluvium			
Date:	6/9/16				% Slope:	50%		Slope Aspect:	-			
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	Well		Depth to Water Table:	-			
RETTEW Job #:	0389962000				Depth to Refusal:	58' Auger refusal		Slope Failure or slip:	-			
NRCS Soil Unit:	Vikert-Belts Complex (S3F)				Bedrock Type:	-		Dip Slope & Direction:	-			
Mineralogy:	Mixed				Vegetation:	Sugar maple, cherry, white snake root, grape vine		Strike:	-			
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mold Condition	Moisture Boundary Diagram	Redox Feature Color	Notes
0e	0-15	2.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-
A	1.5-3.5	10YR 2/2	S.L	18	22	15% CN	< 1/2"	2F5Rk VFC	FC	FC	FC	2F, M 1c0
AB	3.5-6	7.5YR 4/4	S.L	19	25	15% CN	< 1/2"	1F5Rk VFC	FC	FC	FC	2F, M 1c0
Bw1	6-22	7.5YR 5/4	S.L	22	28	20% Gnl	< 1/2"	1G5Rk FC	FC	FC	FC	2F, M 1c0
Bw2	22-52	10YR 5/4	S.L	22	20	38% Gnl	< 2"	1G5Rk FC	FC	FC	FC	2F, M 1c0
Bw3	52-58+	10YR 5/4	S.L	22	20	55% CN	1/2-3/4"	SP	FC	FC	FC	2F, M 1c0

Other Notes:

Augered to 58" from 50" - Refusal on Rocks-Shale CoF
 Shale CoF Throughout

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermaker
 Field Assistant: Max Deegan

Signature: [Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-100-160609-1105-DEF Topographic Position: Ridge top Parent material: Residuum
 Date: 4/9 % Slope: 20% Slope Aspect: 35°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: well Depth to Water Table: -
 RETTEW Job #: 089962000 Depth to Refusal: 29" Slope Failure or slip: -
 NRCS Soil Unit: Berkshelert (G2) Bedrock Type: Shale, 1/8"-2" Beds Dip Slope & Direction: 18° NW Strike: 359°
 Mineralogy: Mixed Vegetation: Chastnut, Blueberry, Mt Laurel, Red maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock/Inclusions	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Temperature & Conductivity	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
Oe	0-8	2.51R 2.51I	-	-	-	-	-	-	2-2	-	-	-	-	-	4.4	S1	
A	8-4	7.51R 2.51I	CN SIL	14	28	30% CN	1-4"	PO SO	2MGR	UFR	AW	-	-	35 2M 1C	5.4	S2	Five grainy Red Sandstone Cat
Bw	4-16	10MR 5/4	CN SIL	16	10	20% CN	1/4-4"	SP BS	1M5Rk	FR	CW	-	-	25 1C	0.75 4.8	S3	
Cr	16-29	10MR 5/4	-	-	-	99% CN	1/2-8"	-	Red bed rock	-	AW	-	-	24	-	-	Bedded + fractured Rock w/ fines in between
R	29+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: De Fenstermacher

Field Assistant: Alex Dugan

Signature: Bruce Stee

RETTEW Associates, Inc.
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Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/ Mottling	Structure Type, Grade, and Size	Mott. Consistence	Modern Rooting Disturbance	Redox Feature Color	Parent Feature Description	Roots	Field Test/soil/ pH	Lab Sample ID	Notes	
P-101-160609-115-DEF																			
Date:		4/9/10		Topographic Position:		% Slope:		Drainage Class:		Upper Backslope		Slope Aspect:		Slope Failure or slip:		Parent material:		Colluvium over Residuum	
Job Name:		Dominion - Atlantic Coast Pipeline Soil Survey		Depth to Refusal:		Bedrock Type:		Vegetation:		Well		Shale 1/2-2" thick		Dig Slope & Direction:		10° NW		Strike: 2340	
RETTEW Job #:		089962000		Mineralogy:		Beilks-Weibert (OE)		Mixed		USDA		Chastnutack, Striped Maple, Hicory, grass, white smoke foot							
D _a	0-3	7.5 ¹⁴ 2.5 ¹¹	-	-	-	-	-	-	-	-	-	-	-	-	25 1M	6.5	-	Thin De overlying	
B _w	3-14	10 ¹⁷ 5 ¹⁴	SIL	17	18	30%	CN	2 1/2	SP	MSBK	Fr	CW	-	-	3FM 2Co	0.5 5.5	-		
B _{w2}	14-22	7.5 ¹⁴ 5 ¹⁴	SIL	17	20	45%	CN	2 4"	SS	MSBK	Fr	CW	-	-	2FM	0.5	-		
C _c	22-41	7.5 ¹⁴ 5 ¹⁴	XCN SIL	16	18	80%	CB	2-8"	SP SS	MSBK	Fr	AW	-	-	2F 1M	1.0 4.0	-		
D _r	41+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Max Degan

Signature: 

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Test Pit ID:	P-101A-160609-1605-DEF			Topographic Position:	nose slope		Parent material:	Residuum						
Date:	08/11/16			% Slope:	28%		Slope Aspect:	-						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	Somewhat excessively		Depth to Water Table:	-						
RETTEW Job #:	089962000			Depth to Refusal:	30"		Slope Failure or slip:	-						
NRCS Soil Unit:	Barks-weikert (6E)			Bedrock Type:	Shale 1/2-2" thick		Dip Slope & Direction:	180 NW						
Mineralogy:	Mixed			Vegetation:	Chestnut oak, Red oak, Hickory, Blueberry, grass		Strike:	017						
USDA														
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist Consistence	Moist Consistence	Redox Feature Color	Roots	Lab Sample ID	Notes
0e	0-1	5YR 2.5/2	-	-	-	-	-	-	-	-	-	3F 2M	-	
A	1-2	10YR 3/2	SIL	16	18	38% CN	4-2"	PO SD	2MGR	VF	AW	3FM 2L	0.1	inner colluvial flow sandstone ccf
Bw	2-7.5	10YR 5/4	SIL	18	16	41% CN	1/4-3"	SP SS	1MSBK	Fc	CW	3CM 2C	4.8	Shale ccf
Cs	7.5-13	10YR 5/4	-	-	-	99% CN	1/2-4"	-	-	-	AW	-	-	fractured rock with fines
R	13+	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

13"

TEST PIT DESCRIPTION

Soil Scientist: John M. Mott
 Field Assistant: _____

Signature: [Signature]

RETTM Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-102-160613-1106-35W					Topographic Position:	SUMMIT					Parent material:	RESIDUUM				
Date:	6/13/16					% Slope:	3%					Slope Aspect:	94°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE					Depth to Water Table:	-				
RETTM Job #:	089962000					Depth to Refusal:	18"					Slope Failure or slip:	-				
NRCS Soil Unit:	BPKC2-WEIKERT					Bedrock Type:	SILTSTONE					Dip Slope & Direction:	30NW (226) Strike: 236°				
Mineralogy:	MIXED					Vegetation:	CISTANT BARK RITCH RIDGE, PLUMBERRY, LAUREL					USDA					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Consistence	Median Rooting Topography Disturbance	Redox Feature Color	Redox Feature Description	Roots	Point Temperature/ pH	Lab Sample ID	Notes
0e	0-2	4YR2.5/1	-	-	-	-	-	-	-	-	-	-	-	2-VF, F	4.5	-	
A	2-2.5	10YR2.5/1	SIL	13	20	10 CH	< 1	OP	1M3R	VER	am	-	-	2-VF, F M	0.25	-	
Bm	2.5-12	10YR5/6	VCH SIL	15	17	38 CH	1-3	OP SS	1M5BPK	FR	cm	-	-	2-F, M, F 1-C, VF	0.5 4.5	-	
Cc	12-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	18+	SILTSTONE	-	-	-	BED ROCK	-	-	-	-	-	-	-	-	-	-	

Other Notes:

ON ROAD SUMMIT, 0-270, LARGE TREES Dying

TEST PIT DESCRIPTION

Soil Scientist: JONAN WALK
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-103-160613-1111-SSW	Topographic Position:	BACKSCOPE	Parent material:	COCCUM OVER RESIDUUM
Date:	6/13/16	% Slope:	SILT	Slope Aspect:	145°
Job Name:	Domionion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-
RETTEW Job #:	089962000	Depth to Refusal:	33"	Slope Failure or slip:	BENT TREES
NRCS Soil Unit:	WEIKERT - BERKS	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	29°NW (310°) Strike: 220°
Mineralogy:	MIXED	Vegetation:	HICKORY, MAPLE, CESTRUM OAK		

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/ modulus	Structure Type, Grade, and Size	Mold Compaction	Moisture Boundary (Temperature & Description)	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pit	Lab Sample ID	Notes
0e	0'-1'	SILT 2.5/1	-	-	-	-	-	-	-	-	RS	-	-	3-V,F,F	5.5	-	
A	1'-3'	2.5/1/2.5/1	QR SIL	12	25	15 QR	<0.5	PO SO	1M SH	VER	CS	-	-	3-V,F,F 2-M	0.25	-	
AB	3'-6'	2.5/1/2.5/1	QR SIL	13	20	25 QR	<0.5	PO SO	2F SBK	FL	CM	-	-	3-V,F,F 2-M,C	0.5	-	
BE1	0'-3'	2.5/1/1/0	QR SIL	25	20	30 QR	<1	SS SP	2MSBK	FL	CS	-	-	3-F 1-C	0.5	-	CLAY SKINS
BE2	3'-22'	2.5/1/1/0	QR SIL	28	20	35 QR 20CM	<1	SS SP	2MSBK	FL	CM	-	-	3-F	1.0	-	CLAY SKINS SANDSTONE CHANNELS
2Bc	20' ³³	2.5/1/1/0	XCH SIL	22	18	30 QR 30CM	<1	SO PO	1F SBK	FL	CM	-	-	2-F	0.5 5.0	-	SILTSTONE CHANNELS
2R	30'	SILT	STONE			BEDROCK											

Other Notes: BACKSCOPE LINEAR CONTAINS: GRAY SILTSTONE; SANDSTONE FLAYS ON SURFACE
 SMALL SANDSTONE OUTCROPS BETWEEN T-103A & T-103B

TEST PIT DESCRIPTION

Soil Scientist: JAMES WATT
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-104-160613-1400-JSN		Topographic Position:		Back Slope		Parent material:		COLUMBIUM OVER RESIDUUM								
Date:	6/13/16		% Slope:		45%		Slope Aspect:		27°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WELL		Depth to Water Table:		-								
RETTEW Job #:	089962000		Depth to Refusal:		46"		Slope Failure or slip:		FEW BENT TREES								
NRCS Soil Unit:	WIKBERT-BRKS		Bedrock Type:		SILTSTONE		Dip Slope & Direction:		-								
Mineralogy:	MIXED		Vegetation:						Strike: -								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Solubility	Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary Topography & Orientation	Redox Feature Color	Moist Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
De	0-1	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF, F	4.5	-	
A	1-2	10YR3/1	SIL	12	18	10 GR	< 1	PO	1 FHR	VFR	as	-	-	3-VF, F 1-C	< 0.25	-	
BE	2-9	10YR5/10	CH	17	15	16 CH	< 1	PO	1 MSBK	FR	CS	-	-	2-VF 3-F, M 2-C	0.5	-	
Bk	9-16	2.5YR5/10	VCH SIL	24	15	35 CH	< 1	SP	2 MSBK	FR	CN	-	-	2-F 1-M	0.5	-	
2Bc	16-46	7.5YR5/10	XCH SIL	20	20	85 CH	1-4	PO	1 FSbk	FR	aw	-	-	1-VF	0.75	-	
2R	46+	SILTSTONE				BEDROCK											

Other Notes:

BACKGROUNDE - LINEAR CONCRETE

TEST PIT DESCRIPTION

Soil Scientist: JOHN W. A. H.
 Field Assistant: _____

Signature: gshuck

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	2-105-160613-1415-05W					Topographic Position:	BACKSCLOPE					Parent material:	COLLUVIUM OVER RESIDUUM				
Date:	6/13/16					% Slope:	12%					Slope Aspect:	305°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE					Depth to Water Table:	-				
RETTEW Job #:	089962000					Depth to Refusal:	23"					Slope Failure or slip:	-				
NRCS Soil Unit:	BERKS-WEIKERT					Bedrock Type:	SILTSTONE					Dip Slope & Direction:	18°W (20) Strike: 180°				
Mineralogy:	MIXED					Vegetation:	LAVRELMAPLE, CHESTNUT OAK, BLUEBERRY					USDA					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Mobility	Moisture	Redox Feature Color	Parent Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
Oe	0-3	5YR2.5/1	-	-	-	-	-	-	-	-	-	-	-	3-VF 2-F, M	4.5	-	
A	3-10	10YR5/1	SIL 11	15	10	GR	< 1	20 50	1M, 2P	VER	am	-	-	3-F, M	< 0.25	-	
Bm	10-19	10YR5/6	GR SIL	14	18	GR	< 1	PO SO	1M, 2P	CR	cm	-	-	2-F 3-M, C 1-C	0.5 5.3	-	SANDSTONE COF
2BC	19-23	10YR5/6	GR SIL	12	15	PO CU	1-3	PO SO	1E, 2P	CR	am	-	-	1-F	0.5	-	
2E	23+	SILTSTONE					BEDROCK										

Other Notes: BACKSCLOPE / SUMMIT AREA

TEST PIT DESCRIPTION

Soil Scientist: David N. A. H.
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-106-160613-1411-SSW				Topographic Position:	BACKSLOPE				Parent material:	COLUVIUM OVER RESIDUUM							
Date:	6/13/16				% Slope:	25%				Slope Aspect:	170°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WELL				Depth to Water Table:	-							
RETTEW Job #:	089962000				Depth to Refusal:	32"				Slope Failure or slip:	-							
NRCS Soil Unit:	BERK1 - WEIKERT				Bedrock Type:	SILTSTONE				Dip Slope & Direction:	18° N (ASS) Strike: 265°							
Mineralogy:	MIXED				Vegetation:	LICKERY, VA PINE, CHESTNUT OAK, BLUEBERRY				USDA								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Muscle/Stubness	Structure Type, Grade, and Size	Molt Consistence	Major Boundary Topography & Distances	Redox Feature Color	Major Feature Description	Roots	Product Measurement/pt	Lab Sample ID	Notes	
0e	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-15" F	-	-	-	
A	2-3	10YR2.5/1	CH SIL	12	18	15 CH	1	PO	1 F P	FR	as	-	-	3-F 2-M	<0.25	-	-	SANDSTONE COF
BE	3-11	10YR5/6	CH SIL	14	18	20 CH	1	PO SO	1 M SBK	FR	as	-	-	2-F, M 1-C	0.5	-	-	SANDSTONE COF
Bt1	11-16	2.5YR5/6	VCU SIL	18	21	40 CH	<0.5	SP SS	2 M SBK	FR	CS	-	-	2-M, C	0.5	-	-	CLAY SKINS SANDSTONE COF
2Rt2	16-29	2.5YR5/6	NCH SIL	19	20	55 CH	<0.5	SP SS	2 F SBK	FR	cm	-	-	2-F, M	4.5	-	-	CLAY SKINS
2C1	26-32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2R	32+	SILTSTONE	SILTSTONE			BEDROCK												

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: _____

S. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P107-10613 - 1053 - sdd										Topographic Position:	Backslope									
Date:	06/13/16										% Slope:	36									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	WD									
RETTEW Job #:	089962000										Depth to Refusal:	32									
NRCS Soil Unit:	Wicker Beck's										Bedrock Type:	fine ground sand stone									
Mineralogy:	M.xed										Vegetation:	chestnut oak mountain laurel, white pine, virginia pine									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Moist Condition	Median Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moist Temperature/ pH	Lab Sample ID	Notes				
Oe	3	5R 2.5/1	-	-	-	25 gf	1-4	-	-	-	aw	-	-	M F	<.25	-					
A	4	7.5R 3/2	sil	16	12	25	1-4	PS	1 f gf	vfr	aw	-	-	C F C M C C	.25 4.75	-					
Bw	22	7.5R 6/6	sil	18	10	55 Ch	2-4	PS SS	1 f sbx	f	aw	-	-	C M C C	1.0 4.75	-					
ZR	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Horaca

Signature: _____

[Handwritten Signature]

Test Pit ID:	P108-100613-1217-5dd																			
Date:	06/13/16																			
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																			
RETTW Job #:	089962000																			
NRCS Soil Unit:	Wellkent - berks																			
Minerology:	Mixed																			
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ridges	Structure Type, Grade, and Size	Moist. Consistence	Rooting Boundary & Distribution	Redox Feature Color	Parent material:	Slope Aspect:	Slope Failure or slip:	Depth to Water Table:	Roots	Product Temperature/ pH	Lab Sample ID	Notes
Do	2	5YR 2.5/1	-	-	-	Ch 30	1-2	-	-	-	-	-	top slope / summit	11%	-	-	CF CM	<.25 4.5	-	coll / res
A	2.5	7.5YR 2/2	Sil	16	15	Ch 30	1-2	PS SS	1 fgr	vfr	CW	-	fine grained sandstone dip slope & direction:	SE 0	-	-	CF CM	.50 5.25	-	
Bw	14	7.5YR 5/6	Sil	19	10	Ch 60	1-4	PS SS	1 msbk	fr	aw	-	chestnut oak, mountain laurel, virginia pine, red maple	32	-	-	CM CC	1.25 5.25	-	
Zcr	32	-	-	-	-	-	-	-	-	-	aw	-	-	-	-	-	FM	-	-	
ZR	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist:

Steve Dadio

Signature:

B. Dadio

Field Assistant:

Stephanie Naraca

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Content:	Moist Consistence:	Structure Type, Grade, and Size	Musky/Sodden	Rock Fragment Size (inches)	Rock Fragment Type & %	% sand	% clay	Texture Class	Matrix Color	Depth in Inches	Horizon
P104-160613-1321-5dd	06/13/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	backstop	45 + (S3 NRCS-VT)	N/D	58' large rocks	red maple, sassafras, virginia maple	colluvium	96°	N/A	N/A		M F	-	-	1 f gr	-	.5-2	ch 40	-	-	5YR 2.5/1	3	Oe	
															M M	-	-	2 m sbk	PS	.5-2	ch 45	10	22	10YR 5/6	24	Bt1	
															M M	-	-	1 f gr	SS	.5-2	ch 40	10	16	7.5YR 3/2	6	A	
															M M	-	-	1 f sbk	SS	.5-2	ch 55	12	20	10YR 5/6	40	Bt2	
															M F	-	-	1 f sbk	SS	.5-2	ch 80	15	18	10YR 5/4	54	2Bc	
															M F	-	-										
															M F	-	-										

Other Notes:

Hand-dug with spade from 50-58

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadi
 Field Assistant: Stephanie Moraca

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-594-3721
 Fax: 717-594-1063

Test Pit ID: P110-160613-1503-50d Topographic Position: Lower b/s/beam
 Date: 06/13/16 % Slope: 16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: MWD
 RETTEW Job #: 089962000 Depth to Refusal: N/A
 NCRS Soil Unit: Shelcta - berks Bedrock Type: siltstone
 Mineralogy: Mixed Vegetation: red maple, ferns

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/Indurability	Structure Type, Grade, and Size	Moist Consistence	Horizon Boundary Topography & Orientation	Redox Feature Color	Major Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
0e	3	7.5YR 2.5/1	-	-	-	20gr 20	1-4	-	-	-	aw	-	-	MVF MF MH	4.25 5.25	S1	
A	6	7.5YR 3/2	S.11	16	15	gr	1-4	PS SS	1 f gr	vfr	aw	-	-	MF CM	0.5 5.25	S2	
B+1	24	10YR 5/6	S.11	22	18	30 gr	1-4	PS SS	2msbk	fr	CW	-	-	CF EH	1.5 4.5	S3	
B+2	32	10YR 5/6	S.11	25	18	35 gr	5-1	PS SS	2msbk	fr	CW	-	-	FF	2.0 4.5	S4	
ZB+3	50	7.5YR 5/6	S.11	27	10	45 ch	5-2	PS SS	1 copr	fi	-	7.5YR 5/6 7.5YR 6/3	cmf cmd	FM	2.5 4.75	S5	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Moraca

Signature: B. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Mold Consistency	Moist Consistency	Redox Feature Color	Parent Feature Description	Lab Sample ID	Notes			
P111-160613-1602-5d	06/13/16	Dominion - Atlantic Coast Pipeline Soil Survey	Macgou - Barks	Mixed	Backslope	52	WD	N/A	silt stone	red maple, hemlock	colluvium	73	N/A	N/A	-	CF CM CC	30 Ch	1-4	1 fgr	Wfr	AW	-	-	-	CF CM CC	<.25 5.2	-	
A	7	7.5YR 3/2	sil	16	18	30	Ch	1-4	PS SS	1 fgr	Wfr	AW	-	-	-	CF CM CC	30 Ch	1-4	1 fgr	Wfr	AW	-	-	-	CF CM CC	2.25 5.1	-	
B+1	28	2.5Y 6/6	sil	20	18	70	Ch	3-6	PS SS	1 f 5bk	fr	CW	-	-	-	CF CM CC	70 Ch	3-6	1 f 5bk	fr	CW	-	-	-	CF CM CC	1.0 4.7	-	
B+2	40	2.5Y 5/6	sil	22	18	40	Ch	3-6	PS SS	1 f 5bk	fr	CW	-	-	-	CF CM CC	40 Ch	3-6	1 f 5bk	fr	CW	-	-	-	CF CM CC	3.25 4.7	-	
2B+3	52	10YR 5/6	sil	15	15	40	Ch	2-4	PS SS	1 f 5bk	fr	-	-	-	-	FC	40 Ch	2-4	1 f 5bk	fr	-	-	-	-	FC	2.75 4.6	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: _____

J.C. Roberts

Test Pit ID:	D-112-160613-1405	Topographic Position:	Lower Shoulder Slope	Parent material:	Coll / Rosslum
Date:	6-13-2016	% Slope:	23	Slope Aspect:	
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Well	Depth to Water Table:	
RETTEW Job #:	089962000	Depth to Refusal:	34"	Slope Failure or slip:	
NRCS Soil Unit:	Wellert - Berks	Bedrock Type:	Sand stone / Shale	Dip Slope & Direction:	60 to E
Mineralogy:	Mixed	Vegetation:	White Pine, Chestnut Oak, Hemlock, White Oak	Strike:	326

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Union Boundary Topography & Orientation	Redox Feature Color	Notes
Oe	1.5	5YR 2.5/1				GR 40	0.5-2.0		VFR	CS		3 F 4.2
A	5	10YR 4/2	SIL	16	18	GR 40	0.5-2.0	GR 1m	FR	CS		1m 2c 4.5
B ₁	19	10YR 5/6	SIL	20	30	CH GR	0.5-3.0	SBL 1m	FR	CS		2 F 2m 4.5
B ₂	24	10YR 5/6	SIL	20	30	ECH 60	1.0-4.0	SBL 1m	FR	CS		2 F 2m 5.2
C ₁	34	10YR 5/6	SIL	16	36	ECH 90	1-6		FR	CS		1 F 4.5
C ₂	34"											

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C. Roberts

Field Assistant: Taylor Walter

Signature: John C. Roberts

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Particulate/ pH	Lab Sample ID	Notes	
P-113-160613-1438-0CR	6-13-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wekivet - Berks	Mixed	Summit	10%	SED	14	Sandstone / Shale	White Pine, Chestnut Oak	Red Maple, Blackberry	Residual	152°		60° S	2 ft	4.25		1090	
A	1.5	10YR 4/2	SIL	13	10	0.25-0.5											2 ft	4.5			
BA	3	10YR 5/6	SIL	15	25	0.5-1.5											2 ft	4.5			
CR	14	10YR 5/6	SIL	15	20	1-5											2 ft				
R	14																				

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C. Roberts
 Field Assistant: Taylor Walter

Signature: John C. Roberts

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-114-1160613-1325-5CR		Topographic Position:		For slope / Flood plain		Parent material:	colluvium over residuum									
Date:	6-13-2016		% Slope:	15		Slope Aspect:											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SFB		Depth to Water Table:											
RETTEW Job #:	089962000		Depth to Refusal:	17		Slope Failure or slip:											
NRCS Soil Unit:	Maccona		Bedrock Type:	large collud rocks / sandstone		Slope Slope & Direction:											
Mineralogy:	Mixed		Vegetation:	Hop hunkerum, Green Ash, White hoad, Tulip Red, Red Maple		USDA											
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Moist Consistence	Moisture Regime & Distribution	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
0a	0.5	5YR 2.5/1	SIL	15	18	GR 10	1.25-1.0	—	GR 1M	VFR	GW	—	—	3m	4.2	S1	
A	3	10YR 3/2	SIL	15	18	UGR 60	0.5-2.0	PD 50	GR 1M	FR	GW	—	—	2.5 3F	0.25 4.7	S2	
AB	9	10YR 4/4	SIL	17	20	UGR 70	0.75-4.0	PO 35	SBC 1M	FR	GW	—	—	3m	0.5 4.5	S3	
Bw	17	10YR 5/6	SIL	19	22	UGR 70	0.25-3.0	SP 55	SBC 1M	FR	GW	—	—	2m 1F 2c0	0.75 4.3	S4	
R	17+	10YR 5/6	SIL	19	22	UGR 70	0.25-3.0	SP 55	SBC 1M	FR	GW	—	—	1F	0.75 4.3	—	

Other Notes: Large Cobble in pit. No soil wetness to 17"

TEST PIT DESCRIPTION

Soil Scientists: John C Roberts

Field Assistant: Taylor Walters

Signature: John C Roberts

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Temperature & Indications	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture/Structure	Lab Sample ID	Notes	
P-115-160613-1227-5CR													Bark slope	50/0								
Date: 6-13-2016													WD									
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey													Sandstone / shale									
RETTEW Job #: 089962000													White Pine / Chestnut									
NRCS Soil Unit: Weichert - Berks													USA									
Miningology: Mixed																						
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Temperature & Indications	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture/Structure	Lab Sample ID	Notes	
Oe	0.5	7.5YR 2.5/1				GR 15	0.25-0.75			VFR	AV							2m ZF				
A	1.0	10YR 3/2	SIL	12	25	20 GR	0.25-0.75			VFR	CW							2m ZF				
BA	4	10YR 5/4	SIL	14	28	30 GR	0.25-1.5			FR	CW							2m ZF				
Be1	11	10YR 5/6	L	20	30	40 CN	0.5-2.0			FR	CW							1m 2m 2.0				
Be2	25	10YR 5/6	L	20	28	60/10 CN/R	0.5-3.0			FR	CW							2F 1.0				Large flagstones randomly positioned
BC	34	10YR 6/6	L	12	40	75 GR	1-2.0			FR	GW							1F				
C	50*	10YR 6/6				95 XFL	1-6"			FR								1F				

Other Notes:

Colluvium throughout pit Flag stones beginning around 11"

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts

Field Assistant: Taylor Walter

Signature: _____



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Test Pit ID:	D-116-160613-1016-508		Topographic Position:	Back slope		Parent material:	coll / Res											
Date:	06-13-2016		% Slope:	50%		Slope Aspect:	Z03											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	—											
RETTEW Job #:	089962000		Depth to Refusal:	40		Slope Failure or slip:	NA											
NRCS Soil Unit:	DeKort - Rocks		Bedrock Type:	Sandstone / Shale		Dip Slope & Direction:	18% 109° Strike: 190°											
Mineralogy:	mixed		Vegetation:	White pine / Hickory / Rhododendron / Red Maple		USDA												
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability / Structure	Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary Temperature & Disturbance	Redox Feature Color	Moisture Feature Description	Roots	Moisture Resistance/ pH	Lab Sample ID	Notes	
De	1	5YR 2/1	—	—	—	10 6L	0.5-2.0	—	—	—	—	—	—	3F	0.25 4.5	—	—	
A	2	10YR 3/2	SIL	14	15	GR 15	0.5-2.0	PO SO	1M GR	VFR	CW	—	—	2F 2m	0.25 4.5	—	—	
BA	4	10YR 3/3	SIL	15	15	GR 15	0.5-1.0	PO SO	1M SDR	FR	CW	—	—	2F 2m	0.5 4.7	—	—	
Bt1	11	10YR 5/6	SL	18	16	GP 20	10-3.0	SP SS	1M SDR	FR	GW	—	—	3M 200	0.5 4.5	—	—	
Bt2	23	10YR 5/6	SL	20	16	CN 40	10-4.0	SP SS	1M SDR	FR	GW	—	—	2m 100	1.6 4.5	—	—	
4C	40	10YR 5/6	SIL	10	25	*FC 90	1-6.0	SO SS	0, M	FR	CI	—	—	1F 1m	— 5.0	—	—	frags in cracks
4R	40+																	

Other Notes: Shale / Sandstone Rock @ 40"

5'

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: M. DUGAN

Signature: MWC

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Test Pit ID: P117-16 0616-1780-MGW Topographic Position: UPPER SHOULDER SLOPE Parent material: RESIDUUM
 Date: 6/16/16 % Slope: 18 Slope Aspect: 180
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well Drained Depth to Water Table: > 29
 RETTEW Job #: 089962000 Depth to Refusal: 29 Slope Failure or slip: -
 NRCS Soil Unit: SHELDONIA-BERKS Bedrock Type: 29 Dip Slope & Direction: 17 S
 Mineralogy: MSPd Vegetation: See Below USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Product Placement/Inch	Lab Sample ID	Notes
0-1	0e	7.5 YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3 F-VF 1 M-LD	5.4	-	-
1-14	Bw	10YR 5/6	VCN PDR	9	46	GR 40	< 2.5"	PD S0	IF S0K	FL	CW	-	-	2 F-VF 1 M-LD	1.75 5.2	-	-
14-29	Cr	10YR 5/6	VCN S1	9	55	GR 80%	< 6.00"	PD S0	IF S0K	FA	CW	-	-	2 F-VF 1 M-LD	5.2	-	-
29+	R	-	-	-	-	-	-	-	OM	-	-	-	-	-	-	-	-

Other Notes: VEG: MAPLE, TULIP POPPLE, HICKORY, WHITE OAK (SPARSE HENG LAYER)

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: M. BUGHAN

Signature: [Signature]

RETTEW Associates, Inc.
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 Fax: 717-394-1069

Test Pit ID:	<u>PIB-060616-1030-MGW</u>	Topographic Position:	<u>LAT SLOPE LINEAN</u>	Parent material:	<u>COLUWIUM / REGIDUUM</u>
Date:	<u>6/11/16</u>	% Slope:	<u>5B</u>	Slope Aspect:	<u>50</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>SEB</u>	Depth to Water Table:	<u>>32</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>32</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>WEIKROT-BRKS-ROUGH</u>	Bedrock Type:	<u>SAND STONE</u>	Dip Slope & Direction:	<u>38°N</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>50% BROWN</u>	Strike:	<u>27Z</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Consistence	Moist Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ft	Lab Sample ID	Notes
0-2	0	7.5R2/2	-	-	-	-	-	-	-	-	AS	-	-	3F-VF 2M-CO	6.5	S1	
2-3	A	10YR2/2	5F ^{GR}	10	47	GN 20	<1.0	P0 S0	1VF GR	VFA	CIL	-	-	3F-VF 2M-CO	0.25 5.8	S2	
3-8	Bw1	10YR4/4	5F ^{GR}	12	55	GN 40	<1.5	P0 S0	1VF SBK=GN	VFA	CW	-	-	3F-VF 1M-CO	0.25 5.5	S3	
8-12	Bw2	10YR5/6	5F ^{GR}	12	55	GN 45	<2.5	P0 S1	1VF SBK	FR	CW	-	-	1F-VF 1M-CO	0.50 5.5	S4	
12-25	Bw3	10YR5/6	5F ^{GR}	12	55	GN 65	<6.0	P0 S0	1+ SBK	FR	CW	-	-	1F-VF 1M-CO	0.75 5.4	S5	
25-32	C1	10YR5/6	5F ^{GR}	12	55	GN 75%	<6.0	P0 S0	DRN	-	-	-	-	1M-CO	-		
32+	R																

Other Notes: VEG: TUSSOCK, BIRCH, STRIPED MAPLE, XMAS FERN

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD

Field Assistant: M. DUGAN

Signature: M. Wood

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Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Description	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes	
P119-16061C-102D-MGW																					
Date: 7/11/16																					
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey																					
RETTEW Job #: 089962000																					
NRCS Soil Unit: WEIVENT-BECKS-ROUGH																					
Mineralogy: MIXED																					
USDA																					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Median Boundary Topography & Description	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes	
0-1	0e	7.5 YR 3/2	-	-	-	-	-	-	-	AS	-	-	-	-	-	-	3 VF-F 2 OD-M	-	-	-	
1-2	A	10 YR 3/3	5.1	12	40	GR 2.15	2.10"	1 VF G.D	VFR	CW	-	-	-	-	-	-	3 VF-F 2 OD-M	0.5 4.6	-	-	
2-5	Bw ₁	10 YR 5/1	5.1 ^{GR}	12	40	GR 30%	2.40"	1 VF SDR-CL	VFR	CW	-	-	-	-	-	-	2 VF-F 2 OD-M	1.5 4.2	-	-	
5-12	Bw ₂	10 YR 5/6	5.1 ^{GR}	12	52	GR 65	2.12"	1 M SBCL	FA	CW	-	-	-	-	-	-	2 VF-F 1 CO-M	1.5 4.8	-	-	
12-19	Q5	10 YR 5/1	5.1	12	52	CR 80%		DM	-	-	-	-	-	-	-	-	1 VF-F 1 CO-M	-	-	-	

Other Notes:

VEG: HEMLOCK, JUNIPER, RED MAPLE, BIRCH

TEST PIT DESCRIPTION

Soil Scientist: M. Wood

Field Assistant: M. DUSAN

Signature: M. Wood

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Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Indicators	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Strike:	Notes					
P120-160116-1010-MCW	6-17-16																						
Date: 6/17/16		Dominion - Atlantic Coast Pipeline Soil Survey		Topographic Position: 4°/0		Drainage Class: 3D		Depth to Refusal: 30		Vegetation: HEMLOCK WITCH HAZEL, RIBON APPLE, HICKORY, STRIPED OAK		Parent material: COLLUVIUM		Slope Aspect: 150°		Depth to Water Table: 30"		Slope Failure or slip: ---		Dip Slope & Direction: ---		Strike: ---	
Job Name: RETTEW Job #: 089962000	NCRS Soil Unit: MACOVEC HAMMONY		Mineralogy: MIXED		USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Redox Boundary Indicators	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip:	Dip Slope & Direction:	Strike:	Notes					
De	0-1	7.5YR 2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
A	1-3	10YR 3/3	S 1.1	18	21	GR 20%	< 2.0"	WF GR	HR	CS	-	-	-	-	-	-	-	-	-				
Bw ₁	3-9	10YR 4/4	S 1.1	20	30	GR 20%	< 2.0"	2F SBK	FR	CW	-	-	-	-	-	-	-	-	-				
Bw ₂	9-30	10YR 4/4	XGR S 1.1	20	42	GR 65	< 8.0"	2F SBK	FR	CW	-	-	-	-	-	-	-	-	-				

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. Bugani

Signature: M. Wood

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Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mott Consistence	Redox Feature Color	Parent Material:	Slope Aspect:	Slope Failure or slip:	Dip Slope & Direction:	Lab Sample ID	Notes				
P20A-160610-1225-M&W	6/17/16	7.5YR 2/2	S.1	16	30	GR 5%	20.5"	1 VFH GR	VH	AS	-	-	-	3 F-VF 2 M-CO	0.25 4.3	-	COLLUVIUM / RESIDUUM			
																		Topographic Position: <u>NOSE SLOPE</u>	Moisture: <u>3</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
																		Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Drainage Class: <u>WD</u>	Slope Aspect: <u>12°</u>
Job Name: <u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	RETTEW Job #: <u>089952000</u>	NRCS Soil Unit: <u>MACDUE CHANNELRY</u>	Mineralogy: <u>MIXED</u>	Depth to Refusal: <u>30"</u>	Bedrock Type: <u>-</u>	USDA	Moisture: <u>30"</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>	Slope Aspect: <u>12°</u>	Slope Failure or slip: <u>230"</u>	Dip Slope & Direction: <u>-</u>	Lab Sample ID: <u>-</u>	Notes: <u>-</u>							
De	0-1	7.5YR 2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
																		Topographic Position: <u>3</u>	Moisture: <u>30"</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
																		Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Drainage Class: <u>WD</u>	Slope Aspect: <u>12°</u>
A	1-1.5	10YR 6/4	S.1	18	33	GR 30%	25"	2 F SRZ	FR	GM	-	-	-	2 F-VF 1 M-CO 1 VC	0.50 5.0	-	-			
																		Topographic Position: <u>3</u>	Moisture: <u>30"</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
																		Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Drainage Class: <u>WD</u>	Slope Aspect: <u>12°</u>
Bw	1.5-14	10YR 6/4	S.1	18	33	GR 30%	25"	2 F SRZ	FR	GM	-	-	-	2 F-VF 1 M-CO 1 VC	0.50 5.0	-	-			
																		Topographic Position: <u>3</u>	Moisture: <u>30"</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
																		Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Drainage Class: <u>WD</u>	Slope Aspect: <u>12°</u>
Bc	14-30	10YR 6/4	XGR S.1	18	33	GR 65%	28"	2 F SRZ	FR	CW	-	-	-	2 F-VF 1 M-CO 1 VC	0.50 5.1	-	-			
																		Topographic Position: <u>3</u>	Moisture: <u>30"</u>	Parent Material: <u>COLLUVIUM / RESIDUUM</u>
																		Vegetation: <u>HEMLOCK, WHITE BARK, RED MAPLE</u>	Drainage Class: <u>WD</u>	Slope Aspect: <u>12°</u>

Other Notes: Refusal on coarse fragments

TEST PIT DESCRIPTION

Soil Scientist: M. WOODS
 Field Assistant: M. DUGAN

Signature: M. Woods

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Test Pit ID: P121-160616-0950-MGW Topographic Position: FLORBLAIN Parent material: ALLUVIAL / COLLUVIAL
 Date: 6/17/16 % Slope: 3 Slope Aspect: 183
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well drained Depth to Water Table: 217"
 RETTEW Job #: 089962000 Depth to Refusal: 17 Slope Failure or slip: -
 NCRS Soil Unit: MACOYE CHANUSKI Bedrock Type: - Dip Slope & Direction: -
 Mineralogy: MIXED Vegetation: SEE BELOW USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Molt Confidence	Nation Boundary & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Profil Temperature/ at	Lab Sample ID	Notes
A	1-3	10YR 3/4	1	14	27	GR 8%	<0.5"	PO 56	1 VF GR	VHR	CS	-	-	2F-VF 1M-CO	0.25	S1	
C1	3-7	10YR 4/4	5/1	21	12	GR 50%	<0.5"	PO 50	2 VF GR	FI	CW	-	-	2F VF 2 CO-M 1 VC	1.25 / 4.9	S3	
C2	7-17	10YR 5/4	X6R 1	12	44	GR 65	<1/2"	PO 50	2 F 2 VF 2 GR	FI	CW	-	-	2 F / VF 1 CO-M 1 VAD	6.75 / 5.2	S4	
	17-																

Other Notes: WHITE RING RED MAPLE, HEMLOCK, HICKORY, GLENN ASH STRIPED MAPLE, PAM PAWS

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: M. Wood

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Test Pit ID:	<u>P-122-16D616-1000-MGW</u>	Topographic Position:	<u>LOW RATIO SLOPE</u>	Parent material:	<u>COLUVIUM / RESIDUUM</u>
Date:	<u>6/11/16</u>	% Slope:	<u>5%</u>	Slope Aspect:	<u>245</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WD</u>	Depth to Water Table:	<u>> 32"</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>32"</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>W85XKTS-BGCLVS-RDUCM</u>	Bedrock Type:	<u>SANDSTONE</u>	Dip Slope & Direction:	<u>8° S</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>SEE BELOW</u>		<u>Strike: 186°</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Reaction Boundary (Depth in inches)	Redox Feature Color	Redox Feature Description	Roots	Moist Permeability (mm)	Lab Sample ID	Notes
De	0-3	7.5YR 3/2	-	-	-	-	-	-	-	-	-	-	3 VF+ 2 M-CO	-	-	
AB	3-5	10YR 6/3	SRL	9	40	5% L 45% S	< 1.0"	1 VF 6 RL	VHL	CW	-	-	3 VF-E 2 M-CO	0.25 4.5	-	
Bw	5-14	10YR 6/4	S	11	50	5% L 35% S	< 1.5"	1 M SRL	HL	CW	-	-	2 VF-F 1 M-CO	1.25 4.8	-	
Cr	14-32	10YR 6/4	S	11	50	5% L 80% S	< 1.2"	OM	-	CW	-	-	2 VF-F 1 M-CO	- 4.8	-	
R	32+															

Other Notes:

VEG: MTN LAUREL, HICKORY, BLACK GUM, HUCKLEBERRY, WHITE PINE, WHITE OAK

TEST PIT DESCRIPTION

Soil Scientist: M Wood S. Pardo
 Field Assistant: M DUGAN R. Pardo

Signature: 

RETTEW Associates, Inc.
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 Phone: 717-394-3721
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Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Lab Sample ID	Notes	
P123-060615-1625-MGW	6/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wickit-Beets-Rough complex (SSm)	Mixed	Mose Slope	34%	Very Hard	24"	VACUUM SILTSTONE	OAK Hickory						CF CM	2750	Calluvium over residuum	
Oa	2	15YR 2.5/1															CF CM	45		
Bw	16	10YR 4/6	SIL	N	10	CN 48%	1/2-1"	SS	RS	1SBL	FR	FR	AW	AW			CF CM	275		
C	24	10YR 4/6	SIL	N	10	CN 90%	1-2"	SS	RS	6M	FR	FR	AW	AW			CF CM	5.2	OPRZ/1 Mn Concentrations on Roots	
ZR	32a																			

Other Notes:

VEG: CHESTNUT OAK, RED OAK, HICKORY, WHITE PINE, HUCKLEBERRY

TEST PIT DESCRIPTION

Soil Scientist: M WOOD
 Field Assistant: M DUGAN

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P124-16015-134L MGW Topographic Position: NOSE SLOPE Parent material: COLLYER MESSIDUUM
 Date: 6/15/16 % Slope: 33 Slope Aspect: 277
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: TWP Depth to Water Table:
 RETTEW Job #: 089962000 Depth to Refusal: 25 Slope Failure or slip:
 NRCS Soil Unit: WEILSMT - BEAKS - ROUGH Bedrock Type: GRAY-YELLOW SLT STONE Dip Slope & Direction: 9° S Strike: 187°
 Mineralogy: MIXED Vegetation: Chestnut oak, Blueberry (from photo)

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Moist Consistence	Major Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Roots Testimonial/pt	Lab Sample ID	Notes
0-1	0e	7-5YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3F/VF	4.5		
1-1.5	A	10YR 5YR	5YR	8	24	GR 40	< 1.0"	Pd 5s	1VF GR	VHR	ATI	-	-	3F/VF	0.25 4.7		
1.5-7	Bw ₁	10YR 6/4	5.1	10	26	GR 65	< 3.0"	Pd 50	1VF SBK	VHR	CW	-	-	3F/VF	0.75 4.9		
7-16	Bw ₂	10YR 6/4	5.1	10	26	GR 80%	< 5.0"	Pd 50	1F SBK	FR	CW	-	-	2F/VF 100/M	1.25 4.7		
16-25	C _r	10YR 6/4	-			GR 790											
25+	R																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M Wood
 Field Assistant: M Bucan

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P 125 160615-1340-MGW</u>	Topographic Position:	<u>NB E SLOPE</u>	Parent material:	<u>FRESHWATER</u>
Date:	<u>6/15/16</u>	% Slope:	<u>25</u>	Slope Aspect:	<u>261</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WD</u>	Depth to Water Table:	<u>724</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>24</u>	Slope Failure or slip:	
NCS Soil Unit:	<u>WICKERT-BECKS-ROUCH</u>	Bedrock Type:	<u>SILTSTONE</u>	Dip Slope & Direction:	<u>8% 90°</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below.</u>	Strike:	<u>0°</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Stubness	Structure Type, Grade, and Size	Mold. Consistence	Moist Boundary Resistance	Redox Feature Color	Region Feature Description	Roots	Root Penetration/ft	Lab Sample ID	Notes
Dc	0-1	7.5YR 3/2	-	-	-	-	-				AS			3 F/VF	5.2		
Bw1	1-3	10YR 5/6	S1R	11	20	GL 15%	<0.5	P6 S0	1VF SBK-CL	VHL	CW	-	-	3 F/VF 2 M/CO	0.25 4.8		
Bw2	3-11	10YR 5/6	S11	14	20	CM 25%	<1.5	P0 S0	1VF SBK	FR	CW	-	-	2 F/VF 1 M/CO	1.25 4.6		
Bc	11-17	10YR 5/6	S11	14	20	CM 65%	<2.5	P0 S0	1VF SBK	FR	CW	-	-	1 F/VF 1 M/CO	1.25 4.5		
Cr	17-24	10YR 5/6				95%	<2.5	-						1 M/CO			
R	24+																

Other Notes:

VIS. CHESTNUT OAK, RED OAK, HICKORY

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	<u>P-26-16 0615-1410-MBW</u>	Topographic Position:	<u>MID BACK SLOPE</u>	Parent material:	<u>COLUMBIUM/RESIDUUM</u>
Date:	<u>6/15/16</u>	% Slope:	<u>51</u>	Slope Aspect:	<u>322</u>
Job Name:	<u>Demolition - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>SED</u>	Depth to Water Table:	
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>29</u>	Slope Failure or slip:	
NRCS Soil Unit:	<u>WEIKENT-BRCKS</u>	Bedrock Type:	<u>Silt Stone</u>	Dip Slope & Direction:	<u>13N</u>
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below</u>	Strike:	<u>172</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Bulk Density	Redox Feature Color	Moisture Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes	
0e	0-1	7.5YR 3/2	-	-	-	-	-	-	-	-	-	-	-	3F/UF	4.5	S1		
AB	1-2	7.5YR 4/2	SIL	12	17	-	-	PO	VF gr	VFr	AI	-	-	3F/UF	1.5 4.5	S2		
BW1	2-6	10YR 5/4	SIL	12	17	Gr 15%	<0.5"	PO	VP 5BX/gr	VFr	CW	-	-	3F/UF 100/m	1.0 4.6	S3		
BW2	6-11	10YR 5/6	SIL	14	12	Gr 25%	<1"	PO	2F 5BX	Fr	CW	-	-	2F/UF 200/m	1.25 4.8	S4		
BW3	11-21	10YR 5/6	SIL	16	25	Gr 35%	<2"	PO	2M 5BX	Fi	CW	-	-	1F/UF 100/m	2.75 4.6	S5		
CR	21-29	10YR 5/6	Xgr SIL	16	25	Gr 70%	<5"	PO	OPM	-	CW	-	-	1F/UF 100/m	4.6	-		
R	29+																	

Other Notes: Veg - CHESTNUT OAK, HUCKLEBERRY, RED OAK

TEST PIT DESCRIPTION

Soil Scientist: M. W. DOD
 Field Assistant: M. DUGAN

Signature: _____

M. W. DOD

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	<u>P-127-160615-1110-MGW</u>	Topographic Position:	<u>VFR BACK SLOPE</u>	Parent material:	<u>COUVIUM</u>
Date:	<u>6/15/16</u>	% Slope:	<u>37</u>	Slope Aspect:	<u>306</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WV</u>	Depth to Water Table:	<u>> 30</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>38"</u>	Slope Failure or slips:	
NRCS Soil Unit:	<u>WEIKCAT-BFKS</u>	Bedrock Type:	<u>314-STOUB</u>	Dip Slope & Direction:	
Mineralogy:	<u>MIXED</u>	Vegetation:	<u>See below</u>		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Region Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
A ₁	1.5-2.5	7.5YR 3/1	SIL	12	20	-	-	PO SO	1VFgr	VFR	CW	-	-	3FAC	0.25		
B ₁	2.5-5	10YR 5/6	SIL	9	22	9% 5% 9%	< 0.5"	PO SO	1VF sbr	VFR	CW	-	-	3FNT 1MCO 1VC	0.75		
B ₂	5-10	10YR 5/6	SIL	13	22	9% 3%	2.1"	PO SO	2VF sbr	F _r	CW	-	-	2FVF 2MCO	0.75		
B _C	10-29	7.5YR 5/6	SIL ^{xcn}	18	22	6% 6% 6%	4.5"	PO SS	2VF sbr	F _r	CW	-	-	1FVF 2MCO	1.00		
C _R	29-38	7.5YR 5/6				9% 9% 9%											
R	38+																

Other Notes:

Chestnut oak, red oak, blueberry

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: M. DUGAN

Signature: _____

M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-228-160615-1050 - M6W1
 Date: 4/15/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 069962000
 NRCS Soil Unit: WEIKERT- BROWN
 Mineralogy: MIXED
 Topographic Position: UPPER SHOULDER
 % Slope: 17
 Drainage Class: SED
 Depth to Refusal: 18
 Bedrock Type: SILTSTONE
 Vegetation: See below
 Parent material: RESIDUUM
 Slope Aspect: 247
 Depth to Water Table: 218
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Mold. Consistence	Moisture Boundary Conditions	Redox Feature Color	Redox Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes							
De	0-1	7.5YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3F/1V	4.6									
A	1-2	10YR 4/2	SIL	12	20	Gr 10%	2.05"	PO	NF gr	VFR	CW	-	-	3F/1V	0.25									
Bw1	2-11	10YR 5/4	Vsr SIL	12	20	Gr 40%	21.5"	PO	1Vt Sbk/gr	FR	CW	-	-	2F/1V 2M/C	2.25									
Bw2	11-18	10YR 5/4	Vsr SIL	15	20	Gr 55	<5"	PO	2Vt Sbk	FR	CW	-	-	2F/1V 2M/C	1.75									
R																								

Other Notes: VEG. RED OAK, HAWK WOOD, HUCKLEBERRY, WHITE PINE

TEST PIT DESCRIPTION

Soil Scientist: Russell Cosco
 Field Assistant: Rachel Hill

Signature: 

[Sampled]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	MRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Content	Lab Sample ID	Notes	
D129-16-015-1045-RLL	10/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	None above saddle	30%	20"	Fire Sandstone	Red Maple Sugar Maple	Colluvium over residuum	180°	20"		N450E 15°			S1		
A	3	5 ^{1/2} R ²⁵ 1													ZF	0	0.75	S2	
Bw	5	7.5YR4/1	L	8	90	5 ^T 15%	1/2"								ZF, M	5.3	5.8		
Cr	12	7.5YR5/10	L	8	45	CN ^A 25% CN ^N 75%	1/2" x 1/4"								IF	1.0 4.9	5.8		
R	18	10YR5/10	SL	15	10		1 x 5									6.4			
	20																		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: Russell Losco

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P130160615-1050-RLL Topographic Position: Backslope Parent material: colluvium over residuum
 Date: 6/15/2016 % Slope: 45% Slope Aspect: 265°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD Depth to Water Table: 24"
 RETTEW Job #: 089962000 Depth to Refusal: 24" Slope Failure or slip: —
 NCRS soil Unit: Wet-Ent-Berks 35-55 Bedrock Type: Fire Sandstone Dip Slope & Direction: S65°E 90°
 Mineralogy: — Vegetation: Maple, Ph. Laur, Evergreen USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture	Structure Type, Grade, and Size	Mastic Consistence	Native Boundary Topography & Distances	Redox Feature Color	Notes	Roots	Moisture Content (%)	Lab Sample ID	Notes
Da	15	10YR2.5/1	—	—	—	—	—	—	FR	FR	CLS	—	—	2VF, F	0	—	—
Bu1	8	10YR4/4	SIL	17	10	ST 5%	1/4"	SS	FISBR	FR	GLS	—	—	3F, 2M	2.0	—	—
Bu2	14	10YR5/8	SIL	20	5	ST 20%	1/2"	SS	FISBR	FR	GS	—	—	1M	4.5	—	—
PC	24	10YR6/10	S.L	20	4	CN 50%	1" x 4"	MS	FISBR	FR	—	—	—	—	4.0	—	—
R	24+	—	—	—	—	—	—	—	—	—	—	—	—	—	4.9	—	—

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P181160615-1100-RLC</u>	Topographic Position:	<u>Shoulder</u>	Parent material:	<u>Colluvium over residuum</u>
Date:	<u>6/15/16</u>	% Slope:	<u>45%</u>	Slope Aspect:	<u>S00</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>interior low</u>	Depth to Water Table:	<u>24" +</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>24"</u>	Slope Failure or slip:	_____
NRCS Soil Unit:	<u>Uc Vert Bould</u>	Bedrock Type:	<u>Fine Sandstone</u>	Dip Slope & Direction:	_____
Mineralogy:	<u>Mixed Bould</u>	Vegetation:	_____	Strike:	_____

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Fracture/Inclusions	Structure Type, Grade, and Size	Moist Consistence	Mottling & Substrata	Redox Feature Color	Redox Feature Description	Roots	Pocket Penetration/psi	Lab Sample ID	Notes
0a	2	5YR 2.5/1	—	—	—	—	—	—	FR	FR	cls	—	—	1F	0	5.3	
A	5	10YR 2.5/1	Sil	5	20	ST 100%	1/2"	PO	FISB2	FR	cls	—	—	3F, 2M	1.5	4.2	
B _{us}	11	10YR 4/1	Sil	15	15	ST 20%	1/2"	SP	FISB2	FR	cls	—	—	—	2.0	5.1	
C _r	24	10YR 7/4	Sil	16	10	CN 40%	1/2 + 4"	SP	FISB2	FR	—	—	—	—	4.5	4.9	
R	24+							SS									

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Rachel Hill

Signature: _____



Sampled

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P13211601615-1110-RELL					Topographic Position:	Rock Slope										
Date:	4/15/16					% Slope:	25%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD										
RETTEW Job #:	089962000					Depth to Refusal:	38"										
NRCS Soil Unit:	Udult BeckS					Bedrock Type:	Fire Sandstone										
Mineralogy:	Mixed					Vegetation:	Red Maple										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Minerals/ Substrata	Structure Type, Grade, and Site	Moist Consistence	Medium Bulk Density (g/cm ³)	Redox Feature Color	Redox Feature Description	Roots	Moist Porosity/ pH	Lab Sample ID	Notes
0a	1.5	5YR2.5/1	—	—	—	—	—	—	FR	FR	cls	—	—	FR, IM	0	1	
A	4	7.5YR2.5/2	SIL	10	20	ST 10%	1/2"	PO SO	FR2CR	FR	cls	—	—	WF, IM	1.25 9.9	2	
Bw	14	10YR5/16	SH	13	30	ST 10%	1/2"	SP SS	FR5BR	FR	gw	—	—	FR	9.5 5.2	3	
Bt	38	7.5YR5/16 5YR7/16	SIL	20	5	CN 25%	1" x 3"	SP MS	MISBR	FR		—	—		4.0 4.4	4	Distinct clay films cgs Lithochromic 2.5YR 5/16

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Lawson
 Field Assistant: Rachel Hill

Signature: _____

Russell Lawson

Sampled

NETTEV Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P133160615-115-R11 Topographic Position: back slope
 Date: 6/15/2016 % Slope: 20%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: SED
 RETTEV Job #: 089962000 Depth to Refusal: 14"
 NRCS Soil Unit: RckS W2c Kert Bedrock Type: Fine Sandstone
 Mineralogy: Mixed Vegetation: Maple

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Position/ Substr.	Structure Type, Grade, and Size	Moist Consistence	Medium-Bounding Fragments & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture/ pH	Lab Sample ID	Notes
<u>0a</u>	<u>1</u>	<u>5gr²⁵/1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>0</u>	<u>1</u>	
<u>A</u>	<u>4</u>	<u>10gr^{3/2}SIL</u>	<u>SIL</u>	<u>20</u>	<u>4</u>	<u>10% b ST</u>	<u>1/2"</u>	<u>SP</u> <u>SS</u>	<u>M2GR</u>	<u>RR</u>	<u>cb</u>	<u>—</u>	<u>—</u>	<u>ZF</u>	<u>5.1</u>	<u>2</u>	
<u>Bw</u>	<u>10</u>	<u>10gr^{5/16}SIL</u>	<u>SIL</u>	<u>22</u>	<u>5</u>	<u>15% b ST</u>	<u>1/2"</u>	<u>MP</u> <u>MS</u>	<u>F15GR</u>	<u>RR</u>	<u>gb</u>	<u>—</u>	<u>—</u>	<u>1VF</u>	<u>5.2</u>	<u>3</u>	
<u>Cr</u>	<u>12</u>	<u>10gr^{6/16}SIL</u>	<u>SIL</u>	<u>26</u>	<u>5</u>	<u>CN</u> <u>10%</u>	<u>1" x 4"</u>	<u>MP</u> <u>MS</u>	<u>F25GR</u>	<u>RR</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>4.5</u> <u>4.4</u>		
<u>R</u>	<u>14</u>																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Stephanie Moraca

Signature: Steve Radio

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Lab Sample ID	Notes									
P134-160615-1506-5D1	06/15/16	Dornton - Atlantic Coast Pipeline Soil Survey	Welkert-Berks	Mixed	concave bowl, foot slope	colluvium	84 / 122										
					% Slope: 15 / 12	Slope Aspect: MWD	34										
					Drainage Class: N/A	Depth to Water Table: N/A											
					Depth to Refusal: N/A	Slope Failure or slip: N/A											
					Bedrock Type: N/A	Dip Slope & Direction: N/A											
					Vegetation: red maple, sugar maple, hickory												
					USDA												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Muscle/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Consistence	Redox Feature Color	Moist Consistence	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
De	2	5YR 2.5/1	-	-	-	gr 15	.5-2	-	-	-	aw	-	-	M=	4.5	S1	
A	4	7.5YR 3/3	S11	16	18	gr 20	1-2	PS	1 fgr	fr	aw	-	CF	4.5	S2		
B+1	22	7.5YR 5/6	S11	24	16	gr 20	.5-1	PS	2 msbk	fr	aw	-	CH	1.5	S3		
B+2	34	7.5YR 6/6	S11	36	16	gr 25	.5-1	PS	2 msbk	fr	aw	-	CH	2.25	S4		
B+3	50	10YR 5/6	S11	30	18	gr 40	.5-1	PS	2 msbk	fr	aw	-	CH	2.75	S5		

Other Notes:

NOT → skeletal top 50 cm of argill. c < 35% rf

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Haracek

Signature: _____

S. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist. Consistence	Notion Boundary Disturbance	Redox Feature Color	Water Feature Description	Lab Sample ID	Notes
						backslope	21	WD	N/A	Sandstone	chestnut oak, mountain laurel, virginia pine, blueberry															
Oe	2	5YR 2.5/1	-	-	ch	20	1-4	-	ow	-							CF	ch	.25						S1	
Oa	4	10YR 2/1	-	-	ch	20	1-4	-	ow	-							CF	ch	1.25						S2	
B+1	20	10YR 6/4	s ⁺ 1	18	18	ch	40	2-4	ow	-							FF	FM	2.25						S3	
B+2	30	10YR 6/6	S.1	18	20	ch	55	2-4	ow	-							FF	FC	5.25						S4	
ZRC	50	7.5YR 4/6	1	20	40	ch	75	.5-1	-	-							VF	F	2.5						S5	

Other Notes:

○ horizons are compacted and dense
 white mycelia present

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Morara

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:		Topographic Position:		Parent material:		Notes											
p136-160615-1239-500		Summit		coll/res													
Date: 06/15/16		% Slope: 4		Slope Aspect: N/A													
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class: WD		Depth to Water Table: N/A													
RETTEW Job #: 089962000		Depth to Refusal: 34		Slope Failure or Slip: N/A													
NRCS Soil Unit: weikat - Barks Mixed		Bedrock Type: Fine-grained sandstone		Dip Slope & Direction: 12 S		Strike: 90											
Mineralogy:		Vegetation: Chestnut oak, white pine, blueberry, hickory															
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Plasticity (clay content)	Structure Type, Grade, and Size	Moist Consistence	Moisture Regime Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Poker Penetration/psi	Lab Sample ID	Notes
Oe	2	5YR 2.5/1	-	-	-	ch 40	.5-2	-	-	-	aw	-	-	CF	2.25	-	
A	2.5	5YR 3/2	sil	15	15	ch 40	.5-2	ps	lf gr	vfr	aw	-	-	CF	4.75	-	
Bw	14	10YR 6/6	sil	16	15	ch 60	.5-2	ps	lf sbk	fr	aw	-	-	CM	1.0	-	
Zc	21	10YR 6/6	sil	14	18	ch 80	1-4	ss	0 m	fr	aw	-	-	CC	5.25	-	
Zcr	34	-	-	-	-	-	-	ps	-	-	aw	-	-	FM	.75	-	
ZR	34+	-	-	-	-	-	-	ss	-	-	aw	-	-	CC	5.25	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Stephanie Morace

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P137-160615-1152-sdd	06/15/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000		Molker + Barks Mixed	backslope	coll/fres									
						% Slope: 27	Slope Aspect: 231									
						Drainage Class: WD	Depth to Water Table: N/A									
						Depth to Refusal: 32	Slope Failure or slip: N/A									
						Bedrock Type: siltstone	Dip Slope & Direction: 20 S									
						Vegetation: chestnut oak, low bush blueberry, hickory	Strike: 120									
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture Condition	Moisture Consistence	Moisture Boundary Temperature & Disturbance	Redox Feature Color	Moist Feature Description	Roots	Moist Temperature/ pH	Lab Sample ID	Notes
Oe	1	5YR 2.5/1	-	-	-	Ch 20	1-4	-	aw	-	-	-	CF CH	2.25 4.75	-	
Bw	14	5YR 5/3	sil	22	10	Ch 40	1-4	fr	fr	aw	-	-	FN CC	2.25 5.25	-	
2C	24	5YR 5/3	sil	20	12	Ch 75	1-4	fr	fr	aw	-	-	FN FC	1.25 5.25	-	
2Cr	32	-	-	-	-	-	-	-	aw	-	-	-	-	-	-	
2R	32"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: P. Fenstermaker
 Field Assistant: Rachel Hill

Signature: Paul Shuck

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Moisture/Temp/PH	Lab Sample ID	Notes	
	8-13-08	1000616-1219-DET	08996200	Wickert-Belts complex (S3F)	Mixed	Nose 15' shoulder	WFI	28"	Strained sandstone	White Pine, Hickory Red Oak, Chestnut oak, Blueberry	Callunum over Redwood	20°	-	-	10° S	2F, M	5.3	-	Feu Sulfates	
A	1.5-3.5	104R 3/2		30% CN		4"	SP	1M9R	VFR	CW	-	2F, M	1C	2F, M	1C	2F, M	4.6	-		
Bu1	3.5-11"	104R 5/3		38% CN		1/2-5"	SP	1R5Bk	FR	CW	-	2F, M	1C	2F, M	1C	2F, M	4.5	-		
Bu2	2.3	104R 5/4		20% Stry		1/2-24"	SP	1M5BK	FR	AS	-	2F	1C	2F	1C	2F	4.5	-		
2CR	2.3-28"	104R 5/3		95% CN		4.3"	SP	1C5BK	FR	AW	-	1C	1C	1C	1C	1C	4.5	-	Shale Fe-Banded with BR-Suff	
3R	28"	-		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermaker
 Field Assistant: R. Kappa

Signature: Daniel Fenster

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	M Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moisture Content	Structure Type, Grade, and Size	Moist Consistence	Soil Consistence	Redox Feature Color	Redox Feature Description	Notes		
P-139-16016-1326-0EF	4/10/16	Dominion - Atlantic Coast Pipeline Soil Survey	08996200	Wichit-Fzrh conroy 53F	n-xrd	Shady Ridge top	24%	Schaly + excessive	12"	Shale 1/8-1/2 thick	White pine, chestnut oak, Red maple, grass	Residuum	230°	-	-	5° S	3'	-	1M5BK Vfr	VF	CW	-	-	2f, 1M	0.75	-
A	15-3	W4R 31a	SIL 15	-	-	PO 5G	1fGR	VF	CW	-	-	2f, 1M	0.1	-	-	5.3	-	-	-	-	-	-	-	-	-	-
Bu1	3-7	10NR513	SIL 16	10	20%	PO 5D	1M5BK Vfr	VF	CW	-	-	2f, 1M	0.75	-	-	1.10	-	-	-	-	-	-	-	-	-	
Bu2	7-12	10NR5M	SIL 17	10	50% CN	PO 5D	1L5BK Fr	Fr	AW	-	-	2f, 1M	1.5	-	-	4.7	-	-	-	-	-	-	-	-	-	
R	12+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Artifacts found during Arch Chloroma Description conducted at of this hole
 Not expanded or deepened.

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fensholt
 Field Assistant: Rachel Hill

Signature: 

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Nation Boundary Topography & Distances	Redox Feature Color	Parent Material: Slope Aspect:	Depth to Water Table:	Parent Feature Description:	Roots	Water Penetration/Inches	Lab Sample ID	Notes	
P-139A-100010-1341-DEF												Upper Back Tuffa							
Date: 4/11/11												Slope Aspect: 49	Depth to Water Table: 100						
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey												Slope Failure or Slip: 83							
RETTEV Job #: 089962000												Dip Slope & Direction: Shale 1-5" thick							
NRCS Soil Unit: W1K1t-Banks complex												Slope Failure or Slip: 83							
Mineralogy: W1K1t-Banks complex												Dip Slope & Direction: Chert outcrops, black clays, red oak, white pine, blueberry							
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistence	Nation Boundary Topography & Distances	Redox Feature Color	Parent Material: Slope Aspect:	Depth to Water Table:	Parent Feature Description:	Roots	Water Penetration/Inches	Lab Sample ID	Notes	
Oe	0-2	5 ^{1/2} 3/2	-	-	-	-	-	-	-	-	-	-	-	-	3f 1m	4.5	-	-	
A	2-5	10 ^{1/2} 3/2	S.L	16	12	10 ^{1/2} cm	2-1 1/4"	20GR	VFR	AW	-	-	-	-	2f, 1m	0.7	-	-	
Bu1	5-10	10 ^{1/2} 4/4	S.L	17	10	15 ^{1/2} cm	2-1 1/4"	145Bx	FR	CW	-	-	-	-	2f, 1m 1c0	4.7	-	-	
Bu2	5-16.5	7 ^{5/8} 5/4	S.L	18	10	15 ^{1/2} cm	2-1 1/4"	1M5Bx	FR	CW	-	-	-	-	2f, 1m 1f	1.25 4.5	-	-	
Bu2	16.5-23	7 ^{5/8} 5/4	S.L	18	10	5 ^{5/8} cm	1/2-4"	1M5Bx	FR	AW	-	-	-	-	1f	0.25 4.7	-	-	
Bu2	23-23+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Component Rocks

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenger-Hermsmeider
 Field Assistant: Rene Hill

Signature: _____

[Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-140-106010 - 1231-DEF		Topographic Position:		Upper Buckskins		Parent material:													
Date:	10/14/10		% Slope:		49%		Slope Aspect:													
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:													
RETTEW Job #:	089962000		Depth to Refusal:		21"		Slope Failure or slip:													
NRCS Soil Unit:	Wetland - Parki Complex (S3F)		Bedrock Type:		Very fine grained sandstone		Dip Slope & Direction:													
Mineralogy:	Mixed -		Vegetation:		Castorocky white pine		Black gum													
USDA																				
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soil	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Disturbance	Redox Feature Color	Moisture Feature Description	Roots	Moisture Feature Description	Roots	Moisture Feature Description	Lab Sample ID	Notes	
A	0-2	10YR 3/2	Sil	17	12	40% CW	2"	Pg Sc	IFGR	Vfr	AW	-	-	26M	-	-	-	0.1	S1	
Bw1	2-14	10YR 5/4	S.L	18	12	40% CW	24"	Pg	IFGR	Vfr	AW	-	-	26M	-	-	-	0.75	S2	
Bw2	14-21	10YR 5/4	Sil	18	12	45% CW	24"	Pg	IFGR	Vfr	AW	-	-	26M	-	-	-	0.75	S3	
Bw2	21+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Kinstler/Machul
 Field Assistant: Rachael Hill

Signature: David Smith

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-19-100610-1235-DET		Topographic Position:		Shoulder		Parent material:	Colluvium over residual							
Date:	6/10/10		% Slope:	2%		Drainage Class:	well		Slope Aspect:	-					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Depth to Refusal:	23"		Bedrock Type:	Very fine grained sandstone		Slope Failure or slip:	-					
RETTEW Job #:	089962000		Vegetation:	Write pin, hickory, chestnut oak, blueberry, sugar maple		Dip Slope & Direction:	40 NE		Strike:	318°					
MNRCS Soil Unit:	Bw1, Vert-P, Ks, complex (53F)		USDA												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moist Consistency	Structure Type, Grade, and Size	Redox Feature Color	Parent Feature Description	Roots	Lab Sample ID	Notes	
A	0:3-3:5	10YR 3/3	S.L	20	18	40% CN	< 4"	PO	HR	VF, AW	-	3f	0.25	-	
Bw1	3:5-12	10YR 5/4	S.L	21	15	40% CN	< 5"	SP	HR	VF, AW	-	3f	1.0	-	Subrounds of top edges oriented randomly
2Bw2	12-23	10YR 5/4	S.L	20	14	50% CN	1/2-8"	SP	MSHR	FR AW	-	3f	1.25	-	Col oriented by BR
2R	23+	-	-	-	-	-	-	SS	-	-	-	-	-	-	

Other Notes:

Abwa - Residuum

TEST PIT DESCRIPTION

Soil Scientist: P Kerner-Madus
Field Assistant: Rachel Hill

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Minealogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Parent Fragmentation %	Lab Sample ID	Notes	
P-142-140116-1240-DET	Collide	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	W/urk Belts Complex (S3Y)	Mixed	Wedge Backslope 47.1.	Well 27"		Shale Brownish Red sat 1	White Pine Red oak, Hickory, Chestnut cone					80° E				Colluvium over Residuum 293	
										USDA										
A	15- 0.5	101R312	SIL	15 28	55% GR	38 L2"	P0 SD		VER CW	Moist Consistence					34m 100		0.1		Red Residual CoP	
Bw	0.5- 17	104R S14	SIL	16 10	40% GR	L2"	P0 SD		VER CW	Moist Consistence					26m 100	1.85				
B3w3	17- 27	7.54R S13	S.L	24 10	60% CN	1-10"	SF SS		FR AW						26m	1.5			Red for mixed w/BR	
A2	27+																			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Rachel Hill

Signature: _____

Daniel Fenstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-143-166016-1735-DEF					Topographic Position:	Summit / Shoulder											
Date:	9/16/16					% Slope:	18% (8' down)											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Semi-wet excess											
RETTEW Job #:	089962000					Depth to Refusal:	10'											
MRCSS Soil Unit:	Weilert-Balks Complex (53F)					Bedrock Type:	Fine grained sandstone - 2' from surface											
Mineralogy:	Mixed					Vegetation:	Chestnut oak Hickory White Pine											
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Structure	Structure Type, Grade, and Size	Moisture Consistence	Surface Boundary Temperature & Direction	Redox Feature Color	Moisture Features Description	Roots	Root Penetration/Depth	Lab Sample ID	Notes	
0e	0-2	5YR	-	-	-	-	-	-	-	-	-	-	-	3R	-	-	-	
A	2-5	7.5YR 3/1	S.L	14	25	40% CN	L 5"	Pc	26GR	VFR	AW	-	-	3F 2m	0.25	S2		
															4.5			
Bw	5.5	7.5YR 5R	S.L	16	20	45% CN	L 6"	Sp	15BR	FR	AW	-	-	2F	1.25	S3		
															4.5			
R	5.0ft	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: David M. Hall
 Field Assistant:

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P-144-160616-1200-SSW	6/16/16		Dominion - Atlantic Coast Pipeline Soil Survey	089962000	WEIKERT - BRKS	MIXED	Backroad	column over residuum									
							% Slope: 63%	Slope Aspect: 230°									
							Drainage Class: M EL	Depth to Water Table: -									
							Depth to Refusal: 28"	Slope Failure or Slip: BENT TREES									
							Bedrock Type: SILTSTONE	Dip Slope & Direction: 1.50 NE									
							Vegetation: HICKORY WHITE OAK WITH WALNUT	Strike: 128°									
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Saturation	Structure Type, Grade, and Size	Mold Consistence	Horizon Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Mold Resistance/ per	Lab Sample ID	Notes
0e	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VE	-	-	
A	2-3	10YR2.5/1	CH SIL	12	18	15 CH	< 1	-	1.5 PR	VER	awn	-	-	3-F, 1-M	0.25	-	SANDSTONE COE
Bm1	3-9	10YR2.5/0	SIL	16	12	30 CH	1-3	PO	2M SBK	VR	cm	-	-	3-F, 2-M, 1-Ve	0.75	-	SANDSTONE COE
Bm2	9-28	10YR5/0	VEH SIL	17	15	55 CH	2-6	PO SS	1M SBK	VR	cm	-	-	2-M, 1-Ve	5.4	-	SANDSTONE COE
2C1	27-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2R	28*	SILTSTONE	SILTSTONE				BEDROCK										

Other Notes: BED SANDSTONE FLAG > 6" at SURFACE, STEEP SLOPE - LINEAR BACKSLOPE

TEST PIT DESCRIPTION

Soil Scientist: Joseph M. M. M.
 Field Assistant: _____

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-145-160616-1145-35W	Topographic Position:	BACKSLOPE (Nose)	Parent material:	RESIDUUM
Date:	6/16/16	% Slope:	34%	Slope Aspect:	137°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	SOMEWHAT EXCESSIVE	Depth to Water Table:	-
RETTW Job #:	089962000	Depth to Refusal:	3b	Slope Failure or slip:	-
MRCSS Soil Unit:	WEIKERT-BEDK1	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	14° NW
Mineralogy:	MIXED	Vegetation:	WHITE PINE MAPLE, STERNING MAPLE, HICKORY	Strike:	350°

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	USDA		Redox Feature Color	Redox Feature Description	Roots	Root Penetration/In	Lab Sample ID	Notes
								Moist Consistence	Texture Class						
0e	0-1	SILT-SH	-	-	-	-	-	-	-	-	-	-	-	-	
A	1-2	10YR2/1	CH SIL	12	15	25 CH	< 1	Po	IFPR	NER	AW	3-VE	-	-	
								So				2-E	0.5		
Bw	2-9	10YR5/6	NCH SIL	13	15	40 CH	1-2	Po	IFSDR	NER	CN	1-F, M	1.0	-	SANDSTONE & SILTSTONE COE IN UPPER
								So				C	5.1		
Bc	9-19	10YR5/6	NCH SIL	11	14	75 CH	1-4	So	IFBRK	NER	CN	-	-	-	
								Ro					-	-	
Cr	16-39	-	-	-	-	-	-	-							
								Ro							
R	36+	SILT	STONE	BED	ROCK	ROCK	ROCK								

Other Notes: SOME COLUMNAR BEDDING AT SURFACE

TEST PIT DESCRIPTION

Soil Scientist: JOHN WARD
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Units:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content:	Redox Feature Color:	Redox Feature Description:	Notes:	
P-146-160616-1147-25W	6/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	WEIKERT - BEERS	MIXED	BACKSLOPE	30°	SOMEWHAT EXCESSIVE	22"	SANDSTONE	WHITE GRK, WHITE RINE, MAPLE, WITCH HAZEL, TSUBERRY	COLUMBUS OVER RESIDUUM	212°	-	BENT TREES	40° NNW	216°	-	-	-	-	-
De 0'1	SYR25/1	-	-	-	-	-	-	-	-	-	-	-	-	-	3-VF	2-F	4.1	-	-	-	-	-
Δ 1-1.5	10FR2/12	SH	10	18	10	GR	<1	-	-	PO	1FR	VER	RM	-	2-VF, F	1-M	0.25	-	-	-	-	
BΔ 1.5-9	10FR25/4	CH SIL	11	14	15	CH	0.5-2	-	-	PO	1MSBK	VER	CM	-	2-F, M	1-C	0.5	-	-	-	-	
2BC	9-116	10FR5/6	SL	11	20	CH	50	1-3	-	PO	1FSBK	FR	CM	-	2-F	-	5.4	-	-	-	SANDSTONE COP	
2C1	118-22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2R	22x	SAND STONE	DEDRCK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: LINEAR-LINEAR BELOW SUMMIT, ABOVE BREAK TO STEEP SLOPE (>45°)

TEST PIT DESCRIPTION

Soil Scientist: JOHN WELLS
 Field Assistant: _____

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-147-100616-1059-JSW	Topographic Position:	SUMMIT	Parent material:	RESIDUUM												
Date:	6/16/16	% Slope:	4%	Slope Aspect:	325°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	SOMEWHAT EXCESSIVE	Depth to Water Table:	-												
RETTEW Job #:	089962000	Depth to Refusal:	29"	Slope Failure or slip:	-												
NRCS Soil Unit:	WEIKERT-BERKS	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	-												
Mineralogy:	MIXED	Vegetation:	MATURE HICKORY, WHITE OAK, BLUEBERRY	Strike:	-												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Peels/ Soluble	Structure Type, Grade, and Size	Moist Consistence	Reaction Boundary Transparency & Distance	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ per cent	Lab Sample ID	Notes
Da	0-3	5YR2.5/1	GR SIL	-	-	GR 25%	< 1	-	FR	FR	FR	-	-	3-4F 2-F 2-F	4.4	-	
A	3-5	10YR2.5/1	GR SIL	11	15	GR 25%	1-2	-	FR	FR	FR	-	-	3-4F 2-F 1-M	0.5	-	
Bm	5-10	10YR5/6	GR SIL	13	12	CH 55%	1-3	-	FR	FR	FR	-	-	2-4 1-C	4.6	-	
Bc	10-14	10YR5/6	GR SIL	13	12	CH 85%	1-3	-	FR	FR	FR	-	-	1-C	-	-	
Cr	14-29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	29"	SILTSTONE	BE DRUCK														

Other Notes: HERBOW SUMMIT / RIDGE CREST

TEST PIT DESCRIPTION

Soil Scientist: JOHN MARI
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTW Job #:	MRCSS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P-148-160616-1044-1SW	6/16/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	WICKERT-BEERS	MIXED	BACKSLICE	RESIDUUM									
						% Slope:	Slope Aspect:									
						Drainage Class:	Depth to Water Table:									
						Depth to Refusal:	Slope Failure or slip:									
						Bedrock Type:	Dip Slope & Direction:									
						Vegetation:										
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moisture	Moisture Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
Dc	0-1	5YR2.5/1	-	-	-	-	-	-	-	as	-	-	3-VEGF	4.4	-	
A	1-2	10YR3/1	CH SIL	10	15	30 CH	<1	90 30	10YR	aw	-	-	2-F, 1M 1-C	0.25 -	-	
C	2-4	10YR2/1	XC ^M SIL	10	12	75 CH	1-4	PO 30	OMB	aw	-	-	2-F, 1M 1-C	0.25 5.1	-	
C1	4-8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	8+	SILTSTONE				BEDROCK										

Other Notes:

BACKSLICE - LINEAR CONVEY; SANDSTONE SWAGS 2-6" ON SURFACE
 SANDSTONE OUTCROPPING 4M ABOUT PIT; SILTY SAND OUTCROPPING TO
 SIDE; BEDROCK DIPPING INTO RIDGE SIDE

TEST PIT DESCRIPTION

Soil Scientist: J. KENNEDY

Signature: [Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: P-149-110616-1023-SSW Topographic Position: BACKSHORE (RIDGE NOSE) Parent material: RESIDUUM
 Date: 6/16/16 % Slope: 18% Drainage Class: SOMEWHAT EXCESSIVE Depth to Refusal: 12" Slope Failure or Slip: -
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Bedrock Type: SILTSTONE Dip Slope & Direction: 310W (90°) Strike: 180°
 RETTEW Job #: 08996200 Vegetation: VAPINE CUCURBITACEA WHITE PINE, BUBBEREY
 NCRS Soil Unit: WICKERT-3E2L3 USDA

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molok Consistence	Moist Consistence	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Moisture/Structure	Lab Sample ID	Notes	
De	0-1	Expansive	-	-	-	-	-	-	-	-	-	-	-	-	3-VE 2-F	4.4	-	-	
A	1-2	10YR 2/3/1	SH CH	11	18	CH 25	1-3	Po 50	1FBR	VER	am	-	-	3-VE 2-M	0.25	-	-	-	
Bw	2-5	10YR 5/10	SH SIL	13	15	CH 50	2-5	Po 30	1FBR	FR	am	-	-	2-M, C VC	4.5	-	-	-	
Dc	5-12	10YR 5/10	SH SIL	13	12	CH 75	2-5	Po 50	1FBR	FR	am	-	-	1-F	0.5	-	-	-	
R	12+	SILTSTONE BEDROCK																	

Other Notes: BACKSHORE ON RIDGE

TEST PIT DESCRIPTION

Soil Scientist: JOHN WANN
 Field Assistant: _____

Signature: [Signature]

RETEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-5721
 Fax: 717-394-1053

Test Pit ID:	7-150-166616-1024-JSW				Topographic Position:	BACKSCOPE				Parent material:	COLUVIUM OVER RESIDVIUM								
Date:	6/16/16				% Slope:	38%				Slope Aspect:	297°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	SOMEWHAT EXCESSIVE				Depth to Water Table:	-								
RETEW Job #:	089962000				Depth to Refusal:	19'				Slope Failure or slip:	-								
NRCS Soil Unit:	WEIKERT - BECKS				Bedrock Type:	SILTSTONE				Dip Slope & Direction:	40 WNW 90° S Jstrike: 200°								
Mineralogy:	MIXED				Vegetation:	WILDTINE, VA PINE, CECY NOT OAK, BLUEBERRY				USA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rock Fragment	Moisture/soil	Structure Type, Grade, and Size	Molt. Consistence	Nation Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Moist. Resistance/ pH	Lab Sample ID	Notes	
A	0-2	10YR 5/1	CH SIL	11	25	15 CH	< 1	-	as	1FR	FR	am	-	-	3-4 FT M	4.4	-	SMALL STONE & COC	
B _M	3-11	10YR 5/10	CH SIL	14	18	35 CH	< 1	-		1M SBK	FR	cm	-	-	2-4 FT c. 1.6	4.7	-	SMALL STONE & SILTSTONE CHALKY	
BC	11-17	10YR 5/10	NCH SIL	13	15	55 CH	1-4	-		1FR	FR	am	-	-	3-4 FT 2-M	1.0	-		
2R	17+		SILTSTONE				BEDROCK												

Other Notes: BEDROCK DIAPHRAGM WITH SLOPE LINEAR LINK AS BACKSCOPE

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Mustafa Eten

Signature: _____

Steve Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist. Consistence	Moist Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
P151-160006-1107-sdd	06/06/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Lehigh-Berks	Mixed	backslope	22	Mod Well	45			sandstone	72	40 water				F1	4-8	LF gr	Vfr	CW	-	cmd	57	
Oe	1	2.5R2.5	-	-	-												Cf	F1								
A	2	10YR 3/2	S1	10	60												Ff	F1								
E	6	10YR 5/2	S1	10	65												Ff	F1								
Bw1	24	10YR 6/4	S1	12	65												Ff	F1								
Bw2	32	10YR 6/6	S1	12	65												Ff	F1								
Zb _{u3}	45	7.5YR 6/5	S1	12	55												Ff	F1								
ZR	45+	-	-	-	-												-	-								

Other Notes: see page 2 @ 6-32' water @ 40'

TEST PIT DESCRIPTION

Soil Scientist: Steve D'Alto
 Field Assistant: Alastair Ertter

Signature: Steve D'Alto

REITW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P152-160006-1257 - SdD					Topographic Position:	backslope										
Date:	06/06/16					% Slope:	3%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W/D										
REITW Job #:	089962000					Depth to Refusal:	32										
NRCS Soil Unit:	Lehew - Berks					Bedrock Type:	Sandstone										
Mineralogy:	Mixed					Vegetation:	black oak, Mahonia laurel, red maple										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	bedrock positions	Structure Type, Grade, and Size	Molt Consistence	Median Boulder Diameter	Redox Feature Color	Redox Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
Oa	2	10YR 2/1	-	-	-	f1 20	6-12	-	-	-	aw	-	-	cf cm	<.25 4.5	-	
A	3	10YR 3/2	SI	10	60	f1 20	6-12	PS SU	1 fgr	vfr	aw	-	-	cf cm	<.25 4.5	-	
Bw1	18	7.5YR 5/6	1	12	45	9f 25	2-4	PS SS	1 m sbk	fr	cu	-	-	ff cm	1.75 5.25	-	
Bw2	32	7.5YR 5/6	1	12	45	9f 40	1-2	PS SS	1 m sbk	fr	aw	-	-	fm	1.5 5.25	-	
2R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Mustafa Elen

Signature: _____

Steve Radio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P153-160606-1407-sdd Topographic Position: Footslope / bench
 Date: 06/06/16 % Slope: 18
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: ND - NW
 RETTEW Job #: 089962000 Depth to Refusal: 4
 NCRS Soil Unit: Oriskany Bedrock Type: red sandstone
 Mineralogy: Mixed Vegetation: red maple, chestnut oak, mountain laurel

USDA

Parent material: _____ Slope Aspect: _____
 Depth to Water Table: _____ Slope Failure or slip: N/A
 Dip Slope & Direction: 8 Strike: 45

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragmentation Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Confidence	Moisture Boundary Topography & Direction	Redox Feature Color	Moist Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
Oe	2	5YR 2.5/1	-	-	-	F1 30	6-12	-	-	-	aw	-	-	CVF MF M	<.25 4.5	-	-
A	3	10YR 3/2	sil	15	30	F1 30	8-12	pd ss	1 fgr	vfr	aw	-	-	MF HM	.25 4.5	-	-
BE	10	7.5YR 4/6	sil	16	30	cb 40	3-6	ps	1 f sbk	fr	cw	-	-	CF CM	.25 5.25	-	-
B+1	24	7.5YR 5/6	sil	18	30	cb 40	3-6	ps ss	2 m sbk	fr	cw	-	-	FF FM	.50 5.25	-	-
B+2	42	7.5YR 5/6	1	16	46	gc 30	2-4	ps ss	1 msbk	fr	aw	7.5YR 5/8 7.5YR 6/3	cmd cmd	FF FF	1.00 5.25	-	-
2R	42+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: _____

water seeping @ 28"

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Mustafa Enken

Signature: Steve Radio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P15H-160606 - 1417 - 5DD					Topographic Position:	backslope										
Date:	06/06/16					% Slope:	24%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Moderately Well AD										
RETTEW Job #:	089962000					Depth to Refusal:	3Z										
NRCS Soil Unit:	Oriskany					Bedrock Type:	sandstone										
Mineralogy:	Mixed					Vegetation:	chestnut oak mountain laurel										
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/soiliness	Structure Type, Grade, and Size	Moist. Consistence	Median Boundary Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Moist. Temperature/ pH	Lab Sample ID	Notes
Oe	4	5YR 2.5/1	-	-	-	f1 60	6-12	-	-	-	aw	-	-	M F M M	4.25 4.5	S1	broken roots
A	8	10YR 3/2	1	10	50	f1 60	6-12	P0 50	1f gf	vfr	aw	-	-	M F M M	.25 4.5	S2	
B+1	20	7.5YR 5/6	1	15	50	ch 40	2-4	P5 55	1msbk	fr	cw	-	-	CH FC	.25 4.75	S3	
B+2	32	7.5YR 5/6	1	15	50	ch 40	2-4	P5 55	1msbk	fr	aw	7.5YR 5/6 6/3	cmd cmd	FM FC	2.0 5.0	S4	
2R	32 ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Duane A. Thruex
 Field Assistant: Max Dugan

Signature: _____



Test Pit ID:	P-155-160606-1110-DAT		Topographic Position:	Backslope		Parent material:	Colluvium									
Date:	06-06-2016		% Slope:	32%		Slope Aspect:	19° South									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Well Drained		Depth to Water Table:	N/A									
RETTEW Job #:	089962000		Depth to Refusal:	> 46" (Refusal on Boulders)		Slope Failure or slip:	N/A									
NRCS Soil Unit:	Oriskany cobbly sandy loam		Bedrock Type:	N/A		Dip Slope & Direction:	N/A									
Mineralogy:	Siliceous		Vegetation:	Mixed Oak Vervetex, Longleaf Pine, Mountain Laurel		Soil Series:	N/A									
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Soil Boundary Type, Depth, & Extent	Redox Feature Color	Soil Texture Description	Roots	Soil Resistance/ pH	Lab Sample ID	Notes
De	0-1	5YR 2.5/1	-	-	-	-	-	-	-	SA	-	-	3F 2CO	- 4.5	S-1A S-1B	
A	1-2	7.5YR 3/1	sil	5	35	GN 20%	0.25-1.5	GR 1F	VRL	SA	-	-	1M 2CO	0.25 4.4	S-2A S-2B	
E	2-4	7.5YR 5/2	sl	6	65	XGR 65%	0.5-2.0	SBR 1M	VRL	IA	-	-	2M	4.3	S-3A S-3B	
B+1	4-12	7.5YR 5/4	l	15	50	VGR 40%	0.5-2.0	SBR 1CO	FL	SA	-	-	2M	1.25 4.6	S-4A S-4B	
B+2	12-24	7.5YR 5/4	l	22	46	XGR 60%	0.5-3.0	SBR 1CO	FL	SA	-	-	1M	1.75 4.5	S-5A S-5B	
BC	24-30	7.5YR 5/4	sl	16	58	XGR 70%	0.5-3.0	SBR 1M	FL	SA	-	-	1M	1.5 4.5	S-6A S-6B	
C	30-46	7.5YR 5/4	sl	11	61	XCB 85%	0.5-16"	SBR 1M	FL	IA	-	-	1M	1.25 4.7	X	NO SAMPLE; INSUFFICIENT FINES

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DiAnne A. Trux
 Field Assistant: Max Dugan

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-15G-160606-1355-DAT				Topographic Position:	TOESCOPE		Parent material:	Callivium									
Date:	06-06-2016				% Slope:	10%		Slope Aspect:	120E									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	Somewhat Poorly Drained		Depth to Water Table:	22"									
RETTEW Job #:	089962000				Depth to Refusal:	N/A		Slope Failure or slip:	N/A									
NRCS Soil Unit:	Oriskany cobbly sandy loam				Bedrock Type:	N/A		Dip Slope & Direction:	N/A									
Mineralogy:	Siliceous				Vegetation:	Various Oaks, Sugar Maple, Long Leaf Pine, etc. Laurel		Strike:	N/A									
USDA																		
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting systems	Structure Type, Grade, and Size	Moist Consistence	Rooting System	Redox Feature Color	Redox Feature Description	Roots	Field Infiltration	Lab Sample ID	Notes	
0e	0-2	7.5YR 2.5/1	-	-	-	-	-	-	-	-	IA	-	-	3F 2m	4.0	S-1A S-1B	many cobbles and stones on surface	
E	2-6	7.5YR 5/2	SL	5	65	KOR 80%	0.5-12.0"	PO	SBR 2, 1	VMS IA	IA	-	-	2F 2m	4.3	S-2A S-2B		
																		PO
Bt1	6-15	10YR 5/6	SL	12	55	GN 10%	0.25-2.0	PO	SBR 1, 2	VMS SA	SA	-	-	2m	4.6	S-4A S-4B		clay skins
Bt2	15-22	10YR 6/6	SL	16	48	GN 5%	0.25-2.0	PO	SBR 1, 2	VMS SA	-	-	-	1m	4.6	S-4A S-4B	clay skins	

Other Notes: Perched Water Table at 22" prevented description of profile to a greater depth

TEST PIT DESCRIPTION

Soil Scientist: Duane A. Trax
 Field Assistant: Max Dugan

Signature: 

Loess does not contain coarse fragments; not present. Just a second colluvial event.

RETTEM Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-157-160606-1512-DAT Topographic Position: BACKSLOPE Parent material: loess / colluvium / residuum
 Date: 06-06-2016 % Slope: 9% Slope Aspect: 1230°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: Well drained Depth to Water Table: N/A
 RETTEM Job #: 089962000 Depth to Refusal: N/A Slope Failure or slip: N/A
 NRCS Soil Unit: Oniscany cobbly sandy loam Bedrock Type: N/A Dip Slope & Direction: N/A
 Mineralogy: Siliceous Vegetation: Various oaks, Longleaf Pine, Mt. Laurel

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure / Stability	Structure Type, Grade, and Size	Moist Consistence	Reaction Boundary Temperature & Resistance	Redox Feature Color	Reaction Feature Description	Roots	Root Penetration / pH	Lab Sample ID	Notes
De	0-2	7.5YR 2.5/1	-	-	-	-	-	-	-	-	SA	-	-	3) F 2) m	-	S-14	
A	2-4	7.5YR 4/2	Silt	10	20	GR 59%	0.25-0.5	PO	SBR 1, VF	VFR	SA	-	-	2) F 2) m 1) Co	0.5	S-2A	
															4.5	S-2B	
Bw	4-11	7.5YR 5/4	Silt	10	26	GR 109%	0.25-1.0	SS	SBR 1, m	FR	SA	-	-	1) m 1) Co	1.0	S-3A	
															5.5	S-3B	
2Bt1	11-18	7.5YR 5/6	silt	31	18	-	-	SS	SBR 1, Co	FR	SA	-	-	1) m 1) Co	1.75	S-4A	
															5.7	S-4B	
2Bt2	18-26	5YR 5/6	Sic	48	6	-	-	MP	DR	FR	SA	-	-	1) m	3.5	S-5A	
															6.0	S-5B	
2Bt3	26-38	5YR 5/6	C	55	5	-	-	VP	SBR 2, Co	FI	SA	-	-	1) m	4.0	S-6A	Lithochromic colors
															6.4	S-6B	
2Bct	38-50	7.5YR 5/6	Sic	38	11	GR 11%	0.25-1.0	MP	SBR 1, Co	FR	SA	-	-	1) m	3.4	S-7A	Lithochromic colors
															6.7	S-7B	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALK
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-158-160606-1717-22M		Topographic Position:	TOE SLOPE		Parent material:	CORALLIUM										
Date:	6/6/16		% Slope:	5		Slope Aspect:	300°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	POOR Somewhat Poorly		Depth to Water Table:	1"										
RETTEW Job #:	089962000		Depth to Refusal:	-10" - WATER TABLE		Slope Failure or slip:	-										
NRCS Soil Unit:	OLISKAWY		Bedrock Type:	- (NO BEDSTONE)		Dip Slope & Direction:	-										
Mineralogy:	SILICEOUS		Vegetation:	MAPLE, RUBBER BENDER, WHITE PINE, CUESTANT, DARK SPASSARTS		Strike:	-										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Musky/Stubby	Structure Type, Grade, and Size	Moist Consistence	Hydrom Boundary Topography & Distribution	Redox Feature Color	Major Feature Description	Roots	Field Temperature/ pH	Lab Sample ID	Notes
De	0-3	5YR2.5/1	-	-	-	-	-	-	-	-	am	-	-	2-V, F, E 1-CO	4.0	-	-
A	3-5	10YR2.5/3	qR sL	10	75	25 qR	2-5	PO SO	1M qR	vR	cm	-	-	2-F, M (METS)	-	-	-
Bm	5-10	10YR5/6	vR sL	13	72	50 qR	2-6	SS	1M sR	FR	-	-	1-F, M	(METS) 4.0	-	-	-

Other Notes: 20' E OF STREAM; SANDSTONE ON SURFACE; 1ST AND 2ND ORDER STREAM - LOT 1
OF WATER MOVING; LITTLE TO NO CONCRETE FEELS/LOPE - STEEP BACKSLOPE TO
REMAINING THAT REQUIRE BRIDG STREAM IN VALLEY BOTTOM;

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAM
 Field Assistant: _____

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Redox Feature Color	Moist Consistence	Structure Type, Grade, and Size	Rock Fragment Type & %	% clay	% sand	Texture Class	Matrix Color	Depth in Inches	Horizon	Notes
P-159-160806-1400-JSW	6/6/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	ORILEVNY	SLICEVDS	BACKSLOPE - LINEAR	26%	SOMEWHAT EXCESSIVE	-	SANDSTONE	WINTERBARK WHITE PINE LAUREL BLUEBERRY	COLLUVIUM OVER RESIDUUM	286°	-	-	-	3-VF 2-F,M	-	FR	2MSBK	25 qR	-	-	GR	5YR2.5/1	0-3	0p	CLAY SEEDS
D	5-4																3-VF, F 2-M	-	FR	1F, FR	25 qR	13	45	GR	10YR5/1	5-4	D	CLAY SEEDS
BE	7-6																2-VF, F M	-	FR	1MSBK	40 qR	16	45	GR	10YR5/6	7-6	BE	CLAY SEEDS
Bk1	6-3																2-F, M	-	FR	2MSBK	20 qR	23	40	GR	5YR5/6	6-3	Bk1	CLAY SEEDS
Bt2	13-24																2-F, M 1-C	-	FR	2MSBK	30 qR	26	40	GR	7.5YR5/6	13-24	Bt2	CLAY SEEDS
2Bc	24-50																-	-	FR	1M, RV	36 qR	10	70	GR SL	5YR5/6	24-50	2Bc	LITHOCLASTIC CLAY SEEDS

Other Notes: LINEAR - MID-LOWER BACKSLOPE; SIMILAR TO P-160; RED SANDSTONE AND SURFACE

TEST PIT DESCRIPTION

Soil Scientist: Jordan Walsh
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3722
 Fax: 717-394-5063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Minerology:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content:	Redox Feature Color:	Notes
P-160-10606-1210-55W	6/6/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DEKALB-ARTISTEEST	31U15003	BACKSLOPE - UNKAR	32%	SOMEWHAT EXCESSIVE	-	SANDSTONE	CHESTNUT OAK, LAUREL, BLUEBERRY	COCCUMIUM OVER RESIDUUM	285°	-	-	-	3-5' FM	2.0	-	CLAY SANDS FEW DECAHYDUS SANDSTONE
De	0-3	CL/R2S/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3-5' FM	4.0	-	CLAY SANDS
A	0-1	10/R2S/1	13	70	25 4R	1-2	20 50	1FR	NR	2M	-	-	-	-	-	-	3-5' FM 2-4' FC	0.25	-	CLAY SANDS
BS	0-1	10/R2S/1	10	70	60 4R	2-4	SS	1MSBK	FR	2M	-	-	-	-	-	-	3-5' FM	4.5	-	CLAY SANDS
BT	0-2	10/R2S/1	21	62	40 4R	2-4	SS	2MSBK	FR	2M	-	-	-	-	-	-	2-5' FM 1-2' FC	0.5	-	CLAY SANDS
20X2	0-3	CL/R2S/1	41	28	5 4R	<1	MS	2MSBK	FR	2M	-	-	-	-	-	-	2-5' FM	2.0	-	CLAY SANDS FEW DECAHYDUS SANDSTONE
20C	0-5	CL/R2S/1	35	30	10 4R	<1	SS MP	1MSBK	FR	-	-	-	-	-	-	-	1-2' M	2.0	-	CLAY SANDS FEW DECAHYDUS SANDSTONE

Other Notes: LINER BACKSLOPE; RED SANDSTONE ON SURFACE

TEST PIT DESCRIPTION

Soil Scientist: JOHN WELLS
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-161-16060a-1130-33W																
Date:	6/6/16																
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																
RETTEW Job #:	089962000																
MRC Soil Unit:	DEKALB-ALTICEEST																
Mineralogy:	MIXED																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Hardness/Soilness	Structure Type, Grade, and Size	Mold Consistence	Moisture Regime	Redox Feature Color	Redox Feature Description	Roots	Field Measurement/ pH	Lab Sample ID	Notes
De	0-2	4-10R-5/1	-	-	-	-	-	-	-	-	as	-	-	3-V,F,F 2-M	4.5	S1 A/B	
A	2-3	10YR3/2	CH SIL	13	15	25 CH	< 1	PO SO	2-4R	FR	am	-	-	3-F 2-V,F,M	4.5	S2 A/B	
Bt	3-5	10YR5/6	CH SIL	18	25	30 CH	< 1	SP SS	2M1BK	FR	as	-	-	2-F,M	4.5	S3 A/B	RAY SKINS
Cr	5-30	10YR5/6	XCH SIL	13	15	90 CH	1-3	SP SS	0MA	FR	-	-	-	1-F	-	-	FINES BETWEEN COE
R	36+																

Other Notes: ROAD SHOULDER, SLIGHTLY LOWER UPON DARK STEPS; SOME COARSE SANDS; SEE AT 36";

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALKER

Field Assistant: _____

Signature: _____



Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mimnerlogy:	Topographic Position:	Parent material:	RESIDUUM	Notes
P-162-160606-1040-SSW	6/6/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DEKALB - ATLICREST COMPLEX	MIXED	% Slope:	Slope Aspect:	20%	
						Drainage Class:	Depth to Water Table:		
						Depth to Refusal:	Slope Failure or slip:		
						Bedrock Type:	Dip Slope & Direction:		
						Vegetation:			
						GUESTINUT OAK, RED OAK, MAPLE, WHITE PINE, LAUREL, BERRY			
						USDA			
De	0-9	5YR2.5/1	-	-	-	gM	-	3-VE 2-F,M	Lab Sample ID: S1 A/B
A	3-5	2.5YR3/3	L	13	40	2F	-	2-VE/F L-C	Lab Sample ID: S2 A/B
DE1	5-1X	5YR4/6	SIL	16	30	5	-	2-F,M	Lab Sample ID: S3 A/B
DE2	5-1X	5YR4/6	SIL	17	29	7	-	2-F	Lab Sample ID: S4 A/B
DE3	5-1X	5YR4/6	SIL	15	30	10	-	2-F	Lab Sample ID: S5 A/B

Other Notes:

2.25%
 4.25%
 SUBMIT SWIRLING TO S, STEEP BACKSLAPE TO E, ROAD IN OVERLOOK TO W

TEST PIT DESCRIPTION

Soil Scientist: DAVID MATA
 Field Assistant: DAVID FOSTER/MAURER

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-163-160620-1126-55W		Topographic Position:		BEEKSTONE		Parent material:		CONVULSION OVER RESIDUUM									
Date:	6/20/16		% Slope:		46%		Slope Aspect:		1150									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WET		Depth to Water Table:		-									
RETTEW Job #:	089962000		Depth to Refusal:		39'		Slope Failure or slip:		FEW BENT TREES									
MIRCS Soil Unit:	Mec 2.0-5/1		Bedrock Type:		SANDSTONE		Dip Slope & Direction:		-									
Mineralogy:	SILICEOUS		Vegetation:		MAPLE WHITE OAK, KICKAPOY, CHESTNUT OAK		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Penetration/ Scales	Structure Type, Grade, and Size	Mohr Consistence	Moisture Boundary Topography & Descriptions	Redox Feature Color	Redox Feature Description	Roots	Proctor Permeability/ pH	Lab Sample ID	Notes	
0a	0-2	S/R2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VE, F	-	-	-	
A	2-11	10YR 5/1	L	10	42	10 qz	< 1	P ₀ S ₀	1E qz	VER	aw	-	-	3-VE, F 2-M 2-C	0.25	-	-	
Bm1	11-11	7.5YR 5/1	SL	10	68	10 qz	< 1	P ₀ S ₀	1M SDR	VER	cm	-	-	2-VE, F 3-F, M	0.25	-	-	
Bm2	11-23	7.5YR 4/6	SL	11	72	1c qz	1	P ₀ S ₀	1M SDR	VER	cm	-	-	2-F, M 1-C	0.5	-	-	
2Bm3	23-39	7.5YR 4/6	SL	11	75	25 qz	1-4	P ₀ S ₀	1M SDR	FR	aw	-	-	1-C, M	0.5	-	-	DIRTYED SAND-STEVED COT
2R	39-x	SANDSTONE					BED ROCK											

Other Notes: DIP 14 degree W/E/W

TEST PIT DESCRIPTION

Soil Scientist: John W. Hall
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3030 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-164-160820-11P-JSW				Topographic Position:	BACKSLOPE				Parent material:	CLAY OVER RESIDUAL							
Date:	6/20/16				% Slope:	45%				Slope Aspect:	129°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WELL				Depth to Water Table:	-							
RETTEW Job #:	089962000				Depth to Refusal:	40				Slope Failure or slip:	FURNENT TREES							
NRCS Soil Unit:	ACCUNG-VLY				Bedrock Type:	SANDSTONE				Dip Slope & Direction:	30° NW/300° Strike: 216°							
Mineralogy:	SILICEOUS				Vegetation:	MAPLE, HICKORY, CHESTNUT, OAK, CHESTNUT, BUCKEYE												
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Feeding/Stubness	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Elevation	Redox Feature Color	Median Feature Description	Roots	Median Permeability/ pH	Lab Sample ID	Notes	
0v	0-2	5/YR 2.5/1	-	-	-	-	< 1	-	-	-	as	-	-	3-VF, F	-	4.9	-	
A	2-1	10/YR 3/2	SL	7	68	10 GR	< 1	PO	1 F GR	VFR	am	-	-	3-VF, F	0.25	-		
								SO						2-F, M	0.25	-		
BE	4-10	7.5/YR 9/6	SL	9	72	10 GR	< 1	SO	1 F SBK	UTR	bm	-	-	1-C	5.1	-		
								SP						1-F, M	0.5	-		CLAY SANDS
FA1	10-19	7.5/YR 5/6	SL	18	65	12 GR	< 1	SS	2 M SBK	FR	cm	-	-			-		
								SP										
BA2	19-29	7.5/YR 5/6	GR SCL	24	55	30 GR	0.5-3	SS	2 M SBK	FR	cm	-	-	2-M				
								SP							1.0	-		TNES DECAYING SAND- STEMM CORE
2BC	29-36	7.5/YR 9/6	L	15	50	20 GR	< 1	PO	1 F SBK	FR	cm	-	-		0.75	-		CLAY SANDS
								SS							4.8	-		
2C1	36-40	-	-	-	-	-	-	SO	-	-	-	-	-	-	-	-	-	
2R	40+	SAND	STONNY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: SEES ROOT BEDROCK DIPPING INTO HILLSIDE!

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALL
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-165-140620-1112-SSW		Topographic Position:	BACKSLOPE		Parent material:	CALUVIUM										
Date:	6/20/16		% Slope:	25%		Slope Aspect:	127°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WELV		Depth to Water Table:	-										
RETTEW Job #:	089962000		Depth to Refusal:	-		Slope Failure or slip:	FURNENT TREES										
NRCS Soil Unit:	OR1SKNY		Bedrock Type:	-		Dip Slope & Direction:	-										
Mineralogy:	GILCEODS		Vegetation:	MAPLE, CHESTNUT OAK, FEW BUCKEY		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Molt Consistency	Moist Boundary Topography & Disturbance	Redox Feature Color	Water Feature Description	Roots	Proctor Parameters/ ρ_d	Lab Sample ID	Notes
00	0-1	S1R2.5/1	-	-	-	-	-	-	-	-	-	-	-	3-VF, F	~	-	
A	1-4	10YR2/1	X9R SV	5	75	65 9R	1-2	PO	1FR	VER	awn	-	-	3-VF, F 2-M 1-Vc	0.25	-	SANDSTONE COE
BE	4-19	2.5YR2.5/10	9R SV	12	72	20 9R	1-3	PO	1FSBK	FR	CS	-	-	3-F 2-M	0.25	-	
OE1	19-26	2.5YR2.5/10	SV	18	70	10 9R	<1	SP	2MSBK	FR	awn	-	-	2-M 1-F	0.75	-	FN DISCONT. CLAY
OE2	26-37	2.5YR2.5/10	SV	15	75	55 9R	1-4	PO	2MSBK	FR	awn	-	-	2-F, M	1.0	-	
OC	37-50	2.5YR2.5/10	SV	10	80	70 9R	<1 1-2	PO	1FSBK	VER	-	-	-	-	4.5	-	

Other Notes:

SANDSTONE FLAG > 8" old SURFACE

TEST PIT DESCRIPTION

Soil Scientist: LOREN WATTS
 Field Assistant: _____

Signature: _____

Somewhat poorly drained

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Soil Temperature (Zones)	Redox Feature Color	Soil Temperature (Zones)	Lab Sample ID	Notes	
T-166-160020-1107-25N	6/20/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DRISKANY-MURRELL	SILICEOUS	BACKSLOPE	8%	Very poorly drained			WASTE DRK CHESTNUT DRK CHESTNUT MERR, BEVERLY	COLUVIUM	13°	37"			2-V, F, M	AS	-	M2D			
A	1-3	2.5/x/A		CD SL			9	75	15	CU	<1	PO	SO				2-V, F, M						
PE	4-11	10F x/10		FR SL			13	72	20	QR	1-4	PO	SO				2-F, M						
Bt1	11-18	2.5FR5/6		FR SL			18	72	25	QR	1-4	ST	SS				1-F, M						
Bt2	18-35	2.5FR5/10		FR SL			17	75	75	CB	4-8	PO	SS										
BtX	35-47	1.5FR5/6		FR SL			18	77	10	QR	1<	SP	SS										

Other Notes:

WATER SEEPING IN AT 37"

TEST PIT DESCRIPTION

Soil Scientist: John W. M. M.
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Soiliness	Structure Type, Grade, and Size	Mott. Consistence	Moisture Boundary Temperature & Moistness	Redox Feature Color	Moist Feature Description	Roots	Moisture Penetration/pt	Lab Sample ID	Notes
7-167-160620-1034-35W	0-3	5YR5/1	-	-	-	-	-	-	-	-	as	-	-	3-V5, F1	4.3	S1	
	3-5	10YR3/1	FSL	5	72	-	-	po	1FR	UFR	am	-	-	3-VF	4.5	S2	
	5-11	10YR5/4	L	17	48	-	-	st	2MSBK	ER	cs	10YR4/6	C2F	2-E, M	4.2	S3	↑VES
	11-22	10YR5/4	SicL	38	10	-	-	mp	2COSK	ER	cs	10YR5/6	C2D	2-VF, F1	4.7	A/B	↑VES TU DISCONTIN. CLAY SKIN
	22-30	10YR5/3	CU	36	25	-	-	mp	2MSBK	ER	cs	7.5YR5/6	C2D	2-F, M	4.5	SS	↑VES
	30-38	10YR5/2	SCL	22	55	-	-	ss	2MSBK	FR	cs	4.5YR5/8	C2P	L-F	4.5	A/B	
	38-50	2.5Y10/4	SL	8	79	-	-	po	1COSBK	FR	-	10YR4/6	M3D	-	4.5	S7	DEUSE IN PLACE
	50-68							so				2.5Y10/2	F3F				

Other Notes:

BECKS VORPE, UNDER 4 M SE OF COUNTESS DRIVE; PROTO-STODIC
 HOPIZON, 4.1", 5YR9/6 ON RIGHT SIDE OF PIT FACE

USDA

TEST PIT DESCRIPTION

Soil Scientist: D. Fenwick
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Structure Type, Grade, and Size	Moist Consistency	Redox Feature	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Moist. Resistance/pen	Lab Sample ID	Notes		
Q-170-100620-1172-DEF	4/20/14	Dominion - Atlantic Coast Pipeline Soil Survey	Dakota Alluvium complex (R2D)	Mixed	De	0-1.75	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					A	1.75-3	10YR 2/1	LS	15	85	30% CB	1/4-7"	1CSBK	VFR	AW	-	-	-	-	-	-	3F 2M	0.05 4.1	S2		
					E	3-4	10YR 2.5/2	LS	5	45	30% CB	1/4-7"	1CSBK	VFR	AW	-	-	-	-	-	-	1F	0.05 4.3	S3		
					Bks	4-6	7.5YR 4/4	SL	7	78	30% CS	1/4-7"	1CSBK	VFR	CWB	-	-	-	-	-	-	3F 2M 1/10	0.05 4.1	S4	Broken in 1/2 way. not present in 100% of pit	
					Bw	6-21	10YR 5/4	SL	7	76	30% GR	1/4-8"	1CSBK	VFR	CW	-	-	-	-	-	-	2F 1/10	0.05 5.3	S5		
					B3L	21-27	10YR 5/4	SL	7	76	40% CB	1/4-14"	1M5BK	VFR	AW	-	-	-	-	-	-	2F	0.05 5.3	S6		
					B2R	27-31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Perry Tenmacker
 Field Assistant: Kalval Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-171-160630-1045-DEF		Topographic Position:		Lower Backslope		Parent material:		Colluvium over Residual								
Date:	01/20/10		% Slope:		18		Slope Aspect:		136°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:		-								
RETTEW Job #:	089962000		Depth to Refusal:		30"		Slope Failure or slip:		-								
NRCS Soil Unit:	O ¹ Skony-Murill-complex (Glc)		Bedrock Type:		Cherty Sandstone		Dip Slope & Direction:		20° SSE								
Mineralogy:	Mica		Vegetation:		Hickory, Chestnut, Oak, Hop hornbeam, Blueberry		USDA		Strike: 55°								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/porosity	Structure Type, Grade, and Size	Molar Constituents	Major Secondary Topography & Outcrops	Redox Feature Color	Bedrock Feature Description	Roots	Prober Penetration/ft	Lab Sample ID	Notes
A	0-25	10YR2/2	SL	12	78	15% GrL	2-3"	So	1F5Bk	VF	AW	-	3F Rm l/c	0.2 4.5	S1	thin drift layer	
Bw1	25- 9.5	10YR 5/3	SL	12	73	38% GrL	1/4-5"	So Sd	1F5Bk	VF	CW	-	2F l/m, l/c	0.25 5.5	S2		
Bw2	9.5- 19	10YR 5/4	SL	15	67	45% GrL	<3"	So Sd	1M5Bk	VF	CW	-	2F M	0.5 5.4	S3		
2Bw3	19- 25	7.5YR 5/4	SL	30	57	35% GrL	<3"	So Sd	1M5Bk	F	aw	-	2F l/m	1.5 4.6	S4	low	
2C	25- 30	7.5YR 5/4 (5D)	SCL	33	57	40% GrL	18"	So Sd	OM	F	AW	-	2F l/m	1.75 4.6	S5	Lithocolumn c note r5	
2R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:
 PM 2 - chert CoF present
 PM 1 - Sandstone CoF present

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Rachel Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-173-1606 20-117-0 EF
 Date: 01/20/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: 015Mcmg Muscill Complex (UdC)
 Mineralogy: Mix
 Topographic Position: Nose Slope
 % Slope: 18%
 Drainage Class: Well
 Depth to Refusal: 250
 Bedrock Type: -
 Vegetation: Saxifraga, blackberry, hop horn beam, red maple
 Parent material: Calvesium over Residuum
 Slope Aspect: SB
 Depth to Water Table: -
 Slope Failure or slip: -
 Dip Slope & Direction: -
 Strike: -

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Topography & Slope	Redox Feature Color	Redox Feature Description	Roots	Soil Temperature/ pH	Lab Sample ID	Notes
A	0-15	10YR 2/6	L	15	55	-	-	PO 15S 5M F1	F1	AM	-	-	3-4" roots	0.1	-	-
B4	15-17	10YR 2/6	L	19	44	-	-	PO 15M 5M F1	F1	CM	-	-	2-3" roots	2.0	-	fine sand
B4	17-19	10YR 2/6	L	19	44	-	-	PO 15M 5M F1	F1	CM	-	-	2-3" roots	4.7	-	-
B4	17-23	10YR 2/6	C	18	16	-	-	PO 15M 5M F1	F1	CM	-	-	1" roots	3.0	-	shredded clumps
B4	23-50	10YR 2/6	C	18	16	-	-	PO 15M 5M F1	F1	CM	-	-	1" roots	6.8	-	-
B4	50-100	10YR 2/6	SicL	45	12	15% CW	1 1/2"	PO 15M 5M F1	F1	CM	-	-	1" roots	2.75	-	orange red shale
														6.7		

Other Notes: Sandstone and Dolomitic Limestones Concretions

10, 33-50"

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermaker
 Field Assistant: RADWELL FIPPLE

Signature: Dennis Fenstermaker

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	0-173-160600-11A-DEF		Topographic Position:	Ballast		Parent material:	Residuals									
Date:	10/20/16		% Slope:	40		Slope Aspect:	S00									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Well		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	110		Slope Failure or slip:	-									
NRCS Soil Unit:	Cummings (9D)		Bedrock Type:	Dolomitic Limestone		Dip Slope & Direction:	-									
Mineralogy:	Mixer		Vegetation:	Sugar maple, Hop hornbeam, black locust, red oak, Black cherry		USDA	-									
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Reaction Summary Toxicity & Odors	Redox Feature Color	Redox Feature Description	Roots	Moisture Equivalent	Lab Sample ID	Notes
Oa	0-1	7.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	3+	7.2	S1	Reddish brown cobbles/stones on surface
A	1-5	7.5YR 4/0	g.l	19	25	-	-	2R5gk	Er	AW	-	-	2f.M	6.8	S2	Ins sands
Bt1	5-9	7.5YR 4/0	L	23	28	-	-	2M5bK	Fr	CU	-	-	2f.M	1.5	S3	
Bt2	9-16	7.5YR 4/4	C	44	18	8i. CN	2 1/4"	2M5gk	F?	AW	-	-	2f.M	4.8	S4	Strong clay films
R	16+															

Other Notes:

Occurs as shallow as 13" and as deep as 24"
 closed depression to SE.
 Limestone cobbles/stones on surface - more impurities in surface stones

TEST PIT DESCRIPTION

Soil Scientist: Russell Leno / John Galbraith
 Field Assistant: Steph Maceira

Signature: [Signature]

RETTEW Associates, Inc.
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 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	MRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Residuum	Notes							
P074-160621-145-RLC	6/21/2016	Dominion - Atlantic Coast Pipeline Soil Survey	MRCS 089962000	Mixed	Backslope	Slope Aspect:	1490								
					26%	Slope to Water Table:	28"								
					MWD	Slope Failure or slip:									
					Sq ft	Dip Slope & Direction:									
					Sandstone										
					Blueberry & Maple										
					USDA										
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist. Consistence	Moisture Boundary Temperature & Conductivity	Redox Feature Color	Redox Feature Description	Roots	Moisture Permeability/In	Lab Sample ID
O ₉	2	5YR2.5/1											2F 1M	2.0	S1
A	4	10YR3/1	FSL	10	60								2F	4.75	S2
AE	6	10YR2/1	FSL	10	60								2F	1.5	S3
E	23	2.5Y7/2	FSL	10	60								2F, 1M	1.5	S3
B ₁	28	10YR5/1	L	25	35								1F	3.5	S4
B ₂	39	10YR5/6	Sil	21	15									3.5	S5
R	39+													5.00	

Other Notes: Red Maple, Chestnut oak, Scarlet Oak, Black Oak, Sassafras, highbush blueberry

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco / John Galbraith Signature: RLL
 Field Assistant: Steph Moravia

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Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes							
P175-110621-150 RLL	6/23/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	McClure-Matohala - Derals	Mixed	% Slope: <u>16%</u> Drainage Class: <u>WS - A</u> Depth to Refusal: <u>14"</u>	Slope Aspect: <u>170°</u> Depth to Water Table: <u>14"</u> Slope Failure or slip: <u>170°</u> Dip Slope & Direction: <u>160°</u>	Colluvial Residuals							
Vegetation: <u>Red Maple</u>						USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	National Standard Symbols & Distinctions	Redox Feature Color	Soil Texture Description	Roots	Rock Fragmentation	Lab Sample ID
Oa	1	SUR 2.5						FIGR	FR	CK			ZC	0	
A	3	10YR 3/11	FSL	8	55	50% ST	1/4"	FIGR	FR	CK			ZFIM	0	
E	7	10YR 6/14	L	16	40	50% ST	1/4"	FISBK	FR	G/S			11C	4.25	
B ₁	14	10YR 5/10	S-CL	29	15	100% ST	1/4"	FESBK	F1				1A	4.5	
R	14+													5.0	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco / John Galbraith
 Field Assistant: Steph Morace

Signature: 

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Test Pit ID: PT16-160621-1155-RLL Topographic Position: Mose - Shoulder Parent material: Colluvium over Piedmont
 Date: 4/21/2016 % Slope: 2% Slope Aspect: 1580
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: U5 Depth to Water Table: 50+
 RETTEW Job #: 089962000 Depth to Refusal: 50 Slope Failure or slip: —
 NRICS Soil Unit: McClure Ustollic - DeKalb Bedrock Type: Limestone Dip Slope & Direction: —
 Mineralogy: Mixed Vegetation: Red Maple Strike: —

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Roots/Stubble	Structure Type, Grade, and Size	Moist Consistence	Relative Amount of Topography & Direction	Redox Feature Color	Redox Feature Description	Roots	Field Test (pH)	Lab Sample ID	Notes
Da	1	5YR 2.5/1	—	—	—	—	—	—	F1UR	UR	ChS	—	—	2F1M	0	S1	
AE	8	10YR 5/10	fsl	10	65	—	—	PO	F1SB	UR	GpS	—	—	2F	1.5	S2	
								SO							5.25		
								PO							—		
Bw	37	10.5YR 2/10	SL	12	70	50% CN	2 x 18"	SP	M1SB	UR	ChS	—	—	2F1M	1.5	S3	
								SP							5.25		
								SP							—		
2Bt	50	7.5YR 4/10	C	50	10	—	—	VP	M1SB	F1	—	—	—	—	3.0	S4	
								VP							6.1		
								VP							—		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DAVID WAIN
 Field Assistant: TAYLOR WATERS

Signature: [Signature]

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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Moisture Content/ Wet wt	Lab Sample ID	Notes	
P-137-160622-1027-1 SW	6/22/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CLAYEY SANDS	SILICEOUS	BACKSLOPE	17%	MEDERATELY WELL	-	-	MATURE DICKCORY, STRIPPING MAPLE, FERN	COLUVIUM	310°	22" (STW)	-	-	3-VE, F	4.5	-	SANDSTONE CONE	
De	11	10YR 5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	11	10YR 5/1	8	72	40	1-3	PO	1EHR	VER	AW	-	-	-	-	-	-	3-VE, F	0.25	-	-	-
Bx1	11	10YR 5/1	7	75	10	<1	PO	1EHR	VER	CS	-	-	-	-	-	-	2-VE, F	6:5	-	-	-
Bx2	11	10YR 5/1	15	60	15	<1	PO	2MSBK	FR	CS	-	-	-	-	-	-	2-VE, F	1.5	-	-	-
Bx3	11	10YR 5/1	18	58	15	<1	PO	2MSBK	FR	CS	-	-	-	-	-	-	2-VE, F	5.2	-	-	-
Bx3	11	10YR 5/1	19	60	10	<1	PO	2MSBK	FR	-	-	-	-	-	-	-	2-VE, F	2.5	-	-	-

Other Notes: LOWER BACKSLOPE, 10 M ABOVE DRIVEWAY

TEST PIT DESCRIPTION

Soil Scientist: Duane Truax
 Field Assistant: Taylor Macken

Signature: 

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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Notes	
P-178-160621-1157-DAT	10-21-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	M1Glang-Watobala-Dekalb Complex	Siliceous	Shoulder	35%	Branchcut Pseudo David	48"	Sandstone	Pol Maple, Yellow Red Oak, Hickory, Alder	Calverton/Reedburn	190° S	N/A	N/A	N/A	3.1 ft	No Stumpes	
A	15-25	5YR 3/1	SLC	10	15	CL	0.25-2.0	SD	1.3	GM	UW	SA	-	-	-	3.1 ft	0.25	5-10	
De	0-15	5YR 2.5/1	-	-	-	-	-	-	-	-	-	IA	-	-	-	2.0 m	4.5	5-10	
Bu1	2.5-11	10YR 6/4	SLC	12	30	OL	0.25-2.0	SD	1.1	SBM	FR	SA	-	-	-	2.1 m	4.5	5-10	
Bu2	11-18	7.5YR 6/4	L	15	40	YCL	0.25-0.3	SD	1.3	SRM	ML	SA	-	-	-	1.1 m	4.5	5-10	
BC	18-29	5YR 6/4	L	14	48	YCL	0.25-0.3	SD	1.2	SRM	FAI	SA	-	-	-	1.1 m	3.25	5-10	
C	29-48	5YR 6/4	SLC	18	55	XCL	0.25-10.0	SD	1.9	SQM	WR	IA	-	-	-	1.1 m	4.6	5-10	
R	48+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	FINISHED SANDSTONE BEDROCK

Other Notes: Dip could not be determined due to irregular weathering of bedrock surface

TEST PIT DESCRIPTION

Soil Scientist: JORDAN WALK
 Field Assistant: TRAYLOR WALTER

Signature: [Signature]

RETEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETEW Job #:	MRCSS Soil Unit:	Miningology:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Parent Material/PI	Lab Sample ID	Notes
P-179-160621-1215-05W	6/22/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	MCCUNNY-WATDOLD-DEKVB	SILICEOUS	BACKSLOPE	35%	WELL-SOILMENT EXCESSIVE	-	-	SANDSTONE	SANDSTONE	2010	-	-	-	3-4F, P	<0.25	-	UNCOATED SAND GRAINS
DA	0-0.5	SYR 2.5/1	-	-	-	-	-	-	-	-	USDA	-	-	-	-	-	3-4F, P	<0.25	-	-
AE	0.5-2.5	10/25/13	VF	SL	6	78	GR 25 CB 15	<1	2-4	PO	IF 9K	VER	CM	-	-	-	3-4F, 2-4M, 1-2C	<0.25	-	-
BA	2.5-6	7.5/25/10	VF	SL	8	15	GR 30 CB 20	<1	2-4	PO	IF 5BK	VER	CM	-	-	-	3-4F, 2-4M, 1-2C	<0.25	-	-
BC1	6-24	10/25/10	VCB	LS	4	85	35 CB 30 ST	3-6	10-15	PO	IF 5BK	VER	CM	-	-	-	2-4M, 1-2C	<0.25	-	-
BC2	24-50	2.5/25/10	VCB	LS	4	87	35 CB 30 ST	3-6	10-15	PO	IF 5BK	VER	-	-	-	-	2-4M, 1-2C	5.5	-	-

Other Notes: UPPER BACKSLOPE USES/GROUNDED; REDD-STODIC HORIZON; SANDSTONE COBBLES AND STONED AND SURFACE

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALL

Signature: [Signature]

Field Assistant: TAYLOR WALTER

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Fax: 717-394-1063

Test Pit ID:	P-180-160621-1252-05W	Topographic Position:	BACKSLOPE/FOOTSLOPE	Parent material:	COCCUVIUM
Date:	6/22/16	% Slope:	35%	Slope Aspect:	146°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	MODERATELY WELL	Depth to Water Table:	29" (SW)
RETTEW Job #:	089962000	Depth to Refusal:	-	Slope Failure or slip:	FEW BENT TREES
NRCS Soil Unit:	DEKALB - WESTGAARD - MEDIUM	Bedrock Type:	SANDSTONE	Dip Slope & Direction:	-
Mineralogy:	SILICEOUS	Vegetation:	RESTAUR ORK	USDA	MAPLE / SASSAPARILLA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Roots/ nodules	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Topography & Drainage	Redox Feature Color	Redox Feature Description	Roots	Roots	Roots	Lab Sample ID	Notes
De	0-3	5R2.5/1	SC	4	4	-	-	-	-	-	AS	-	-	3-4 FT	2-M	4.5	-	-
A	3-5	2.5R2.5/1.5	SL	9	21	10 CB	4-6	PO SD	1F SBK	NEZ	CM	-	-	2-F, 1-M	1-4F	<0.25	-	-
B ₂	5-9	10YR2.5/6	SC	9	75	25 CB	4-6	PO SO	1F SBK	NEZ	CM	-	-	2-F, 1-M	C	-	-	-
B ₂	9-22	10YR2.5/6	SC	6	25	65 CB	4-10	PO SO	1F SBK	NEZ	CM	-	-	2-F, 1-M	E	<0.25	-	-
B ₂	22-50	10YR2.5/6	SC	5	85	65 CB	4-10	PO SO	1F SBK	NEZ	-	10YR2.5/6	C2F	1-M	5.0	-	-	POCKETS OF SL FEW STONES

Other Notes: LOWER DARKSLOPE/UPPER FOOTSLOPE BEGINNING TO BE CONCAVE;

TEST PIT DESCRIPTION

Soil Scientist: JORDAN WELLS
 Field Assistant: TAMARA WALTER

Signature: [Signature]

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 Fax: 717-394-1063

Test Pit ID:	P-181-160621-1300-35N	Topographic Position:	BACKSLOPE	Parent material:	COLLUVIAL ODEE RESIDUAL												
Date:	6/22/16	% Slope:	35%	Slope Aspect:	320°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WELL	Depth to Water Table:	-												
RETTEW Job #:	089962000	Depth to Refusal:	-	Slope Failure or slip:	-												
NRCS Soil Unit:	MELCUMH - WATAWULT - DEKALB	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	-												
Mineralogy:	MIXED	Vegetation:	MARLE WICKORY, CHESTNUT OAK, WITCH HAZEL, SASSAFERAS	Strike:	-												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Fracturing/Weakness	Structure Type, Grade and Size	Moist Consistence	Moist Boundary Topography & Discontinuity	Redox Feature Color	Moist Feature Description	Roots	Under Investigation/ft	Lab Sample ID	Notes
0a	0-3	S1R2.5/1	-	-	-	-	-	-	-	as	-	-	3-VF	4.5	-		
A	3-4	10R2/1	SIL	14	12	10 GR	<1	PO	1FR	VR	an	-	3-VF	0.25			
								SO					2-E				
								PO					1-CVNC	0.25			
BE	4-12	10R2/1b	SIL	13	18	12 GR	<1	PO	1SBK	FR	cs	-	3-E				
								SO					2-M				
								PO					1-CVNC				
Bx1	12-14	10R2/1b	GR	18	20	15 GR	<1	PO	2MSBK	FR	cm	-	1-M, c	0.75			
								SO					vc	4.5			
								SP					1-M, c				
Bx2	14-20	10R2/1b	GR	22	19	10 GR	<1	SS	2MSBK	FR	cm	-	1-M, c	1.0			
								PO					1-M				
								PO					1-M				
2BC1	26-33	S1R5/1b	SIL	16	25	25 CH	2-4	PO	1MSBK	FR	cm	-	1-M	0.5			
								SO									
								PO									
2BC2	33-50	S1R5/1b	SIL	14	22	85 CU	2-4	PO	1MSBK	FR	-	-		0.5			
								SO						4.5			

Other Notes: UPPER BACKSLOPE - SANDSTONE; PROX. SPINDLE HORIZON, <0.5% 2.5 GR/1.5
INTERBEDDED CHESTNUT SILTSTONE

TEST PIT DESCRIPTION

Soil Scientist: John Wais
 Field Assistant: Taylor Watter

Signature: [Signature]

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Test Pit ID:	Date:	Job Name:	NRCS Job #:	Mineralogy:	Topographic Position:	Parent material:	Notes												
P-182-160621-1310-35W	6/22/16	Dormition - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	Summit	colluvium over Residuum													
					% Slope: 3%	Slope Aspect:													
					Drainage Class: Well	Depth to Water Table:													
					Depth to Refusal:	Slope Failure or slip:													
					Bedrock Type:	Dip Slope & Direction:													
					Vegetation: Cucumber														
					USDA														
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soilness	Structure Type, Grade, and Size	Mold Confidence	Moisture/soilness	Redox Feature Color	Redox Feature Description	Roots	Roots	Roots	Lab Sample ID	Notes	
OB	0-2	5/2 4/1	-	-	-	-	-	-	-	as	-	-	-	3-VF,F	4.5	-	-		
A	2-4	10/2 3/2	SL	9	75	2 GR	< 1	PO	1 ER	SR	am	-	-	3-VF,F	0.25	-	-		1.5 8" sandstone core
								PO											
								SO											
BE	4-10	10/4 5/6	SL	14	70	2 GR	< 1	PO	1 MSBK	CR	CS	-	-	3-M	0.5	-	-		TM DISCONT. CLAY SKINS
								SO											
								SS											
Bx1	10-18	10/2 5/6	SL	17	72	2 GR	< 1	PO	2 MSBK	CR	CS	-	-	2-M	4.5	-	-		
								SS											
								MP											
								SS											
Bx2	18-32	5/2 5/6	SL	41	10	-	-	MP	2 COSBK	FI	cm	-	-	2-F	3-25	-	-		LITHOLOGIC CLAY SKINS DELAYING SILT-STONE ETC
								SS											
								MP											
								SS											
Bx3	32-50	5/2 5/6	SL	40	10	5 CIA	< 1	MP	2 MSBK	FR	-	-	-	-	4.5	-	-		
								SS											

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAH
 Field Assistant: TAYLOR WALTER

Signature: _____

[Handwritten Signature]

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Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes										
T-183-160621-1318-JSW	6/22/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DEKALB - WESTLYLE - MEDIUM SILICEOUS	BACKSLOPE	COLUVIUM											
					% Slope:	Slope Aspect:											
					Drainage Class:	Depth to Water Table:											
					Depth to Refusal:	Slope Failure or slip:											
					Bedrock Type:	Dip Slope & Direction:											
					Vegetation:												
					USDA												
					TUFF POORLY CEMENTED SAND, SASSAFRAS, FERN												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soiliness	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Direction	Redox Feature Color	Moisture Description	Roots	Moisture Retention/pt	Lab Sample ID	Notes
D _a	0-2	5YR5/1	-	-	-	-	<1	-	-	as	-	-	3-4 FT, 2-2	-	4.5	-	
D	2-4	10YR3/2	LS	4	87	2 qz	<1	po	1/4 qz	vfr	aw	-	3-4 FT, 2-2	<0.25	-		
B _m	4-10	10YR2/6	LS	5	85	2 qz	<1	po	1/4 sbr	vfr	cs	-	3-4 FT, 2-2	<0.25	-		
C ₁	10-21	10YR5/1	S	3	90	5 qz	1-2	po	0.5 q	co	cm	-	1-1/2	<0.25	-		
C ₂	21-50	10YR5/1	XCB S	4	90	6.5 qb	4-10	po	0.5 q	co	-	-		<0.25	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALKER
 Field Assistant: _____

Signature: [Signature]

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Test Pit ID:	Dominion - Atlantic Coast Pipeline Soil Survey				Topographic Position:	Parent material:												
Date:	6/2/16				% Slope:	300°												
Job Name:	RETTW Job #: 089962000				Drainage Class:	SOMEWHAT EXCELLENCE												
NRCS Soil Unit:	WEIKERT - BERKS - ROUGH				Depth to Refusal:	38"												
Mineralogy:	MIXED				Bedrock Type:	SHALE												
Vegetation: PIN OAK, SCARLET OAK, WHITE PINE, HICKORY, BLUEBERRY																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Confidence	Moisture/Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Roots	Roots	Lab Sample ID	Notes
Oe	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	am	-	-	2-VE	1-E	4.5	-	
A	2-5	10YR2.3/3	KCH SIL	12	15	65 CH	<1	PO	1MPR	VER	am	-	-	1-VE	2-E	4.5	-	
Bw	5-13	10YR5/6	KCH SIL	15	15	85 CH	1-3	PO SS	1MSPK	FR	am	-	-	1-F, M, C	4.5	-		
R	13+	SWACK	-	-	-	-	-	-	BI	ROCK	-	-	-	-	-	-	-	

Other Notes: Bedrock dipping into steps; trees 'bending' up slope; shale bedrock
about 38" in

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAH
 Field Assistant: _____

Signature: [Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-15C-160603-1034-15W																
Date:	6/2/18																
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																
RETTEW Job #:	089962000																
NRCS Soil Unit:	MELKENT-BEAKS-RODGM																
Mineralogy:	MIXED																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Mollic Consistence	Moisture Regime & Distribution	Redox Feature Color	Redox Feature Description	Roots	Product Development/ pH	Lab Sample ID	Notes
0e	0-1	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VE 2-F 1-M, C	5.5	-	-
A	1-3	10YR2.5/3	Y9R SIL	13	20	35 CH	< 1	PO	FRG VER	VER	am	-	-	2-VE, F L-M, C	0.25 4.5	-	-
Bm	3-12	10YR5/6	X9R SIL	15	20	70 CH	0.5-2	PO SS	1M, BK FR	FR	cm	-	-	2-F 1-M, C	0.5 4.5	-	-
Cc	12-23	10YR5/6	X9R SIL	12	18	89 CH	2-4	PO SO	OMP FR	FR	am	-	-	1-F	-	-	FIND ? BETWEEN ROCKS
R	23*																

Other Notes:

SCORING RIDGE SUMMIT, NARROW - BEAK TO STEEP BACKSLOPE ~ 3M TO W AND 4M TO E

TEST PIT DESCRIPTION

Soil Scientist: JOHN WARD
 Field Assistant:

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Topographic Position:					Parent material:		Notes									
Date:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:								
R-18 SA-160602-1234-JSW	6/7/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	WEIEST-BECKS-ROUGH	MIXED	BACKSLOPE	RESIDUUM	3420	5% N/W (92°) Strike: 7°								
Job Name:	Drainage Class:					Depth to Refusal:		Notes									
RETTEW Job #:	089962000					2870		SOMEWHAT EXCESSIVE									
NRCS Soil Unit:	Drainage Class:					26'		SHALE									
Mineralogy:	Bedrock Type:					SHALE		USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Molt Confidence	Nation Boundary Topography & Orientation	Redox Feature Color	Water Feature Description	Roots	Rock Permeability/ pH	Lab Sample ID	Notes
0e	0-2	10R2.5/1	-	-	-	-	-	-	-	-	AS	-	-	3-VE, E	4.5	-	
A	2-3	10YR2.3/3	NCU SIL	12	18	45 CH	< 1	PO	1-3	PO	VER	AW	-	2-VE-E	4.5	-	
B _u	3-12	10YR5/6	NCU SIL	14	20	75 CH	1-3	PO	1-3	PO	VER	AW	-	2-F	0.5	-	
R	12	SHALE BEDROCK												3-M	4.5	-	

Other Notes: BACKSLOPE BETWEEN TWO FLAT SUMMITS ON RIDGELINE; SOFT SHALE
 BEDROCK EXPOSED AT 19'-EXPOSED TO 26"

TEST PIT DESCRIPTION

Soil Scientist: JOHN MAH
 Field Assistant: _____

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-1XB-160607-1245-SSW																
Date:	6/2/16																
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																
RETTW Job #:	089962000																
NRCS Soil Unit:	WEIKERT-BARKS-ROUGH																
Mineralogy:	MIXED																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Suckness	Structure Type, Grade, and Size	Molt Confidence	Natural Boundary Topography & Obstacles	Redox Feature Color	Redox Feature Description	Roots	Field Resistance/ ft	Lab Sample ID	Notes
Oa	0-2.5	5YR 2.5/1	-	-	-	-	-	-	-	-	OS	-	-	3-VF, F 2-M	-	S1 A/B	
A	2.5-3	10YR 3/1	VCH SIL	12	22	40 CU	< 1	OS	1MBR	FR	OS	-	-	3-VF, F, M	0.25	S2 A/B	
Bm	3-6	10YR 5/1b	XCH SIL	14	20	80 CH	1-3	OS	1MSBK	FR	OS	-	-	3-F 2-M, L	0.5 4.7	S3 A/B	
Cc	6'-10'	10YR 5/1b	XCH SIL	13	20	90	2-5	OS	DMA	FR	OS	-	-	1-F	-	-	FINE & BETWEEN RINGS
R	10x	CHALK					BEDROCK										

Other Notes:

SUMMIT HASTON STAIRS RIDGE; STEEP BANKS (225%) W4M TO THE E AND W3M TO THE W.

TEST PIT DESCRIPTION

Soil Scientist: John Wain
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	7-187-160602-1422-05W					Topographic Position:	Summit					Parent material:	RESIDUUM						
Date:	6/2/16					% Slope:	8%					Slope Aspect:	306°						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE					Depth to Water Table:	-						
RETTEW Job #:	089962000					Depth to Refusal:	48"					Slope Failure or Slip:	-						
NRCS Soil Unit:	B1P1N					Bedrock Type:	SHALE					Dip Slope & Direction:	22° SE (140°) Strike: 50°						
Mineralogy:	MIXED					Vegetation:	PIN OAK, HICKORY, CHRISTNUT OAK												
USDA																			
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Moisture	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Temperature & Disturbance	Redox Feature Color	Root Feature Description	Roots	Roots	Roots	Lab Sample ID	Notes	
Oc	0-1.5	5R2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF,F	1-M	4.5	S1		
A	1.5-2	10YR5/2	VCH SIL	11	25	70 CH	< 1	PO	1FR	VER	am	-	-	3-VF,F	2-M	4.5	S2		
Bm	2-7	10YR5/6	XCH SIL	14	22	85 CH	1-3	PO	1M5BK	FR	ci	-	-	3-VF,F	2-M	0.5	S3		
C1	7-17	10YR5/6	XCH SIL	13	20	90 CH	2-5	PO	OND	FR	am	-	-	1-F	-	-	-	FINES BETWEEN	
R	17+	SHALE	BEDROCK																

Other Notes: SMALL ROUND SUMMIT KNOB

TEST PIT DESCRIPTION

Soil Scientist: Steve Radic

Signature: B. O'Neil

Field Assistant: Dave Skippin

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Rock Fragmentation Type & %	Rock Fragment Size (Inches)	Moisture Consistence	Moist Consistence	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes		
P188-160607-0937-514	06/07/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	M. Yed	Upper B5	27	WD	36	siltstone	white pine, chestnut oak, mountain laurel			N/A	15	170°	CF	30 gr	1-2	VF	VF	-	-	-	CF	<.25	thin "4" or present
Bw1	12	10YR 6/4	S11	16	20	30	gr	30	gr	1-2	PS	1msbk	fr	CW	CM	CM	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Bw2	20	10YR 6/4	S11	16	20	50	gr	50	gr	2-4	PS	1fshv	fr	aw	CM	CM	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		
2C	36	10YR 6/4	S11	14	10	80	fr	11-8	fr	aw	PS	0 m	fr	aw	FM	FM	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5		
2R	36																									

Other Notes:

plasticity was difficult due to ↑ rock content

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: S. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P189-160607-1143-5dd		Topographic Position:		lower backslope		Parent material:		colluvium / res								
Date:	06/07/16		% Slope:		38%		Slope Aspect:		180								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WD		Depth to Water Table:		N/A								
RETTEW Job #:	089962000		Depth to Refusal:		47		Slope Failure or slip:		N/A								
NRCS Soil Unit:	Weikert-Berks Rough Complex		Bedrock Type:		Siltstone		Dip Slope & Direction:		90 N Strike: 20°								
Mineralogy:	Mixed		Vegetation:		chestnut oak, hickory, white oak		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Molar Conductance	Moisture Regime & Observations	Redox Feature Color	Redox Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
Oa	2	10YR 3/2	-	-	-	30 gr	<.5	-	-	-	aw	-	-	CM FC	<.25 4.5	S1	
B+1	16	10YR 6/6	Sic1	30	10	30 gr	<.5	PS MS	2 m sbr	fr	cw	-	CF CM	2.25 5.25	S2		
Bt2	25	10YR 6/6	Sic1	32	8	40 gr	<.5	PS MS	2 m sbr	fr	cw	10YR 6/3 10YR 5/4	cm d cm f	CM CM	1.5 5.25	S3	
2Bc	35	7.5YR 5/6	Sic1	28	12	30 gr	2-4	PS SS	1 m sbr	fr	cw	10YR 6/3	cm d	FW	2.75 5.25	S4	
2C	47	7.5YR 5/6	Sic1		15	70 f1	3-6	PS SS	0 m	fr	aw	5YR 5/4	fm f	FW	5.25 3.0	S5	
2R	47+															-	

Other Notes: plasticity is difficult due to rock content

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadie
 Field Assistant: Dave Skippan

Signature: D. Dadie

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mold Consistency	Moist Consistency	Redox Feature Color	Redox Feature Description	Lab Sample ID	Notes
P190-160607-1315-sdd	06/07/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Gilppn	M1, 200	back slope	32	WD	42	42	White pine, black oak, mountain laurel	CS	32	W/A	W/A	20	CS	20	1msbk	fr	fr	-	-	330	Callunum hesidum	
De	2	5YR 2.5/1	-	-	gr	< .5	-	-	-	-	-	CVF	< .25	-	-	-	CF	1.0	-	-	-	-	-	-	-	
Da	4	10YR 2/1	-	-	gr	< .5	-	-	-	-	-	CM	.25	-	-	-	CF	4.5	-	-	-	-	-	-	-	
E	9	10YR 6/4	S11	20	gr	1-2	-	-	-	-	-	CF	1.0	-	-	-	CF	1.0	-	-	-	-	-	-	-	
B+1	20	7.5YR 5/6	S11	25	gr	1-2	-	-	-	-	-	CF	1.5	-	-	-	CF	1.5	-	-	-	-	-	-	-	
B+2	26	7.5YR 5/6	S11	30	ch	2-4	-	-	-	-	-	CF	1.75	-	-	-	CF	1.75	-	-	-	-	-	-	-	
2C	42	7.5YR 5/6	S11	22	ch	2-4	-	-	-	-	-	CF	2.25	-	-	-	CF	2.25	-	-	-	-	-	-	-	
R	42+																									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	p191-160607-1459-sdd					Topographic Position:	Summit					Parent material:	Residuum				
Date:	06/07/16					% Slope:	5					Slope Aspect:	260				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SED					Depth to Water Table:	N/A				
RETTW Job #:	089962000					Depth to Refusal:	24					Slope Failure or slip:	N/A				
NRCS Soil Unit:	Gilpin					Bedrock Type:	Siltstone					Dip Slope & Direction:	5° 120				
Mnerealogy:	Mixed					Vegetation:	Virginia pine chestnut oak, scarlet oak					Strike:	75				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Bulk Density	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ pH	Lab Sample ID	Notes
A	3	10YR ³ /5	S:11	14	10	Ch 40	1-2	PS	1 f gr	fr	aw	-	-	C f	1.0	-	
B ₁	8	10YR ⁴ /6	S:11	20	8	Ch 25	2-4	PS	1 m s bk	fr	cw	-	-	C f	1.0	-	
B ₂	13	10YR ⁴ /6	S:11	20	8	Ch 60	2-4	PS	1 m s bk	fr	aw	-	-	C f	1.75	-	
C ₁	23							-			aw					-	
R								-								-	

Very thin Oa (less than 1/4")

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippen

Signature: B Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P192-160607-1631-SD1 Topographic Position: upper backslope
 Date: 06/07/16 % Slope: 18
 Job Name: Domion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD
 RETTEW Job #: 089962000 Depth to Refusal: 36
 NRCS Soil Unit: Gilpin Bedrock Type: Siltstone
 Mineralogy: Mixed Vegetation: chestnut oak, blackgum, scarlet oak
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soiliness	Structure Type, Grade, and Size	Molt Conductance	Moisture Retention & Distribution	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/PI	Lab Sample ID	Notes
0e	2	5YR 2.5/1	-	-	-	gf 20	1-2	-	-	-	aw	-	-	CF	.25	-	
B+1	12	10YR 6/6	sil	25	15	gf 20	1-2	P5 SM	1 f sbk	fr	-	-	FF	1.25	-		
B+2	28	10YR 6/4	sil	23		ch 40	2-4	P5 SM	2 m sbk	fr	10YR 6/3	cmf	FF	1.75	-		
B+3	36	7.5YR 6/6	sil			ch 70	2-4	P5 SM	1 m sbk	fr	-	-	FM	2.25	-		5YR 5/8 lithochromic colors
ZR	36+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOYD WEL
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-193-160602-1620-JSM					Topographic Position:	BACKSLOPE		Parent material:	CALCIVUM OVER RESIDUUM								
Date:	6/2/16					% Slope:	35%		Slope Aspect:	70°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SOMEWHAT EXCESSIVE		Depth to Water Table:	-								
RETTEW Job #:	089962000					Depth to Refusal:	40"		Slope Failure or slip:	-								
NRCS Soil Unit:	BERKS-WEIKERT					Bedrock Type:	SILTSTONE/SILT		Dip Slope & Direction:	N								
Mineralogy:	MIXED					Vegetation:	CHESTNUT OAK, RED OAK, HICKORY, WHITE PINE		Strike:	-								
USDA																		
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soiliness	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Field Resistance/ pH	Lab Sample ID	Notes	
Da	0-2	5YR2.5/1	-	-	-	-	-	-	-	as	-	-	-	3-VF,F	4.4	-	-	
Bm	2-10	10YR5/6	XCH SIL	14	22	65 CH	1-3	PO SS	1MSSBK	FR CI	-	-	-	2-VF,M 3-F	4.5 4.7	-	-	
2C1	10-30	10YR5/6	XCH SIL	12	20	90 CH	2-5	PO SS	0MA	FR CW	-	-	-	1-M	-	-	-	BETWEEN ROCKS & WEATHERED SHALES
2B	30+	SHALE	SILT	STONY	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	

Other Notes:

Fe-RICH SHALE/SILTSTONE IN BOTTOM OF PIT AT 40", I.S.YR4/6;
 WEATHERED SOFT BEDROCK AT 10" BY EXT TO 36"

TEST PIT DESCRIPTION

Soil Scientist: Steve Radin
 Field Assistant: Dave Skippon

Signature: *[Signature]*

Test Pit ID:	P195-160608-1325-SDD										Topographic Position:	Upper backstop									
Date:	06/08/16										% Slope:	19									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	WD									
RETTEW Job #:	089962000										Depth to Refusal:	N/A									
NRCS Soil Unit:	McClure - Watahala - Delcobb										Bedrock Type:	Siltstone									
Mineralogy:	Mixed										Vegetation:	hickory, red maple, tulip poplar									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Hardness/ Substrata	Structure Type, Grade, and Size	Moist Consistence	Moisture Binding Characteristics	Redox Feature Color	Redox Feature Description	Roots	Rootlet Penetration/ pH	Lab Sample ID	Notes				
Oe	4	5YR 2.5/1	-	-	-	10 gr	1-2	-	-	-	aw	-	-	M F M M	4.25 5.5	-					
																		PS	1 f gr	vfr	aw
A	6	10YR 3/2	S.1	14	12	20 gr	1-2	PS SS	1 f gr	vfr	aw	-	-	F F F M	2.25 4.75	-					
																		PS	1 msbk	fr	cw
E	14	10YR 5/4	S.1	13	20	20 gy	1-2	PS SS	1 msbk	fr	cw	-	-	F F F M	3.0 4.75	-					
																		PS	2 msbk	fr	cw
B+1	25	10YR 5/6	S.1	19	18	25 gr	1-2	PS SS	2 msbk	fr	cw	-	-	V F F	3.25 5.0	-					
																		PS	2 msbk	fr	gw
2B+2	35	7.5YR 5/6	S.1	20	10	40 ch	1-2	PS SS	2 msbk	fr	gw	-	-	V F F	3.5 5.0	-					
																		PS	2 msbk	fr	gw
2B+3	60	7.5YR 5/6	S.1	20	10	60 ch	1-2	PS SS	2 msbk	fr	-	-	-	V F F	5.0	-					
																		PS	2 msbk	fr	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: *[Signature]*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P196-160608-1157-SDD					Topographic Position:					Upper backslope						
Date:	06/08/16					% Slope:					32						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:					WD						
RETTEW Job #:	089962000					Depth to Refusal:					N/A						
NRCS Soil Unit:	Mccung-Watahala-Dekalb					Bedrock Type:					siltstone						
Mineralogy:	Mucung Mired					Vegetation:					red maple, tulip poplar						
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	mineralogy/notes	Structure Type, Grade, and Size	Molt Consistence	Medium Rooting Temperature & Distribution	Redox Feature Color	Parent Feature Description	Roots	Point Temperature/ pH	Lab Sample ID	Notes
Oa	1	10YR 2/1	-	-	-	gr 20	1-2	-	-	-	aw	-	-	MF MH	4.5	-	
								ps									
A	6	10YR 4/2	s.1	16	30	gr 20	1-2	ss	1fg	vfr	aw	-	-	MF MH FC	4.5	-	
								ps									
E	13	10YR 7/3	s.1	15	35	gr 20	1-2	ss	1msbk	fr	cw	-	-	FM FC	5.0	-	
								ps									
Bw	25	10YR 6/4	s.1	16	30	gr 40	1-2	ss	1msbk	fr	cw	-	-	FC	5.0	-	
								ps									
2Bc1	35	7.5YR 6/6	s.1	20	20	ch 40	2-u	ss	1msbk	fr	gw	-	-	VFC	5.25	-	
								ps									
2Bc2	50	7.5YR 6/6	s.1	20	20	ch 70	2-4	ss	1msbk	fr	-	-	-	VFC	5.25	-	
								ps									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skipper

Signature: _____

S. Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1083

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes						
P197-16005-1047-Sdd	06/08/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	McClung - Watahala - Delcobb	Mixed	backlope	colluvium/res							
						% Slope:	Slope Aspect:							
						Drainage Class:	Depth to Water Table:							
						Depth to Refusal:	Slope Failure or slip:							
						Bedrock Type:	Dip Slope & Direction:							
						Vegetation:								
USDA														
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moist Consistence	Normal Boundary Topography & Discontinuity	Redox Feature Color	Roots	Lab Sample ID	Notes	
0e	2	5YR 2.5/1	-	-	-	30 gr	1-2	-	aw	-	MF MM FC	<.25 5.0	S1	
A	5	10YR 3/2	S1	10	60	20 gr	1-2	-	aw	-	MF CM	.25 4.5	S2	
E	14	10YR 6/3	S1	9	60	20 gr	1-2	-	aw	-	FF CM CC	1.0 4.5	S3	
Bw	31	10YR 6/4	S1	10	65	40 gr	1-2	-	aw	-	FF CC	1.5 4.75	S4	
2Bc	52	7.5YR 4/6	S1	16	38	60 ch	1-2	-	fr	-	FF FM	2.25 5.0	S5	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippan

Signature: Steve Dadio

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Polart Parameter/ pH	Lab Sample ID	Notes	
	P-199-160608-0856-01		Dominion - Atlantic Coast Pipeline Soil Survey	089962000			Linear	5	WD	N/A		Red maple, white pine, tulip poplar	SOP	N/A	N/A							
	06/08/16				McClung - Whitaker - DeKalb	Mixed																
Oo	3	5YR 2.5/1	-	-	20 gr	.5-1	-	aw	-	-	-		MF	CM	<.25	4.5	S1					
A.	5	10YR 2/1	s:ll	15	20	.5-1	1 fgr	vfr	aw	-	-		CF	CM	0.75	4.5	S2					
E	11	10YR 6/4	s:ll	13	22	.5-1	msbk	fr	aw	-	-		FE	CM	1.25	4.5	S3					
ZB+	20	7.5YR 6/6	s:ll	20	15	<.5	2msbk	fr	aw	-	-		FF	FM	1.75	5.0	S4					
ZB+2	30	7.5YR 6/6	s:ll	23	15	<.5	2msbk	fr	g-v	-	-		FF	FM	1.0	5.0	S5				2.5YR 5/8 a 150 present	
ZBC	50	7.5YR 6/6 2.5YR 5/8	s:ll	20	15	1-2	1m pl	fr	-	-	-		VF	M	2.75	5.0	S6				Manganese	

Other Notes: Z BC grading to parallelitic contacts

TEST PIT DESCRIPTION

Soil Scientist: Steve Radzio

Signature: [Signature]

Field Assistant: Dave Skopron

RETTEW Associates, Inc.
3070 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	200-160603-1446-SS1	Topographic Position:	Parent material:	Notes													
Date:	12/09/16	% Slope:	31%														
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WD														
RETTEW Job #:	089962000	Depth to Refusal:	LN														
NRCS Soil Unit:	PERKLELLV16 Vertisol	Bedrock Type:	sandstone														
Mineralogy:		Vegetation:	chestnut oak red pine white pine														
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Readily Soluble	Structure Type, Grade, and Size	Moist Consistence	Moist Density, Temperature & Odor	Redox Feature Color	Root Features	Roots	Water Impregnation/ pH	Lab Sample ID	Notes
Dr	2	5YR2.5/1	-	-	-	qtz 10	1-2	-	-	-	aw	-	-	CM	4.25	-	
FE	4	7.5YR5/1	S1	8	50	qtz 10	1-2	PO	14-5bk	fr	aw	-	CF	4.5	-		
Bv1	16	10R2.5/6	1	10	40	25 clb	4-8	PO	14-5bk	fr	aw	-	CF	5.25	-		
Bv2	28	7.5YR5/6	S1	10	60	10 clb	1-2	SD	1m sbk	fr	aw	-	FM	5.25	-		
2R	48							SS	1m sbk	fr	aw	-	FM	5.25	-		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Vered Wall
 Field Assistant: Miguel Pavales

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	MIRCS Soil Unit:	Mithenagr:	Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/structure	Structure Type, Grade, and Size	Moisture Consistence	Moisture Determination	Redox Feature Color	Moisture Descriptor	Roots	Moisture/structure pH	Lab Sample ID	Notes	
2020-160505-1326-35N	6/3/16	Dominion - Atlantic Coast Pipeline Soil Survey	08996200	DRKAWR-CLY-N2CWD9	SILICEOUS	A	2-3	10YR3/3	SL	10	72	5% GR	<1	OP OS	IFSBK	VF	AW	-	-	3-VF	6.5	-	-	-
						Ge	0-2	5YR2.5/1	-	-	-	-	-	-	-	-	-	-	-	1-C	-	-	-	-
						BE	3-12	10YR6/6	SL	13	72	2% GR	<1	OP OS	MSBK	FR	CW	-	-	2-F	4.7	-	-	-
						Bt1	12-18	10YR5/1	GR SL	18	64	16% GR	<1	SP SS	MSBK	FR	CW	-	-	3-F	1.25	-	-	-
						2Bt2	18-28	7.5YR5/6	CL	34	25	5% CH	1-2	MP SS	2MSBK	FR	CS	-	-	1-F	5.5	-	-	-
						2Bt4	28-34	7.5YR5/6	SL CL	32	12	12% CH	2-3	MP SS	HWPL	FR	CS	2.5	2B	-	1.5	-	-	-
						2Bt2	34-50	7.5YR5/6	SL CL	32	12	12% CH	2-3	MP SS	ITNPL	FR	-	-	-	-	-	1.5	-	-

Other Notes: WARDLOW BRIDGE SECTION TO S.W. 21572 BARRIERSIDE 30M TO SW, 20M TO SE, 25M TO EAST

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadijs
 Field Assistant: Dave Skippa

Signature: B. Davis

REITW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	1-201-150603-1334-5DD	Topographic Position:	Summit/Shoulder	Parent material:													
Date:	06/03/16	% Slope:	8%	Slope Aspect:	240°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	W/D	Depth to Water Table:	N/A												
REITW Job #:	089962000	Depth to Refusal:	24	Slope Failure or slip:	N/A												
NMCS Soil Unit:	Delatah-Lily-Holmes	Bedrock Type:	sandstone	Dip Slope & Direction:	E 7-80°												
Mineralogy:	Mixed	Vegetation:	Chestnut oak, mountain laurel, sugar maple		350°												
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	rooting/ nodules	Structure Type, Grade and Size	Moist Consistence	Moist Bulk Density Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Plant Penetration/ pH	Lab Sample ID	Notes
De 2	0-2 1/2	6YR 2/1	SI	7	-	10 gr	1-2	-	-	-	AW	-	-	MF	4.25	-	
E	3-5	7.5YR 5/4	SI	8	60	10 gr	1-2	-	lf gr	VF	AW	-	-	CF	4.25	-	
Bt 1	14	7.5YR 2/2	SI	10	45	10 gr	1-2	-	1m sbk	fr	AW	-	-	CM	4.75	-	
Bw 1	22	10YR 6/6	SI	14	40	ch 25	3-6	-	1m sbk	fr	AW	-	-	FA	5.00	-	
R	24+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadi
 Field Assistant: Dave Skippon

Signature: *S. Dadi*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-3063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Structure Type, Grade, and Size:	Moist. Conductance:	Field Saturated Temperature & Conductance:	Redox Feature Color:	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Field Penetration/ pH:	Lab Sample ID:	Notes:	
P203-160603-1123-5d1	06/03/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Dakota Silty - Medium	Mixed	concave backslope	16	WD	N/A	N/A	USDA	2msbk ft	ft	CW	-	-	300	N/A	N/A	N/A	N/A	N/A	N/A	-	rocks are para-channels
0a	2	10YR 2/1	-	-	10Cb	2-4	-	-	-	-	-	1 ft gr	ft	CW	-	-	MVE MF CW	<.25 4.25	-	-	-	-	-	-	-
E	3	10YR 5/1	1	10	10Cb	2-4	-	-	-	-	-	1msbk ft	ft	CW	-	-	CF MF	.75 4.25	-	-	-	-	-	-	-
Bt1	14	10YR 5/6	1	14	10Cb	2-11	-	-	-	-	-	1msbk ft	ft	CW	-	-	CF MF	4.5	-	-	-	-	-	-	-
Bt2	20	7.5YR 5/6	1	16	10Cb	1-2	-	-	-	-	-	2msbk ft	ft	BW	-	-	CF MF	4.5	-	-	-	-	-	-	-
Bb	32	7.5YR 5/6	1	18	10Cb	1-2	-	-	-	-	-	2msbk ft	ft	CW	-	-	CF MF	2.25	-	-	-	-	-	-	-
2Ct	50	7.5YR 5/6	5/1	25	10Cb	1-2	-	-	-	-	-	Over ft	ft	-	-	-	CF MF	5	-	-	-	-	-	-	close to CR horizon

Other Notes: closely correlates with P204

TEST PIT DESCRIPTION

Soil Scientist: Steve Dario
 Field Assistant: Don Skippin

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-5721
 Fax: 717-394-1053

Test Pit ID:	P204-160603-0939-5dd		Topographic Position:	Wood		Parent material:	residuum									
Date:	06/03/16		% Slope:	7%		Slope Aspect:	095°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	N/A									
RETTEW Job #:	08996200		Depth to Refusal:	N/A		Slope Failure or slip:	N/A									
NCRS Soil Unit:	DeKalb-1:1v-1c1v		Bedrock Type:	Siltstone		Dip Slope & Direction:	N/A									
Mineralogy:	M:R2D		Vegetation:	white pine and other chestnut oak pasture land		Strike:	N/A									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molar Conductance	Neutral Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
De	1	5YR 2.5/1	-	-	-	F1 20	4-8	-	-	aw	-	-	M F M M	<.25 4.25	S1	
E	9	10YR 7/3	1	11	55	F1 20	4-8	1fg	vf	cw	-	-	M F M M F C	.5 4.75	S2	
Bt1	16	10YR 4/6	S:1	16	35	9r 10	1-2	2m sbk	fr	aw	-	-	C F C M	1.25 5.25	S3	
2B2	30	5YR 5/6	S:cl	39	8	-	-	2 m sbk	fr	cw	-	-	C F C M	1.75 5.25	S4	
2Bc	50	7.5YR 5/6	S:1	20	10	-	-	1 m sbk	fr	-	-	-	F w	2.0 5.25	S5	getting close to weathered Pw

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Veronica Mann
 Field Assistant: _____

Signature: [Handwritten Signature]

RETROW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETROW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots:	Lab Sample ID	Notes	
P-205-160602-11CT-13W	6/3/18	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	DE KALB - CIV. - MCCRACKEN	SILICEAN	SUMMIT / SHOULDER	X70	WELL			CHESTNUT OAK, WHITE OAK, WATER PINE, LAUREL, BURNING BUSH	COLLUVIUM OVER RESIDUUM	9300							
00	0' - 2'	greyish															3-4" F			
E	2' - 4'	10YR5/2															2-4" F			
E 2/1	4' - 12'	10YR5/6															1-4" C			
																	3-0" C			
																	2-4" F			
																	2-4" M			
																	4.7			
																	3.25			
																	3.0			
																	4.5			

Other Notes: BEFORE CROSSING SUMMIT / SHOULDER, SHOULDER TO STEEP BACKSLOPE
50M TO THE WINDY, WOODEN DECK ON RIDGE 40M TO ESE; SAME UNIT AS P-206

TEST PIT DESCRIPTION

Soil Scientist: David Mann
 Field Assistant:

Signature: [Signature]

RETTM Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Topographic Position:				Parent material:	Notes							
P-206-160603-0530-15W	SWANIT				CONCRETE OVER REINFORCED								
Date:	6/2/16	% Slope:	11%	Slope Aspect:	2600								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WELL	Depth to Water Table:								
RETTM Job #:	089962000	Depth to Refusal:		Slope Failure or slip:									
NRCS Soil Unit:	DEKALB	Bedrock Type:		Dip Slope & Direction:									
Mineralogy:	SILICEOUS		Vegetation:	MIXED DECIDUOUS-CONSTANT OAK. BUCK OAK (SEE NOTES)	Strike:								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Method/Section	Structure Type, Grade, and Size	Molt Conductivity	Index Bulk Density	Redox Feature Color	Notes
0E	0-9	5YR5/1	-	-	-	-	-	-	-	-	AM	-	3-VEFC 2-M
BE	10-16	10YR5/1	L	14	40	5 GR	<1	2 nd SS	1M5BWK	FR-05	CS	-	3-VEFC 1-M
B21	17-19	10YR5/1	L	18	38	7 GR	<1	SP SS	2M5BK	FR	CS	-	2-FC F-C
B22	19-26	2.5YR5/1	L	19	40	10 GR	<1	SP SS	2M5BK	FR	CS	-	2-C
B23	26-37	2.5YR5/1	SCL	35	10	GR	<1	MP MS	1COPR 2COPV	F1	CS	-	
B24	37-50	5YR5/1	SCL	42	10	GR	-	MP MS	1COPR 1COPV	F1	-	-	

Other Notes:

BROWN STAINING COMMON IN BROWN WHITE AND GRAY; SOME UNITS AT P-214
 FEIN RUBBERSEED, LAUREL

TEST PIT DESCRIPTION

Soil Scientist: John W. Hall
 Field Assistant: Duane Truax

Signature: [Signature]

Well Drained

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	E-201-160602-1508-NSW		Topographic Position:	SUMMIT/SHOULDER		Parent material:	RESIDUUM										
Date:	6/2/18		% Slope:	2%		Slope Aspect:	230°										
Job Name:	Dominion Atlantic Coast Pipeline Soil Survey		Drainage Class:	WATER		Depth to Water Table:	-										
RETTEW Job #:	089962000		Depth to Refusal:	21		Slope Failure or slip:	-										
NRCS Soil Unit:	DEWB		Bedrock Type:	SANDSTONE		Dip Slope & Direction:	70 SW (210°) Strike: 150°										
Mineralogy:	CLAYEON		Vegetation:	MIXED DECIDUOUS - COUNTRY		USA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rockiness/fragments	Structure Type, Grade, and Size	Moist. Condition	Major Secondary Direction	Redox Feature Color	Moist. Feature Description	Roots	Field Parameters/ pH	Lab Sample ID	Notes
O ₀	0-2	5YR 5/1	-	-	-	-	-	-	-	-	awn	-	-	2-NE 3-E 2-M	-	-	
A	2-9	4.5YR 6/3	VgR L	10	48	3 @ 9R 2 @ 5R 1 @ 5Y	1-3 2-6	Po SS	1-2 PR	VER	awn	-	-	2-NE LE	0.25 4.5	-	
B ₀₂	9-12	10YR 5/6	VST. L	12	40	15 @ 9R 9 @ 5Y 1 @ 5Y	4-1 > 6	70 50	1-2 SBK	FR	awn	-	-	3-NE 2-EM 1-C	0.25 5.5	-	
R	21+	SANDSTONE				BEDROCK											

Other Notes:

KNIFE NEXT TO PROPERTY BOUNDARY; SUMMIT SLOPING DOWN TO SW;
 CURSIVE DARK WHITE OR WHITE TIDE, SILVERBERRY; MANY SURFACE STONES > 12"
 SANDSTONE; FROM INERT. WEATHER STATE GIVEN 2-3" SUBROCK BY SANDSTONE BEDS;
 DEPTH TO BEDROCK VARIES FROM 9" TO 26"; WESTWARD SLOPE IN BEDROCK
 (CONTINUED 6/3)

TEST PIT DESCRIPTION

Soil Scientist: Steve Doolin
 Field Assistant: Dave Skippin

Signature: Steve Doolin

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-8721
 Fax: 717-394-1053

Test Pit ID:	p208-16002-0827-SD					Topographic Position:	Backslope		Parent material:															
Date:	06/03/16					% Slope:	75		Slope Aspect:															
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	W0		Depth to Water Table:															
RETTW Job #:	089962000					Depth to Refusal:	36		Slope Failure or slip:															
NRCS Soil Unit:	Mined - low & water					Bedrock Type:	Sandstone		Dip Slope & Direction:	20° SE Strike: 47°														
Mineralogy:	Mined					Vegetation:	Chestnut oak white oak		USDA															
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Hard/Soft	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature Distribution	Redox Feature Color	Soil Feature Subgroup	Roots	Field Measurement/ pH	Lab Sample ID	Notes							
Oe	4	5YR 2.5/1	-	-	-	10 of	1-2	-	-	-	-	-	-	M VF	4.25	-								
																		PO	1.5 gr	VF	QW	-	CE	< .25
																		SO			QW	-	CM	4.25
E	6	7.5YR 5/1	S 1	9	50	10 of	1-2	PO	1.5 gr	VF	QW	-	-	CE	4.25	-								
																		PO			QW	-	CF	.25
																		SS			QW	-	CM	4.5
Bw1	16	10YR 5/6	1	10	45	10 gr	2-4	PO	1 m sbk	fr	QW	-	-	CF	4.5	-								
																		PO			QW	-	FF	1.0
																		SS			QW	-	FM	4.5
Bw2	32	7.5YR 5/4	1	13	40	40 of	4-6	SS	1 m sbk	fr	QW	-	-	FM	4.5	-								
																		SS			QW	-		
																					QW	-		
R	36	36																						

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Daile Skippan

Signature: Steve Dadio

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P209 E 160602-1356 - S44					Topographic Position:	Shoulder										
Date:	06/22/16					% Slope:	8%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD										
RETTW Job #:	089952000					Depth to Refusal:	30' Sandstone										
NRCS Soil Unit:	Dokoh Rock Outcrop					Bedrock Type:	Sandstone										
Mineralogy:	mixed					Vegetation:	chestnut oak woodpile										
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Roots/Stubble	Structure Type, Grade, and Size	Moist. Consistence	Hydrom. Behavior & Distribution	Redox Feature Color	Major Feature Description	Roots	Water Temperature/ pH	Lab Sample ID	Notes
Oe	2	Spr 2.5/	-	-	-	20 gr	1-2	-	-	-	CS	-	-	N VF M E C M	<.25 4.25	-	
Os	6	TSR 2.5/1	-	-	-	10 gr	1-2	-	-	-	aw	-	-	CVF CF CM	.25 4.25	-	
A/E	7	TSR 4/2	1	10	50	10 gr	1-2	-	1 fgr	var	aw	-	-	CF CM	.5 4.25	-	
Bw	21	10YR 5/6	1	12	45	30 gr	15-2	-	1 msbk	f	aw	-	-	CM FC	.75 5.0	-	
R	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bedrock	30'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve David
 Field Assistant: Steve Swanson

Signature: Steve David

RETTEW Associates, Inc
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-8721
 Fax: 717-394-1083

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Redox Feature Color:	Redox Feature Description:	Lab Sample ID	Notes	
P210-1101607-1327-SD0	06/02/2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Dw		hackslope	35	SED	20		chestnut oak, mountain laurel, white pine	residuum		N/A	N/A	16 326	VF M F CM			326		
Oe	2	5YR 2.5/1																				
Oa	4	10YR 2/1																				
E	6	7.5YR 5/1																				
Bw	20	10YR 6/4																				
R	20+																					

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadiio
 Field Assistant: Dave Skippon

Signature: Steve Dadiio

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	0-211-169602-1146-SSH					Topographic Position:	Backslope		Parent material:	residuum							
Date:	06/02/16					% Slope:	16%		Slope Aspect:	15°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD		Depth to Water Table:	N/A							
RETTW Job #:	089962000					Depth to Refusal:	N/A		Slope Failure or slip:	N/A							
NCRS Soil Unit:	Dekalb Red-Grey					Bedrock Type:	sandstone / red sandstone		Dip Slope & Direction:	Dip Not oak, mountain Laurel, Sassafras							
Mineralogy:	Mixed					Vegetation:	USA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Roots / Stems	Structure Type, Grade, and Size	Moist Consistence	Moist Density / Temperature / Humidity	Redox Feature Color	Redox Feature Description	Roots	Product Temperature / pH	Lab Sample ID	Notes
Oe	1	5YR 2.5/1	-	-	-	1/0	1-2	-	-	-	aw	-	-	M F M M	<.25 4.25	S1	
EA	2	10YR 5/2	1	10	45	12	1-2	PO SO	1 m of	vf	aw	-	-	M F M M	.25 4.5	S2	
R.1	20	10YR 6/6	1	12	45	8	1-2	PO SS	2 m sbk	fr	aw	-	-	C M	.5 5.25	S3	
Bw2	50	7.5YR 5/6	S1	10	60	CO Cb	4-8	PO SS	1 m sbk	fr	aw	-	-	F M	.5 4.5	S4	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippin

Signature: _____

Steve Dadio

RETTEW Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3722
 Fax: 717-394-5083

Test Pit ID:	P-212-160602-1002 - Sd				Topographic Position:	Shoulder				Parent Material:	Residuum						
Date:	06/02/16				% Slope:	11				Slope Aspect:	238						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	22				Depth to Water Table:	NONE						
RETTEW Job #:	089962000				Depth to Refusal:	22				Slope Failure or Slip:	N/A						
NRCS Soil Unit:	DeKalb - Rock Outcrop				Bedrock Type:	Chestnut oak, mountain laurel				Dip Slope & Direction:	S-1007 Strike: 10						
Mineralogy:	USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Parent/ Substratum	Structure Type, Grade, and Size	Moist Consistence	Major Secondary Minerals	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ M	Lab Sample ID	Notes
O ₀	3	5YR 2.5/1	-	-	-	Cl 10	1-6	-	-	-	ow	-	-	MYF MF M	0.25 4.25	S1	
E	5	7.5YR 6/1	s1	6	60	f1 10	1-6	PO SO	1-6 gr	vf	ow	-	-	CF CM	0.75 4.5	S2	
Bw	22	10YR 2.5/6	1	9	50	f1 40	1-6	PO SS	1-6 sbk	f	ow	-	-	CF CM	0.75 4.5	S3	
R	22+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dedio
 Field Assistant: Dave Skippin

Signature: *Steve Dedio*

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-3083

Test Pit ID:	212A-160207-11109- ^{SH}	Topographic Position:	Rock Slope	Parent material:	Residuum												
Date:	06/02/16	% Slope:	15	Slope Aspect:	SE												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	SED	Depth to Water Table:	NONE												
RETTW Job #:	089962000	Depth to Refusal:	24	Slope Failure or slips:	W/A												
NRCS Soil Unit:	Dekalb - Rock Outcrop	Bedrock Type:	sandstone	Dip Slope & Direction:	6 225 strikes												
Mimnology:	1	Vegetation:	Rt Laurel, chestnut oak, red maple	USDA													
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Hardness/abrasion	Structure Type, Grade, and Size	Molar Conductance	Water Swell Potential	Redox Feature Color	Redox Feature Description	Roots	Water Potential/pH	Lab Sample ID	Notes
Oe	0-5	5YR 2.5/1	-	-	-	18 gr	1-2	PO	-	-	-	-	-	M VF M F M VF M F	4.25	-	
E	1	10YR 6/4	S1	12	65	25 gr	1-2	PO SO	1 fgr	vf	ow	-	-	M VF M F M VF M F	4.5	-	
Bw	14	10YR 4/6	1	78	40	vb	2-5	SD SS	1 m sbk	fr	ow	-	-	CF CM	4.5	-	
C	24	10YR 4/6	1	14	40	xcb	5-10	SP SS	0 m	fr	ow	-	-	FF	4.5	-	
R	24"																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John M. Miller
 Field Assistant: Douglas F. Roush

Signature: _____

[Handwritten Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-213-160602-1236-15W		Topographic Position:		SUMMIT/ROAD SHOULDER		Parent material:		COLUMBIAN BEDROCK								
Date:	6/2/16		% Slope:		11%		Slope Aspect:		325°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		WEL		Depth to Water Table:		-								
RETTW Job #:	089962000		Depth to Refusal:		-		Slope Failure or slip:		-								
NRCS Soil Unit:	BREVARD		Bedrock Type:		-		Dip Slope & Direction:		-								
Minerals:	SILICATEOUS		Vegetation:		MIXED DECIDUOUS		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Molt Condition	Hydro-Soil/Topography & Slope	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
0a	0-1.5	5YR5/1	-	-	-	-	-	-	-	-	as	-	-	3-V.F.F	4.4	S-1 A/B	
BE	1.5-8	2.5YR5/1p	GR	13	32	15 GR	< 1	-	1M SBK	ER	CS	-	-	2-F 1-C	0.7-5 6.5	S-2 A/B	
B3	8-15	2.5YR5/1p	L	20	41	10 GR	< 1.5	-	1M SBK	FR	CS	-	-	1-M/C	1.25 6.5	S-3 A/B	
B4	15-20	5YR5/1p	CL	33	25	-	-	-	2.5-10K	FR	CS	-	-	1-F/M	2.75 6.5	S-4 A/B	CLAY SKINS
B5	20-24	5YR5/1p	CL	22	10	-	-	-	2M SBK	FR	CS	-	-	1-M	4.25 6.7	S-5 A/B	CLAY SKINS LITTLE REDDISH BROWN
B6	24-50	5YR5/1p	SCV	37	10	-	-	-	1M SBK	FR	-	-	-	-	3.75 6.3	S-6 A/B	CLAY SKINS LITTLE REDDISH BROWN

Other Notes:

225' ABOVE SHOULDER AND STREET BACKSLOPE. SURROUNDING AREA IS PRIVATE PROPERTY. SUMMIT IS PRIVATE PROPERTY. LITERATURE RESERVATION

TEST PIT DESCRIPTION

Soil Scientist: JORDAN WEAVER
 Field Assistant: BOBBIE TRUBB

Signature: [Signature]

RETTEW Associates, Inc.
 3021 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-8721
 Fax: 717-394-1063

Test Pit ID:	P-219-160602-11X-25W		Topographic Position:	BACKSLOPE - LINEAR		Parent material:	COLLUVIUM OVER BEDROCK										
Date:	6/2/18		% Slope:	26%		Slope Aspect:	330°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WET		Depth to Water Table:											
RETTEW Job #:	089962000		Depth to Refusal:	28"		Slope Failure or slip:											
NCRS Soil Unit:	DEKALB		Bedrock Type:	SANDSTONE		Dip Slope & Direction:	10% WNW										
Mineralogy:	SILICATE		Vegetation:	MIXED DECIDUOUS		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Fracture Pattern	Structure Type, Grade, and Size	Molar Constance	Nelson Textural Topography & Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ M ³	Lab Sample ID	Notes
Oe	0-2	5YR 5/1	-	-	-	-	-	-	-	-	AM	-	-	3-NE, 2-M	-	-	-
A	2-4	10YR 5/1	SL	6	70	5	1-3	SP	VER	VER	AM	-	-	3-NE, 4-M	4.3	-	-
E	4-6	10YR 5/2	SL	6	75	5	1-3	SP	VER	VER	AM	-	-	3-NE, 1-C	1	-	-
Bm1	6-12	10YR 5/10	SL	13	60	10	2-4	SS	VER	VER	AM	-	-	2-F, 1-M, 1-C, 1-C	0.25	-	-
Bm2	12-18	10YR 5/6	SL	12	65	25	2-4	SS	VER	VER	AM	-	-	2-F, 1-M, 1-C	0.25	-	-
2R	18-X	SAND	ST	5	15	25	2-4	SP	VER	VER	AM	-	-	1-C	4.5	-	-
																	gray SANDSTONE

Other Notes: BACKSLOPE LINEAR; SANDSTONE; SANDSTONE; WHITE PINE, LAUREL, BLUE BERRY

SAME DELINEATION AS P-215

TEST PIT DESCRIPTION

Soil Scientist: JOHN W. H.

Field Assistant: ROBERT FROMB

Signature: [Signature]

RETIEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1065

Test Pit ID:	Date:	Job Name:	RETIEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Rock Fragmentation/Parent Material:	Roots:	Rock Fragmentation/Parent Material:	Lab Sample ID:	Notes:
P-21S-160602-1032-35M	6/2/15	Dominion Atlantic Coast Pipeline Soil Survey	089962000	DFCEALB	SILICEOUS	BACKSLOPE - LINEAR	29%	WELL			MIXED DECIDUOUS	COLUMNAR SANDSTONE	380°			97° WNW (288°)			1-2	S1	
A	2-2.5	10YR2/12	SL	8	70	S	QR	1-2		SS PO	IFPR	VER	OM			3-NV-F	Ø	4.3	S2		
E	1.5	10YR5/12	SL	8	70	S	QR	2-3		SS PO	IFPR	VER	OM			3-NV-F	Ø	4.4	S3		
Bm1	13	10YR2/10	SL	12	65	F	QR	2-3		SS PO	1MSBK	VER	CM			3-F	0.25	4.7	S4		
Bm2	13	10YR5/10	SL	16	65	F	QR	3-5		SS SP	1MSBK	VER	CM			3-F	0.25	4.7	S5		
Bc	24-38	10YR2/10	SL	6	75	S	QR	1-2		SS PO	1MSBK	VER	CM			1-FM	3.5	5.8	S6	DECAYING SANDSTONE COF LITHOCROMIC MORTAR PA ON PURVEINDED SANDSTONE	
Bc	24-38	10YR2/10	SL	6	75	S	QR	1-2		SS PO	1MSBK	VER	CM			1-FM	3.5	5.8	S6	DECAYING SANDSTONE COF LITHOCROMIC MORTAR PA ON PURVEINDED SANDSTONE	

Other Notes:

ON THE TERRACE, SUMMIT DRAINAGE, 25% SLOPE, CURRENT COLE, WHITE SANDS, SANDSTONE AND SANDSTONE AND SANDSTONE

TEST PIT DESCRIPTION

Soil Scientist: DUANNE TRIMAX
 Field Assistant: Taylor Walter

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes									
06-08-2016	06-08-2016	Atlantic Coast Pipeline Soil Survey	089962000		Silicoos	Bank Slope	Residuum										
						% Slope: 30%	Slope Aspect: 196°										
						Drainage Class: Moderate Well Drained	Depth to Water Table: N/A										
						Depth to Refusal: 36"	Slope Failure or slip: N/A										
						Bedrock Type: SHALE	Dip Slope & Direction: 60° N										
						Vegetation: White Oak, Chestnut Oak, Scarlet Oak, Dogwood, Virginia Pine, White Pine											
						USDA											
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/ Substrata	Structure Type, Grade, and Size	Moist Consistence	Adverse Aesthetics, Toxicity & Disturbance	Redox Feature Color	Soil Feature Description	Roots	Root Penetration/ Depth	Lab Sample ID	Notes
De	0-1	7.5YR 2.5/1	-	-	-	-	-	-	-	-	SA	-	-	-	4.3	-	
Bw1	1-8	10YR 6/4	λ	18	35	NH 35%	0.25-2.0	PS 50	SAH 1,1	SA	SA	-	2.4-1.0	1.25-4.5	-		
Bw2	8-21	10YR 5/4	λ	21	43	XcH 70%	0.25-6.0	PS 55	SAH 1,2	SA	WA	-	1.4-1.0	4.5	-		
C	21-36	10YR 5/4	Sil	24	28	XcH 95%	0.25-12.0	PS 55	SAH 1,2	SA	IA	D:10YR 6/4 C:7.5YR 6/4	1.0	1.5-4.7	-		
R	36+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SHALE

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dwaine Truax
 Field Assistant: Taylor Walter

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	PZ16A-160608-1320-DAT		Topographic Position:		SHOULDER		Parent material:		Residuum								
Date:	06-08-2016		% Slope:		28%		Slope Aspect:		306° NW								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		SDMWHAT EXCESSIVELY DRAINED		Depth to Water Table:		N/A								
RETTEW Job #:	089962000		Depth to Refusal:		2.2M		Slope Failure or slip:		N/A								
NRCS Soil Unit:	Berks channery silt loam		Bedrock Type:		Shale		Dip Slope & Direction:		74° W								
Mineralogy:	siliceous		Vegetation:		Virginia Pine		USDA		Strike: 215°								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stoniness/fragments	Structure Type, Grade, and Size	Mottling Consistence	Native Boundary Topography & Disturbance	Redox Feature Color	Native Feature Description	Roots	Rooter Penetration/ft	Lab Sample ID	Notes
Oc	0-1	7.5YR 2.5/1	-	-	-	-	-	-	-	-	SA	-	-	-	4.2	-	
Bw1	1-5	10YR 4/4	SL	12	42	NCH 95%	0.25-1.5	PO SO	SGR 1,1	FNE SA	SA	-	-	2.1M 1.1C	4.3	-	
Bw2	5-10	7.5YR 5/4	S	15	46	XCLT 75%	0.08-3.0	PO SO	SGR 1,2	FNE SA	SA	-	-	2.1M 1.1C	2.5 4.7	-	
C	10-18	7.5YR 5/4	SdL	10	30	XCLT 98%	4.0-8.0	PO SO	M, D	FNE IA	IA	-	-	1.1M	N/A 4.5	-	SMILE REMOVED
R	18+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Suave Truax

Field Assistant: Taylor Walter

Signature: _____



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/ %	Lab Sample ID	Notes	
P216B-160608-141-DAT	06-08-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Barks Channing Silt loam	Siliceous	RADIUS CORE	SOMEWHAT EXCESSIVE MAINTENANCE	2.6'	Snod	Krohn's Pine, White Pine, Quercus, Oak, White Oak, Sweet Oak		263°	N/A	N/A	86° N				245	
De	0-1	7.5% 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bs1	1-7	10% 4/4	SIL	12	25	GR 25%	0.25-1.0	Pd	SBK 1.1	FINE SA	SA	-	-	-	-	2m 1.0	4.5	-	-	-
Bs2	7-14	10% 6/4	SIL	14	35	XCH 70%	0.25-4.0	Pd	SBK	FINE SA	SA	-	-	-	-	2m 1.1	4.5	-	-	-
C	14-26	10% 6/6	SIL	18	24	XCH 92%	0.25-6.0	Pd	M, D	FINE SA	SA	-	-	-	-	1m	4.3	-	-	-
R	26+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dwaine A. Truax
 Field Assistant: Taylor Walker

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Hydro Boundary Temperature & Depth (ft)	Redox Feature Color	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Residual	Lab Sample ID	Notes
P-217-160508-0523-DAT	0-08-2010	5YR 2.5/1	-	-	-	-	-	-	-	-	-	Backslope	05R	WET DRAINCD	19"	SHALE	70° NE	195°	SHALE BEDROCK
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																		
RETTEW Job #:	089962000																		
NRCS Soil Unit:	BcKs Chanery loam																		
Mineralogy:	Siliceous																		
Horizon	Vegetation: <u>Red Maple, Sugar Maple, Sycamore, Oak, Birch, 1 figured, 2 yellow</u>																		
Horizon	0-05	5YR 3/2	Sil	9	15	BR 15%	0.25-0.5	GR 1,2	VNS	SA	-	-	-	-	-	-	-	-	-
A	05-15	7.5YR 3/2	Sil	9	15	BR 15%	0.25-0.5	GR 1,2	VNS	SA	-	-	-	-	-	-	-	-	-
De	0-05	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bw1	15-90	7.5YR 5/4	Sil	14	35	GR 30%	0.25-1.5	SBK 1,2	FNE	SA	-	-	-	-	-	-	-	-	-
Bw2	90-190	5YR 5/6	S	21	45	YOLK 70%	0.25-3.0	SBK 1,3	FNE	SA	-	-	-	-	-	-	-	-	-
R	19.0'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DUANNE TRAXX
 Field Assistant: Taylor Walter

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3221
 Fax: 717-394-1063

Test Pit ID:	P218-160608-1010-DAT					Topographic Position:	SHOULDER		Parent material:	RESIDUUM							
Date:	06-08-2016					% Slope:	24%		Slope Aspect:	221° N							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL DRAINED		Depth to Water Table:	N/A							
RETTEW Job #:	089962000					Depth to Refusal:	18"		Slope Failure or slip:	N/A							
NRCS Soil Unit:	Banks channeling loam					Bedrock Type:	SHALE		Dip Slope & Direction:	79° W							
Mineralogy:	Siliceous					Vegetation:	chestnut Oak, Red Maple, Scarlet Oak, White Pine, Virginia Pine										
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubbing	Structure Type, Grade, and Size	Molt Confidence	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Field Measurements/pt	Lab Sample ID	Notes
De	0-1	5YR 2.5/1	-	-	-	-	-	-	-	-	SA	-	-	-	AS	-	-
A	1-3	7.5YR 4/2	λ	13	41	6% 20%	0.25 0.5	PO SO	GR 1,3	VEAI SA	-	-	-	3,F 2,M	0.25 4.7	-	-
Bt1	3-9	7.5YR 5/4	λ	22	47	VEH 60%	0.25- 2.0	PS SS	SRM 1,2	FNE SA	-	-	-	2,F 2,M	1.75 4.4	-	-
Bt2	9-18	7.5YR 5/6	αλ	31	50	XCH 75%	0.25- 4.0	PS SS	SRM 1,3	FNE IA	-	-	-	1,F 1,M	3.5 4.6	-	-
R	18"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SHALE

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: DVANE TRIMAR
 Field Assistant: J. E. SKIN GALBRAITH

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1083

Test Pit ID:	P219-100607-1A30-DAT		Topographic Position:	Rock slope		Parent material:	Residuum											
Date:	06-07-2016		% Slope:	57%		Slope Aspect:	330°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SOMEWHAT EXCESSIVE		Depth to Water Table:	N/A											
RETTEW Job #:	089962000		Depth to Refusal:	15.5'		Slope Failure or slip:	N/A											
NRCS Soil Unit:	Becks downy oat loam		Bedrock Type:	SHALE		Dip Slope & Direction:	50° S											
Mineralogy:	Siliceous		Vegetation:	White Pine, Hickory Oak, White Oak, Red Maple		Strike:	Z81°											
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Priority/Status	Structure Type, Grade, and Size	Mott. Consistence	Rooting Boundary Description	Redox Feature Color	Rooting Feature Description	Roots	Rooter Resistance/ pH	Lab Sample ID	Notes	
Da	0.0-0.5	7.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A	0.5-2.0	10YR 4/3	SIL	8	10	GR 15%	0.25-2.0	P0	SBR	Vn	SA	-	-	2.1m	4.5	S-14		
																		50
Bw1	2.0-8.0	10YR 5/4	SIL	10	15	GH 75%	0.25-2.0	S0	SBR	En	SA	-	-	2.1m	4.5	S-2A	S-2B	
Bw2	8.0-15.5	10YR 5/4	SIL	15	15	VCLT 55%	0.25-3.0	S5	SBR	En	WA	-	-	2.1m	4.5	S-3A	S-3B	
R	15.5+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SHALE BEDROCK	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Juane Trux
 Field Assistant: Dr. John Galbraith

Signature: _____



RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-220-100607-1336-DAT		Topographic Position:		SHOULDER ON NOSE		Parent material:	Basalium									
Date:	06-07-2016		% Slope:		18%		Slope Aspect:	240° NORTH FACING									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well Drained		Depth to Water Table:	N/A									
RETTW Job #:	089962000		Depth to Refusal:		24"		Slope Failure or slip:	N/A									
NRCS Soil Unit:	Becke Shannons silt loam		Bedrock Type:		Shale		Dip Slope & Direction:	120 South Strike: 110°									
Mineralogy:	Silt/clays		Vegetation:		Overcast Oak / Hickory Virginia White Pine white oak												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Molt/ Conistence	Moisture Boundary Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Rooting/ Penetration/ pH	Lab Sample ID	Notes
0c	0-0.5	7.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	2.5F	4.5	-	
A	0.5-3.0	10YR 4/4	Sil	15	15	10YR 4/7.5	0.25-1.0	PS	SX	1.1	1.1	WA	-	2.5F 1.0	4.5	-	
Bw1	3.0-9.0	10YR 5/6	Sil	20	20	10YR 5/7.5	0.25-4.0	PS	SX	1.2	1.2	SA	-	2.5F 1.0	4.5	-	
Bw2	9.0-20.0	7.5YR 5/4	Sil	24	20	10YR 7/7.5	0.25-8.0	PS	SX	1.3	1.3	SA	-	1.5F 1.0	4.5	-	
R	24+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SHALE BEDROCK

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Duane Truax
 Field Assistant: Dr. John Gebreits

Signature: _____

RETTEW Associates, Inc.
 3030 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Rock Fragmentation/Type & %	Structure Type, Grade, and Size	Mold Condition	Natural Boundary Topography & Disturbance	Redox Feature Color	Mold Feature Description	Lab Sample ID	Notes
P221-160407-1723-DAT	06-07-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Barks Channing Loam	Siliceous	BACKSLOPE	20%	WELL DRAINED	> 50"	N/A	Block Oak, Chestnut Oak, White Oak, White Pine, Ash	COLLOVIA	200°	> 50"	N/A	N/A	1, F	XGR 60%	0.25-	0.75	GR 1, 3	NMS SA	SA	-	-	5-1A	
A	1-3	7.5YR 4/2		Sil			8	10	XGR 60%	0.25-	0.75	GR 1, 3	NMS SA	SA	-	-	1, F 2, W	XGR 60%	0.25-	0.75	GR 1, 3	NMS SA	SA	-	-	5-2A	
E	3-9	10YR 6/3		Sil			10	10	XGR 70%	0.25-	1.0	SBR 1, 1	NMS SA	SA	-	-	2, W	XGR 70%	0.25-	1.0	SBR 1, 1	NMS SA	SA	-	-	5-3A	
Bw1	9-15	10YR 6/4		L			12	50	VCX 50%	0.25-	2.0	SBR 1, 2	NMS SC	SC	-	-	2, W	VCX 50%	0.25-	2.0	SBR 1, 2	NMS SC	SC	-	-	5-4A	
Bw2	15-23	10YR 5/4		L			15	50	VCX 60%	0.25-	2.0	SBR 1, 2	NMS SA	SA	-	-	1, W	VCX 60%	0.25-	2.0	SBR 1, 2	NMS SA	SA	-	-	5-5B	
C	23-50	10YR 5/4		Sil			8	70	XCH 70%	0.25-	0.5	OSG	NMS		-	-	-	XCH 70%	0.25-	0.5	OSG	NMS		-	-	5-6A	

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: Dwaine Traver
 Field Assistant: Dr. John Galbraith

Signature: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Strike:	Notes
A	0.0.5	10 ⁴ R 3/1	Sil	10	12	GL 25%	-	PO 50	GR 1,1,1	VFI SA	SA	-	-	1, F	0.25 4.3	5-1A 5-1B		
E	0.5- 9	10 ⁴ R 6/4	Sil	12	15	VGR 40%	0.25- 0.5	PO 50	SBK 1,1,1	VFI SA	SA	-	-	2, M	0.75 5.3	5-2A 5-2B		
Bu1	9-18	10 ⁴ R 5/4	Sil	15	20	VCR 50%	0.25- 3.0	PS SA	SBK 1,1,3	VFI SA	SA	-	-	2, M	1.5 4.8	5-3A 5-3B		
Bw2	18-33	7.5 ⁴ R 5/4	Sil	18	25	XO4 65%	0.25- 4.0	PS SA	SBK 1,1,3	VFI SA	SA	-	-	1, M	1.75 4.5	5-4A 5-4B		
Bc	33-50 ¹	7.5 ⁴ R 5/4	Sil	12	38	XO4 80%	0.25- 4.0	PO 50	SBK 1,1,3	VFI SA	-	D:10 ⁴ R 6/3 C:7.5 ⁴ R 5/4	ED CD	-	3.0 4.5	5-5A 5-5B		

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: DUANE TEUAX
 Field Assistant: Dr. John Galbraith

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-ZZ3-160607-0910-DAT					Topographic Position:	BACKSLOPE		Parent material:	CALCIUM / RESIDUUM					
Date:	06-07-2016					% Slope:	49°		Slope Aspect:	180°					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL DRAINED		Depth to Water Table:	N/A					
RETTEW Job #:	089962000					Depth to Refusal:	Bottom @ 4ft SOFT SILTSTONE		Slope Failure or slip:	N/A					
NRCS Soil Unit:	Belt's channeling silt loam					Bedrock Type:	Siltstone		Dip Slope & Direction:	15° South					
Mineralogy:	MIXED					Vegetation:	Scrub oaks, chestnut oak, white oak, Hickory, Dogwood		USDA	Silt: 110°					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Penalty/ Subclass	Structure Type, Grade, and Size	Moist Consistence	Machine Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Notes
A	0-0.25	5YR 2.5/1	-	-	-	GR 8%	0.25	PO	GR 1.3	MLT	SA	-	-	2, M	-
	0.25-3.5	10YR 2/2	hoom	10	40	GR 8%	0.25	PO	GR 1.3	MLT	SA	-	-	2, M	-
Bt1	3.5-7.5	7.5YR 5/4	Sil	18	31	GR 35%	0.25-0.5	PS	SBR 1.1	MLT	SA	-	-	1, M	-
	7.5-17.0	7.5YR 5/4	hoom	25	35	GR 25%	0.25-1.0	SS	SBR 1.2	MLT	SA	-	-	1, M	-
Bt2	17-29	7.5YR 5/4	cl	30	30	GR 30%	0.25-3.0	PS	SBR 1.2	MLT	SA	-	-	1, M	-
	29-36	7.5YR 5/4	Sil	18	15	GR 70%	0.25-4.0	PS	SBR 1.1	MLT	SA	-	-	1, M	-
ZCr	36-46+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P-224-160608-1315-500	06/08/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Berks Chamney s.l	Mixed	Backslope	Colluvium over residuum									
						% Slope: 34	Slope Aspect: N/A									
						Drainage Class: SED	Depth to Water Table: N/A									
						Depth to Refusal: 26	Slope Failure or slip: N/A									
						Bedrock Type: siltstone	Dip Slope & Direction: 35° E 40									
						Vegetation: hickory, white pine, white oak	Strike: 300									
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Motion Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Soil Temperature/ pH	Lab Sample ID	Notes
0e	1	5YR 2.5/1	-	-	-	ch 10	1-2	-	-	aw	-	-	C F	4.25	-	
A	3	10YR 3/2	s.l	16	20	ch 20	1-2	1 f gr	vfr	aw	-	-	C F	5.0	-	
Bw	11	10YR 5/6	s.l	15	20	ch 60	2-4	1 f sbk	fr	aw	-	-	C F	1.25	-	
C	26	10YR 5/6	s.l	15	20	f1 90	4-8	po	fr	aw	-	-	F F	4.75	-	roots between rocks
R	26+	-	-	-	-	-	-	po	-	-	-	-	F F	4.75	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Dr. Galbraith

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	D-225-160601-1130-MED	Topographic Position:	footslope/terrace	Parent material:	Colluvium												
Date:	6/01/2010	% Slope:	2.5%	Slope Aspect:	250°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	MWD	Depth to Water Table:	> 45												
RETTEW Job #:	089962000	Depth to Refusal:	cobbly fragic horizon 45"	Slope Failure or slip:	—												
NRES soil Unit:	Memoquahela fine loamy	Bedrock Type:	—	Dip Slope & Direction:	—												
Mineralogy:	Mixed mineralogy	Vegetation:	super malle, white pine, ironwood, styrax, hickory, privet, fl. dogwood.	Soiler:	—												
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Reactivity/Soil System	Structure Type, Grade, and Size	Molar Consistency	Medium Density Fragments & Distribution	Redox Feature Color	Soil Feature Description	Roots	Moisture Content/pt	Lab Sample ID	Notes
Ap	0-7	10YR4/3	sil	12	10			PO	2fgran	fr	SC	—	—	3vfm	0.5	S1	
Bt	7-16	7.5YR5/6	sil	20	10	gran 40%	<1	MP MS	2msbk	FR	SC	—	—	3m, 3c	4.7	S2	
ZBt1	16-24	7.5YR5/4	sil	15	15	gran 40%	<1	SP SS	2fsbk	FR	SG	—	—	2f, m	4.6	S3	
ZBt2	24-30	7.5YR5/4	sil	15	15	gran 40%	<1	SP SS	1fsbk	FR	SC	7.5YR5/2 7.5YR5/6	cmf	2f, m	4.5	S4	
Bb1	30-39	10YR5/6	sil	23	8			MP SS	2msbk	FE	SG	10YR5/2 7.5YR5/6	md	2f	2.0 4.5	S5	
Bb	39-45	7.5YR4/4	sil	20	5	30%	up to 6"	SP SS	2mabk	F1		10YR5/2 7.5YR5/6	mcP	—	4.5	S6	

Other Notes: Sampled/Dup.

TEST PIT DESCRIPTION

Soil Scientist: John Roberts
 Field Assistant: M. W. S. S. / Sohn Wah

Signature: [Handwritten Signature]

Somewhat Poorly Drained

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-225A-16 D6 D1-130-TR-1					Topographic Position:	FLATLAND					Parent material:	KUMULUS				
Date:	6/1/16					% Slope:	2					Slope Aspect:	215°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	NO DRAINAGE					Depth to Water Table:	3.6'				
RETTEW Job #:	089962000					Depth to Refusal:	-					Slope Failure or Slip:	-				
NRCS Soil Unit:	CRACKSOLC					Bedrock Type:	-					Dip Slope & Direction:	-				
Mineralogy:	MICEO					Vegetation:	MIXED BEECHES					Dip Slope & Direction:	-				
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mollic Condition	Rooting Pattern & Orientation	Redox Feature Color	Rooting Feature Description	Roots	Field Temperature/ pH	Lab Sample ID	Notes	
A	0-4	10YR 2/2	SILT	15	15	10% c4	< 1	PO SS	2MR FR CS	-	-	3F 2M	0.75 6.5	S1			
Bm1	4-18	10YR 2/1	SILT	17	24	30% GR	< 0.5	PO SS	1MSBR VER QS	-	-	2FMC	1.5 6.5	S2			
Bm2	18-30	10YR 2/1	SILT	16	25	40% GR	< 1	PO SS	1MSBR FR	F2D	10YR 5/4 2F 1C	1.75 6.5	S3				

Other Notes:

18" x 24" FWD CORNER, MATURE WOODS, VERY POOR

TEST PIT DESCRIPTION

Soil Scientist: STEVE DABLO
 Field Assistant: John Wall

Signature: _____

Steve Dablo

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-225 B-188601-1312-5DD		Topographic Position:	Feet slope		Parent material:	Colluvium										
Date:	6-1-16		% Slope:	17%		Slope Aspect:	190°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SWP		Depth to Water Table:	12'										
RETTEW Job #:	089962000		Depth to Refusal:	50"		Slope Failure or slip:	---										
NRCS Soil Unit:	Bx2		Bedrock Type:	henatite cemented sandstone		Dip Slope & Direction:	---										
Mineralogy:	mixed		Vegetation:	Blueoak white pine, white oak, wild hazel, red maple, sassafras		Strike:	---										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/structure	Structure Type, Grade and Size	Moisture Consistence	Robert Dunbar Transparency & Substratum	Redox Feature Color	Moisture Swell/shrink	Roots	Water Penetration/ pH	Lab Sample ID	Notes
D	0-2	10YR 5/2	sil	12	12	3% R	< 1	SS, PO	2M, 9R	ER	am	-	-	3-VF, F 1-M	0.25 0.0	S1	
Bt1	2-12	10YR 6/6	sil	18	12	10% R	< 1	SS, SP	2M, 5SBK	ER	cm	-	1-F 1-M	2.0 6.0	S2	FN DISCONTINUOUS CUTS STAINS	
Bx2	12-26	10YR 6/6	sil	22	14	14% R	< 1	SS, SP	2M, 5BK	ER	cm	C2D C2B C2S	10YR 6/6 10YR 6/6 7.5YR 6/6	2.5 6.0	S3		
Bk1	26-50	7.5YR 5/6	sil	18	10	10% R	< 1	SS, ST	1C, 9R 1M, 9R	F1	-	C3B C3D	7.5YR 5/6 5YR 5/8	24.5 6.0	S4	FRAGILE PROPERTIES WEAK PM FN CUTS STAINS	

Other Notes: _____

f-si, mixed, mesic Fragile Kapp Lndu H

TEST PIT DESCRIPTION

Soil Scientist: Duane Truax
 Field Assistant: Michael Lane

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-226-160601-1400-DAT					Topographic Position:	Shoulder, slightly concave					Parent material:	Colluvial creep over residuum				
Date:	6/1/16					% Slope:	43%					Slope Aspect:	195°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD					Depth to Water Table:	-				
RETTEW Job #:	08962000					Depth to Refusal:	38"					Slope Failure or Slip:	-				
NRCS Soil Unit:	Barks					Bedrock Type:	siltstone					Dip Slope & Direction:	28° E				
Mineralogy:	mixed					Vegetation:	White pine, White oak, Black gum					USDA	Red maple				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rockiness / Shaliness	Structure Type, Grade, and Size	Mold Compliance	Moisture Regime & Distribution	Redox Feature Color	Water Feature Description	Roots	Moisture/Infiltration/Percolation	Lab Sample ID	Notes
Oe	0-1	7.5YR 2.5/1	-	-	-	-	-	-	-	S/A	-	-	-	-	-	S1	
A	1-2	10YR 4/3	si	8	5	10	channers < 1"	PO SO	1 cogr	FR S/A	-	-	-	3m	0.25 5.0	S2	
BE	2-7	10YR 5/6	si	10	7	15	channers < 1"	PO SS	1 m slk	FR S/A	-	-	-	3m, c	1.0 5.0	S3	
Bt1	7-16	10YR 5/8	sil	20	18	45	channers 1/4"-1 1/2"	SP SS	1 m slk	FR S/A	-	-	-	2m	1.5 4.5	S4	
Bt2	16-24	7.5YR 5/6	XCN	20	35	65	channers < 1"	PO SO	1 f slk	FR S/A	-	-	-	1m	1.75 4.5	S5	Micaceous colors 7.5YR 5/3
2C1	24-31	10YR 4/6	XCN	-	-	85	channers 1"	-	ØM	FR I/A	-	-	-	-	too rocky	-	siltstone w/ fines
2R	31-38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	siltstone bedrock

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: David W. Smith
 Field Assistant: David Galbraith

Signature: [Signature]

Test Pit ID:	Topographic Position:	Parent material:	Lab Sample ID	Notes													
R-227-165601-1500 - 15W	SUMMIT	RESIDUAL	S1														
Date: 6/1/16	% Slope: 5%	Slope Aspect: 240°	425														
Job Name: Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class: 10-METER BASE EXCESSIVE	Depth to Water Table: -	0.25														
RETIEW Job #: 089962000	Depth to Refusal: 18"	Slope Failure or slip: -	9-5														
NRCS Soil Unit: BERKS	Bedrock Type: SILTSTONE	Dip Slope & Direction: 20%E (85°)	8.0														
Mineralogy: MIXED	Vegetation: MIXED DECIDUOUS																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rockiness (thickness)	Structure Type, Grade, and Size	Mold Conductance	Horizon Boundary Topography & Discontinuity	Redox Feature Color	Redox Feature Description	Roots	Moisture Parameter/ pH	Lab Sample ID	Notes
Oa	0-1	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VF,F, M, 1-C	-	S1	
D	1-3	10YR3/2	SIL	10	20	10% CL	0.5-3	PO SS	2MHR	NR	aw	-	-	3-VF,F, M, 1-C	0.25	S2	
Bm1	3-11	10YR5/1	VCH SIL	15	25	40 CH	0.5-3	SP SS	1 FSBK	FR	cs	-	-	2-VF,F, M, 3-C, VC	0.75	S3	
Bm2	11-18	10YR5/6	VCH SIL	18	25	55 CH	0.5-3	SP SO	1 FSBK	FR	aw	-	-	1-VF,F, M, 2-C, VC	0.5	S4	
R	18+	SILT STONE				BED ROCK											

Other Notes: WHITE OAK, CHESTNUT OAK, WICKBERRY, WHITE PINE, RED MAPLE

TEST PIT DESCRIPTION

Soil Scientists: *D. Traverser*
 Field Assistant: _____

Signature: *[Handwritten Signature]*

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1083

Test Pit ID:	P-223-160910-007-DEF		Topographic Position:		Headwaters		Parent material:		Solluvium								
Date:	6/16/16		% Slope:		35		Slope Aspect:		316								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:		-								
RETTW Job #:	089962000		Depth to Refusal:		56" Augur		Slope Failure or slip:		-								
NRCS Soil Unit:	BeTKg (8F)		Bedrock Type:		-		Dip Slope & Direction:		-								
Mineralogy:	Mixed		Vegetation:		Red maple, Black gum, White oak, White pine, hickory		USDA		-								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Vegetation Boundary Disturbance & Orientation	Redox Feature Color	Soil Feature Description	Roots	Rock Fragmentation/ in	Lab Sample ID	Notes	
Oe	0-15	5YR 2.5/1	-	-	-	-	-	-	-	AW	-	-	3F	4.5	S1		
AB	15-4	10YR 1/3	S.L	18	22	15% CN	L 2"	P6	SS	MSBk	Vfr	CW	-	2M	4.8	S2	
																	3F
Bw	4-14	7.5YR 5/4	S.L	20	22	38% CN	L 2"	9P	SS	MSBk	Vfr	CW	-	1M	5.5	S3	
																	2F
2Bw	14-26	7.5YR 5/4	S.L	14	35	95% CN	1/2-3"	9C	60	MSBk	Vfr	CW	-	1M	5.3	S4	
																	2F
3Bw	26-37	7.5YR 5/4	S.L	22	18	36% CN	L 4"	9P	9S	MSBk	Fv	CW	-	1F	4.8	S5	
																	1F
3C	37-56+	7.5YR 5/4	S.L	18	25	38% CN	L 4"	5P	5S	MSBk	Fv	-	1F	4.8	S6		
																1F	1.25

Other Notes: _____

Agreed to SG - Refusal on coarse fragments - CN

7.5YR 5/6 - F. The clay can be from weakly indurated Mn-centering.

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant: Mary Dugan

Signature: David Fenster

Test Pit ID:	P-229-160610-0900-DEF		Topographic Position:	Mid Backslope		Parent material:	Colluvium										
Date:	01/01/10		% Slope:	5%		Slope Aspect:	187										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Well Drained		Depth to Water Table:											
RETTEW Job #:	089962000		Depth to Refusal:	52" Auger Refusal		Slope Failure or slip:											
NRCS Soil Unit:	Barks (E1)		Bedrock Type:			Dip Slope & Direction:											
Mineralogy:	Barks Mixed		Vegetation:	Hickory, white oak, white pine, white shadecod, grass, ferns		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Temperature & Distribution	Redox Feature Color	Roots	Roots	Roots	Roots	Notes
A	0-15	10YR 3/2	SIL	16	28	25% Gr	< 1/2"	PO	1/5YR	VtG	CW	-	3M	3M	3M	3M	Thin layer of duff No organic layer
Bw	4.5-17	7.5YR 5/10	SIL	18	28	40% Gr	1/2" - 1 1/4" Mostly 1/4" - 1/2"	PG SS	1/5YR	Ft	CW	-	2cm	1cm	2cm	2cm	
BC	17-27	7.5YR 5/14	SIL	18	28	85% CM	1/4" - 10"	PG SS	1/5YR	Ft	GW	-	2cm	2cm	2cm	2cm	
C	27-52+	-	-	-	-	85% CN	2-16"	-	OM	-	-	-	2cm	2cm	2cm	2cm	15% voided space Few clays on rock faces

Other Notes: Could not auger any deeper
C-Contains random sized coarse fragments with voided space in between.
Shale coarse fragments

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermacher
 Field Assistant: Max Degan

Signature: Paul Fenstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-230A-100010-D-855-0EF		Topographic Position:		Back Slope		Parent material:		Residuum (colluvium in A)				
Date:	10/11/10		% Slope:		35%		Slope Aspect:		257				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		well		Depth to Water Table:		-				
RETTEW Job #:	089962000		Depth to Refusal:		27"		Slope Failure or slip:		-				
NRCS Soil Unit:	Berks (BE)		Bedrock Type:		Shale 1/4-1" thick		Dip Slope & Direction:		15° E				
Mineralogy:	Mixed		Vegetation:		White oak, with hazel, Virginia Pine, blueberry, MT Laurel, Yew		Strike:		348°				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist Consistence	Parent Material Description	Redox Feature Color	Notes	
A	0-4.5	10YR 4/12	S.L	15	28	40% CW	< 1/2"	PO	2MGR	VF	CW	0.1 4.4	Very thin and sparse Red shale CF
Bu1	4.5-18	7.5YR 5/14	S.L	16	18	30% CW	1/4-3"	SP SS	1.5GR	F	CW	0.5 5.2	Brown shale CF
Bu2	18-24	7.5YR 5/14	S.L	17	20	55% CW	1/2-8"	SP SS	1MSGR	F	CW	1.25	
Cr	24-27	7.5YR 5/14	CN Channals	-	-	90% CW	2-8"	-	Rock defined	-	CW	-	Bedded Rock w/ Pines in the lower fractures
R	27+	-	-	-	-	-	-	-	-	-	-	-	

Area Clearcut Several years ago very thick shrubby growth w/ few Redwood Mature trees
 Brown shale core throughout profile, except in A which has Red and Brown Shales

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenstermacher

Field Assistant: Max Dugen

Signature: [Signature]

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Lancaster, PA 17603
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Fax: 717-394-1053

Test Pit ID:	P-231-160610-1130-DEF		Topographic Position:		Parent material:											
Date:	01/01/10		% Slope:		Residuum											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Slope Aspect:											
RETTEW Job #:	089962000		Depth to Refusal:		Depth to Water Table:											
MRCs Soil Unit:	Berks (BE)		Bedrock Type:		Slope Failure or slip:											
Mineralogy:	Mixed		Vegetation:		Dip Slope & Direction:											
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moist Consistency	Moist Consistency	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation	Lab Sample ID	Notes
A	0-2.5	10YR 3/3	SIL	15	28	38% gr	<1/2"	PO	10YR 3/3	VF AW	-	-	3M 1C	0 5.5	-	Red Shale Co F
AD	2.5-7	10YR 5/3	SIL	15	29	36% gr	<1/2"	PO	10YR 5/3	VF CW	-	-	3M 1C	0.25	-	Red shale Co F
BD	7-18	10YR 5/4	SIL	17	22	45% CW	1/4-7"	PO	10YR 5/4	Fr CW	-	-	RM	0.25	-	
Cr	18-26	10YR 5/4	-	-	-	95% CW	2-16"	-	10YR 5/4	Fr CW	-	-	H	-	-	Bedded Rock w/ Fines in between structures
R	26+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Mines Colluvial influence in A & AB horizons

with hazel, chestnut oak, Red maple, Allegheny Blackberry, black locust, Christmas fern

TEST PIT DESCRIPTION

Soil Scientist: Mitchael Lane
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-233-160607-1000-MEL Topographic Position: Ridge shoulder
 Date: 6/7/16 % Slope: 14%
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD
 RETTEW Job #: 089962000 Depth to Refusal: 14"
 NRCS Soil Unit: Becks BD Bedrock Type: Shale
 Mineralogy: mixed Vegetation: white pine, dead oak, white oak

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Suckness	Structure Type, Grade, and Size	Moist. Consistence	Horizon Boundary Topography & Discontinuity	Redox Feature Color	Bedrock Features (manganese)	Roots	Proctor/Thomson/air %	Lab Sample ID	Notes
De	0-1	5YR2.5/1															
A	1-2	10YR 3/2	GR S.L.	10	25	15	< 1	P0 S0	1MGR FR	FR	SC			3FM	0.0 5.4	S1	
Bw	2-6	10YR 5/4	GR S.L.	12	25	30	1	P0 S5	1MGR FR	FR	SC			2FM	0.5 5.5	S3	
C	6-14	10YR 5/6	XGR S.L.	15	30	75	1-3	P0 S5	massive FR	FR	SC			2FM	too tacky 5.2		DR 1107 sample in 100g sieve
Cr	14-18	10YR 5/6	XGR S.L.	15	30	90+	very fine		mass	FR	SC						
R	fractured shale bedrock																

Other Notes:

233

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-234-160607-1049-115L					Topographic Position:	Side Slope					Parent Material:	Colluvium out-wash				
Date:	06/07/16					% Slope:	45					Slope Aspect:	155				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	LDD-ED					Depth to Water Table:					
RETTEW Job #:	089962000					Depth to Refusal:	24"					Slope Failure or slip:					
NRCS Soil Unit:	Bek's BF					Bedrock Type:	Shale					Dip Slope & Direction:	15% NE				
Minerology:	Mixed					Vegetation:	chestnut oak, Hickory					Strike:	290				
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soil	Structure Type, Grade, and Size	Molt. Consistence	Major Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Acid Potential/ pH	Lab Sample ID	Notes
Be	0-1.5	5YR2.5/1												2F	6.5	S1	
A	1.5-3	7.5YR 3/2	VGR S.L	10	25	35	1	P0	HGR FR	FR	SC	—	—	3F	0.25	S2	
								S0							6.0		
Bw	3-8	7.5YR 5/6	VGR S.L	12	30	50	1-2	P0	HSBK FR	FR	SC	—	—	2FM	0.5	S3	
								S0							5.0		
Cr	8-21	7.5YR 5/6	XCB S.L	12	20	90+	4 to 10	P0	Amusive	—	IC	—	—	Seasonal fractures	5.1		fracture shale
								S0									
R2	24+	fracture bedrock															

Other Notes:

234

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane

Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
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Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: P-235-160607-1135-MEL
 Date: 6/7/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Beks BD
 Mineralogy: Mixed

Topographic Position: Ridge Summit
 % Slope: 5%
 Drainage Class: WD
 Depth to Refusal: 23"
 Bedrock Type: Silt
 Vegetation: White Oak, hickory, dogwood, pine

Parent material: _____
 Slope Aspect: _____
 Depth to Water Table: _____
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 Strike: _____

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number/ Subclass		Structure Type, Grade, and Size	Moist Consistence	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ in	Lab Sample ID	Notes
								PO	SO									
0e	0-2	5YR2.5/1																
AE	2-4	10YR 5/3	GR SIL	15	25	20	1	PO SO		LFGR	FR	SA			3FM	0 5.5		
Bw	1-1	6YR 5/6	VGR SIL	15	20	40	1	PO SO		MSBK	FR	WC			2FM	0.75 4.5		
Cp	10-18	10YR 9/6	XGR SIL	15	20	85	1-3	PO SO		Omissive	FR	IL			occasional ferrous	4.5		
R	1-23	fractured shale bedrock																

Other Notes:

Did not sample
See P-233-160607-1000-MEL

235

TEST PIT DESCRIPTION

Soil Scientist: Michael Love
 Field Assistant: Rachel Hill

Signature: _____

M. Love

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Minerology:	Topographic Position:	Parent Material:	Notes										
P-236-160607-1535-MEL	06/07/16	Domination - Atlantic Coast Pipeline Soil Survey	Berks 8 F	Mixed	Side slope	Colluvium over residuum											
					% Slope: 30	Slope Aspect: 310°											
					Drainage Class: VAD	Depth to Water Table: —											
					Depth to Refusal: 34	Slope Failure or slip: —											
					Bedrock Type: Shale	Dip Slope & Direction: 20° E											
					Vegetation: Large Pine, Chestnut oak, White oak, Red maple, Blackberry, Blackberry, Blackberry, Blackberry	Strike: 350											
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Moist Consistence	Moist Bulk Density Temperature & Dimensions	Redox Feature Color	Redox Feature Description	Roots	Product Temperature/ pH	Lab Sample ID	Notes
De	0-2	5YR2/1												3FM	0.0	S1	
A	2-4	10YR3/2	GR L	12	40	25	< 1	Po 50	HGR GRK	SC	SC	—	—	2FM	0.25	S2	Some sand and some gravel
Bw	4-14	10YR5/4	GR S-L	15	30	25	1	Po 50	MSBK FK	FK	SC	—	—	2FM/C	0.75	S3	
C	14-35	10YR5/6	GR SIL	12	30	40	1-3"	Po 50	OMass FK	FK	WC	—	—	M	0.75	S4	
R	25'	Fractured Shale															

Other Notes:

236

TEST PIT DESCRIPTION

Soil Scientist: Michael Leane
 Field Assistant: Rachel Hill

Signature: _____



Test Pit ID: P-237-160007-1240-MEL
 Date: 6/7/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Barks 8E
 Mineralogy: Mixed

Topographic Position: Sideslope, head of hollow
 % Slope: 33%
 Drainage Class: UDB
 Depth to Refusal: _____
 Bedrock Type: _____
 Vegetation: White oak, white pine, chestnut oak, Hickory

Parent material: Colluvium
 Slope Aspect: 205°
 Depth to Water Table: _____
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 Strike: _____

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	USDA		Moist Consistence	Molar Conductivity	Redox Feature Color	Molar Conductivity Description	Roots	Penetration/pt	Lab Sample ID	Notes
								Structure Type, Grade, and Size	Moist Consistence								
AE	0-210	10K 4/5	GR SIL	12	25	15	1	PO SD	IFGR	FR	SC	—	3FM	0.75 5.2	S1	thin O horizon	
BE	2-8	10K 5/4	GR SIL	12	25	15	<1	PO SS	1MSBK	FR	UC	—	3FM	1.25 5.5	S2		
B ₀₀	8-110	10K 5/8	VGR SIL	18	25	40	<0.25	PO SS	1FSBK	FR	UC	—	2MC	1.25 5.0	S3	no clay films	
BC	15-31	7.5K 5/6	VGR SIL	15	25	60	<0.25	PO SO	1FSBK	FR	UC	—	1M	1.25 4.5	S4		
C	31-52	7.5K 5/6	VGR SIL	15	25	60	up to 1	PO SD	omass ve FR	FR	UC	—	1M	4.5	S5	most gravel 20-25	

Other Notes: Very coarse sand, very fine & fine gravel affect texture, penetrometer accuracy
Head of hollow - deep colluvium, very gravelly silt loam, wk structural development in
transitional horizons, pit dissimilar to adjoining pits

237

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: Michael Lane

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-238-160007-1355-NE				Topographic Position:	sideslope				Parent material:	colluvium over residuum						
Date:	6/7/10				% Slope:	30				Slope Aspect:	320						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	C/D				Depth to Water Table:	—						
RETTEW Job #:	089962000				Depth to Refusal:	—				Slope Failure or slip:	—						
NRCS Soil Unit:	Barks (BF)				Bedrock Type:	Shale				Dip Slope & Direction:	—						
Mineralogy:	mixt				Vegetation:	witch hazel, pine				Strike:	—						
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability Index	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Rock Temperature/ pH	Lab Sample ID	Notes
De	0-25	5YR2.5/1												2FM	6.0		
A	25-35	10YR 7/2	S.L	10	25	410			1FGR FR	FR	SC	—	—	3FM	0.25		
															5.0		
															0.3		
BE	35-12	10YR 5/4	G.R S.L	12	20	15	1		1FSBK FR	FR	UC	—	—	2FM/C	5.3		
															4.5		
															4.5		
Bw	12-19	10YR 5/6	VGR S.L	15	20	40	1+		1MSBK FR	FR	UC	—	—	1FM	4.5		
															4.5		
															4.5		
C	11-28	10YR 5/8	XGR S.L	12	20	75	up to 6		0msbk FR	FR	UC	—	—	class. org. / 100 rocks	4.5		
															4.5		
R	2-50	weathered							stone			—	—	class. org. / 100 rocks	4.5		

Other Notes:

238

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Max

Signature: David Fenstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Moisture Content	Lab Sample ID	Notes
A	0-3	10YR 2/1	SIL	1B	22	15.1% CN	2 1/2"	PO	145BK	Fr	AW	-	3F	0.25	5.4	S1	Roots at top of plumbon very thin de			
Bu1	3-14	7.5YR 4/6	SIL	22	22	25.1% CN	2 1/2"	PO	145BK	Fr	CW	-	3FM	1.25	5.2	S2	Remnants of Aluvial			
Bu2	14-26	10YR 4/6	CN	26	22	98.1% CN	2 1/4"	PO	145BK	VFC	AW	-	2F	0.75	5.4	S3	Sharp edged CoF Aluvial			
Bu3	26-42	2.5Y 6/11	SIL	26	14	50.1% CN	9.5" 2 1/2" 3"	SS	165BK	F ₀	-	10Y 5/6	MP	3.5	5.2	S4	Colluvium			

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: D Fenstermaker
 Field Assistant: Max

Signature: David Fenster

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-239A-1101007-1430-DEF		Topographic Position:	flood plain		Parent material:	Alluvium over colluvium										
Date:	6/17/10		% Slope:			Slope Aspect:	182°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Moderately well drained		Depth to Water Table:	29"										
RETTEW Job #:	08996200		Depth to Refusal:	20 - water table		Slope Failure or slip:	-										
NRCS Soil Unit:	Balks (G/E)		Bedrock Type:			Dip Slope & Direction:	-										
Mineralogy:	Mixed		Vegetation:	Chestnut oak, Red maple, white hore, Hickory, white pine, hop for spruce		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock Substratum	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Orientation	Redox Feature Color	Redox Feature Orientation	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
A	0-1	10YR 2/1	SIL	16	21	15% CH	2-4"	PO	2PGR	VFC	AW	-	-	3FM	0.25	S1	
Bw1	1-12	10YR 5/4	SN	16	21	30% CN	2-4"	PO	1MSBK	FR	CW	-	-	2FM 3FM 3co	0.75	S2	
						80% GR	< 1/4"	PO	1MSBK	VFC	CW	-	-	2FM 2FM	1.25	S3	
Bw2	12-18	10YR 5/4	SIL	22	25	6% GR	< 1/4"	SS	1MSBK	VFC	CW	-	-	2FM	5.2	S4	
Bw3	18-27	10YR 6/4	SN	22	25	30% CN	2-2"	SS	1MSBK	FR	CW	-	-	2FM	0.5		
Bw3	27-30+	10YR 6/4	SN	22	18	70% GN	2-4"	SS	1.5BN	FR	-	-	2.5/2.2/2.2	5.5	S5	Colluvium Cofine Sand	

Other Notes:

Series of Alluvial materials of Colluvium

TEST PIT DESCRIPTION

Soil Scientist: D. Stenske macher
 Field Assistant: Max

Signature: David Stenske

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-240-160607-0432-DEF			Topographic Position:	Backslope/terrace			Parent material:	residuum							
Date:	07/16			% Slope:	well			Slope Aspect:	-							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	25'			Depth to Water Table:	-							
RETTEW Job #:	089962000			Depth to Refusal:	-			Slope Failure or slip:	-							
NRCS Soil Unit:	Beks (BE)			Bedrock Type:	-			70° SW	-							
Mineralogy:	Mixed			Vegetation:	-			Striker:	186°							
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moist Consistence	Reaction Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
0e	0-3	5YR 2.5/1	-	-	-	-	< 2"	-	-	-	-	-	3f	-	-	-
A	3-4.5	10YR 3/2	GR SIL	16	15	15% gr	< 2"	PO	1.5BR	WFR	AW	-	OM 2f	0	-	-
Bw	4.5-20	10YR 5/4	GR SIL	18	16	40% gr	2-8"	SP	1.5BR	FR	CW	-	OM 2f	4.5	-	-
Cr	20-29	10YR 5/4	-	-	-	99% CB	2-8"	SS	OM	-	CW	-	1f	4.9	-	-
R	29+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

Cr - Rocks in sinus in between - bedded

186°

TEST PIT DESCRIPTION

Soil Scientist: D. F. Ansley, Inc. m.w.l.v.e.r
 Field Assistant: MAX

Signature: David Ansley

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-241-160607-0926-DEF			Topographic Position:	Ridge Top		Parent material:	Residuum									
Date:	6/7/14			% Slope:	3%		Slope Aspect:	295°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	Well		Depth to Water Table:	-									
RETTEW Job #:	089962000			Depth to Refusal:	19"		Slope Failure or slip:	-									
NRCS Soil Unit:	Per Ks SF			Bedrock Type:	Fine grained sandstone shale		Dip Slope & Direction:	31° NE									
Mineralogy:	Mixed			Vegetation:	Chestnut oak, white pine, white oak, blueberry		Strike:	294°									
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Substr.	Structure Type, Grade, and Size	Moist. Consistence	Moist. Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Moist. Permeability/ pH	Lab Sample ID	Notes
0e	0-15	5YR 2.5/2	-	-	-	-	-	-	-	-	-	-	-	3F, M	4.4	S1	
A	15-3.5	10YR 4/3	SIL	14	18	20% CN	2"	SP, SD	1F5Bk	UFr	AW	-	-	3F, M	4.5	S2	
Bw1	35-11	10YR 6/4	SIL	15	10	38% CN	2"	SP, SS	1F5Bk	Fr	CW	-	-	2F, M	5.2	S3	
Bw2	11-19	10YR 6/4	SIL	15	10	60% CN	2"	SP, SS	1M5Bk	Fr	AW	-	-	3F, M	5.2	S4	
R	19+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenechew
 Field Assistant: Max

Signature: Daniel Fenechew

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 Phone: 717-394-3721
 Fax: 717-394-1083

Test Pit ID:	P-201A 100007-0940-PEE		Topographic Position:		Backslope		Parent material:		Rapidown								
Date:	4/7/16		% Slope:		5.2		Slope Aspect:		-								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		30" well		Depth to Water Table:		-								
RETTEW Job #:	089962000		Depth to Refusal:		-		Slope Failure or slip:		-								
NRCS Soil Unit:	1A1K5 (8F)		Bedrock Type:		-		Dip Slope & Direction:		28° NE								
Mineralogy:	Mixed		Vegetation: <td colspan="2">Line grass and Sand spurs Hickory, Red oak, Blueberries</td> <td colspan="2">USDA</td> <td colspan="2">chestrutloek</td>		Line grass and Sand spurs Hickory, Red oak, Blueberries		USDA		chestrutloek								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock Substratum	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Bedrock Fragmentation/pt	Lab Sample ID	Notes
De	0-0.5	7.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3E	4.5	-	
A	0.5-3	10YR 3/2	UGR SIL	15	20	38% GAR	2-1"	PD 50	DMGAR	VFA	AW	-	-	3MF	0	-	
Bw	3-12	7.5YR 5/1	UGR G.L.	17	18	38% GAR	1-2"	SP 35	MSH	FC	CW	-	-	3EM	0.75	-	
Bc	12-30	7.5YR 5/1	VCB SIL	17	16	55% CB	1-6"	SP 85	MSH	Fc	AW	-	-	3AM 2Co	1.25 5.2	-	
R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Ferstermacher
 Field Assistant: _____

Signature: Daniel Ferstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-242-100607-0920-DEF		Topographic Position:		Backslope		Parent material:		Colluvium								
Date:	6/7/16		% Slope:		18		Slope Aspect:		270°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well Drained		Depth to Water Table:		-								
RETTEW Job #:	089962000		Depth to Refusal:		-		Slope Failure or Slip:		-								
NRCS Soil Unit:	Bc1s (8F)		Bedrock Type:		-		Dip Slope & Direction:		-								
Mineralogy:	Mica		Vegetation:		Meadow		Meadow		Meadow								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Solubility	Structure Type, Grade, and Size	Mobility Consistency	Hydrolytic Order	Redox Feature Color	Redox Feature Description	Roots	Root Depth (inches)	Lab Sample ID	Notes
Oe	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3F	4.2	S1	
A	2-4	10YR 2/1	GR	16	22	15% GR	1/2"	PO	1FSBK	VF	AW	-	-	3FM	0.5	S2	
Bw1	4-17	10YR 6/4	GR	16	18	13% GR	1/2"	SP	MSBK	FR	CW	-	-	2FM	1.5	S3	
Bw2	17-32	7.5YR 5/4	GR	18	18	20% GR	1/2"	SP	MSBK	FR	CW	-	-	1FM	1.75	S4	
Bw3	32-50+	7.5YR 5/6	GR	18	15	30% GR	1/2"	SP	MSBK	FR	-	-	-	1F	4.8	S5	on the firm side of friable

Other Notes:

No clay films or Redox observed. Red siltstone and brown sandstone and shale fragments throughout profile.

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Signature: David Fenstermaker

Field Assistant:

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	8-243-100607-0900			Topographic Position:	Backslope - slight nose			Parent material:	Residuum								
Date:	6/7/16			% Slope:	33%			Slope Aspect:	281°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	Well			Depth to Water Table:	-								
RETTEW Job #:	089962000			Depth to Refusal:	27			Slope Failure or slip:	-								
NRCS Soil Unit:	Barks SE			Bedrock Type:	Sandstone-fine-grained			Dip Slope & Direction:	23° NE								
Mineralogy:	mixed			Vegetation:	Chestnut oak, white pine, Blackgum, Gladiolus			Strike:	312°								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Molt Consistence	Native Boundary Topography & Disposition	Redox Feature Color	Major Feature Description	Roots	Proctor Parameters/ ρ_d	Lab Sample ID	Notes
O _e	0-2	5YR 3/2	-	-	-	-	-	-	-	-	-	-	-	3F	-	-	-
A	2.5-2.5	10YR 3/2	SIL	21	18	-	-	PO	2MBR	VF	AW	-	-	2F	0.85	-	-
B _{w1}	2.5-7	10YR 5/4	CN	23	18	20%	2.1"	SP	1MBR	FR	CW	-	-	2FM	0.5	-	-
B _{w2}	7-20	7.5YR 5/4	CN	23	18	25%	2.2"	SP	1MSBR	FR	CW	-	-	2FM	0.75	-	Shake test
B _C	20-27	7.5YR 5/4	XCB SIL	22	20	70%	3-8	SS	1SSBR	FR	AW	-	-	2FM	1.25	-	Find ground sandstone
R	27+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

Bedrock 15 in sheets on thick dipping into hillside

TEST PIT DESCRIPTION

Soil Scientist: D. Konafermacher
 Field Assistant: M. Nivola

Signature: David Konafermacher

RETW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P-244-160607-0910-DEF
 Date: 6/17/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETW Job #: 089962000
 NCRS Soil Unit: Balks (GE)
 Mineralogy: Mixed
 Topographic Position: Balk slope
 % Slope: 42
 Drainage Class: well
 Depth to Refusal: 39
 Bedrock Type: Shale Bedrock 1/4-1/2' thick
 Vegetation: Chestnut oak, black gum, scarlet oak, Mountain laurel
 Parent material: Balk slope
 Slope Aspect: 862
 Depth to Water Table: -
 Slope Failure or slip: -
 Dip Slope & Direction: 50° ENE
 USDA: 390°

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Consistence	Redox Feature Color	Moist Feature Description	Roots	Moist Temperature at 1"	Lab Sample ID	Notes
A	0-3	10YR 2/1	XGR SIL	15	33	70% Gr	<2"	PO SD	1MGR	VFr	AW	-	-	3F 1M	0.25	S1	Sandstone Cor
AB	3-8	10YR 5/6	XGR SIL	15	28	60% Gr	1/2-2"	PO SS	1MSBK	VFr	CW	-	-	3F 2M 2C	0.25	S2	Sandstone Cor
ABu1	8-25	10YR 6/4	SIL	15	22	48% Gr	1/2"	SS	1MSBK	Fr	CW	-	-	3F 2M 1C	0.75	S3	Shale Cor
ABu2	25-39	10YR 5/4	SIL	17	22	30% Gr	<1"	SS	1CSBK	Fr	CW	-	-	2F 1M	1.25	S4	
ACr	37-39	10YR 5/4	CN (S.D)	16	14	CN 92%	2-6"	SS	OM	Fr	AS	-	-	1F	-	-	
AR	39+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Thin Mantle of Colluvium that has been mixed with Residuum in AB horizon
Bedrock Dips Down into hillside

Just some Duff on surface - fairly rocky and No organic layer under Duff/moss

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Field Assistant: _____

Signature: 

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-245-100608-0855-DEF		Topographic Position:	Back / slight nose		Parent material:	Residuals											
Date:	6/8/10		% Slope:	33		Slope Aspect:	240°											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Somewhat excessively drained		Depth to Water Table:	-											
RETTEW Job #:	089962000		Depth to Refusal:	18'		Slope Failure or slip:	-											
NRCS Soil Unit:	Berk5 (GE)		Bedrock Type:	fine grained sandstone		Dip Slope & Direction:	18° ENE											
Mineralogy:	mixed		Vegetation:	White Pine, Black oak, Chestnut oak, Blueberries		Strike:	330°											
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Soil/fragments	Structure Type, Grade, and Size	Molar Consistence	Moisture Regime	Redox Feature Color	Redox Feature Description	Roots	Moisture Regime	Lab Sample ID	Notes	
Oe	0-1.5	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3F, M	-	-	-	-
A	1.5-3.25	10YR 3/1	SIL	15	33	35% Gr	2-1"	Po	1.5BK	Fr	AW	-	-	3F, M	0.1	-	-	-
								So										
Bw	3.25-14	7.5YR 6/4	SIL	14	20	40% Gr	2-3"	SP	1.5BK	Fr	CW	-	-	3F, M	0.75	-	-	-
								SS										
Cf	14-18	7.5YR 6/4	Cobbles (S.L)	14	20	90% CB	2-10"	-	OM	Fr	AW	-	-	2F, M	-	-	-	-
								-										
R	18+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Bed Rock w/ roots in between.

Other Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant: _____

Signature: David Fenster

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-246-160608-0900-DEE
 Date: 01/11/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Waylinton (SID)
 Mineralogy: Mixed

Topographic Position: Ridge - shoulder
 % Slope: 20% towards Aug 24
 Drainage Class: W1
 Depth to Refusal: 22"
 Bedrock Type: Siltstone
 Vegetation: chestnut oak, Hickory, White pine, blueberry, grass

Parent material: Residual
 Slope Aspect: 168°
 Depth to Water Table: -
 Slope Failure or slip: -
 Dip Slope & Direction: 18° NE
 USDA

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size		Moist Consistence	Nutrient Availability	Redox Feature Color	Moist Feature Description	Roots	Moist Temperature/ pH	Lab Sample ID	Notes
								Quality/ Index	Structure								
A	0-3.5	10YR3/2	S.L	14	28	45% CN	< 1"	PO	2A GR	VFR	AW	-	3+ 3M	0.35	-	Very thin (1/8") sand sparse & not consistent on surface	
Bw	3.5-17	7.5YR5/4	S.L	14	20	85% CN	< 1"	PO SO	1C5 GR	VFR	CW	-	3+ 3M 1C, 1/10	1.0 4.4	-	Soil bedded rock minimal finds bitum	
Cr	17-22	7.5YR5/4	-	-	-	-	-	-	-	-	AW	-	-	-	-	Competent Rock No fine sin between	
R	22+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Cr - rips as channels 1/2-4"

TEST PIT DESCRIPTION
 Soil Scientist: D. Fenstermaker
 Field Assistant: Max Degan

Signature: Daniel Fenstermaker

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-247-160008-0912-DEF		Topographic Position:		Upper Backslope		Parent material:	Colluvium over Residuum								
Date:	6/26/16		% Slope:		well		Slope Aspect:	-								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		3%		Depth to Water Table:	-								
RETTEW Job #:	089962000		Depth to Refusal:		-		Slope Failure or slip:	-								
NRCS Soil Unit:	Hazleton (SOE)		Bedrock Type:		Shale 1/4-1/2 thick Shale's Break		Slope and Direction:	22° NE								
Mineralogy:	Mixed		Vegetation:		Young Saplings - 80% Red maple, Red oak, White Strake, etc		Strike:	300°								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Moisture Boundary Description	Redox Feature Color	Moisture Transition	Roots	Root Penetration/Depth	Lab Sample ID	Notes
A	0-6	7.5YR 3/3	SIL	16	24	15% GR	< 1/2"	PO	FR	CW	-	-	2ft, 1m	0	S1	No Organics Only thin dust
Bu1	6-19	5YR 5/4	SIL	18	24	15% GR	< 1/2"	SP	VF	CW	-	-	2ft, 1m	0.5	S2	Red shale and brown sandstone cap
Bu2	19-28	7.5YR 5/6	XCN SIL	22	18	70% CN	1/2-3"	SP	FR	CW	-	-	2ft, 1m	2.0	S3	Go for oriented w/BR
2R	28-34	7.5YR 5/6	CN (SIL)	22	18	90% CN	1/2-3"	OM	FR	AW	-	-	1ft	2	-	Mn concentrations on rock face 5' below shale with fines in between
2R	34+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: Slightly concave horizontally

TEST PIT DESCRIPTION

Soil Scientist: D. Fensholt
 Field Assistant: Max Dugan

Signature: David Fensholt

201
201

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-242-K06008-080-DEF					Topographic Position:	N/A Slope		Parent material:	Residuum							
Date:	08/16/08					% Slope:	20%		Slope Aspect:	-							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Somewhat excessively drained		Depth to Water Table:	-							
RETTW Job #:	089962000					Depth to Refusal:	17"		Slope Failure or slip:	-							
NRCS Soil Unit:	Barks (8D)					Bedrock Type:	Shale 14-12" thick		Dip Slope & Direction:	20 NE							
Mineralogy:	Mixed					Vegetation:	Chestnut oak, Red Maple, Striped maple, with some blueberry										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Particle Size	Structure Type, Grade, and Size	Moist Consistence	Machine Boundary Topograph & Description	Redox Feature Color	Redox Feature Description	Roots	Point Measurement/ pH	Lab Sample ID	Notes
0e	0-1	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3F RM	4.7	S1	
A	1-3	10YR 4/2	SIL	16	22	38% GR	2"	PO	H5BK	VFR	CW	-	-	3RM 1C	4.5	S2	Some Colloidal material in sandstone loc
BE	3-8	10YR 5/3	S.L	18	14	40% CN	2"	SS	1M5BK	FR	CW	-	-	3E 2M Co	4.4	S3	
Bt	8-17	7.5YR 6/6	S.L	24	10	40% CN	23"	MP MS	2M5BK	FR	AW	-	-	2M F	4.3	S4	clay fillings
R	17+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher
 Field Assistant: Max Regan

Signature: _____



Test Pit ID:	Topographic Position:			Parent material:	Notes												
7-249-1001a08-09a3	Upper Backslope			Colluvium over Residuum													
Date:	Drainage Class:	Depth to Refusal:	Slope Aspect:	Depth to Water Table:													
4/21/10	well	50"															
Job Name:	Bedrock Type:	Vegetation:	Slope Failure or slip:	Dip Slope & Direction:													
RETTEW Job #: 089962000	Wickert (SPE3)	Chestnut oak, Black Gum, Mountain Laurel, white pine, blueberry															
NRCS Soil Unit:	USDA		Moisture Regime:	Redox Feature Color:	Parent Feature Description:	Roots	Soil pH	Lab Sample ID									
Mineralogy: <u>Mixed</u>																	
Horizon	Depth in Inches	Match Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rating/Structure	Structure Type, Grade, and Size	Molt Confidence	Moisture Regime	Redox Feature Color	Parent Feature Description	Roots	Soil pH	Lab Sample ID	Notes
Oe	0-1.5	2.5YR 2.5/1	-	-	-	-	-	-	-	-	AW	-	-	3F	4.4	S1	
A	1.5-3	10YR 3/2	SIL	15	23	35% Gr	1/2	Pc	1MGR	VFR	Aw	-	-	3F, M	4.5	S2	
AB	3-11	10YR 4/2	SIL	15	20	35% Gr	1/2	Pc	1.5BR	VFR	CW	-	-	3M, F, 2C	5.2	S3	
Bw	1-29	10YR 5/4	L	16	38	55% CoB	2-10"	Pc	1.05BR	F	CW	-	-	3M, F	4.6	S4	
AC	29-50	2.5YR 5/6	SIL	23	8	35% CH	<6"	SP	OM	F ^o	AW	-	-	3M	4.2	S5	Little charge in color
R	50+	-	-	-	-	-	-	SS				-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Michael Levine
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P-250-160608-1320-MEL Topographic Position: Ridge Summit Parent material: Shale Colluvium/Residual
 Date: 6/8/16 % Slope: 8% Slope Aspect: 180°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD Depth to Water Table: —
 RETTEW Job #: 089962000 Depth to Refusal: 32" Slope Failure or slip: —
 NRCS soil unit: Beks BD Bedrock Type: Shale Dip Slope & Direction: 45° N
 Mineralogy: Mixed Vegetation: Maple, Hickory, Black Locust

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/soil		Structure Type, Grade, and Size	Moist. Consistence	Native Boundary Temperature & Seasonality	Redox Feature Color	Native Feature Description	Roots	Parent Fragmentation/ pH	Lab Sample ID	Notes
								PO	SO									
Oe	0-2	5YR 2.5/1																
AE	2-4	10YR 4/3	SL	12	25	25	1	PO	SO	1FGR	FR	WC			25M	0.75 5.0		Sandstone c.f.
BE	4-9	10YR 5/4	GR SIL	12	20	25	1	PO	SO	1FSBK	FR	WC			3EMC	1.25 4.9		
Bcd	9-18	10YR 5/6	GR SIL	15	20	30	10 to 1/3	PO	SO	1FSBK	FR	WC			3EMC	1.25 4.5		
Cr	18-32	10YR 5/6	SIL			75		PO	SO	Omassive	FR				Vertical	4.5		Some lithoclastic < 2 cm pyrite silt veins along faces
R	32+	bedrock	shale															

Other Notes: Some surface stoniness, sandstone

250

TEST PIT DESCRIPTION

Soil Scientists: Michael Leue
 Field Assistant: Rachel Hill

Signature: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-251-160608-1230-MEL	Topographic Position:	Shoulder/Sidestope	Parent material:	Collyer silt over residuum
Date:	6/8/16	% Slope:	35%	Slope Aspect:	170°
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	2 Somewhat Excessively	Depth to Water Table:	—
RETTEW Job #:	089962000	Depth to Refusal:	26	Slope Failure or slip:	—
NRCS Soil Unit:	Uvelert (89F3)	Bedrock Type:	Fire gravel sandstone	Dip Slope & Direction:	—
Mineralogy:	mixed	Vegetation:	Red maple chestnut oak, blackberry, white pine		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Muscle/Stubble	Structure Type, Grade, and Size	Moist Consistence	Uniform Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Soil Temperature/ pH	Lab Sample ID	Notes
0	0-1.5	5YR 2.5/1									UVC	—	—	35% C	0.0 4.5		Very thin A hor from 0.5
BE	1.5-4.5	10YR 5/4	S:L	14	30	1/0	1		MSBK FR	FR	UVC	—	—	25% C	1.0 5.0		
B _w	4.5-13	10YR 5/6	S:L	15	20	2/0	1+		MSBK FR	FR	UVC	—	—	25% C	1.25 5.3		
C _r	13-26	10YR 5/6	XCB S:L	15	20	7/5	6+		Massive		UVC	—	—	15% C	5.1		
R	26+	fractured sandstone bedrock															

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-252-160008-1452-MEL
 Date: 6/8/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS soil Unit: Berks BD
 Mineralogy: mixed
 Topographic Position: Ridge Summit
 % Slope: 8%
 Drainage Class: WD
 Depth to Refusal: —
 Bedrock Type: Shale
 Vegetation: Chestnut Oak, Hickory, Mountain Laurel
 Parent Material: Colluvium over Bedrock
 Slope Aspect: —
 Depth to Water Table: —
 Slope Failure or Slip: —
 Dip Slope & Direction: —
 Strike: —

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubness	Structure Type, Grade, and Size	Mott Confidence	Major Boundary Topography & Dominance	Redox Feature Color	Matrix Feature Description	Roots	Acid Potential/ pH	Lab Sample ID	Notes
O ₂	0-2	5YR 2.5/1															
BE	0-9	10YR 7/4	UGR S:L	12	25	40	<1	P0 50	1FSBK FR	FR	W/C	—	—	ZFM	4.5		
															1.0		
															4.7		
B ₀	1-2	10YR 7/6	UGR S:L	15	25	50	W ₃ to W ₁₀	P0 50	1MSBK FR	FR	W/C	—	—	ZFM/C	1.75		
															4.7		
															4.7		
C _r	25-100	10YR 7/6	XGR S:L	15	25	70		P0 50	Omissive FA	FA	W/C	—	—	crossed rocky	4.7		

Other Notes: few surface stones, some sandstone gravel in BE horizon
unable to advance beyond 50" w/ pit rod alone
clean shale faces extending up to 29", few roots, silt loam veins extending to depth

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: [Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>D-253-160608-0950-MEL</u>		Topographic Position:	<u>Slopedge</u>	Parent material:	<u>Calvernum over residuum</u>
Date:	<u>6/8/16</u>		% Slope:	<u>50%</u>	Slope Aspect:	<u>85° E</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>		Drainage Class:	<u>WD</u>	Depth to Water Table:	<u>—</u>
RETTW Job #:	<u>089962000</u>		Depth to Refusal:	<u>28"</u>	Slope Failure or slip:	<u>—</u>
NRCS Soil Unit:	<u>Bkls BF</u>		Bedrock Type:	<u>Sandstone</u>	Dip Slope & Direction:	<u>—</u>
Minerology:	<u>Mixed</u>		Vegetation:	<u>Red maple sapling stand</u>		

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Molt Conductance	Soil Boundary Temperature & Direction	Redox Feature Color	Redox Feature Description	Roots	Parent Material/ pH	Lab Sample ID	Notes
<u>Oe</u>	<u>0-2</u>	<u>SWR 2S/1</u>											<u>3FM</u>	<u>0</u>	<u>S1</u>	
<u>A</u>	<u>2-4</u>	<u>10YR 3/3</u>	<u>G⁺ L</u>	<u>12</u>	<u>40</u>	<u>20</u>	<u>1</u>	<u>P₀ / 50</u>	<u>FR</u>	<u>SW</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>5.5</u>	<u>S2</u>	
<u>Bu1</u>	<u>4-10</u>	<u>10YR 5/6</u>	<u>VGR SL</u>	<u>15</u>	<u>60</u>	<u>40</u>	<u>1-2</u>	<u>P₀ / 50</u>	<u>FR</u>	<u>WC</u>	<u>—</u>	<u>—</u>	<u>2FM</u>	<u>5.3</u>	<u>S3</u>	
<u>Bu2</u>	<u>10-21</u>	<u>10YR 6/6</u>	<u>VCB SL</u>	<u>10</u>	<u>65</u>	<u>75</u>	<u>6-10</u>	<u>10 / 50</u>	<u>FR</u>	<u>WC</u>	<u>—</u>	<u>—</u>	<u>2FMC</u>	<u>5.0</u>	<u>S4</u>	
<u>2Cr</u>	<u>2-28</u>	<u>10YR 5/6</u>	<u>KCB S.L</u>				<u>90+</u>	<u>G+</u>								

Some surface staining
 Few shale ghost fragments in B horizons,
 Bu2 w/ some pockets of silt clay

253

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane

Field Assistant: Rachel Hill

Signature: _____



RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-254-160608-1050-MEL			Topographic Position:	nose slope			Parent material:	Colluvium over residuum								
Date:	6/8/16			% Slope:	30%			Slope Aspect:	130°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	WD			Depth to Water Table:	—								
RETTEW Job #:	089962000			Depth to Refusal:	26"			Slope Failure or slip:	—								
NRCS Soil Unit:	Barks BD			Bedrock Type:	Sandstone			Dip Slope & Direction:	20° SE								
Mineralogy:	mixed			Vegetation:	Hickory, red maple, sycamores			Strike:	40								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soiliness	Structure Type, Grade, and Size	Molt Consistence	Median Spherule Diameter	Redox Feature Color	Parent Feature Description	Roots	Soil Temperature/ pH	Lab Sample ID	Notes
O	0-2	5YR 2.5/1								FR	WDC			2F	0 6.7	S1	
A	2-3	10YR 4/3	GR SIL	12	35	20	1		IFGR	FR	WDC			3FMC	0.5 6.1	S2	
Bw1	3-10	10YR 5/6	GR SIL	15	30	30	1		IFSBK	FR	WDC			3FMC	0.5 5.2	S3	
Bw2	10-16	10YR 7/6	UGR SIL	12	30	50	3-6		IMSBK	FR	WDC			2MC	1 5.4	S4	
Cr	16-26	10YR 9/6				90			Dominic		WDC			occasional	4.0 5.4		Cobbles 3"-10"+
R1e	rock fine grained sandstone																

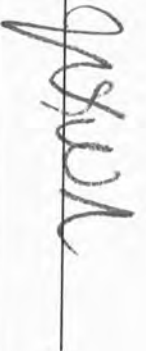
Other Notes:

254

TEST PIT DESCRIPTION

Soil Scientist: John W. Hall
 Field Assistant: David G. Berman

Signature: _____



RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-255-160608-0850-J5W					Topographic Position:	BACKSLOPE					Parent material:	COLUVIUM OVER RESIDUUM				
Date:	8/8/16					% Slope:	45%					Slope Aspect:	-				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL					Depth to Water Table:	-				
RETTW Job #:	089962000					Depth to Refusal:	40'					Slope Failure or slip:	-				
NRCS Soil Unit:	BARKS					Bedrock Type:	SILTSTONE					Dip Slope & Direction:	-				
Mineralogy:	MIXED					Vegetation:	RED MAPLE, CISTENUT OAK, HICKORY, WHITEHAZE, BLACK WALNUT					Strike:	-				
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/Indurated	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moisture Equivalent/ pH	Lab Sample ID	Notes
De	0-3	5YR 2.5/1	-	-	-	-	-	-	-	-	AS	-	-	3-15, F 1-1, C	-	-	
A	3-5	10YR 2/3	qR sL	15	30	25 qR	< 1	SP SS	1 F BR	FR qR	AM	-	-	3-15, F 2-11	0.25 4.5	-	
Bx1	5-11	2.5YR 5/0	qR sL	21	25	30 qR	< 1	SP SS	1 MSBK	FR FR	CM	-	-	3-15 1-11	0.5 4.5	-	
Bx2	11-24	2.5YR 5/1	qR L	18	50	50 qR	< 1	SP SS	2 MSBK	FR FR	CM	-	-	1-15 2-11 2-11	0.5 4.5	-	↑ NCO5, CO3
Cr	24-40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	40+	SILTSTONE	-	-	-	BEDROCK	-	-	-	-	-	-	-	-	-	-	

Other Notes: _____

LINEAR CONCAVE BACKSLOPE

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAT
 Field Assistant: JOHN GURBALTH

Signature: _____

JSW

Test Pit ID:	P-256-160608-0925-3SW		Topographic Position:	SUMMIT		Parent material:	RESIDUUM										
Date:	6/8/16		% Slope:	8%		Slope Aspect:	-										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	PO SOMEWHAT EXCESSIVE		Depth to Water Table:	-										
RETTEW Job #:	089962000		Depth to Refusal:	21"		Slope Failure or Slip:	-										
NRCS Soil Unit:	R R R K S		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	-										
Mineralogy:	MIXED		Vegetation:	HICKORY, CHESTNUT, OAK, BUCKBERRY, VA PINE		Strike:	-										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soiliness	Structure Type, Grade, and Size	Moist Confidence	Adverse Features/Discontinuity	Redox Feature Color	Redox Feature Description	Roots	Product Development/pt	Lab Sample ID	Notes
OC	0-1	S/R 2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-4F 2-F 1-C	4.8	-	
A	1-3	10YR 3/3	QR SIL	10	20	15 QR	<1	PO 50	1E FR	FR	CM	-	-	3-F 2-M 1-C	0.25 4.5	-	
B _M	3-10	10YR 5/6	NCH SIL	14	20	55 CU	0.5-2	PO 50	1M FR	FR	CM	-	-	2-F, M 1-C	0.50 4.5	-	
Cr	10-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	21+	SILTSTONE	RED ROCK														

Other Notes:

NARROW SUMMIT, N 2 M TO STEEP BACKSLOPE TO W P S; SILTSTONE ON SUMMIT, SANDSTONE ON BACKSLOPES

TEST PIT DESCRIPTION

Soil Scientist: JOHN WAH
 Field Assistant: JOHN GUERRA III

Signature: [Signature]

RETTEV Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-257-160608-1040-25W		Topographic Position:	Rocky Slope Nose slope		Parent material:	RESIDUUM											
Date:	10/8/16		% Slope:	27%		Slope Aspect:	270°											
Job Name:	Definition - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SOMEWHAT EXCESSIVE		Depth to Water Table:	-											
RETTEV Job #:	089962000		Depth to Refusal:	27"		Slope Failure or slip:	-											
NRCS Soil Unit:	BEEKS		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	12 ESE (120°) Strike: 30°											
Mineralogy:	MIXED		Vegetation:	HICKORY CRESTED OAK, PITCH PINE, PINE, BUCK OAK, BLUEBERRY		USDA												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rock Fragment Stability/ modulus	Structure Type, Grade, and Size	Mold Condition	Natural Moisture Temperature & Distribution	Redox Feature Color	Redox Feature Description	Roots	Moisture/porosity/ pH	Lab Sample ID	Notes	
Oe	0-1	5YR2.5/1	-	-	-	-	-	-	-	-	as	-	-	3-VE,F	4.5	-	-	
Δ	1-4	10YR3/2	CH SIL	11	20	25 CH	<1	Po	IMBR	NER	aw	-	-	3-VE,F	0.25	-	-	
								So							4.5			
Bm	4-7	10YR5/6	CH SIL	19	18	55 CH	<1	Po	IMBRK	FR	cm	-	-	3-F,M	0.5	-	-	
								SS							4.5			
Bc	7-27	10YR5/6	XCH SIL	13	20	75 CH	2-4	Po	IMBRK	ER	cm	-	-	2-F,M	0.5	-	-	
								SS							4.5			
R	275	1LT	STONE															

Other Notes: BACKSLOPE ON SUMMIT, NARROW-FALLING OFF TO STEEP BANK SLOPS TO N & S.

TEST PIT DESCRIPTION

Soil Scientist: John Mah
 Field Assistant: John Galbraith

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	PCS 8-160608-1051-35W	Topographic Position:	Linear - Convex Backslope	Parent material:	Siltstone Residuum												
Date:	6-8-16	% Slope:	36%	Slope Aspect:	280°												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	Excessive	Depth to Water Table:	> 24"												
RETTEW Job #:	089962000	Depth to Refusal:	20"	Slope Failure or slip:	-												
NRCS Soil Unit:	Berts	Bedrock Type:	Siltstone	Dip Slope & Direction:	80° 290°												
Mineralogy:	Mixed	Vegetation:	Pitch Pine scrub oak	Strike:	200°												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/structure	Structure Type, Grade, and Size	Molt Consistence	Moisture Boundary Distances	Redox Feature Color	Soil Texture Description	Roots	Parent Fragmentation/ pH	Lab Sample ID	Notes
Oe	0-1	5YR 3/2	hemis	-	-	-	-	-	-	-	sa	-	-	-	-	-	
Oa	1-2	5YR 2.5/1	smpnc	-	-	-	-	-	-	-	sa	-	-	m, vf-m, f, c	0.25 4.5		
A	2-5	10YR 3/2	s.l	10	15	15% GR	1/2-2	po	wk, f, gr	vfr	wc	-	-	m, vf-vc	0.25 4.5		
Bw	5-10	10YR 4/6	X _{CL} S _L	14	25	70% XCH	1/2-3	po	wk, f, shk	fr	wa	-	-	c, vf-vc	0.25 4.5		
Cr	10-14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R	> 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Roots follow vertical bedding planes to 19". No soil material between rock layers in Cr

TEST PIT DESCRIPTION

Soil Scientist: JOSH WATKINS
 Field Assistant: _____

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P-259-160608-1305-35N	6/8/16	Dominion - Atlantic Coast Pipeline Soil Survey	BECKS	MIXED	SUMMIT	RESIDUUM									
					% Slope: 5%	Slope Aspect: SOMWHAT EXCESSIVE									
					Drainage Class: 1F	Depth to Water Table: -									
					Depth to Refusal: -	Slope Failure or slip: -									
					Bedrock Type: -	Dip Slope & Direction: 57° NN Strike: N66W									
					Vegetation: HICKORY, CISTENUT OAK, WHITE PINE, MAPLE, BUCKEYE										
USDA															
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Mol. Consistence	Medium Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Moisture/Structure	Lab Sample ID
D _e	0-2	5YR2.5/1	-	-	-	-	-	-	2-VE 2-C	-	-	-	3-VE 2-C	-	4.5
A	2-3	10YR2.5/2	qR sIL	12	18	25 qR	<1	PO	VER	AM	-	-	2-VE 1-F	0.25	
B _M	3-8	10YR2.5/6	qR sIL	14	20	55 CH	1	PO SS	FR	CM	-	-	1-F, M, C	0.5	
B _C	8-14	10YR2.5/6	qR sIL	14	20	85 CH	1-3	PO SS	FR	CM	-	-	1-F	4.5	
R	14+	SILTSTONE	SILTSTONE			BEDROCK	BEDROCK								

Other Notes: BEDROCK VERTICALLY BEDDED; SANDSTONE FLINTS ON SUBFACE

TEST PIT DESCRIPTION

Soil Scientist: David White
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-260-160609-0845-33W		Topographic Position:	BACKSLOPE		Parent material:	RESIDUUM									
Date:	6/9/16		% Slope:	17%		Slope Aspect:	110°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	EXCESSIVE		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	16"		Slope Failure or slip:	-									
NRCS Soil Unit:	PERKS		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	27° SE (158°) strike: 40°									
Mineralogy:	MIXED		Vegetation:	HICKORY, CHESTNUT OAK, PIN OAK, VA PINE, BLUEBERRY		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Molt Consistence	Moisture Binding Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moisture Potential/ pH	Lab Sample ID	Notes
Oe	0-2	5YR 2/1	-	-	-	-	-	-	-	as	-	-	3-VF	-	-	-
A	2-3	10YR 2.5/1.2	CH SIL	13	19	25 CH	< 1	PO	VER	AW	-	-	3-VF	0.25	-	-
Bm	3-8	10YR 5/6	VCH SIL	14	22	60 CH	1-2	PO	FR	CW	-	-	2-VF, F	0.5	-	-
Cc	8-16	-	-	-	-	-	-	PO	-	-	-	-	1-M	4.5	-	-
R	10x	SILTSTONE	-	-	-	BEDROCK	-	-	-	-	-	-	-	-	-	-

Other Notes: 8-257a BACKSLOPE ON NESE OF RIDGE FROM P-259 SUMMIT TO
0-8 SUMMIT BELOW; STREET BACKSLOPE > 257a ~ 4 M TO N & 5 M TO SOUTH

TEST PIT DESCRIPTION

Soil Scientist: JOHN MAW
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-261-160609-0920-05W										Topographic Position:	BACKSLOPE						
Date:	6/9/16										% Slope:	49%						
Job Name:	Dominion Atlantic Coast Pipeline Soil Survey										Drainage Class:	WELL						
RETTEW Job #:	089962000										Depth to Refusal:	-						
NRCS Soil Unit:	BEK3										Bedrock Type:	-						
Mimnology:	MIXED										Vegetation:	HICKORY, MAPLE, WHITE PINE, CHESTNUT, LAUREL, RIVERBERRY						
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability Index	Structure Type, Grade, and Size	Molt Consistence	Nation Boundary (inches)	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/Inch	Lab Sample ID	Notes	
De	0-2	5YR2.5/1	-	-	-	-	-	-	-	as	-	-	-	3-V,E,F	-	4.5	-	
A	2-3	10YR2.5/1	SR SIL	13	20	20	< 1	PO	IMGR	VER	AM	-	-	3-V,E,F, M	0.25	-		
BE	3-6	10YR5/6	QR SIL	13	22	20	< 1	PO	IMSBK	FR	CM	-	-	3-V,E,F, 1-C	0.5	-		
								SS										
Bk1	6-22	10YR2.5/6	QR SIL	16	20	19	< 1	PO	2MSBK	FR	CM	-	-	2-F,M, 1-C	0.5	-		TM DISCONT. CLAY SKINS
								SS										
Bk2	22-40	5YR2.5/6	SIL	24	19	19	2-5	SP	2MSBK	FR	CM	-	-	1-F,M, 1-C	0.5	-		CLAY SKINS
								SS										
Bk3	40-52	5YR2.5/6	XCH SIL	22	20	19	< 1	SP	2ESBK	FR	-	-	-	1-M, 1-C	0.5	-		CLAY SKINS
								SS										

Other Notes:

BACKSLOPE - LINEAR - CONCAVE; SILTSTONE COLEUVIUM TO 22' OVER
 FINE SANDSTONE COLEUVIUM; LEAS OF SANDSTONE FLAGGS
 BEGINNING AT 17"

TEST PIT DESCRIPTION

Soil Scientist: David M. A.
 Field Assistant: _____

Signature: [Handwritten Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes										
P-267-160609-1134-23M	6/9/16		Dominion Atlantic Coast Pipeline Soil Survey	089962000	PERKS	MIXED	% Slope: _____ Drainage Class: _____ Depth to Refusal: _____ Bedrock Type: _____ Vegetation: _____	COLUMLUM OVER RESIDUUM											
	Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Swellability	Structure Type, Grade, and Size	Moisture Consistence	Moisture Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Product Weighted/ M	Lab Sample ID	Notes	
	0e	0-2	S/R 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3-VF 2-F	5-5	S1 A/B		
	Δ	2-1	10YR 3/3	GR SIL	13	25	GR 20	< 1	OP OS	1F 5B K	aw	aw	-	-	3-VF, F L-VN	0.25 4.5	S2 A/B		
	B _M	4-13	10YR 2.5/1.6	GR SIL	14	28	GR 36	< 1	OP OS	1M 5B K	cm	cm	-	-	2-VF, F M, C L-VN	0.5 4.5	S3 A/B		
	2c	13-26	2.5YR 1/6	XF VFSL	8	65	F 78	3-8	OS OP	OMP	cm	cm	-	-	2-F L-C	0.25 4.5	S4 A/B	LITAUIC ROMIC FINES	
	2c1	26-33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2R	33+	SANDSTONE	SANDSTONE			BEDROCK												

Other Notes: LINEAR-ROOTS FOR SCOPE. FINE GRAINED RED SANDSTONE WITH MICA!
 TWO DARK SANDSTONE-TUND-STRAIKERS AT 26"

TEST PIT DESCRIPTION

Soil Scientist: John W. W.
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-263-160609-1324-25W				Topographic Position:	SUMMIT		Parent material:	RESIDUUM								
Date:	6/9/16				% Slope:	37%		Slope Aspect:	S80								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	SOMewhat EXCESSIVE		Depth to Water Table:	-								
RETTEW Job #:	089962000				Depth to Refusal:	22"		Slope Failure or slip:	-								
NRCS Soil Unit:	BERLY				Bedrock Type:	SILTSTONE		Dip Slope & Direction:	90°								
Mineralogy:	MIXED				Vegetation:	CUSTARD APPLE, BLACKBERRY, WHITE PINE, BLUEBERRY, LAUREL		Striker:	240°								
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soiliness	Structure Type, Grade, and Size	Moist. Consistence	Median Bulk Density (g/cm ³)	Redox Feature Color	Root Feature Description	Roots	Moist. Temperature/ pH	Lab Sample ID	Notes
0e	0-1	5YR2.5/1	-	-	-	-	-	-	-	as	-	-	3-4F 2-F	4.5	-	-	
B _M	1-10	10YR5.5/6	VSP SIL	11	20	40 9R	< 1	PO SO	1MSSDK	FR	CM	-	3-F 1-M	4.5	-	-	
BC	6-22	10YR5.5/6	XCH SIL	11	18	70 CH	1-3	PO SO	OVN	FR	CM	-	1-F 1-M	0.5	-	-	FINED LITHOCLASTIC
R	22+	SILT	STONE			BEDROCK											

Other Notes:

NARROW SUMMIT/EDGE BEST; SANDSTONE INCORPORATED; VERTICAL BEDDED

TEST PIT DESCRIPTION

Soil Scientist: JOHN WALK
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-264-160609-1425-11W					Topographic Position:	BACKSLOPE										
Date:	6/9/16					% Slope:	26%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WELL										
RETTEW Job #:	089962000					Depth to Refusal:	-										
NRCS Soil Unit:	BERKS					Bedrock Type:	-										
Mineralogy:	MIXED					Vegetation:	MICROLYCISTANT OAK, MAPLE, BLUEBERRY, LAUREL										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Number nodules	Structure Type, Grade, and Size	Molt Consistence	Median boundary Temperature & Disturbance	Redox Feature Color	Root Feature Description	Roots	Moisture/ Temperature/ pH	Lab Sample ID	Notes
Oe	0-3	5YR2.5/1	-	-	-	-	-	-	-	as	-	-	3-4F, 1-F, M	-	4.5	-	-
BE	3-6	10YR2.5/10	qR sIL	13	22	15 qR	< 1		1M5BK	FR	CN	-	2-4F, C, 1-C	-	1.0	-	IN DISCONT. CLAY SKINS
BK1	6-14	10YR2.5/10	qR sIL	16	20	15 qR	< 1		2M5BK	FR	CN	-	2-4F, M, 2-C	-	4.5	-	CLAY SKINS
BK2	14-23	7.5YR2.5/10	clt sIL	24	20	25 clt	< 1		2M5BK	FR	CN	-	2-F, M, 1-C	-	1.0	-	CLAY SKINS
BK3	23-31	2.5YR2.5/10	sIL	29	15	10 clt	< 1		2C5BK	FR	CS	-	1-E, C, VC	-	1.5	-	CLAY SKINS
BK5	31-54	2.5YR2.5/10	sIL	33	10	2 clt	< 0.5		1M5BK	FR	CS	-	1-4F	-	2.0	-	LITHOCLASTIC DEFORMING SILT-STONE CLAY SKINS

Other Notes:

BACKSLOPE - LINEAR LINEAR

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-265-160609-10410-MEL					Topographic Position:	side slope											
Date:	6/9/16					% Slope:	55%											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	LSD											
RETTEW Job #:	089962000					Depth to Refusal:	29'											
NRCS Soil Unit:	Berks (BF)					Bedrock Type:	sandstone											
Mineralogy:	mixed					Vegetation:	chestnut oak, hickory, white oak											
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Soilness	Structure Type, Grade, and Size	Molt Consistence	Natural Hardness (penetration in Decimeters)	Redox Feature Color	Parent Feature Description	Roots	Moist Penetration/ pH	Lab Sample ID	Notes	
De	0-25	10YR 2/1																
A	2-35	10YR 2/3	CH	12	50	15	1		1FGR	FR	SA	—	3FM		0	S1		
Bw	15-13	10YR 2/6	GR	12	55	25	4 to 3		1FSBK	FR	LY	—	3FM		0.25	S3		
Bw2	2-24	10YR 2/6	VCB	10	60	50	6+		1FSBK	FR	LY	—	2FM		0.75	S4		
Cr	24-39	10YR 3/6	XST			90			1FSBK	HA	UC	—	Occasional		5.2			
R	39+	Fractured				Sandstone												

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: Michael Lane

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-266-160609-0950-WEL Topographic Position: Ridge Summit Parent material: Residuum
 Date: 6/9/16 % Slope: 4% Slope Aspect: 100°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: ED Somewhat excessively
 RETTEW Job #: 089962000 Depth to Refusal: 20" Slope Failure or slip: —
 NRCS Soil Unit: Perks 8D Bedrock Type: siltstone/shale Dip Slope & Direction: 75° + SE Strike: 50°
 Mineralogy: mixed Vegetation: red maple/white oak, with hazel, blueberry, mountain laurel, spurge

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Stability/Restrictions	Structure Type, Grade, and Size	Mott. Consistence	Uniform Boundary Topography & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Parent Potential/ pH	Lab Sample ID	Notes
De	0-1	10YR 2.5/1	—	—	—	—	—	—	—	—	—	—	—	3F/1	4.5	—	—
A	1-2	10YR 7/2	VCH S.L.	12	25	35	up to 3	PO	1F0R	FR	SC	—	—	3F/1L	4.6	—	A horizon not complete
Bw	2-5	10YR 6/4	VCH S.L.	13	20	35	up to 3	PO	1M5R	FR	BC	—	—	2F/1	4.8	—	—
Cr	5-20	10YR 6/4	XCH S.L.	—	—	70+	6	PO	Amesive FR	FR	WS	—	—	Original	4.9	—	—
R	bedrock shale																

Other Notes: Narrow ridge line sloping to N and S
< 12" bedrock Cr

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: _____



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 3020 Columbia Avenue
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 Fax: 717-394-1053

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Nation Boundary Topography & Drainage	Redox Feature Color	Soil Feature Description	Roots	Parent Material	Soil Depth to Water Table	Soil Failure or Slip	Dip Slope & Direction:	Lab Sample ID	Notes
P-267-160609-1205-MEL	6/9/16																			
Date:	6/9/16																			
Job Name:	089962000																			
RETTEW Job #:	089962000																			
NRCS Soil Unit:	Bkys BE																			
Mineralogy:	Mixed																			
USDA																				
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Nation Boundary Topography & Drainage	Redox Feature Color	Soil Feature Description	Roots	Parent Material	Soil Depth to Water Table	Soil Failure or Slip	Dip Slope & Direction:	Lab Sample ID	Notes
A	1-2	10YR 5/5	GR S.L	12	25	20	1	P0 D0	1FGR	FR	SC	—	—	2F4	0.0 5.4	—	—	30 SW	65°	Silt stone
B _u 1	2-8	10YR 5/6	GR S.L	12	20	25	2	P0 S0	1F8K	FR	SC	—	—	3F4C	0.75 5.0	—	—	30 SW	65°	
B _u 2	8-14	10YR 5/8	VCU S.L	12	20	40	1*	S0 P0	1F5DK	FR	SC	—	—	2F4C	1.0 5.0	—	—	30 SW	65°	
C	14-21	10YR 5/8	XCN S.L	12	30	70	1-6	D0 P0	1F5DK	FR	SC	—	—	2M	5.1	—	—	30 SW	65°	
C _r	21-31	10YR 5/5	XFL S.L						1F5DK	FR	SC	—	—	1C		—	—	30 SW	65°	
R	31+																			

Other Notes:

Sideslope w/ tree throws
silt stone in Cr breaking to 6" + frags, overlying P₂₀ w/ oriented siltstone Cf.

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: 

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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P-268-160609-1430-MEL</u>	Topographic Position:	<u>Sideslope</u>	Parent material:	<u>Colluvium over bedrock</u>
Date:	<u>6/9/16</u>	% Slope:	<u>38%</u>	Slope Aspect:	<u>150</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>4/D</u>	Depth to Water Table:	<u>—</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>29</u>	Slope Failure or slip:	<u>—</u>
NRCS Soil Unit:	<u>Berks (BE)</u>	Bedrock Type:	<u>Siltstone</u>	Dip Slope & Direction:	<u>—</u>
Mineralogy:	<u>mixed</u>	Vegetation:	<u>—</u>	Strike:	<u>—</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rustling/ Mottling	Structure Type, Grade, and Size	Moist Consistence	Hydro Boundary Type/Depth	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes	
																		USDA
		<u>020-2</u>	<u>SM^{25/1}</u>															
A	<u>2-3</u>	<u>10R^{3/2}</u>	<u>SIL</u>			<u>15</u>	<u>1</u>		<u>IFGR</u>	<u>FR</u>	<u>SC</u>			<u>3FM</u>	<u>0</u>			<u>Some non-stone gravel</u>
Bw1	<u>3-9</u>	<u>10R^{3/6}</u>	<u>SIL</u>			<u>12</u>	<u>20</u>		<u>IFGR</u>	<u>FR</u>	<u>UC</u>			<u>2FAL</u>	<u>0.75</u>			
Bw2	<u>9-21</u>	<u>10R^{5/8}</u>	<u>SIL</u>			<u>15</u>	<u>20</u>		<u>MSBK</u>	<u>FR</u>	<u>UC</u>			<u>1FM</u>	<u>1.25</u>			<u>Few stones</u>
2R	<u>27+</u>	<u>fractured bedrock</u>																

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: _____



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Test Pit ID: P-269-100609-1320-MEL
 Date: 6/19/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTW Job #: 089962000
 NCRS Soil Unit: Berks BD
 Mineralogy: mixed

Topographic Position: Ridge Summit
 % Slope: < 3% nearly level
 Drainage Class: BD to ED
 Depth to Refusal: 23"
 Bedrock Type: shale/siltstone
 Vegetation: white pine chestnut oak with hazel

Parent material: _____
 Slope Aspect: _____
 Depth to Water Table: _____
 Slope Failure or slip: _____
 Dip Slope & Direction: _____

residual soil
 ridge runs EW slopes N and S

35% NE Strike: 290

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ nodules	Structure Type, Grade, and Size	Moist Consistence	Native Secondary Minerals	Redox Feature Color	Native Feature Description	Roots	Field measurement/ pH	Lab Sample ID	Notes
0e	0-1	5YR 4.5/1	—	—	—	—	< 1	—	—	—	SC	—	—	3EM1C	4.5		
Bw	1-3	10YR 5/6	XGR S.L.	15	20	70	< 1	Pb 50	MSSBKFR	—	WC	—	—	2EM1C	4.7		
Cr	3-15	10YR 4/4	—	—	—	90+	—	—	Onesive	—	WC	—	—	1M1	—		
R	15+	bedrock	—	—	—	—	—	—	—	—	—	—	—	—	—		

Other Notes: _____

very thin A/AE horizon, 0.25in broken, 7.5 YR 4/1

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lave
 Rachel Hill
 De Galbraith

Signature: Michael Lave

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1065

Test Pit ID: P-270-160610-0915-MEL Topographic Position: side slope Parent material: hard siltstone residuum
 Date: 6/10/16 % Slope: 52% Slope Aspect: 180°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: W2 to ED Depth to Water Table: —
 RETTEW Job #: 089962000 Depth to Refusal: 12' Slope Failure or slip: —
 NRCS Soil Unit: Barks BF Bedrock Type: Hard siltstone Dip Slope & Direction: 35% NE
 Mineralogy: mixed Vegetation: chestnut oaks, Red Maple, Serviceberry Strike: 323°

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Boundary Topography & Description	Redox Feature Color	Moisture Features Description	Roots	Moist Resistance/ pH	Lab Sample ID	Notes
0e	0-1	5R 25/1	hemix	—	—	—	—	—	—	—	SC	—	—	MBF CMB	0.0 4.5	1	
A	1-2	10R 3/2	SIL	12	25	410	—	PO SO	IFGR	FR	SC	—	—	3FM 2C	0.25 5	1	
Bw	2-4.5	10R 5/4	VGR S.L	15	10	46	1	PO SO	IFSBK	FR	SC	—	—	2FM 2MC	0.75 5.5	1	
C	4.5-15	10R 5/6	XCB L	17	40	75	wp 10	SP SS	Densive	FR	W/C	—	—	1MC	rocky 5.3	1	
CR	15-21	—	—	—	—	—	—	—	—	—	W/C	—	—	Ores and	—	—	
R	air	Silt	Stone	—	—	—	—	—	—	—	—	—	—	—	—	—	

Other Notes: Sandstone outcrop above head of concave slope, near ridge summit

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill
Dr. Galbraith

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P-271-160610-105-MEL Topographic Position: Sideslope
 Date: 6/10/16 % Slope: 120°
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: WD
 RETTEW Job #: 089962000 Depth to Refusal: 34
 NRCS Soil Unit: Barks BD Bedrock Type: Siltstone
 Mineralogy: mixed Vegetation: red maple, striped maple, grape

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rock Fragment	Structure Type, Grade, and Size	Moist Consistence	USDA	Redox Feature Color	Parent Material	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/PI	Lab Sample ID	Notes
<u>O_e</u>	<u>0-1</u>	<u>5YR 2/1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>CS</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>0.0</u>	<u>S1</u>	
<u>A</u>	<u>1-3</u>	<u>10YR 3/2</u>	<u>GR S.L</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u><1</u>	<u>—</u>	<u>1FGR</u>	<u>FR</u>	<u>GW</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>0.25</u>	<u>S2</u>	
<u>Bw1</u>	<u>3-9</u>	<u>10YR 5/4</u>	<u>S.L</u>	<u>15</u>	<u>10</u>	<u><10</u>	<u>1</u>	<u>—</u>	<u>2FSBK</u>	<u>FR</u>	<u>GLD</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1FM</u>	<u>1.25</u>	<u>S3</u>	
<u>Bw2</u>	<u>9-24</u>	<u>10YR 5/6</u>	<u>VGR S.L</u>	<u>20</u>	<u>15</u>	<u>60</u>	<u>D.S-3</u>	<u>—</u>	<u>2FSBK</u>	<u>FR</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1FM</u>	<u>5.3</u>	<u>S4</u>	
<u>R</u>	<u>24+</u>	<u>bedrock</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>Siltstone</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>5.2</u>	<u>—</u>	

Other Notes: bench, possible log landing area

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane

Field Assistant: Rachel Hill

Dr. Galbraith

Signature: Michael Lane

RETTEW Associates, Inc.
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Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-272-160610-1210-MEL							Topographic Position:	sideslope		Parent material:	colluvium over residuum					
Date:	6/10/16							% Slope:	5%		Slope Aspect:	10°					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey							Drainage Class:	WD		Depth to Water Table:	240"					
RETTEW Job #:	089962000							Depth to Refusal:	35		Slope Failure or slips:	-					
NRCS Soil Unit:	Berks RE							Bedrock Type:	siltstone		Dip Slope & Direction:	82° S, 30° Strike					
Mineralogy:	mixed							Vegetation:	Min. Laurel, chestnut oak, service berry, white pine, white pine		USDA						
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	bedrock/stratification	Structure Type, Grade, and Size	Molt. Consistence	Median Boundary Topography & Orientation	Redox Feature Color	bedrock Feature Description	Roots	Rock Testimonial/ pH	Lab Sample ID	Notes
Oe	0-1.5	5YR 2/1	humic	-	-	-	<1	SP	2FCR	VHR	AS	-	-	3Vt-c	0.0	-	
A	1.5-2	10YR 5/2	GR	8	10	15	<1	PO SO	2FCR	VHR	AS	-	-	W-C	0.0 4.4	-	
Bw1	2-12	10YR 5/4	GR s.l.	12	10	25	4-10 1.5	SP SO	2FSBK	VHR	AS	-	-	2V-F 3Vt-c	1.0 5.2	-	
Bw2	12-20	10YR 5/6	VGN s.l.	17	15	55	4-10 3	SP SS	1MSBK	FR	Vt-c	-	-	3Vt-c	1.2 5.0	-	
ZBL	20-43	10YR 5/4	VGN s.l.	20	20	85	4-10 6	SP SS	1MSBK	FR	Vt-c	-	-	1V-F 2A-C	1.0	-	
2 Cr	43-52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2 R	252	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

evidence of parent material. Highly fractured siltstone almost vertical, so a deeper pit. No soil between fragments in Cr or R.

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill
Dr. Galbraith

Signature:



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-273-160610-1300-MEL
 Date: 6/10/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Berks
 Mineralogy: Mixed

Topographic Position: Side slope, convex nose slope
 % Slope: 28%
 Drainage Class: AD to FD
 Depth to Refusal: 21
 Bedrock Type: Siltstone
 Vegetation: Hickory, chestnut oak

Parent material: colluvium over residuum
 Slope Aspect: —
 Depth to Water Table: —
 Slope Failure or slip: —
 Dip Slope & Direction: 220 NE
 Strike: 330

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soil	Structure Type, Grade, and Size	Mold Condensance	Moisture Binding Temperature & Conductance	Redox Feature Color	Redox Feature Description	Roots	Roots Functional/ pH	Lab Sample ID	Notes
<u>O_e</u>	<u>0-1.5</u>	<u>5R 2.5/1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>0.0</u> <u>4.4</u>	<u>—</u>	<u>—</u>
<u>AB</u>	<u>1.5-3</u>	<u>10R 4/3</u>	<u>GR SIL</u>	<u>12</u>	<u>35</u>	<u>25</u>	<u>40.5</u>	<u>P0</u> <u>S0</u>	<u>1FSBK</u>	<u>FR</u>	<u>SC</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>0.5</u> <u>4.6</u>	<u>—</u>	<u>—</u>
<u>Bw</u>	<u>3-8</u>	<u>10YR 5/6</u>	<u>UGR SIL</u>	<u>16</u>	<u>25</u>	<u>35</u>	<u>1</u>	<u>P0</u> <u>S0</u>	<u>1FSBK</u>	<u>FR</u>	<u>WC</u>	<u>—</u>	<u>—</u>	<u>3FM</u>	<u>1-25</u> <u>4.8</u>	<u>—</u>	<u>—</u>
<u>2C</u>	<u>8-15</u>	<u>10YR 5/6</u>	<u>XGR SIL</u>	<u>15</u>	<u>30</u>	<u>70</u>	<u>cap to 1</u>	<u>P0</u> <u>S0</u>	<u>Densic</u>	<u>FR</u>	<u>WC</u>	<u>—</u>	<u>—</u>	<u>2FM</u>	<u>4.8</u>	<u>—</u>	<u>—</u>
<u>2CR</u>	<u>15-21</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>Occasional</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>2R</u>	<u>21+</u>	<u>bedrock</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: John Wall
 Field Assistant: _____

Signature: [Signature]

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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Vegetation:	Parent material:	Notes:								
P-274-160610-1210-JSW	6/10/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	BEKES	MIXED	% Slope: Drainage Class: Depth to Refusal:	Summit 4% SOME WITH EXCESSIVE 32	SLOPE ASPECT: DEPTH TO WATER TABLE: SLOPE FAILURE OR SLIP:	RESIDUUM 4.0								
						Bedrock Type:	CUTSTONE	Dip Slope & Direction:									
							CHESTNUT OAK, HICKORY, WHITE PINE, BLUEBERRY, MAPLE										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Siltiness	Structure Type, Grade, and Size	Moist Confidence	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Product Measurement/ pH	Lab Sample ID	Notes
De	0-2	-	CH	-	-	18 CH	< 1	-	-	-	OS	-	-	2-V, F	4.5	-	
D	2-3	10YR5/1	CH SIL	11	15	18 CH	< 1	-	IMPR	NR	CM	-	-	1-V, F, M	4.5	-	
Bm	3-11	10YR5/6	NCH SIL	14	18	60 CH	1-3	-	IFBK	ER	CM	-	-	2-M	4.5	-	
C1	11-32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P	32+	SILTS TO NE	STONE	NE	BE	DR	CK										

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: JOHN WARD
 Field Assistant: _____

Signature: [Signature]

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 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-275-160610-1046-JSW		Topographic Position:	BACKSLOPE		Parent material:	RESIDUUM									
Date:	6/10/16		% Slope:	67%		Slope Aspect:	74°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WELL		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	30"		Slope Failure or slip:	SILT TREES									
NRCS Soil Unit:	BEKKS		Bedrock Type:	SANDSTONE		Dip Slope & Direction:	22° S (100°) Strike: 100°									
Mineralogy:	MIXED		Vegetation:	HICKORY, FEW WHITE OAK & BUCKBERRY		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rock Fragment Stability/Indicators	Structure Type, Grade, and Size	Molt Condition	Medium Boundary Topography & Orientation	Redox Feature Color	Roots	Parent Parameters/ pH	Lab Sample ID	Notes
DV	0-3	K-R2.5/1	-	-	-	-	-	-	-	-	-	-	2-VF	-	-	
A	m-p	5R5/3	VQR L	13	40	35 QR	< 1	S ⁹ P ₀	1M5R	FR	GM	-	3-F 1-VF, M ₁	D 5.0	-	
AX	0-10	5R5/6	VQR SL	17	65	60 QR	< 1	S ⁹ P ₀	1F5R	FR	CM	-	2-F, L	0.25 4.5	-	TN CLAY SKINS
BC	10-30	5R5/6	XGM SL	15	68	90 CH	1-3	S ⁰ P ₀	OMB	FR	CM	-	1-VF	1.0 4.5	-	
R	30px	SANDSTONE														

Other Notes: STEEL LINEAR BACKSLOPE (APPROXIMATING LINEAR CONVEY

TEST PIT DESCRIPTION

Soil Scientist: Jessie Wall
 Field Assistant: _____

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Rock Fragmentation/Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moisture Consistence	Moisture Boundary Temperature & Difference	Redox Feature Color	Moisture Feature Description	Lab Sample ID	Notes		
P-226-160610-0828-JSW	6/10/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CEA89SV1LCE	MIXED	FLATWOOD	4%	WELL	-	-	MAPLE, BEECH, CHESTNUT OAK, WHITEWOOD FERN, MAYAPPLE	ALLUVIUM/COLLUVIUM	18°	41"	-	-	3-4F, M	3-4F, M	<1	PO	1E5R	VER	CW	-	-	3-4F, M	4.5	S1 A/B	
A	3-6	101R3/11		V9R S1L													3-4F, M 2-C 1-2C	3-4F, M 2-C 1-2C	<1	PO SO	1E5R	VER	CW	-	-	3-4F, M 2-C 1-2C	0.25 4.5	S2 A/B	
Bm1	6-15	2.5YR2.5/1X		X9R SL													3-F, M 2-C 1-V, VC	3-F, M 2-C 1-V, VC	<1	PO SO	1E5BK	VER	CW	-	-	3-F, M 2-C 1-V, VC	0.25 5.5	S3 A/B	
Bm2	15-20	2.5YR2.5/3		X9R SL													3-F, M 1-C	3-F, M 1-C	<1	PO SO	1E5BK	VER	CS	-	-	3-F, M 1-C	0.25 5.5	S4 A/B	
C	20-21	2.5YR2.5/3		X9R LS													2-F, M 1-C	2-F, M 1-C	<1	PO SO	OS9	-	-	-	-	2-F, M 1-C	0 5.5	S5 A/B	

Other Notes:

5 M SW OF STREAM, 12 M NE OF STEEP BAKSLOPE; MULTIPLE CHANNELS;
 0.75 M ABOVE STREAM; SUBROUNDED SANDSTONE & CONGLOMERATE CORALS;
 AND STONES ON SURFACE; VERY COARSE ALLUVIUM/COLLUVIUM IN
 UPPER, STEEP SIDED STREAM VALLEY

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: _____

S. Dadio

RETTW Associates, Inc.
 3020 Columbia Avenue
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 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P277-160610-0941-5d1										Topographic Position:	Foot slope					
Date:	06/10/16										% Slope:	6%					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	SWP					
RETTW Job #:	089962000										Depth to Refusal:	43 - large stones					
NRCS Soil Unit:	Monongahela										Bedrock Type:	sandstone					
Minerology:	mixed										Vegetation:	tulip, paper, scarlet oak, locust, red maple					
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Muscle/ nodules	Structure Type, Grade, and Size	Mollic Consistence	Natural boundary Topography & Direction	Redox Feature Color	Redox Feature Description	Roots	Field Penetration/ μ m	Lab Sample ID	Notes
A	3	7.5YR 4/3	Sil	16	25	gf 20	1-6	PS	1 mg	fr	aw	-	-	CF	1.0	S1	
Bt1	8	7.5YR 5/6	Sil	24	8	gf 20	2-4	PM	1 mp	fi	cw	-	-	CF	1.75	S2	
								SS							5.25		
Bx	20	7.5YR 5/6	Sil	24	8	gf 20	2-4	PM	2 mp	vf	aw	7.5YR 4/2	(m) d	-	7.425	S3	
								SS							5.25		
2Bt1	36	5YR 5/6	Sil	30	12	ch 65	2-10	PM	1 msbk	f1	aw	10YR 4/1	mmp	f c	1.25	S4	Coll
								SM							5.25		
3Bt2	43	10YR 4/6	Sil	32		75 gf	<.5	PM	1 f sbk	fr	-	-	-	-	1.0	S5	all
								SM							3.5		

Other Notes:

Argillic subgroup

TEST PIT DESCRIPTION

Soil Scientist: Steve Dadio
 Field Assistant: Dave Skippon

Signature: *[Signature]*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Minerology:	Topographic Position:	Parent material:	Notes:				
P278-160610-1143-Sdd	06/10/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Mixed	Shoulder	Residuum					
					SED EXCESSIVELY	N/A					
					Bedrock Type: siltstone	Slope Failure or Slip: N/A					
					Vegetation: scarlet oak, red maple, chestnut oaks	Dip Slope & Direction: 25° W					
					USDA	Striker: 225°					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Roots	Product Temperature/ pH	Lab Sample ID	Notes
De	2	5YR 2-5/1	-	-	-	30 ch	1-4	CF CH CC	c.25 4.25	S1	
A	3	10YR 7/1	S.1	16	25	ch 30	1-4	CF CH CC	1.0 4.25	S2	
Bw	9	10YR 6/6	S.1	24	10	ch 40	1-4	CF CH CC	2.75 4.5	S3	
Cr	50										

Other Notes: 5YR 5/4 color of siltstone parallel to rocks

TEST PIT DESCRIPTION

Soil Scientist: Dwain Tramm
 Field Assistant: Taylor Walter

Signature: 

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 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes								
P279-160610-1359-DAT	06-10-20	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Chapelville sandy loam	siliceous	Floodplain	Alluvium									
						% Slope:	Slope Aspect:									
						Drainage Class:	Depth to Water Table:									
						Depth to Refusal:	Slope Failure or slip:									
						Bedrock Type:	Dip Slope & Direction:									
						Vegetation:										
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Mold Consistence	Native Boundary Temperature & Structure	Redox Feature Color	Soil Feature Description	Roots	Rock Fragmentation/PS	Lab Sample ID
D0	0-0.5	5YR 2.5/1	-	-	-	-	-	-	-	-	SA	-	-	-	-	S-1A
A	0.5-4	5YR 3/1	2	43	55	GL 10%	0.25- 2.0	P0 S0	GR 1, 3	VEN	SA	-	-	3F 3R	0.25 4.25	S-2A
AB	4-7	5YR 4/3	AL	11	55	VEN 50%	0.25- 3.0	P0 S0	SGR 1, 1	VEN	SA	-	-	2M 2C	0.5 4.5	S-3A
C1	7-18	7.5YR 4/2	S	2	90	GL 15%	0.25- 1.0	P0 S0	SG 8	VA	NA	-	-	2m	0.25 4.7	S-4A
C2	18-36	7.5YR 4/2	S	4	91	XGL 65%	0.5- 8.0	P0 S0	SG 1	L	VA	-	-	-	0.25 4.5	S-5A
C3	36-50	7.5YR 4/2	S	5	92	XGB 85%	0.5- 24.0	P0 S0	SG 8	L	-	-	-	-	-	S-5B

Observed along stream cut bank

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermacher
 Field Assistant: _____

Signature: David Fenster

RETTEW Associates, Inc.
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 Fax: 717-394-1053

Test Pit ID:	P-079A - 106010-1450-DEF		Topographic Position:	Terrace		Parent material:	Alluvium over Colluvium										
Date:	6/10/10		% Slope:	7		Slope Aspect:	213°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	Med well		Depth to Water Table:	-										
RETTEW Job #:	089962000		Depth to Refusal:	-		Slope Failure or slip:	-										
NRCS Soil Unit:	Nevangahaka (G3B)		Bedrock Type:	-		Dip Slope & Direction:	-										
Mineralogy:	Mixed		Vegetation:	with hazel, Red oak, hemlock, Red maple, White pine, My laurel		USDA	-										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Native Boundary	Redox Feature Color	Native Feature Description	Roots	Parent Fragmentation	Lab Sample ID	Notes
A	0-25	7.5YR 3/2	SIL	18	33	38% CN	28"	P6 S6	2MGR	NFR	AW	-	-	24M 2C0	0.25 4.0	S1	
Bw1	25-115	7.5YR 5/3	S.L	21	29	38% CN	28"	SP SS	1M5BR	FR	CW	-	-	25M 1C0	0.75 4.7	S2	Rounded Edgson Cat Five grained Sandstone Cat
2Bw2	115-360	7.5YR 5/4	S.L	22	27	45% GR	44"-18"	SP SS	1C5BR	FR	AW	-	-	24 1M	1.25 4.6	S3	
3Bx	360-50+	7.5YR 5/4	S.L	26	27	20% CN	23"	MP SS	1WGR	F0	-	7.5YR 6/6 10YR 6/8	CP CP	14	2.25 4.0	S4	Angular Cat

Other Notes: 3Bx is Colluvium -

TEST PIT DESCRIPTION

Soil Scientist: Steve Radio
 Field Assistant: Dave Skippin

Signature: Steve Radio

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P2790-160610-1249-sd1		Topographic Position:	backslope		Parent material:	coll										
Date:	06.10.16		% Slope:	21		Slope Aspect:	120										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SWP ZHW		Depth to Water Table:	26										
RETTEW Job #:	089962000		Depth to Refusal:			Slope Failure or slip:	N/A										
NRCS Soil Unit:	Berks		Bedrock Type:			Dip Slope & Direction:	-										
Mineralogy:	Mixed		Vegetation:	black oak, red maple, scarlet oak		Strike:	-										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Molting/ Solubility	Structure Type, Grade, and Size	Molting Consistence	Nation Boundary Topography & Elevation	Redox Feature Color	Redox Feature Description	Roots	Root Parameter/ pH	Lab Sample ID	Notes
0e	2	7.5YR ^{2.5} ₁	-	-	-	20 gr	.5-1	-	-	-	aw	-	-	M f M m F c	2.25 4.25	-	
A	4	10YR ^{3/2}	s.1	16	15	20 gr	.5-1	PO	1 f gr	fr	aw	-	-	C f C m C c	.5 4.25	-	
B+1	18	10YR ^{6/4}	s.1	20	15	75 gr	.5-1	PS	2 m sbk	fr	cw	-	-	C f C m	1.25 4.75	-	
2B+2	26	7.5YR ^{6/6}	s.1	25	10	20 gr	1-2	PS	2 m sbk	f	cw	-	-	C f C m	2.5 4.75	-	red rocks in coll
								SS									
3B+3	50+	5YR ^{5/6}	s.1	30	10	25 gr	2-4	PS	2 m sbk	fr	-	7.5YR ^{6/4} 7.5YR ^{6/4} 7.5YR ^{6/4}	cmf cmf cmf	f f f c	3.5 4.75	-	red rocks in coll
								SM									

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Yuane Truax
 Field Assistant: Taylor Walton

Signature: 

RETTEW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slips:	Dip Slope & Direction:	Rock Fragment Type & %:	Rock Fragment Size (inches):	Structure Type, Grade, and Size:	Moist Consistency:	Median Bulk Density (g/cm³):	Redox Feature Color:	Redox Feature Description:	Roots:	Rock Fragmentation/ pH:	Lab Sample ID:	Notes:				
P290-160610-1308-DAT	06-10-2016	Dominion - Atlantic Coast Pipeline Soil Survey	089962000		BACKSCAPE	5-2	SOMEWHAT EXCESSIVE	24"	Siltstone	White Pine, Presect and			N/A	N/A	25°															
A	0-0.5	7.5YR 4/2	1	10	45	CH 25%	0.25-1.0	PO SD	GA 1,2	VMT SA	SA	-	-	-	-	4.2	4.2	GA	VMT	SA	-	-	-	0.25	4.4	-				
Bu1	2.5-8.0	10YR 5/6	sil	16	35	YCH 40%	0.75-4.0	PO SO	SA 1,1	VMT SA	SA	-	-	-	-	4.5	4.5	SA	VMT	SA	-	-	-	0.75	4.5					
Bu2	8.0-19	10YR 5/6	sil	20	31	YCH	0.25-8.0	PO SO	SA 1,1	VMT SA	SA	-	-	-	-	1.75	4.5	SA	VMT	SA	-	-	-	1.75	4.5					
2C	19-24	10YR 5/6	sil	16	20	YCH 95%	0.5-10.0	PO SD	M, O	FNE IA	IA	-	-	-	-	4.6	4.6	M, O	FNE	IA	-	-	-	4.6						
2R	24+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		Siltstone Bedrock			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: *Drew Truse*

Field Assistant: *Rapier Walker*

Signature: *[Handwritten Signature]*

Test Pit ID:	PSB1-100610-1144-DH	Topographic Position:		SUMMIT			Parent material:	Residuum	Notes							
Date:	10-10-2016	% Slope:	12%	Slope Aspect:	275° W	Depth to Water Table:	N/A	Lab Sample ID								
Job Name:	Domillon - Atlantic Coast Pipeline Soil Survey	Drainage Class:	SOMEWHAT POORLY DRAINCD	Depth to Refusal:	32"	Slope Failure or Slip:	N/A	Notes								
RETTEW Job #:	089962000	Bedrock Type:	Siltstone	Dip Slope & Direction:	18°	Strike:	23° N	Mineralogy: 51% siliceous								
NRCS Soil Unit:	Bekus clayey silt loam	Vegetation:	White Oak, Dogwood, Bay, White Pine, Dogwood, Virginia Pine													
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Nutrient Boundary Topography & Orientation	Redox Feature Color	Roots	Moisture Content (%)	Lab Sample ID	Notes	
De	0-1	5YR 2/2	-	-	-	-	-	-	-	SA	-	-	-	-	-	-
BE	1-7	10YR 6/4	2	14	38	Nc1F 40%	0.25-1.5	SBw 1, 1	FR	SA	-	2, F, 2, m	2.25, 4.5	5-2A, 5-2B		
Bwt	7-13	10YR 6/6	SiL	26	22	Xc1F 60%	0.25-3.0	SBw 1, 2	FR	SA	-	1F 2, m	2.75, 4.7	5-3A, 5-3B		
BwL	13-18	10YR 6/6	SiL	21	27	Xc1F 80%	0.25-4.0	SBw 1, 2	FR	SA	D ^{10YR 6/6} D ^{17.5YR 6/6}	1, F	3.75, 4.7	5-4A, 5-4B		
Cr	18-32	-	-	-	-	-	-	-	-	SA	-	-	-	-	Aspartic fibres	
R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	Dilatation	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Duane Truax
 Field Assistant: Taylor Walter

Signature: 

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:		Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots:	Parent Penetration/ft	Lab Sample ID	Notes
P282-160610-0839-D4	06-10-2016		Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Barks Channing silt loam	Illite	Topographic Position: TESSCOE	% Slope: 32°	Drainage Class: Well drained	Depth to Refusal: 6ft	Bedrock Type: Sandstone	Vegetation: Red maple, Beech, Oak, Chestnut Oak, White Oak, Red Gum	Parent material: Adairton / Redburn	Slope Aspect: 113° E	Depth to Water Table: N/A	Slope Failure or slip: N/A	Dip Slope & Direction: 2.60	Roots: -	Parent Penetration/ft: 5.4	Lab Sample ID: S-14	
De	0-1	5 ^{yr} 2.5/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	S-24	
A	1-3	7.5 ^{yr} 4/2	8	12	45	GL 20%	0.25- 0.5	PO 50	GR 1,3	VGRT SA	SA	-	-	-	2F 2F	4.9	5-28		4.9	S-28	
Be	3-9	7.5 ^{yr} 5/6	8	21	51	CH 15%	0.25- 1.5	PO 50	SBK 1,1	VHNT SA	SA	-	-	-	2F 1m	4.5	5-38		4.5	S-38	
BH1	9-16	5 ^{yr} 5/6	8	25	60	VC ^V 45%	0.25- 2.0	PO 50	SBK 1,2	ENT SA	SA	-	-	-	1 ^{ft} 1m	2.5	5-44		2.5	S-44	clay shins
BH2	16-27	5 ^{yr} 5/6	8	29	56	VC ^H 40%	0.25- 3.0	PO 50	SBK 1,3	HNS SA	SA	-	-	-	1F 1m	3.25	5-54		3.25	S-54	clay shins
BH3	27-44	7.5 ^{yr} 5/6	8	35	44	VC ^H 35%	0.25- 3.0	PO 50	SBK 1,3	ENT SA	SA	-	-	-	1F	4.7	5-59		4.7	S-59	clay shins
BC	44-51	7.5 ^{yr} 5/6	8	30	50	CH 20%	0.25- 2.0	PO 50	SBK 1,3	ENT SA	SA	-	-	-	1F	1.5	5-74		1.5	S-74	no clay shins
ZC	51-64	7.5 ^{yr} 5/6	8	23	55	VC ^H 85%	0.25- 6.0	PO 50	SBK 1,2	ENT SA	SA	-	-	-	-	2.0	5-84		2.0	S-84	bedding planes

Other Notes: 6ft

Sandstone Bedrock

TEST PIT DESCRIPTION

Soil Scientist: D. Fenske Macher
 Field Assistant: Taylor Watter

Signature: Daniel Macher

Head slope

RETTW Associates, Inc.
 3020 Columbia Avenue
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 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P-2833-160606-0743-DFE					Topographic Position:	Slope/Backslope										
Date:	10/11/16					% Slope:	28%										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Moderately well										
RETTW Job #:	089962000					Depth to Refusal:	-										
NRCS Soil Unit:	Mixer + (89F3)					Bedrock Type:	-										
Mineralogy:	Mixed					Vegetation:	chestnut oak, white hazzel, red oak, red maple, R. canadensis										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moist Consistence	Moisture Banding Temperature & Direction	Redox Feature Color	Parent Feature Description	Roots	Rock Fragmentation	Lab Sample ID	Notes	
Oe	0-1 0.5	7.5YR 2.5/1	-	-	-	-	-	-	-	AW	-	-	34M	-	S1		
A	0.5 4.5	10YR 4/3	SL	16	16	25% CN	2-1/2"	SS SP	MSAK	AW	-	-	34 34M 34M 100	1.0 4.7	S2	Red & Brown silt/clay	
Bw	4.5- 16	7.5YR 4/4	VEN S.L	16	16	40% CN	2-1/2"	SS SP	MSAK	AW	-	-	34 34M 100	1.0 4.7	S3		
2C1	16- 33	7.5YR 5/4	EXCN S.L	18	21	96% CN	2-1/2"	SS PO	MSAK	CS	-	-	34 34M	1.25 4.5	S4		
3C2	33- 44	7.5YR 5/4	VCN S.L	16	22	60% CN	2-1/2"	SS SP	MSAK	FR	CW	10YR 7/2 7.5YR 5/8	CMP CMD	14	1.75 4.5	S5	Reddish brown silt/clay
4C3	44- 50+	7.5YR 5/4	Changep S.D	16	22	95% CN	2-1/2"	SS PO	MSAK	FR	-	-	14	1.75 4.8	S6		

Other Notes: Horizontal 5' or less on a slope or a gully bottom

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Signature: David Fenstermaker

Field Assistant: Jayce Walter

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-284-60606-0748-DEF			Topographic Position:	Backslope		Parent Material:	Thin claystone residue										
Date:	10/10/10			% Slope:	55%		Slope Aspect:	SSS										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	Well		Depth to Water Table:	-										
RETTEW Job #:	089962000			Depth to Refusal:	36"		Slope Failure or slip:	-										
NRCS Soil Unit:	Balks GF			Bedrock Type:	Shale 2.5 ft top		Dip Slope & Direction:	40° S										
Mineralogy:	M. red			Vegetation:	Chestnut oak, Red oak, Knoblochen, Blueberry, S. pedunculate		Strike:	73°										
USDA																		
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moist. Consistence	Moist. Consistence	Redox Feature Color	Redox Feature Description	Roots	Rock Fragment Description	Roots	Rock Fragment Description	Lab Sample ID	Notes
Oe	0-25	7.5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	3ft	-	-	-	S1	
A	25-4	10YR 4/3	SN Sil	15	25	20% gr	1 1/4"	SP	1F5SK	VF	AW	-	3ft am	-	-	-	S2	Collusion Red C.F.
2Bw1	4-16	7.5YR 6/4	SN Sil	17	25	30% gr	2 1/2"	SP	1M5SK	Fr	CW	-	2ft am	-	-	-	S3	Residuum
2Pw2	16-25	7.5YR 5/6	VCH Sil	17	25	50% gr	2.3"	SP	1M5SK	Fr	CW	-	2ft am	-	-	-	S4	
2Cr	25-34	7.5YR 5/6	Cobbly	-	-	98% cob	2-6"	-	OM	-	CS	-	R	-	-	-	-	
3R	34-36	-	tan shale	-	-	-	-	-	-	-	AS	-	-	-	-	-	-	
4R	36+	-	light brown S. H stone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

Thin colluvial mantle over residuum

TEST PIT DESCRIPTION
 Soil Scientist: D Fenstermacher
 Field Assistant: Taylor Walter

Signature: Berni Paul

RETTEV Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-385-100006-0757-DEF		Topographic Position:	Ridge top		Parent material:	Residuum over Residuum										
Date:	6/11/10		% Slope:	7		Slope Aspect:											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	well		Depth to Water Table:											
RETTEV Job #:	039962000		Depth to Refusal:	37		Slope Failure or slip:											
NRCS Soil Unit:	Berks RTD		Bedrock Type:	Siltstone - light color		Dip Slope & Direction:	270 S										
Mineralogy:	Mixed		Vegetation:	USA		Strike:	73°										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Medium/Coarseness	Structure Type, Grade, and Size	Molt Consistence	Medium Boundary Topography & Orientation	Redox Feature Color	Redox Feature Subtype	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
De	0-1	7.5 y/r 2.5/1	-	-	-	-	-	-	-	-	-	-	-	3F	4.5	S1	
A	1-2.5	10 y/r y/a	SIL 14	28	10%	10%	2"	PO	1F5BK	Fr	Aw	-	-	3F	4.5	S2	
Bt1	2.5-12	10 y/r 6/y	SN S.L	16	20	15%	2.1"	SS	1M5BK	Fr	CW	-	-	3F 2M 1C	1.6 6.5	S3	Clay (1m) Redolite
Bt2	12-23	7.5 y/r 6/y	SN S.L	33	12	30%	< 1/2"	SS	2M5BK	Fr	CW	-	-	2F 1M 1C	1.75 6.5	S4	
Bt3	23-34	10 y/r 7.5 y/r 5/y	S.L S.L	36	5	-	-	MP MS	3M5BK	Fr	CW	-	-	1F 1M	3.5 6.5	S5	Clay (1m) Clay (1m) 5
Bt4	34-37	10 y/r 10 y/r 8.5 y/r	S.L	25	4	-	-	PO SS	OM	Fr	CW	-	-	-	-	-	Weathered siltstone Rocks still in place Soft enough to break apart
Bt5	37+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: Gr- Very soft rocks - completely breakdown into fines w/o reassembly fragments
with 3 bit medium matrix colors.

TEST PIT DESCRIPTION

Soil Scientist: D. Penzester-machler

Signature: _____

David Penzester-machler

Field Assistant: Taylor Walter

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID: P-286a-110000-0808-DEF
 Date: 10/11/10
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Barkus (BE)
 Mineralogy: Mixed
 Topographic Position: Upper back landscape
 % Slope: 24%
 Drainage Class: Well
 Depth to Refusal: _____
 Bedrock Type: _____
 Vegetation: Backgum White pine, Red oak, Knudsen Iron, Blueberry
 Parent material: Calivium
 Slope Aspect: 839°
 Depth to Water Table: _____
 Slope Failure or slip: _____
 Dip Slope & Direction: _____
 Strike: _____

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/soiliness	Structure Type, Grade, and Size	Mold. Consistence	Soil Boundary Transition & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Water Potential/ pH	Lab Sample ID	Notes
Oa	0-15	5Mn 2.5/11	-	-	-	-	-	-	-	-	-	-	-	3m	4.2	S1	Broken up under 1/4" depth AE under 1/4" depth
Bw1	1.5-19	10YR5/4	S.L	15	10	15% CN	4.1"	PO	1.5BK	VF	CW	-	-	3m 5m 10m	0.25 5.8	S2	Red fine sandstone and brown shale oriented different direction
Bw2	19-28	10YR5/4	S.L	17	12	29% CN	4.1"	PO	1M5BK	F	CW	-	-	4m 1M	1.5 4.8	S3	No clay films
BwC	28-50+	7.5YR5/4 10YR4/3	V.CN S.L	18	12	40% CN	<3"	SP SS	1.5BK	F	-	-	-	1M	1.5 4.8	S4	Lithochromic colors CAF - randomly oriented

Other Notes: Calivium

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Signature: Paul Foster

Field Assistant: Taylor Walker

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Test Pit ID:	p-287-160606-0825-02F		Topographic Position:	Ridge Shoulder		Parent material:	Residual over Residual									
Date:	10/16/16		% Slope:	27%		Slope Aspect:	120°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WET		Depth to Water Table:	-									
RETTEW Job #:	089962000		Depth to Refusal:	3'		Slope Failure or slip:	-									
NRCS Soil Unit:	Borcks (R2D)		Bedrock Type:	G1T5tan		Dip Slope & Direction:	90° SW, 80°									
Mineralogy:	Mixed		Vegetation:	Chestnut oak, Black gum, White Pine, Blueberry, Kunkelberry		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/Structure	Moist Consistence	Median Boundary Temperature & Distribution	Redox Feature Color	Median Feature Description	Roots	Median Temperature/ pH	Lab Sample ID	Notes
De	0-2.5	Su/L 2.5/1	-	-	-	-	-	-	-	-	-	-	3f	-	-	Thin Oa under nearly 5" Broken E under 2 1/4"
Bw	2.5-15	10uR 6/4	CN	16	15	15% CN	< 1"	PO	FR	CS	-	-	2f, M	0.5	-	
Bw	15-29	7.5uR 6/4	N,CN	18	14	38% CN	< 2"	SS	FR	CW	-	-	2f, M	0.75	-	Co Forested w/ Bedrock under Fine Sandstone
Bw	29-39	10uR 6/4	XCN	32	10	75% CN	2-6"	SS	FR	CW	-	-	2f, M	4.5	-	
Bw	39+	-	-	-	-	-	-	SP	-	-	-	-	-	-	-	

Other Notes:

Water at 38" in hole resultant from recent rainfall, No redox present

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermacher

Field Assistant: + Taylor Walker

Signature: David M...

RETTW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-288-1000000-1433-DEF					Topographic Position:	Shoulder		Parent material:	Residuum							
Date:	6/6/16					% Slope:	85-90		Slope Aspect:	178°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Well		Depth to Water Table:	-							
RETTW Job #:	089962000					Depth to Refusal:	38"		Slope Failure or slip:	-							
NRCS Soil Unit:	Berks BD					Bedrock Type:	fine-grained sandstone		Dip Slope & Direction:	22° S							
Mineralogy:	N.K.Rd					Vegetation:	Red oak, chestnut oak, red maple, white pine, mountain laurel, blueberry (from photos)										
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Maturity/ Solubility	Structure Type, Grade, and Size	Molt Consistence	Medium Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation %	Lab Sample ID	Notes
Oe	0-2	5YR 2.5/1	-	-	-	-	-	-	-	-	AW	-	-	8f	4.3	S1	
A	2-5.5	10YR 4/3	S1L	15	15	20% CN	2-8"	P0	1F5Mk	VF	AW	-	-	8f 3M 9Co	0.25 4.5	S2	
Bw1	5.5-22	10YR 6/4	S1L	16	14	40% CB	2-8"	P0	1M5Mk	Fr	CU	-	-	8f 2M	0.75 4.4	S3	
BwC	22-32	7.5YR 6/6	S1L	25	12	45% CB	2-8"	SP SS	1C5Mk	Fr	CW	-	-	8f 1M	1.75 4.4	S4	White siltstone CoE-Doft mostly sandstone
2R	32+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: 

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-289-160006-1540-ME1										Topographic Position:	Sideslope									
Date:	6/6/16										% Slope:	40% +									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	WD									
RETTW Job #:	089962000										Depth to Refusal:	27"									
NRCS Soil Unit:	Berks BE										Bedrock Type:	Siltstone									
Mineralogy:	mixed										Vegetation:	chestnut oak, white oak, white pine, hickory									
USDA																					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Stubble	Structure Type, Grade, and Size	Mollic Condition	Natural Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Root Temperature/soil depth	Lab Sample ID	Notes				
A	0-1	10YR 3/3	GR SIL	10	25	15	0.5	PO SO	IFGR FR	FR	WC			3FM	0.25 5.0		Thin horizon L 0.5 in				
Bu1	1-9	10YR 5/6	GR S.L	12	25	15	0.5	PO SO	IFSBK FR	FR	WG			3FM	0.5 5.2						
Bu2	9-16	10YR 5/8	GR S.L	12	30	20	1	PO SS	IMSBK FR	FR	WG			3FMC	0.75 5.0						
Ck	16-21	10YR 5/8	UGR SIL	15	30	50	1	SP SS	Ombic FR	FR	WC			2M	5.0						
R	2-27	Be d																			

Other Notes: Steep sideslope increasing to F slopes

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Ell

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soilness	Structure Type, Grade, and Size	Molt Condition	Moisture/soilness	Redox Feature Color	Parent Feature Description	Roots	Moisture/soilness/ pH	Lab Sample ID	Notes
P-290-160606-1445-MEL	0-2	5YR2.5/4	-	-	-	-	-	-	-	-	SC	-	-	3FA1	0.25 4.0	S1	
A	2-3.5	10YR3/3	GR SL	15	60	15	<1	PO	1F6R	VFR	WC			3FA1C	0.5	S2	
								SO							4.5		
BE	3.5-10	10YR 5/4	GR FSL	12	65	15	1	PO	1F5.5R	VFR	WC			3FMC	0.5	S3	
								SO							5.5		
Bw	10-21	10YR 5/6	V6R FSL	15	65	40	1	SP	1M5BK	VFR	WG			2M1C	0.75	S4	
								SO							5		
C	21-39	10YR 5/6	X6R FSL	10	60	70	1	PO	O ₁ ms	FR	WC			2P1			
								SO									
CR	39-50	Fractured	fractured	fine	grain	sand	stone										

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: Michael Love
 Field Assistant: Rechel Hill

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-291-160606-1330-MEL		Topographic Position:		Summit		Parent material:		Collection over Residuum								
Date:	6/6/16		% Slope:		20%		Slope Aspect:		215°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		W3		Depth to Water Table:		—								
RETTEW Job #:	089962000		Depth to Refusal:		40 (Pinacle 35")		Slope Failure or slip:		no								
NRCS Soil Unit:	Berks 8D		Bedrock Type:		SFT Stone		Dip Slope & Direction:		45° SE								
Mineralogy:	mixed		Vegetation:		Chestnut oak, scarlet oak, white pine, red maple, privet		Strike:		250°								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/voids	Structure Type, Grade, and Size	Moist Confidence	Major Boundary Features & Textures	Redox Feature Color	Major Feature Description	Roots	Field Moisture/ pH	Lab Sample ID	Notes
A	0-1.5	10YR 3/2	GR	15	15	15	1	PO	MGR	FR	SC	—	—	2FM	0.5 5.0	S1	thin horizon
BE	1.5-7	10YR 3/4	GR S:L	18	15	25	>1	SP	IFSBK	FR	W6	—	—	3FM	1.5	S2	
								SS							4.7		
Bt	7-18	10YR 5/6	GR S:CL	30	15	20	1	MP	W6BK	FR	W6	—	—	3FM	1.5	S3	
								SS							4.5		
2C	18-20	10YR 5/3	VGR S:CL	30	20	40	1	SP	Omissive	FR-FI	W6	—	—	2M	1.75	S4	Lithochromic
								SS							4.5		
Cr	20-35	10YR 5/3	XGR S:CL	30	20	80	1	SP	Omissive	FI	W6	—	—	Occasional			
								SS									
Bed Rock																	

Other Notes:

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill

Signature: _____



RETTW Associates, Inc.
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 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-292-160606-1230-MEL			Topographic Position:	Side slope			Parent material:	colluvium over residual								
Date:	6/6/16			% Slope:	35%			Slope Aspect:	180°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	4P			Depth to Water Table:	see note								
RETTW Job #:	08996200			Depth to Refusal:	4P			Slope Failure or slip:	No								
MNCS Soil Unit:	Beks 8D			Bedrock Type:	shale/siltstone			Dip Slope & Direction:	60 S								
Minerology:	Mixed			Vegetation:	red maple, hickory, chestnut oak,				Strike: 250								
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rock Fragment Stability/ Substrata	Structure Type, Grade, and Size	Mold Condition	Median Boundary Topography & Orientation	Redox Feature Color	Redox Feature Description	Roots	Root Penetration/ per	Lab Sample ID	Notes
A	0-2	10YR 4/3	GR s.l	15%	30%	15%	1/2	P0	1MGR	FR	BA			2FM	0.5	-	
								S0							5.0	-	
Bt	2-9	10YR 5/6	GR s.l	20%	20%	15%	1/2	P0	1MSBK	FR	SG			2FM	0.75	-	
								S0							4.6	-	
Bt	9-23	10YR 5/6	SiCL	30%	15%	<10%		MP	1MSBK	FR	SG			3FM	1	-	
								SS							4.4	-	
Bt	33-33	10YR 6/4	SiCL	28%	15%	<10%		MP	2MSBK	FR	WG			2FM	1	-	
								SS							5.0	-	
ZCR	33-43	2.5Y 6/3	Xcn SiCL			90+			Omissive FR	FR	WC			occasional		-	
																-	
R Bed	43+	rock														-	
																-	

Other Notes:
 - Similar to P296 additional samples not required
 - heavy rain w/in last 24 hr

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TEST PIT DESCRIPTION

Soil Scientist: Michael Lave
 Field Assistant: Rachel Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-293-160606-1056-MEL
 Date: 6/6/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCS Soil Unit: Hazelton (SOD)
 Mineralogy: Mixed

Topographic Position: Summit Ridge
 % Slope: 8%
 Drainage Class: WD
 Depth to Refusal: 46"
 Bedrock Type: Sandstone
 Vegetation: Chestnut Oak, Scarlet Oak, White Pine, Hickory, Red Maple

Parent material: Sandstone residuum
 Slope Aspect: ---
 Depth to Water Table: ---
 Slope Failure or slip: ---
 Dip Slope & Direction: could not measure
 USDA

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture	Structure Type, Grade, and Size	Moist Consistence	Major Boundary Temperature & Disturbance	Redox Feature Color	Redox Feature Description	Roots	Moist Temperature/ pH	Lab Sample ID	Notes
ae	0-1	5Y10/2.5/11	---	---	---	---	---	---	---	---	---	---	---	3F	0.25 4.5	S1	
A	1-2	10YR 4/2	GR SL	12%	60%	15%	1	P0 S0	1E GR	VFR	SC	---	---	3FM	0.25 5.0	S2	
BE	2-5	10YR 5/3	GR SL	10%	60%	15%	1	P0 S0	1MSBK	VFR	WG	---	---	3FM	0.25 5.2	S3	
Bw	5-12	10YR 5/6	VGR SL	15%	60%	40%	1-3	P0 S0	1MSBK	VFR	WG	---	---	2FM	0.25 5.5	S4	clay + 5% coarse
BC	12-24	10YR 5/8	XGR SL	15%	65%	80%	3	P0 S0	1MSBK massive	VFR	WG	---	---	1M	4.5	S5	
CR	24-46	10YR 5/8 sandstone	---	---	---	---	---	---	---	---	---	---	---	Very few			
Bedrock		Sandstone															

Other Notes:

293

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
Field Assistant: Rachel Hill

Signature:

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3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1083

Test Pit ID:	P-294-100006-0905-MEL			Topographic Position:	Slopede, head of hollow			Parent material:	Colluvium over residuum								
Date:	06/06/16			% Slope:	24%			Slope Aspect:	None								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	LAD			Depth to Water Table:	None								
RETTEW Job #:	089962000			Depth to Refusal:	35"			Slope Failure or slip:	No								
NRCS Soil Unit:	Berks 8D			Bedrock Type:	fractured shale			Dip Slope & Direction:	65° S								
Mineralogy:	Mixed			Vegetation:	Red maple, oak, mainly pines			Strike:	80°								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Adhesion	Structure Type, Grade, and Size	Molt Consistence	Medium Boundary Topography & Disturbance	Redox Feature Color	Active Feature Description	Roots	Moistness/Permeability	Lab Sample ID	Notes
O	0-1.5	5YR2.5/1	—	—	—	—	—	—	—	—	SA	—	—	3FM	0.0		
A	1.5-2.5	10YR 3/3	GR SIL	15%	25%	25%	< 0.5	RD SS	2F6R	FR	SA	—	—	3FM	0.75		
BE	2.5-7	10.5YR 5/4	GR SIL	17%	30%	15%	< 1	RD SS	2MSPK	FR	SA	—	—	2FM	0.75		
BC	7-14	10YR 5/6	GR-VLR SIL	15%	25%	35%	< 1	SD SS	1F5PK	FR	WG	—	—	3MC	1.75		
CR	14-35	10YR 5/6	XFL SIL	—	—	90%					BG	—	—				~ 6 in wide SIL similar to PTG in T20N 2C

Other Notes: Some surface quartzite stoneiness (colluvial)
Moving from Berks to Harpers series

294

TEST PIT DESCRIPTION: Michael Lane
 Soil Scientist: 2295-16003-1335-MEL
 Field Assistant: Rachel Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone 717-394-3721
 Fax: 717-394-4053

Test Pit ID:	P-2295-16003-1335-MEL																
Date:	6/13/16																
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																
RETTEW Job #:	089962000																
NRCS Soil Unit:	<u>Bw2-7</u> (B2)																
Mineralogy:	<u>WIPED</u>																
Vegetation: <u>WTA forested maple, chestnut</u>																	
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	bedrock/ nodules	Structure Type, Grade, and Size	Moist. Consistence	Median Boundary Temperature & Disturbance	Redox Feature Color	bedrock/ nodules	Roots	bedrock/ nodules	Lab Sample ID	Notes
OA	0-2	10YR 5/3	SIL	10%	15%	410	ZT	PO	1FG R	F	SC			SEM	0.25		
Bw	2-7	10YR 5/4	GR SIL	12%	15%	30	ZT	PO	1FSPK	F	IC			ZEM	0.75		
C	7-24	10YR 5/4	XCO SIL	0%	15%	85	G+	PO	OM Sive	F				Occasional			
R	24	Fractured bedrock															

Narrow ridge top, border line loamy skeletal reddish shale cobbles

295

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermacher
 Field Assistant: _____

Signature: Dan Fenstermacher

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-2916-160603-12YS-DEF
 Date: 08/31/16
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NCRS Soil Unit: Burb (S)
 Mineralogy: _____
 Topographic Position: VP 1 back edge
 % Slope: 03
 Drainage Class: WQ11
 Depth to Refusal: 39"
 Bedrock Type: Sandstone
 Vegetation: chestnut oak
 Parent material: Colluvium from road side
 Slope Aspect: 160 (adjust for wind direction)
 Depth to Water Table: Minor seepage above rock
 Slope Failure or slip: _____
 Dip Slope & Direction: 33° S
 USDA: Red Oak Hardwood
 Strike: 92

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Moisture	Structure Type, Grade, and Size	Molt Consistence	Major Boundary Topography & Orientation	Redox Feature Color	Major Feature Description	Roots	Rock Fragmentation/ %	Lab Sample ID	Notes
A	0-2.5	10YR3/2	L	14	38	15% 9'	1"	Pe	W/G	V/S	AW	-	-	20"	0	S1	Very fine carb
B+1	2.5-10	2.5Y10/4	S.L	14	20	15% 9'	1"	SS	15R/1	V/S	GS	-	-	20"	0	S2	Sandstone LF Red sandstone
2B+1	10-25	10YR6/4	S.L	14	14	-	-	MP	2M/S/1	F	CS	-	-	20"	0.75	S3	No carb LF
2C	25-39	2.5Y5/3	S.L	38	5	-	-	VP	OM	FR	AS	-	-	14"	0.75	S4	Guest coarse fragments L Aluminous colors
3R	39+	-	-	-	-	-	-	VS	-	-	-	-	-	-	-	-	Complete + no carb LF

Other Notes: Bed rock slopes with Slope

TEST PIT DESCRIPTION

Soil Scientist: Michael Leare
 Field Assistant: Richard Hill

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1033

Test Pit ID:	P-297-10003-153-MEL		Topographic Position:		Summit along ridge		Parent material:	residuum shale									
Date:	3/2/10		% Slope:	5%		Slope Aspect:	270°										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	well drained		Depth to Water Table:	see notes										
RETTEW Job #:	08992200		Depth to Refusal:	27		Slope Failure or slip:	no										
NRCS Soil Unit:	Bekks		Bedrock Type:	shale siltstone		Dip Slope & Direction:	45° NW										
Mineralogy:	amxkd		Vegetation:	red oak pine with laurel		Strike:	70°										
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moder Confidence	Moisture Boundary Temperature & Distance	Redox Feature Color	Root Feature Description	Roots	Soil Fragmentation/pt	Lab Sample ID	Notes	
A	0-1.5	10YR 2/2	SFL					1FGR					3FM	0.5 4.7	S2		
BE	2-7	10YR 6/4	USL	15%	10%	25%	1	1FSBK Fr	Fr	WC			3FMC	0.5 5.4	S3		
Bw	7-13	10YR 5/6	SFL	15%	15%	30%	2	2FSBK Fr	Fr	WC			2MC	1.25 5.2	S4		
C	13-17	10YR 5/8	USL	15%	15%	30%	< 1	DMASSIVE Fr	Fr	WC			1F	1.25 5.0	S5		
Cr	17-27	10YR 7/2s 7.5YR 5/6	XGN SFL			85%	3			WC			Fe ²⁺ B ₂ O ₃ fragments				
R																	

Other Notes: Pin water in bottom of pit, heavy rain when test 24 hrs

297

TEST PIT DESCRIPTION

Soil Scientist: Penelope Macher
 Field Assistant: _____

Signature: David Turner

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-29B-100003-1000-0EF				Topographic Position:	Backstage		Parent material:	Residuum									
Date:	6/3/16				% Slope:	SS		Slope Aspect:	30°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	Well		Depth to Water Table:	9" - 10" due to gain									
RETTEW Job #:	089962000				Depth to Refusal:	30		Slope Failure or slip:	-									
NRCS Soil Unit:	Oa1p				Bedrock Type:	S1stony		Dip Slope & Direction:	38° S									
Mineralogy:	Mixed				Vegetation:	Washed oak, Red oak, Hickory with hazel Knobbybush Str. podagrace		USDA										
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Particle Size	Structure Type, Grade, and Size	Moist Condition	Natural Boundary Topography & Orientation	Redox Feature Color	Redox Feature	Roots	Moisture/temperatures/ pH	Lab Sample ID	Notes	
Oa	0-15	5YR 2.5/2	-	-	-	-	-	-	-	-	-	-	-	3F	-	-	-	Thin Oa underlying
A	15-25	10YR 3/2	SIL	16	18	20% 3F	2.2"	SS SP	1FSBK	VEG AW	-	-	-	3FM 1C	0	4.5	-	
Bw1	25-35	7.5YR 6/4	S2	16	14	CH 30	2.2"	SS SP	1MSBK FR	FR	GW	-	-	2FM 2C	0.25	-	-	
Bw2	35-30	10YR 6/4	S1L	18	15	8F 40	<3"	SS SP	1OSBK FR	FR	CW	-	-	2FM 1C	0.25	4.8	-	
R	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S1stony, almost saturated fractured

Other Notes:
Several inches of Rain fall Evening Prior.

TEST PIT DESCRIPTION

Soil Scientist: D. Tompkins
 Field Assistant:

Signature: Daniel Tompkins

RETVM Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	Date:	Job Name:	MRCS Soil Units:	Mineralogy:	Topographic Position:	Parent material:	Notes:										
0-299-160003-0880-08		Dominion - Atlantic Coast Pipeline Soil Survey			Ridge Top	Residuum over Residuum											
					% Slope:	Slope Aspect:											
					Drainage Class:	Depth to Water Table:											
					Depth to Refusal:	Slope Failure or Slip:											
					Bedrock Type:	Dip Slope & Direction:											
					Vegetation:												
					USDA												
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting Systems	Structure Type, Grade, and Size	Molt Condition	Median Boundary Topography Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
De	0-1	5YR 2.5/2	-	-	-	-	-	-	-	-	-	-	-	3F	4.25	S-1	
A	1-2.5	10YR 2/1	L	15	39	-	-	-	1.5SR	VF	AW	-	-	2F 100	0.25 4.75	S-2	
BE	2.5-4.5	10YR 5/3	L	16	35	5% gr	1"	SS	1.5SR	FR	AW	-	-	3F 1F	0.25 5.0	S-3	
Bud	4.5-7	10YR 5/5	L	16	35	10% gr	1"	SS	1.5SR	FR	CW	-	-	3F 2M 1C	0.25 4.5	S-4	
Bud	7-17	10YR 6/4	SAL	17	35	20% gr	2"	SS	1.5SR	FR	CW	-	-	3M 1C	0.5 4.5	S-5	Fine Sands
Bud	17-27	10YR 6/4	SAL	18	33	20% gr	2"	SS	2M SR	FR	CW	-	-	2M	0.25 4.5	S-6	Fine sands
Bud	27-50	10YR 6/4	SAL	22	18	40% cab	1-4	MS SP	1.6SR	FR	-	-	-	2F 1M	0.5 4.5	S-7	Bluish brown 7.5YR 5/4 fine sands Brown slightly clayey at geology

Other Notes: No clay films
water table not representative of seasonally high water - just reflective of rainy fall - will drain

TEST PIT DESCRIPTION

Soil Scientist: *John C Roberts*
 Field Assistant: *Taylor Walter*

Signature: *John C Roberts*

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-300-110603-1123-5CR			Topographic Position:	Lower Shoulder along back slope			Parent material:	Residual under colluvium								
Date:	0603-2016			% Slope:	55			Slope Aspect:	24								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	W0			Depth to Water Table:	-								
RETTEW Job #:	089962000			Depth to Refusal:	34			Slope Failure or Slip:	-								
NRCS Soil Unit:	Bkks			Bedrock Type:	Silt stone			Dip Slope & Direction:	90° 163 Strike: 73								
Mineralogy:	- Mixed			Vegetation:	Blueberry, Dog wood, Red Maple, White Pine			USDA	Chickadee Oak								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Bedrock Stratum	Structure Type, Grade, and Size	Moist Consistence	Median Bulky Fragment A Direction	Redox Feature Color	Redox Feature Residual	Roots	Water Ingress/pt	Lab Sample ID	Notes
0e	1	10YR 2/1	—	—	—	GR 15	<0.5"	—	—	VFR	CS	—	—	ZF	0.25	1	
A	2	10YR 2/2	S12	12	10	GR 15	0.5-10"	PO	1m GR	FR	CS	—	—	3f	0.25	2	
BA	5	10YR 5/4	S12	14	12	GR 10	0.5-10"	PO	1m SBK	FR	CS	—	—	2f	0.25	3	
Bw	9	10YR 6/6	S12	14	12	GR 10	0.5-10"	PO	1m SBK	FR	CS	—	—	2m	0.5	4	
ZB1	15	7.5YR 5/6	S12	20	18	GR 20	0.5-20"	SS	2m SBK	FR	CS	—	—	2f	1.0	5	clay films
ZB2	23	7.5YR 5/8	S12	22	16	GR 20	0.5-3"	SD	1m SBK	FR	CS	—	—	2m	1.25	6	clay films
ZC	34	10YR 5/8	—	—	—	GR 95	1-6"	SS	0m	—	GW	—	—	1f	4.5	—	L, Thodolmic Chrysoma Z15
R	34+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

Other Notes:

Water seeping in pit @ 15 from previous night's rain, no bedrock observed.

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Tracy Lee Walker

Signature: [Signature]

RETW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-501-160603-1326-5CR					Topographic Position:	Edge to Ground										
Date:	06-02-2014					% Slope:	15										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	IND										
RETW Job #:	089962000					Depth to Refusal:	25										
NRCS Soil Unit:	Rocks					Bedrock Type:	SHL Stone										
Mineralogy:	Mixed					Vegetation:	Red Maple Hickory Chestnut Oak - Red Oak										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Push/ subsoil	Structure Type, Grade, and Size	Molt Condensation	Hydro-Bonding Typology & Observations	Redox Feature Color	Bedrock Description	Roots	Soil Permeability (mm)	Lab Sample ID	Notes
D	1	10YR 2/1	L	—	—	CW 10	0.5-2"	5	—	—	CW	—	—	2f 10R	0.25 9.5	—	—
A	2	10YR 4/3	CW SIL	0	10	CW 14	1-2"	PO 50	1m 6R	1/5R	CW	—	—	3d 2m	0.25 4.25	—	—
Bw1	6	10YR 5/6	SIL	15	2	CW CD	1-3"	—	massive	FR	CW	—	—	2c 3m	0.5 5.0	—	—
Bw2	9	10YR 5/8	SIL	16	10	CW 30	1-4"	—	massive	FR	CW	—	—	2d 2m	0.5 5.0	—	—
Cv	24	10YR 5/2	—	—	—	CS CW	2-6"	—	—	—	CW	—	—	1c	—	—	—
24N																	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. Wosb
 Field Assistant: _____

Signature: M. Wosb

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P302-160603-115-MGW	Topographic Position:	RIDGE	Parent material:	RESIDUUM
Date:	6/13/16	% Slope:	5%	Slope Aspect:	290
Job Name:	Domion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	MOD Well Drained	Depth to Water Table:	2.32
FASTEM Job #:	08996200	Depth to Refusal:	32	Slope Failure or slip:	
NR 25 Soil Unit:	AZKVS	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	
M. Inealogy:	Mixed	Vegetation:	SEE GLOW	Strike:	

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Rooting/Structure	Structure Type, Grade, and Size	Moisture Condensance	Moisture Temperature & Outflow	Redox Feature Color	Redox Feature Slope	Roots	Probe Penetration/pt	Lab Sample ID	Notes
Be	0-1													3 f/vf 2 m	4.2		
Buc	1-4	10YR5/4	GR S.R.	11	14	GR 30	<1.5	PO 50	1 FR GR	WFA	CW	-	-	3 f/vf 1 Co/m	0.25 4.7		
Bu2	4-12	10YR5/4	S.R.	14	16	GR 55	<2.0	PO 50	1 M SRK 1 M GR	WFA	CW	-	-	1 f/vf 1 Co/m	0.35 4.7		
R	12-19	10YR5/4	S.R.	14	16	GR 70	<6.0	PO 50	1 M SRK 1 M GR	WFA	CW	-	-	1 f/vf			
R	19-32	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
R																	

Other Notes:

32" STAND BULG WITHIN 27" (DUVE TO RECENT RAIN)

CHICKENIT OAK, RED OAK, RED MAPLE, CHERRY, HOCKEYHAW

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: MAX DEGAN

Signature: [Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P 303-160603-0830-MGW				Topographic Position:	back slope											
Date:	6/3/16				% Slope:	34%											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	W											
RETTW Job #:	089962000				Depth to Refusal:	37											
NRCS Soil Unit:	B(Blk)				Bedrock Type:	SILTSTONE											
Mineralogy:	Mixed				Vegetation:	BELOW											
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/ Stability	Structure Type, Grade, and Size	Moist Consistence	Nodules, Rooting & Bedrock	Redox Feature Color	Bedrock Feature Description	Roots	Water Penetration/ In	Lab Sample ID	Notes
Oe	0-1													3F/VF 2M	4.2	S1	
A	1-2	10YR 4/1	S ₁	9	15	20% Gr	4.5"		1FG	Vfr	AS	-	-	3F/VF 2M	.25 4.6	S2	
Bw1	2-7	10YR 5/6	V ₉ S ₁ L	15	15	40% Gr	2.2"		1MSBK	Fc	CW	-	-	2F/VF 1C0/M	.25 4.6	S3	
Bw2	7-15	10YR 5/6	V ₉ S ₁ L	18	15	45% Gr	2.2.5"		2MSBK	Fc	CW	-	-	2F/VF 2C0/M	.75 4.6	S4	
Bw3	15-23	7.5YR 5/6	Ex ₉ S ₁ L	15	18	65% Gr	2.3"		1MSBK	Fc	CW	-	-	1F/VF 1C0	1.0 4.6	S5	
2CB	23-30	7.5YR 5/6	Ex ₉ S ₁ L	15	18	70% Gr	2.2.5"		OM	-	CW	-	-	1F/VF 1C0	1.25 4.6		
2Ck	30-37	7.5YR 5/6	Ex ₉ S ₁ L	15	18	90% Gr	2.5"		OM	-	-	-	-	1F/VF	-		

Other Notes: REG: RED MARLE, HIEROXY, WHITE OAK, HUCIACE BECKLY

TEST PIT DESCRIPTION

Soil Scientist: MICHAEL WOOD
 Field Assistant: MAX BUEAN

Signature: [Signature]

RETTEW Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID: P-303A-150603-0920-MGW Topographic Position: SHOULDER/BACK SLOPE Parent material: RESIDUAL

Date: 6/3/16 % Slope: 10% Slope Aspect: 312

Job Name: Dominion - Atlantic Coast Pipeline Soil Survey Drainage Class: ~~MDP~~ Somewhat excessively Depth to Water Table: N/A

RETTEW Job #: 089962000 Depth to Refusal: 32" Slope Failure or slip: N/A

NRCS Soil Unit: BERKS Bedrock Type: SILTSTONE Dip Slope & Direction: 73% S

Mineralogy: MIXED Vegetation: Red maple, sec below

Horizon	Depth in Inches	Match Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/voids	Structure Type, Grade, and Size	Mold Compaction	Andric Boundary Temperature & Resistance	Redox Feature Color	Andric Feature Description	Roots	Andric Penetration/ pH	Lab Sample ID	Notes
Oe	0-1	10yr 2/1	-	-	-	-	-	-	-	-	-	-	-	3F/VF 2C0/M	4.3	-	-
BA	1-3	10yr 5/4	gr SIL	12	12	Gr 20%	<1"	P0 S0	IFGr	VF	AS	-	-	3F/VF 2C0/M	0.25 4.7	-	-
BW1	3-8	10yr 5/6	vgr SIL	14	12	50% gr	<1.5"	P0 S0	IFSBK IFgr	F	CW	-	-	2F/VF 1C0/M	0.25 4.7	-	-
BW2	8-13	7.5YR 5/6	Exgr SIL	14	15	75% gr	<2"	P0 S0	IMSBK	VF	GW	-	-	1F/VF 1C0/M	1.25 4.7	-	-
CR	13-19	7.5YR 5/6	S:L	-	-	gr 85%	<6"	-	OM	-	-	-	-	1 VF/F	3	-	-
R	19-32	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes: Red maple, chestnut oak, mountain Laurel, huckleberry

TEST PIT DESCRIPTION

Soil Scientist: M.G. Adams
 Field Assistant: MATX BOGARD

Signature: M.G. Adams

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P304-160603-DB15-MGW										Topographic Position:	RIDGE UPPER SHOULDER									
Date:	6/3/16										% Slope:	7%									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey										Drainage Class:	WELL									
RETTEW Job #:	089962000										Depth to Refusal:	24'									
MRCSS Soil Unit:	DBGR										Bedrock Type:	GILTSSTONE BEDDING BROWN									
Mineralogy:	Mixed										Vegetation:	BROWN									
USDA																					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/ Stability	Structure Type, Grade, and Size	Moist. Condition	Nearest Shrub/ Tree/ Vine & Description	Redox Feature Color	Soil Structure Description	Roots	Water Penetration/ pH	Lab Sample ID	Notes				
Oe	0-1																				
A	1-15 2-15	7.5 YR 4Y1	SIL	12	12	GR 5%	<1.5"	PO BO	2FGR	VFR	AS	NA	NA	3-F/VF 2-M	4.8		SMALL ROCKETS IF E HDR20W				
Bw1	15-10"	10YR 6/6	SIL gr	15	14	35% GR	<1.5"	PO SO	2MSBK	F-	CW	-	-	2-F/VF 1-M 1-CO	4.7						
Bw2	10-16	7.5 YR 5/6	SIL Vg	18	18	45% GR	<2.5"	PS SS	1MSBK	F-	CW	-	-	1-F/VF 1-M	4.7						
B/Cr	16-24	7.5 YR 5/6	SIL S.L	14	20	50% GR	<4"	SO PO	OM	-	CW	-	-	1-F/VF							

Other Notes: Standing water @ 21" - rain night before
 this pit from 6/2 was redng, previous pit filled w/ water

CHRISTINA AAR, BUCKEY, DOGWOOD, MTN LAUREL, HICKORY

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker
 Field Assistant: _____

Signature: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-305-1601002-1145-DET				Topographic Position:	Shoulder		Parent material:	Residuum								
Date:	6/21/0				% Slope:	25%		Slope Aspect:	78°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	Well		Depth to Water Table:	-								
RETTEW Job #:	089952000				Depth to Refusal:	21		Slope Failure or slip:	-								
NRCS Soil Unit:	Ge1K4				Bedrock Type:	S. Hard Redish Brown		Dip Slope & Direction:	78° SE								
Mineralogy:	Mixed				Vegetation:	Mast oak, scrub oak, blackgum, blueberry.											
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/ Sideslip	Structure Type, Grade, and Size	Molt Consistence	Rooting Boundary Topography & Slope	Redox Feature Color	Redox Feature Description	Roots	Moisture/ pH	Lab Sample ID	Notes
0e	0-1	5YR 2.5/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	1-1.5	10YR 3/2	SIL	16	13	10% gr	<1"	-	amg	-	-	-	-	3F 1c0	0	-	-
Bw	1.5-12	10YR 6/4	SIL	16	12	38 gr	4.1"	-	SS	FR	CW	-	-	3F 2m 1c0	4.8	-	-
Bw2-1a-	20	7.5YR 6/4	SIL	18	16	55% gr	<2"	-	SS	FR	CW	-	-	2F 1m	4.85	-	-
Cr	20-28	7.5YR 6/6	SIL	18	18	90% gr	1-4"	-	SS	OM	CW	-	-	1f	-	-	-
R	28-31+							-									

Closely bedded w/ fissures in crevices soft rocks

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Michael Wood
 Field Assistant: DEF

Signature: Mary D

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-306-16D602-1100-MGW					Topographic Position:	RIDGE		Parent material:	Residual						
Date:	6/2/16					% Slope:	4%		Slope Aspect:	S						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	Well		Depth to Water Table:	-						
RETTEW Job #:	089962000					Depth to Refusal:	90"		Slope Failure or slip:	-						
NRCS Soil Unit:	Roi Us					Bedrock Type:	Siltstone - Reddish Brown		Dip Slope & Direction:	Not Clear in Pit						
Mineralogy:						Vegetation:	Chestnut oak, Black gum, Red maple, Norway spruce									
USDA																
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Consistence	Median Bulky Fragments & Orientation	Redox Feature Color	Parent Material Description	Roots	Water Penetration/pt	Lab Sample ID	Notes
0e	0-1	3YR7/2	-	-	-	-	-	-	-	AS	-	-	3-4 VF 2M	0-1 4.3	S1	
A	1-2	10YR4/2	Sil	14	12	10% gr	4.15"	2FGm Fr	Fr	CW	-	-	3-4 1M	0-2.5 4.8	S2	
Bu1	2-9	10YR5/6	Sil	15	12	10% gr	4.15"	2MSBk Fr	Fr	CW	-	-	2F 5M	1.85 4.8	S3	
Bu2	9-19	10YR4/6	Sil	18	15	20% gr	4.9"	2MSBk Fr	Fr	CW	-	-	2F 1C	1.85 4.8	S4	
Cu	19-31	7.5YR6/6	Sil	18	15	80% gr	4.9"	0M	-	CW	-	-	1C	-	-	P105 05 (coarse gravel)
R	31-40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes: in nearby Roadcut - visible bed shale 90° Dip w/ Strike to S30°

TEST PIT DESCRIPTION

Soil Scientist: Dan Fenstermacher
 Field Assistant: Max

Signature: 

RETTEM Associates, Inc.
 3070 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-307-1601602-1045- MTD DEF				Topographic Position:	Upper Backside		Parent material:	Residual								
Date:	6/29/16				% Slope:	21		Slope Aspect:	45°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	We II		Depth to Water Table:	-								
RETTEM Job #:	089962000				Depth to Refusal:	40		Slope Failure or slip:	-								
NCS Soil Unit:	Soils				Bedrock Type:	Siltstone - reddish brown		Dip Slope & Direction:	55° SE								
Mineralogy:	Mixed				Vegetation:	Mature oak scrub oak, Red oak, black oak, dogwood		Striker:	60°								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Mollic Condition	Natural Density Topography A	Redox Feature Color	Root Feature Description	Roots	Field Temperature/ pH	Lab Sample ID	Notes	
De	0-25	5YR2.5/2	-	-	-	-	-	-	-	AW	-	3F	3F	-	-	-	
A	25-4	10YR4/2	SIL	14	13	30%	2 1"	28g	VF	AW	-	3F	3F	0.25	-	-	log thin E in some spots 25-50%
Bw	4-13	10YR6/4	SIL	15	16	80%	2 1"	1M5gk	E	CS	-	3F	3F	0.25	-	-	
Bw2	13-21	7.5YR6/4	SIL	15	15	40%	2 2"	1M5gk	F	CW	-	3F	1M	1.75	-	-	
BCL	21-28	7.5YR5/4	SIL	16	16	85%	13"	1C50gk	F	CW	-	1F	1F	2.0	-	-	
Cp	28-33	7.5YR6/6	Gravel (SIL)	13	12	95%	2 4"	QAN	-	CW	-	1F	1F	-	-	-	
R	33-40+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: John C. Roberts
 Field Assistant: Taylor Walter

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-308-16060E-1231-5CR					Topographic Position:	Back slope		Parent material:	Pa siduron							
Date:	06-02-2016					% Slope:	38		Slope Aspect:	111°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	SED		Depth to Water Table:	---							
RETTEW Job #:	089962000					Depth to Refusal:	---		Slope Failure or slip:	---							
NRCS Soil Unit:	Berks / Veikert					Bedrock Type:	Silt Stone		Dip Slope & Direction:	80% 142°							
Mineralogy:						Vegetation:	Fed Made. Black Gum. White Pine, Chestnut Oak, Blackwood Hickory.		USDA								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Penet./ Sph. / Silt	Structure Type, Grade, and Size	Molt. Consistency	Moist. Boundary Temperature & direction	Redox Feature Color	Redox Feature description	Roots	Rock fragments/ in	Lab Sample ID	Notes
0e	0-1	---	---	---	---	GR 10	< 1"	P0	---	VFR	< 5	---	---	2F	0.25	S1	
AE	1-8	10YR 6/4	SIL	18	12	GR 10	< 1"	SP	1M5BK	VFR	CS	---	---	3F	0.75	S2	
Bw	8-16	10YR 5/6	VER	20	15	GR 40	1-3"	SP	1M5BK	FR	CS	---	---	3F	0.75	S3	
Cr	16-50*	10YR 5/6	---	---	---	GN	2-6"	---	---	---	---	---	---	---	---	---	Few Pines 5/16 rocks - no roots

Other Notes:

No tree surface or A horizon present

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1063

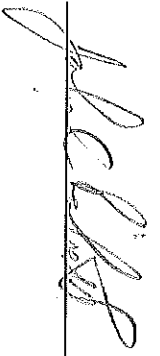
Test Pit ID:	P-3084-160602-343-5CR		Topographic Position:	Summit		Parent material:	Residuum									
Date:	06-02-2016		% Slope:	6		Slope Aspect:	170									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	SED		Depth to Water Table:	---									
RETTEW Job #:	089962000		Depth to Refusal:	30		Slope Failure or slip:	---									
NRCS Soil Unit:	Wet/loam - Barks		Bedrock Type:	C17 Stone		Dip Slope & Direction:	78° 158°									
Mineralogy:	---		Vegetation:	Dog wood, Red Maple, White Pine, Chestnut Oak		Soil Temperature/ pH	78° 158°									
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Moisture/ Structure	Moisture/ Confidence	Medium Saturated Temperature & Structure	Redox Feature Color	Bedrock Feature Description	Roots	Soil Temperature/ pH	Lab Sample ID	Notes
De	0-1	---	---	---	---	CW	0.5-1"	---	---	---	---	---	2f	0.25 4.25	---	---
AE	1-10	10YR 6/6	VCN S12	14	15	CN 4/5	0.5-3"	PD SS	FR	CS	---	---	1c 3f	0.75 4.5	---	Slight seepage @ AE/BW transition
Bw	10-17	10YR 5/8	ECN S12	16	15	CN 7/5	1-6"	PD SS	FR	GV	---	---	3f	0.75 4.5	---	---
C1	17-30	10YR 5/8	---	---	---	CN 9/5	---	---	---	---	---	---	---	---	---	---
R	30+	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Other Notes: Skiny Ridge / Summit ≈ 75-90' wide; No tree surface or A horizon

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: Taylor Walter

Signature: _____



RETTW Associates, Inc
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-309-060602-1499-5CR	Topographic Position:	Rock slope	Parent material:	Reddish-brown silty clay
Date:	06-02-2016	% Slope:	48	Slope Aspect:	1710
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	E0	Depth to Water Table:	—
RETTW Job #: 089952000		Depth to Refusal:	28	Slope Failure or slip:	—
NRCS Soil Unit:	Barks	Bedrock Type:	Silt stone	Dip Slope & Direction:	80% 3210
Minerology:	—	Vegetation:	White Pine, Hickory	Soil: 3210	Soil: 2310

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	number/section	Structure Type, Grade, and Size	Moist Crustiness	Horizon Boundary Topography & Orientation	Redox Feature Color	Soil Feature Description	Roots	Moisture/Temp at	Lab Sample ID	Notes
De	0-1	—	—	—	—	CM 10	0.5"-1.0"	—	—	VR	CS	—	—	3F	5.0	—	—
AE	1-4	10YR5/4	CM SIL	14	10	CM 30	0.5"-2"	P0 SS	1M5BL	FR	CS	—	—	3F 2m	0.5 4.75	—	Coarse rock dispersed within AE
2BW	4-10	10YR4/6	CM SIL	15	10	CM 30	1"-4"	P0 SS	1M5BL	FR	GW	—	—	2m 2.0	1.0 5.5	—	—
2C	10-28	10YR4/6	—	—	—	95% cm/lo	1"-8"	—	—	—	—	—	—	—	—	—	Could not remove loose stones with dry bar
R	28+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Notes: No true A horizon; Some fines between rock faces within Cr; no roots observed in Cr horizon; colluvium over nodules

TEST PIT DESCRIPTION

Soil Scientist: John C Roberts
 Field Assistant: TECC Wozniak

Signature: John C Roberts

RETTW Associates, Inc
 3020 Columbia Avenue
 Lancaster, PA 17603
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 Fax: 717-394-1063

Test Pit ID:	P-310-110603-835-5CK		Topographic Position:	Back Slope		Parent material:	Collection / Residuum										
Date:	06-03-2016		% Slope:	25%		Slope Aspect:											
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	W0		Depth to Water Table:											
RETTW Job #:	089962000		Depth to Refusal:	≥ 50'		Slope Failure or slip:											
NRCS Soil Unit:	Weberd		Bedrock Type:			Dip Slope & Direction:											
Mineralogy:	Mixed		Vegetation:	Black Locust, Chestnut Oak, White Pine		USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (Inches)	Number/Size	Structure Type, Grade, and Size	Molar Condensite	Natural Boundary Vegetative & Occurrence	Redox Feature Color	Moisture Regime	Roots	Root Penetration/In	Lab Sample ID	Notes
De	0.5					LR	<0.5"			VQR	AS			2m	0.25 4.5		
A	1	10YR 4/2	SIL	15	10	GR	<0.5"	PO SO	Im GR	VFR	CS			Zf	0.25 4.25		
Bw	10	10YR 4/4	S ⁵ SIL	15	10	GR	0.5"-1.0"	PO SO	Im SBK	FQR	CS			Zf 2m	0.5 4.5		
Z Bw1	14	10YR 4/4	GR SIL	20	15	GR	0.5"	SP SS	Im SBK	FQR	CS			Zf 2.40	0.5 5.25		
Z Bw2	29	10YR 5/6	S ⁴ SIL	22	15	GR	<0.5"	SP SS	Im SBK	FQR	CS			Zf 1m	0.75 5.25		
Z Bw3	39	7.5YR 5/6	SIL	24	10	GR	0.5"-1.0"	SP SS	Im SBK	FR	CS			1m	0.75 5.25		Lithochromic colors
Z C	50+	7.5YR 5/6	SIL	20	15	GR	0.5"-2"	SS SP	Im	F1	CS			1m	1.5 4.0		

Other Notes:

Pit filled with water from previous night's rainfall, No bedrock observed

TEST PIT DESCRIPTION
 Soil Scientist: Michael Lane
 Field Assistant: Rachel Hill / Gersper

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-3053

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade and Size	Moisture Condensability	Moisture Condensability	Redox Feature Color	Parent Material	Slope Aspect	Depth to Water Table	Slope Failure or slip	Dip Slope & Direction	Soil Temperature / pH	Lab Sample ID	Notes	
P-311-100002-1000-MEL	6/2/2016	Domination - Atlantic Coast Pipeline Soil Survey	W20101	Mixed: Grpb Kaolinite / Illite															Upland Ridge-top	80%						
																			Summit							

Soil reaction will be determined from samples.
 Description made to assist Retew: Bad weather - heavy rain.
 Staff did not have Penetrometer - Penetrometer readings, strike dip, aspect from 6/3/16 + T-311-A

311

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane

Field Assistant: R-312-160602-1509-MEL
Rachel Hill

Signature: 

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-5721
Fax: 717-394-1053

Test Pit ID:	P-312-160602-1509-MEL						Topographic Position:	Heat & Chollow		Parent material:	Residuum w/colloidal cap						
Date:	6/2/16						% Slope:	35%		Slope Aspect:	220°						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey						Drainage Class:	SWPD		Depth to Water Table:	14"						
RETTEW Job #:	08992000						Depth to Refusal:	40"		Slope Failure or slip:							
MBCS Soil Units:							Bedrock Type:	Siltstone		Dip Slope & Direction:	no trace						
Mineralogy:	Mixed						Vegetation:	cabin oak, Hickory		Soil Slope & Direction:	no trace						
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Mineralogy/Structure	Structure Type, Grade, and Size	Molar Cation Ratio	Moisture Equivalent %	Redox Feature Color	Moisture Equivalent Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
A	05-1	10YR4/4	sil	12	20	<10%		PO	1 frag	FR	SC	—	—	3fmc	1.0	S2	
BE	14	10YR5/4	sil	12	20	<10%		PO	1f sbk	FR	wc	Roots	—	—	1.75	S3	
Bw	14-22	10YR5/6	sil	14	25	<10%		PO	Zm sbk	FR	wc	Roots	—	—	5.0	S4	
C	22-31	10YR5/4	sil	15	20	25%	<1"	PS	Ømass	FR	wc	Roots	—	—	2.25	SS	
C	31-40	variegated weathered siltstone													4.8		
R	40+																

Other Notes: Redox Feature Colors recorded in the "Roots" column for Bw and C horizons, Roots recorded in "Redox Feature Color" column for BE, BW, and C horizons.

TEST PIT DESCRIPTION

Soil Scientist: Michael Lane
 Field Assistant: Richard Hill, Gary Carter

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-314-160602-1115-MEL					Topographic Position:	sloped, near summit of ridge											
Date:	6/2/16					% Slope:												
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	V/D											
RETTEW Job #:	089962000					Depth to Refusal:	250"											
NRCS Soil Unit:	Ustic Entisol					Bedrock Type:	shale/siltstone											
Mineralogy:	mixed					Vegetation:	Pro. White oak network, mountain laurel, asterisk (See notes for outcrop material)											
Horizon	Depth in inches	Matrix color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Rooting/Status	Structure Type, Grade, and Size	Moist. Consistence	National Database Properties & Restrictions	Redox Feature Color	Water Feature Description	Roots	Moist. Temperature/ pH	Lab Sample ID	Notes	
O _i	0-2	10YR3/2									SA			3 fine	4.2	S1	Combined for samples	
O _e	2-3	10YR3/1									SA			3 fine	4.2	S1		
A	3-4	10YR4/4	GR	12	40	30%	<3"	PD SO	2 fgr	VFR	WA			3 fine	0.5 4.2	S2		
BE	4-11	10YR4/6	GR	14	40	30%	<3"	SP SS	1 w/bk	VFR	WC			2 fine	0.5 5.0	S3		
Bu1	11-20	7.5YR4/6	VAR	16	35	45%	<3"	SP SS	1 w/bk	FR	WC			2 fine	0.75 5.2	S4		
Bu2	20-32	10YR5/6	VAR	16	35	45%	<3"	SP SS	1 w/bk	FR	WC			2 fine	1.0 4.8	S5		
ZC	32-40	variegated 7.5YR5/6 5YR4/6	VAR cl- sc	20	55	60%		SP SS	Dispersive	FR- FI	WC			1 f	4.3	S6		
ZCu	40-50																	

Other Notes:

Bedrock outcrop at summit - quartzite dipping 60° E / Strike 20°
 Extremely stony surface, quartzite stones

occasional roots between profiles

TEST PIT DESCRIPTION

Soil Scientist: JOHN MAHA
 Field Assistant: TAYLOR WALTER

Signature: [Signature]

[Signature]

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-333-160621-1327-35W		Topographic Position:		Backslope		Parent material:		Columium over Reservoir								
Date:	6/22/16		% Slope:		36%		Slope Aspect:		355°								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		well		Depth to Water Table:		-								
RETTW Job #:	089962000		Depth to Refusal:		-		Slope Failure or Slip:		FEN BENT TERES								
NRCS Soil Unit:	DEKALB-WATAUGA-MERCUR		Bedrock Type:		-		Dip Slope & Direction:		-								
Mineralogy:	MIXED		Vegetation:		MIDDLE CRESTWOOD		USDA		FERN								
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	bedrock nodules	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Distribution	Redox Feature Color	Bedrock Feature Description	Roots	Soil Testimonial/pt	Lab Sample ID	Notes
DC	0-3	SPR25/1	-	-	-	-	-	-	-	-	AS	-	-	3-NF 2-F	4.5	-	
A	3-10	10YR3/1	XPR SIL	10	15	QR 8S	1-2	PO SO	1FR	VER	awn	-	-	2-NF, F M 1-C	0.25	-	
BE	10-12	10YR4/6	SIL	12	20	QR 4S	1-2	PO SO	1FSBK	FR	cm	-	-	2-F, M	0.5	-	
BE1	12-22	10YR6/4	SIL	15	25	QR 2S	1-2	PO SO	1M SBK	FR	cm	-	-	2-F, M 1-C, VC	1.0 6.5	-	
BE2	22-30	10YR6/4	SIL	18	22	SO CB	4-7	SP SS	1FSBK	FR	cm	-	-	3-F 1-C	1.0 -	-	CLAY SKINS
BE3	30-50	9.5YR5/6	SIL	22	20	SO QR	<1	SP SS	2ASBK	FR	-	-	-	2-F	1.25 4.5	-	CLAY SKINS

Other Notes:

NICE CART COF

TEST PIT DESCRIPTION

Soil Scientist: Russell Lorio
 Field Assistant: Steph Morera

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID: P334-140622-115-RLL
 Date: 4/22/2016
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089962000
 NRCS Soil Unit: Mixed Berks Rough
 Mineralogy: Mixed
 Topographic Position: Bar Slope
 % Slope: 45%
 Drainage Class: WD
 Depth to Refusal: 24"
 Bedrock Type: Siltstone
 Vegetation: Mixed hardwoods & Pine
 Parent material: Colluvium over Residuum
 Slope Aspect: 195°
 Depth to Water Table: 24"
 Slope Failure or slip: ---
 Dip Slope & Direction: N350W 350
 Strike: N55E

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Reaction/ Solubility	Structure Type, Grade, and Size	Moist Consistence	Uniaxial Compressive Strength & Orientation	Redox Feature Color	Bedrock Features Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
Da	1/5	8YR2.5/1	—	—	—	—	—	—	GR	HR	CL/S	—	—	IF IM	0		
E	5	2.5Y 1/3	L	10	40	ST 100%	1/2"	PD	FISBL	FR	G/S	—	—	IF	2.5		
Bw	15	10YR2.5/3	SIL	22	5	ST 30%	1/2"	SP	FISBL	FR	G/S	—	—	2F 2M	4.5±		
Cr	24	10YR2.5/3	SIL	20	9	ST 70%	1/2-3/4"	MS	DM	F1				IM	4.5±		
R								MS							5.1		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Morara

Signature: _____



over Residuum

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P335-160622-110-RL				Topographic Position:	Stream Terrace				Parent material:	Alluvium				
Date:	4/22/2016				% Slope:	10%				Slope Aspect:	356°				
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	UD				Depth to Water Table:	18" ±				
RETTEW Job #:	089962000				Depth to Refusal:					Slope Failure or slip:					
NRCS Soil Unit:	Macove				Bedrock Type:	Siltstone				Dip Slope & Direction:	S100E 90				
Mineralogy:	Mixed				Vegetation:	Mixed Hardwoods & Evergreens				USDA					
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture Consistency	Soil Structure	Soil Color	Soil Texture	Roots	Soil pH	Lab Sample ID	Notes
Da	1	5YR 2.5/1	—	—	—	—	—	—	FR	FR	FR	2F 2M	5.1	S1	
A	4	10YR 3.5/3	SL	18	20	20% GR	1/4"	FR	FR	FR	FR	2F 2M	5.0	S2	
Bw1	9	10YR 5/10	SL	10	UD	80% GR	1/4"	FR	FR	FR	FR	1M	5.25	S3	
Bw2	18	10YR 6/6	SL	8	7D	80% GR	1/4 - 3/4"	FR	FR	FR	FR		5.25	S4	
R	18+														

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Marasca

Signature: _____



RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	<u>P336-110027-1100-RLL</u>	Topographic Position:	<u>Belt Slope</u>	Parent material:	<u>Colluvium over Bedrock</u>
Date:	<u>6/22/2016</u>	% Slope:	<u>35%</u>	Slope Aspect:	<u>329°</u>
Job Name:	<u>Dominion - Atlantic Coast Pipeline Soil Survey</u>	Drainage Class:	<u>WD</u>	Depth to Water Table:	<u>20+</u>
RETTEW Job #:	<u>089962000</u>	Depth to Refusal:	<u>20"</u>	Slope Failure or Slip:	_____
NRCS Soil Unit:	<u>Wdclact-Rch</u>	Bedrock Type:	<u>Siltstone</u>	Dip Slope & Direction:	<u>570°W 90</u>
Mineralogy:	<u>K.fzd</u>	Vegetation:	<u>Oak + Pine</u>		<u>Strike: N20°W</u>

Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Soil	Structure Type, Grade, and Size	Molt Consistence	Median Boundary Topography & Distances	Redox Feature Color	Redox Feature Description	Roots	Roots	Roots	Lab Sample ID	Notes
0a	1	5YR 2.5/1	—	—	—	5% ST	1/2"	—	FLGR	FR	c/s	—	—	1F 1M	0	4.5		
AE	7	2.5Y 8/3	SIL	20	3	40 ST	1/2"	PO	FLGR	FR	c/s	—	—	1F	2.5			
Cr	15	10YR 8/3	SIL	32	5	80 CN	1/2 x 3"	SP	WF 15BT	FR	clw	—	—	2F 1M	4.5+			
R	20							MS							5.25			

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Russell Losco
 Field Assistant: Steph Maraca

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Notes									
P38T-160622-10C5-RLC	4/22/2016	Dominion - Atlantic Coast Pipeline Soil Survey	06996200		Backslope - Nose	Slope Aspect: 320°	Collection over Residium									
					Drainage Class: W/D	Depth to Water Table: 35"										
					Depth to Refusal: 35"	Slope Failure or slip: ---										
					Bedrock Type: ---	Dip Slope & Direction: ---										
					Vegetation: Mixed Oak + Pine											
					USDA											
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molar Consistence	Soil Banding Description	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/ pH	Lab Sample ID	Notes
0a	2	5YR2.5/1	---	---	---	---	---	Flg	FR	C/S	---	---	2F2H 1C0	0 4.75	S1	
E	8	2.5Y8/3	SiL	20	5	40 ST	1/4-1/2"	FR	FR	C/S	---	---	2F1H 1C0	1.25 5.25	S2	
Cc	22	10YR6/6	SiCL	35	8	40 ST	1/2-1"	FR	FR	C/S	---	---	IF	4.5+ 5.25	S3	
R	35+															

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: Rossell Losco
 Field Assistant: Steph Maraca

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Rock Fragment Size (inches)	Rock Fragment Type & %	% clay	% sand	Texture Class	Matrix Color	Depth in Inches	Horizon	Notes
P339-160622-1035-R11	06/22/2014	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Udiktent-Rough	Mixed	Backslope-Shoulder	28%	SPD	18"	Siltstone	Oaks & Walnut	Colluvium over Residuum	89	4"	- Perched on R		1/2"	10% ST			—	59R2.5/1	2	Da	
																	1/2-1"	50% ST	10		Silt	10R2.5/10	4	Bu	
																	1x3"	80% b CN	5		Silt	10R2.5/10	12	Cc	
																						18+	R		

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: R. Hill

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1053

Test Pit ID:	P340-160622-1600-M6W		Topographic Position:		SADDLE SIDE SLOPE		Parent material:		Chestnut + Red Oak, Hickory, Dogwood, White Pine, Blue Grey								
Date:	6/22/16		% Slope:	15		Slope Aspect:	39										
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	> 20										
RETTEW Job #:	089962000		Depth to Refusal:	20		Slope Failure or slip:											
NRCS Soil Unit:	W81KRP1-0EERVS-ROUGH		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	30 74°		Strike: 344								
Mineralogy:	Mixed		Vegetation:	Chestnut + Red Oak, Hickory, Dogwood, White Pine, Blue Grey													
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Stability/Inches	Structure Type, Grade, and Size	Moist. Consistence	Moist. Boundary Temperature & Disturbance	Redox Feature Color	Moist. Feature Description	Roots	Proctor Pct. Moisture/pt	Lab Sample ID	Notes
De	0-1	7.5 YR 3/2	-											2F-VF 1C0-M	4.2		
A	1-1.5	10YR 4/1	GR S, 1	8	30	GR 20%	< 1.0"	PO SD	1VF GR	VFR	CS	-		2F-VF 1C0-M	0.25 4.8		
Bw	1.5-4	10YR 6/4	VG S, 1	9	30	GR 40%	< 2.0"	PO SD	1VF SBR-6R	VFR	CW	-		2F-VF 1C0-M	D, 25 5.4		
CR	4-20	10YR 6/4	XGR S, 1	9	35	GR 90%	< 6.0"	PO SD	DM	VFR	CW	-		1F-VF 1C0-M	-		
R	20+																

Other Notes:

TEST PIT DESCRIPTION
 Soil Scientist: D. Penzance-McCles
 Field Assistant: Richard Hill

Signature: Dan Penzance-McCles

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Drainage Class:	Depth to Refusal:	Bedrock Type:	Vegetation:	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Lab Sample ID	Notes
P-341-160602-1585-DEF	10/22/10	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	Wet-Rough Camps (605)	Wet-Rough Camps (605)	Upper Back Slope	42%	14.5	5:1 Stone	USDA	Colluvium over Residuum	84°	26" W	10°	None	None	None	None
Or	0-1.75	S1R	S11	-	-	-	-	-	-	-	-	-	-	-	-	3F	-	-
A	1.75-2.25	10YR3/2	S1L	20	12	2"	PO	2MGR	Vfr	AW	-	-	-	-	-	3FM	0.1	-
Bw1	2.25-7	10YR5/4	S1L	20	12	12-4"	PO	15BRK	Ff	CW	-	-	-	-	-	2FM	0.75	-
Bw2	7-19.5	10YR6/4	S1L	20	12	11.2-8"	PO	16SBH	Ff	AW	-	-	-	-	-	2FM	0.75	-
AR	19.5+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2FM	0.75	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: R. Hill

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	1342-160622-1040-M6W	Topographic Position:	SUMMIT	Parent material:	RESIDUUM												
Date:	6/22/16	% Slope:	2	Slope Aspect:	20												
Job Name:	Domition - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WD	Depth to Water Table:	> 4'11"												
RETTEW Job #:	089962000	Depth to Refusal:	14"	Slope Failure or slip:													
NRCS Soil Unit:	WEIWEPT-GERRS - RODGH	Bedrock Type:	SILTSTONE	Dip Slope & Direction:	150 SSE												
Mineralogy:	Amfod	Vegetation:	CHESTNUT OAK, HICKORY, WHITE PINE	Strike:	251°												
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock structure	Structure Type, Grade, and Size	Molt Consistence	Horizon Boundary Topography & Orientation	Redox Feature Color	Scale Feature description	Roots	Moisture Equivalent/pt	Lab Sample ID	Notes
De	0-1.5	7.5YR 3/2	-	-	-	-	-	-	-	-	AS	-	-	3 F-VF 200-M	4.3	S1	
A	1.5-2	10YR 3/1	VGR	8	30	GR 30%	< 1.0"	PO 50	1 VF GR	VFR	CW	-	-	3 F-VF 200-M	0.25 4.4	S2	
Bw	2-4	10YR 6/6	VGR S11	9	30	GR 30%	< 1.5"	PO 50	1 VF SBK-CR	VFR	CW	-	-	3 F-VF 100-M	4.4	-	
Cp	4-14	10YR 6/6	VGR S11	8	35	GR 85	< 7.0"	PO 50	0 M	-	-	-	-	2 F-VF 100-M	4.6	-	
R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R. HILL

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P343-160622-1130-MGW		Topographic Position:	LINEAR SIDE SLOPE		Parent material:	CALCIVUM / RESIDUUM								
Date:	6/22/16		% Slope:	30		Slope Aspect:	304								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:	WD		Depth to Water Table:	236"								
RETTEW Job #:	089962000		Depth to Refusal:	36"		Slope Failure or slip:	-								
MRCSS Soil Unit:	WESTGAT-BERRYS-ROUGH		Bedrock Type:	SILTSTONE		Dip Slope & Direction:	1°/0, 124°								
Mineralogy:	MIXED		Vegetation:	WHITE PINE		Redox Feature Color:	RED OAK, BLACK GUM, BLUE BERRY								
USDA															
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture Consistence	Native Boundary Description	Redox Feature Color	Redox Feature Description	Roots	Moisture Potential/ pH	Lab Sample ID	Notes
De	0-1.5	7.5YR 3/2	-	-	-	-	-	-	AS	-	-	3F-VF 3C0-M 1VC	4.4	-	
A	1.5-2	10YR 3/2	S.1	9	30	GR 15	<0.5"	VHL	CS	-	-	3F-VF 3C0-M 1VC	0.1 4.5	-	
BA	2-5	10YR 5/4	S.1	9	30	GR 15	<0.5"	VFR	CS	-	-	3F-VF 2C0-M 1VC	0.25 5.1	-	
Bt1	5-10	10YR 6/4	GR S.1	14	30	GR 20	<1.0"	FR	CW	-	-	3F-VF 2C0-M 1VC	0.5 5.4	-	
Bt2	10-14	10YR 5/6	VGR S.1	17	35	GR 45	<3.0"	FR	GW	-	-	2F-VF 1C0-M	1.75 5.1	-	
CR	19-36	10YR 5/6	XGR S.1	11	35	GR 75	<6.0"	-	CW	-	-	2F-VF 1C0-M	- 4.6	-	
R	36+	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

E HORIZON (9.25") ^{TURK} VERY SPOTTY

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R. HILL

Signature: 

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	349-160622-1030-MGW	Date:	1/22/16	Topographic Position:	NORSE SLOPE	% Slope:	19	Parent material:	COVULIN / RESIDUUM	149°	Lab Sample ID:		Notes:		
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	WD	Depth to Refusal:	28	Slope Failure or slip:	SILTSTONE	170°					
RETTEW Job #:	08996200	Mineralogy:	M. XRD	Bedrock Type:	CHERT/UTARK, HICKORY, BLUE GRAY	Vegetation:		Dip Slope & Direction:		149°					
NRCS Soil Unit:	WBEVGLS - GRKS - ROUGH	Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Topography & Distances	Redox Feature Color	Roots	Rock Fragmentation %
		D _e	0-1	7.5 YR 3/2	-	-	-	-	-	-	-	-	-	-	-
		A	1-2	10 YR 4/2	VGR	10	35	GR 40	2.10	IVF GR	VFR CS			3 F-VF 2 C-M	5.1
		BA	2-5	10 YR 5/4	VGR	11	35	GR 45	2.10	IVF GR	VFR CW			2 F-VF 1 C-M	5.4
		B _w	5-10	10 YR 6/4	XGR	11	38	GR 70	2.40	IF SBV	FR GW			2 F-VF 1 C-M	5.2
		CR	10-28	10 YR 5/4	XGR	9	40	GR 75	< 0.0	IM SBV	FR CW			2 F-VF 1 C-M	5.2
		R	28+	-	-	-	-	-	-						

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R. HILL

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P345-160622-1025-MGW			Topographic Position:	NOSE SLOPE			Parent Material:	COLUMBIA / RESTIUM						
Date:	6/22/10			% Slope:	23			Slope Aspect:	323						
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey			Drainage Class:	WD			Depth to Water Table:	712"						
RETTEW Job #:	089962000			Depth to Refusal:	17"			Slope Failure or Slip:	-						
NRCS Soil Unit:	VEGET. GENES-ROCK			Bedrock Type:	SILTSTONE			Dip Slope & Direction:	9°/0 196						
Mineralogy:	MIXED			Vegetation:	CHESTNUT + RED OAK, WHITE PINE, DOGWOOD, BLUEBERRY			Strike:	100						
USDA															
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moist Consistence	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/pt	Lab Sample ID	Notes
De	0-15	7.5YR 3/2	-	-	-	-	-	-	AS	-	-	2F-VF 1M-10	1.6	-	
A	15-2	10YR 4/1	SN	10	27	GN 20%	< 1.0	VFL	CS	-	-	2F-VF 1M-10	0.25 4.5	-	
EB	2-4	10YR 4/4	SN	10	27	GN 20%	< 1.0	VFL	CW	-	-	2F-VF 1M-10	0.25 5.3	-	
Bt	4-9	10YR 5/1	SN	17	30	GN 25%	< 2.0	FJ-FAL	CW	-	-	2F-VF 1M-10	1.0 5.2	-	
BC	9-17	10YR 5/1	SN	12	35	GN 75%	< 8.0"	VFL	CW	-	-	1F-VF 1M-10	- 5.2	-	
CR	17	10YR 5/6	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R Hill

Signature: M. Wood

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P346-160622-1020-MGW				Topographic Position:	SUMMIT		Parent material:	RESIDUUM							
Date:	6/22/16				% Slope:	40%		Slope Aspect:	303							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey				Drainage Class:	WD		Depth to Water Table:	713							
RETTEW Job #:	089962000				Depth to Refusal:	13		Slope Failure or slip:	-							
NRCS Soil Unit:	WELLGAT BEGS R06LH				Bedrock Type:	SILTSTONE		Dip Slope & Direction:	40° 213							
Mineralogy:	MIXED				Vegetation:	HICORY CHESTNUT OAK - WHITE PINE BLUEBERRY		Strike:	123							
USDA																
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture	Structure Type, Grade, and Size	Moist Consistence	Redox Feature Color	Redox Feature Description	Roots	Moisture	Lab Sample ID	Notes
D ₀	0-1	7.5YR 3/2	-	-	-	-	-	-	-	AS	-	-	3 F-VF 100-M	4.8	-	
A	1-1.5	10YR 4/1	VGL S, 1	11	35	GL SD	< 2.0"	PO SD	1 VF CR	VFL	-	-	3 F-VF 100-M	0.25 4.5	-	
B _w	1.5-13	10YR 6/6	XGL S, 1	11	35	GR FD	< 6.0"	PB SO	1 M SBK	VFL	-	-	2 F-VF 100-M	0.25 5.2	-	
R	13+	10YR 6/6	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fenstermaker

Field Assistant:

Signature:

David Fenstermaker

RETIW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P 347-1600A1 - 1409-DEF																
Date:	12/21/16																
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																
RETIW Job #:	089962000																
NRCS Soil Unit:	Sialocta-Balks Complex (SCE)																
Mineralogy:	Mixed																
USDA																	
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Structure Type, Grade, and Size	Moist Consistence	Moist Consistence	Redox Feature Color	Parent Feature Description	Roots	Moisture/Structure	Lab Sample ID	Notes
A	0-15	10YR2/1R	SIL15	20	80	70% CN	4"	PO	2GR	VF	AW	-	-	3"	0.2	S1	Surface Chambers
Bw	15-4	10YR1/1H	SIL	10	20	70% CN	2"	PO	1.5GR	F	AW	-	-	2"	0.5	S2	
R	4+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R. HALL

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P348-160621-115-MGLW		Topographic Position:		SUMMIT		Parent material:		RESIDUAL								
Date:	6/21/16		% Slope:		4% 14%		Slope Aspect:		273								
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Somewhat Excessively		Depth to Water Table:		> 15"								
RETTEW Job #:	089962000		Depth to Refusal:		15"		Slope Failure or slip:		-								
NRCS Soil Unit:	WISKEGNT - BENEKS - ROUGH		Bedrock Type:		SANDSTONE		Dip Slope & Direction:		16% 312°								
Mineralogy:	Mixed		Vegetation:		WHITE PINE, VIRGINIA PINE, CHESTNUT OAK, HICKORY, BLUE BERRY		USDA		222								
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Bedrock/stratification	Structure Type, Grade, and Size	Moist Consistence	Medium Boundary Topography & Orientation	Redox Feature Color	Bedrock Features Description	Roots	Bedrock Fragmentation	Lab Sample ID	Notes
A	0-1.5	10YR 4/2	VCB S ₂	8	55	CN 30%	< 6"	PO S ₂	1 VF GR	VRL	CS	-	-	3 F-VF 3 M-CO	-	4.5	-
BC	1.5-15	10YR 5/4	XCN S ₁	8	55	CN 75%	< 6"	PO S ₀	1 VF SBL	VRL	CW	-	-	2 F-VF 1 M-CO	-	5.1	-
R	15+																

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: M. WOOD
 Field Assistant: R. HILL

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Description	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Soil Penetration/ in	Lab Sample ID	Notes	
P349-160821-1215-MGW	6/21/16											NO FLUVIUM over residuum	24	24"							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey																				
RETTEW Job #:	089962000																				
MRCs Soil Unit:	WICKERT-BERKS-ROUGH																				
Mineralogy:	Mixed																				
USDA																					
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Moist Consistence	Native Boundary Description	Redox Feature Color	Parent Material:	Slope Aspect:	Depth to Water Table:	Slope Failure or slip:	Dip Slope & Direction:	Roots	Soil Penetration/ in	Lab Sample ID	Notes	
O ₁	0-1	7.5YR 3/2	-	-	-	-	-	-	-	AS	-	-	-	-	-	-	2 F-VF 1 M-CO 1 VC	4.4	-	-	
A	1-2	10YR 2/2	S, R	14	25	10% G _L	< 1.0"	1 VF G _L	FR	AS	-	-	-	-	-	-	2 F-VF 1 M-CO 1 VC	0.25	-	-	
E	2-5	10YR 5/4	S, R	15	25	10% G _L	< 1.0"	1 VF G _L	FR	CW	-	-	-	-	-	-	2 F-VF 1 M-CO 1 VC	0.25	-	-	
BE	5-10	10YR 5/4	R	17	35	10% G _L	< 1.0"	2 M SBL	FR	CW	-	-	-	-	-	-	1 F-VF 1 M-CO	0.25	-	-	
BE	10-19	10YR 5/6	S, R	22	55	15% G _L	< 1.0"	2 M SBL	FR	CW	-	-	-	-	-	-	1 F-VF 1 M-CO	0.5	-	-	
BE	19-32	7.5YR 6/8	S, R	18	60	5% G _L	< 2.0"	1 M SBL	FR	CW	10YR 5/4	CLD	-	-	-	-	1 F-VF	2.75	-	REDUX 24"	
R	32+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: *D. Fordham*

Signature: *Daniel Fordham*

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Field Assistant:

Test Pit ID:	P-350-160021-1005-DEF	Topographic Position:	NESE STEPS	Parent material:	Bas. dune
Date:	6/24/16	% Slope:	12	Slope Aspect:	290
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey	Drainage Class:	WEN	Depth to Water Table:	-
RETTEW Job #:	089962000	Depth to Refusal:	19"	Slope Failure or slip:	-
NRCS Soil Unit:	Wet. Vert. Ge. Vs. Rough complex (S7D)	Bedrock Type:	granite	Dip Slope & Direction:	10° NW
Mineralogy:	Mixed	Vegetation:	White Pine, Chestnut oak, Blueberry	Strike:	150°

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/soiliness	Structure Type, Grade, and Size	Moist Consistence	Moisture/soiliness & structure	Redox Feature Color	Water Table Description	Roots	Moisture/soiliness/ pH	Lab Sample ID	Notes
Qc	0-0.25	54R 25/11	-	-	-	-	-	-	-	-	-	-	-	3f	4.8	-	
A	0.25-2	10YR3/2.5.2	2	14	15	25% CN	4.4"	P0 S0	ARGR	VER	AW	-	-	3f 3M	0.25 4.6	-	
Bw1	2-9	10YR5/4	S.2	16	15	25% CN	4.4"	P0 S5	1.5gr	WFK	CW	-	-	2f 1.6	0.5 4.2	-	
Bw2	9.15	10YR5/10	S.2	16	15	50% CN	4.6"	P0 S8	1.5gr	FR	AW	-	-	2f 1.6	0.75 4.0	-	
R	19+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Tenslermacher

Signature: [Signature]

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1053

Field Assistant:

Test Pit ID: P351-110021-1140-DEF
 Date: 10/21/10
 Job Name: Dominion - Atlantic Coast Pipeline Soil Survey
 RETTEW Job #: 089963000
 NRCs Soil Unit: WVACT BcLs Bvgn Compvr (57D)
 Mineralogy: Mixed

Topographic Position: Back slope
 % Slope: 0%
 Drainage Class: W11
 Depth to Refusal: 35
 Bedrock Type: Shale - Ya
 Vegetation: Chesnut oak, Hickory, White Oak, Spice blueberry in understory

Parent material: Colluvium - Reddium
 Slope Aspect: 101°
 Depth to Water Table: -
 Slope Failure or slip: -
 Dip Slope & Direction: 5° NW
 Strike: 235°

Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size		Moist. Consistence	Moist. Bulk Density	Redox Feature Color	Moist. Feature Description	Roots	Moist. Temperature	Lab Sample ID	Notes		
								Structure	Grade and Size										
A	0-15	10YR2/2	SIL 20	18		60% CN	L2"	PO	1FSBK	VFR	AW	-	-	gt 2m 1c	0.75	44		10sthan 1/4" of Dominant soil	
Bw1	15-9	10YR2.5/1	SIL 21	16		60% CN	L2"	PO	1FSBK	FR	CW	-	-	2cm 1c	4.8				
Bw2	9-29	10YR5/1	SIL 22	16		85% CN	L2"	SP	1MSBK	FR	CW	-	-	2cm 1c	1.25				
Bw3	29-35	10YR6/1	SIL 22	12		95% CN	2-12"	SP	1OSBK	FR	AW	-	-	14m	4.6			Reddish OaF	
Bw4	35+	-	-	-		-	-	-	-	-	-	-	-	-	-				

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: P. Fenechmacher
 Field Assistant: Max Pagen

Signature: Daniel Pagen

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P-352-1100021-1145-DEF		Topographic Position:	Floodplain		Parent material:	Alluvium over colluvium									
Date:	6/22/11		% Slope:	3%		Slope Aspect:	183°									
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:			Depth to Water Table:										
RETTEW Job #:	089962000		Depth to Refusal:			Slope Failure or slip:										
NRCS Soil Unit:	Shalocta - Bealus complex (SOD)		Bedrock Type:			Dip Slope & Direction:										
Mineralogy:	Mixed		Vegetation:	White oak, Shagbark hickory, microstegium virginicum, Deschampsia		USDA										
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moist Consistence	Moisture Boundary Conditions	Redox Feature Color	Redox Feature Description	Roots	Rock Fragmentation/Size	Lab Sample ID	Notes
Delta	0-0.5	5YR 2.5/1	-	-	-	-	-	-	-	-	-	-	3ft	6.3	S1	Portions are highly decomposed
A	0.5-3	10YR 3/2	S.L	17	16	15% GR	1 1/8"	SP	1 MGR	WFR	AW	-	3ft	0.1	S2	
Bw	3-7	10YR 4/1	S.L	17	18	20% GR	1 1/8"	SP	1 MSAK	FR	CW	-	2ft	1.5	S3	
Bc	7-29	10YR 4/3	S.L	16	20	40% CN	1"	SP	1 GSK	VFR	CS	-	2ft	0.75	S4	CoF more rounded edges
C1	29-34	10YR 5/4	S.L	18	22	60% CN	1"	SP	1 GSK	FR	CS	-	1ft	1.5	S5	Some lithochromic orange, iron, Mn, S, Sh, CoF
Ac2	34-50	2.5Y 6/2	S.L	18	22	40% CN	1.3"	SP	1 GSK	FR	-	-	1ft	2.0	S6	Some lithochromic orange, iron, Mn, S, Sh, CoF

Other Notes:

Small ephemeral stream meandering through valley bottom. headcut 5' deep located downstream of A of creek bed is dry. No water observed in hole, moist throughout.

TEST PIT DESCRIPTION

Soil Scientist: M. Wood
 Field Assistant: R. Hill

Signature: M. Wood

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Test Pit ID:	P352A-160621-11A3-MGW					Topographic Position:	TOG SLOPE		Parent material:	COLLUVIUM					
Date:	6/21/16					% Slope:	43%		Slope Aspect:	46°					
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey					Drainage Class:	WD		Depth to Water Table:	50+					
RETEW Job #:	089962000					Depth to Refusal:	50+		Slope Failure or slip:	-					
NRCS Soil Unit:	WEIKENT-BERRKS-ROVGH					Bedrock Type:	-		Dip Slope & Direction:	-					
Mineralogy:	MIXED					Vegetation:	WHITE OAK, CHESTNUT OAK, HICKORY		USDA						
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture Consistency	Moist Consistency	Redox Feature Color	Redox Feature Description	Roots	Moist Fragments/ft	Lab Sample ID	Notes
De	0-2	7.5YR 3/2	-	-	-	-	-	-	AS	-	-	3F-VF 2M-CD 1VC	5.0	-	-
A	2-4	7.5YR 3/3	S1	10	50	AL 30	<1.0	VF GR	VFR ES	-	-	3F-VF 2M-CD 1VC	0.25 5.5	-	-
Bw1	4-12	5YR 5/4	S1	12	55	GR 55	<2.0	1M SBL	FR CW	-	-	2F-VF 2M-CD 1VC	0.5 5.2	-	-
Bw2	12-50+	5YR 5/4	S1	12	65	GR 65	<2.0	1M SBL	FR CW	-	-	1F-VF 1M-CD	1.25 5.0	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Fennel
 Field Assistant: Max Dugan

Signature: [Signature]

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1059

Test Pit ID:	Date:	Job Name:	RETTEW Job #:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	% Slope:	Drainage Class:	Depth to Refusal:	Redrock Type:	Vegetation:	Parent material:	Slope Aspect:	Depth to Water Table:	Slope Failure or Slip:	Dip Slope & Direction:	Roots	Product Temperature / pH	Lab Sample ID	Notes	
R-353-1400A-1050-DEF	6/22/16	Dorchester - Atlantic Coast Pipeline Soil Survey	089962000	Wetland, heath, Rough Complex (STD)	Mixed	Ridge top	14.1	well	26"	Shale - tan	White Pine, mica, quartz, chert, sandstone, speckled blue clay + heath/lyg	Residual	255	-	-	120 E	3F	-	-	-	14y°
A	1.5-2.5	10 ¹ R 5/2	Sil	15	22	40%	21"	PO SO	14GR	VFR	AW	-	-	-	-	3F 2JN	0 4.6	-	-	-	
Bw	3.5-8	7.5 ¹ R 5/4	Sil	16	18	75%	14-4"	SP SS	14GR	FR	CW	-	-	-	-	2F 1C0 2F 1M	0.5 4.6	-	-	-	
C	8-26	7.5 ¹ R 4/4	Clayey Sil	-	-	98%	1-6"	-	OM	-	CW	-	-	-	-	2F 1M	CoF	-	-	-	
K	26+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Other Notes:

TEST PIT DESCRIPTION

Soil Scientist: D. Santschmoller

Signature: *David Santschmoller*

Field Assistant:

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	P-353A-1600000-1035-DEF		Topographic Position:		URR's back slope		Parent material:		Colluvium over res. down							
Date:	4/22/11		% Slope:		UR		Slope Aspect:		140°							
Job Name:	Dominion - Atlantic Coast Pipeline Soil Survey		Drainage Class:		Well		Depth to Water Table:									
RETTEW Job #:	089962000		Depth to Refusal:		27"		Slope Failure or slip:									
NRCS Soil Unit:	Wet A - Barkly-Rough Complex (STE)		Bedrock Type:		Shale-Tan		Dip Slope & Direction:		28° E							
Mineralogy:	Mixed		Vegetation:		White oak, Chestnut oak, hickory, wise pine, very sparse herb layer		USDA									
Horizon	Depth in Inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Structure Type, Grade, and Size	Molt Condition	Moisture Boundary Temperature & Conductivity	Redox Feature Color	Water Feature Description	Roots	Moisture Potential/ pH	Lab Sample ID	Notes
Dc	0-05	5-1R 2.5/8	-	-	-	-	-	-	-	-	-	-	2f	6.5	-	
A	05-3	buR 2.11	S.L	16	25	501- CN	1 1/2"	1M6R	VF	AW	-	-	2f 1M, 10	0.2 6.5	-	
Bu1	3-10	7.5-1A 5.14	S.L	18	18	751- CN	2 1/4"	1VFS3K	VF	CW	-	-	2f 1M, 10	0.2 5.4	-	
Bu2	10-19	7.5-1A 5.14	S.L	18	22	851- CN	4"	1M58K	F	AW	-	-	2M, f	5.10	-	Orange Shale lof Random CF or pink lin
2C	19-27	10R4/4	Clum 1/4	-	-	981- CN	1-6"	OM	-	CW	-	-	f	-	-	Fractured Rock with Sins in between or. ented with BedRock
2R	27+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Other Notes:

Attachment 5
Soil Transect Log

Dominion ACP - Soil Survey
 Soil Transect Log

Soil Scientist: Diane Trax
 Rettew Job #: 089962000

Date: 06/20/2016
 Section: _____

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T087A160620-1420-DAT

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	
Da	0-0.5	5 ^{yr} 2.5/1	SIL	XST 40%	-	-	
A	0.5-1.0	5 ^{yr} 3/2	SIL	XST 40%	-	-	
A ₂	1.0-7.0	5 ^{yr} 4/4	SIL	VC1 ^r 40%	-	-	
Bt1	7.0-14.0	2.5 ^{yr} 5/4	S:CL	6 ^r 10%	-	-	
Bt2	14.0-18 ⁺	2.5 ^{yr} 5/4	S:CL	6 ^r 5%	-	-	

Notes: * many stones and clumps on surface

Transect Point ID: _____

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	

Notes: _____

Transect Point ID: T087B160620-1418-DAT

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	
A	0-2	2.5 ^{yr} 3/1	S:1L	VC1 ^r 50%	-	-	
A ₂	2-6	2.5 ^{yr} 3/3	S:1L	VC1 ^r 40%	-	-	
Bt1	6-12	2.5 ^{yr} 5/4	S:1L	6 ^r 5%	-	-	
Bt2	12-18 ⁺	2.5 ^{yr} 5/4	S:1L	6 ^r 10%	-	-	

Notes: * many stones and clumps on surface

Transect Point ID: _____

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	

Notes: _____

TEST PIT DESCRIPTION

Soil Scientist: JONATHAN WALT
Field Assistant: MIGUEL PARAMES

Signature: JMWALT

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Test Pit ID:	Date:	Job Name:	NRCS Soil Unit:	Mineralogy:	Topographic Position:	Parent material:	Residuum	Notes									
T-025A-160614-1455-SW	6/14/16	Dominion - Atlantic Coast Pipeline Soil Survey	089962000	CAV112-DEKAB-BEKS	% Slope:	Slope Aspect:											
					Drainage Class:	Depth to Water Table:											
					Depth to Refusal:	Slope Failure or slip:											
					Bedrock Type:	Dip Slope & Direction:											
					Vegetation:												
USDA																	
Horizon	Depth in inches	Matrix Color	Texture Class	% clay	% sand	Rock Fragment Type & %	Rock Fragment Size (inches)	Moisture/Structure	Moldor Consistence	Medium Structure & Orientation	Redox Feature Color	Redox Feature Description	Roots	Product Positioner/ pH	Lab Sample ID	Notes	
0e	0-2	S/R2S/1	-	-	-	-	-	-	-	CS	-	-	3-UF 2-F	-	-	-	
A	2-3	10YR2.5/1	SIL	12	10	5 GR	1	PO SO	VER	AM	-	-	2-F	-	-	-	
Bt	3-7	10YR5/6	SIL	14	15	5 GR	<1	PO	FR	CS	-	-	2-F 1-C	-	-	-	-
								SO									
Bx1	7-11A	10YR5/8	SIL	24	20	2 CH	1	SP	FR	CS	-	-	2-M 1-C	-	-	-	-
								SS									
Bx2	11-2D	10YR5/4	SIL	29	18	1 CU	<1	MP	FR	-	-	-	2-F, M	-	-	-	-
								SS									

Other Notes:

SOIL COUPLER INFEEDENCE IN SURFACE, JUST OVER R-024

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: John C Roberts
 Rettew Job #: 089962000

Date: 6-17-2010
 Section: P-027-029

RETTAW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-027A-160617-1116-5CR

Slope & Aspect:	Position:	PM:	Notes				
<u>34°/240°</u>	<u>Back slope</u>	<u>colluvium</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0e</u>	<u>1</u>	<u>5YR2.5/1</u>	<u>sl</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>2</u>	<u>10YR2/1</u>	<u>sl</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bw</u>	<u>18</u>	<u>7.5YR5/6</u>	<u>sl</u>	<u>-</u>	<u>-</u>	<u>-</u>	

Notes: colluvium

Transect Point ID: T-027A-160617-1219-5CR

Slope & Aspect:	Position:	PM:	Notes				
<u>71°/136°</u>	<u>Bench</u>	<u>colluvium</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0e</u>	<u>3</u>	<u>5YR2.7/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>6</u>	<u>10YR2/1</u>	<u>L</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bw</u>	<u>10</u>	<u>10YR5/6</u>	<u>L</u>	<u>-</u>	<u>-</u>	<u>-</u>	

Notes: colluvium

Transect Point ID:

Slope & Aspect:	Position:	PM:	Notes				
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:	Notes				
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: John C Roberts

Retnew Job #: 089962000

Date: 06-14-2014

Section: P-041 - P-045

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-045A-160614-1201-5CR

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
Oe	1	5YR 2.5/1					
A	3	10YR 3/2	S1L	20 CH			
Bw	20	10YR 5/4	S1L	30 CH			
Bt	34	10YR 5/6	S1L				25% clay films

Notes: colluvium

Road cut

Transect Point ID: T-042A-160614-1441-5CR

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
Oe	1	5YR 3.5/1		10 BR			
A	3	10YR 3/2	S1L	15 GR			
Bw	10	10YR 5/6	S1L	15 GR			

Notes: Residuum material

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: P. Feinbrun
Retnew Job #: 089962000

Date: 6/14/16
Section: P-047-049

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-049A-160614-1410-DEF

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
<u>4% 331</u>							

Transect Point ID: T-049B-160614-1430-DEF

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
<u>330</u>							

Notes: located in pocket on east side of creek
about 1' above creek bottom. Peely Drained
with 7"

Notes: 24" above creek bottom
Mod Well Drained

Transect Point ID: T-047A-160614-1555-DEF

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
<u>351 630</u>							

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes: As 4 dr

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Russell Losco
Retnew Job #: 089962000

Date: 6.13.16
Section: P-055

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-055A 160618-1115-R2L
Slope & Aspect: 2/5 Position: Shoulder PM: Silt Residual

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
O _a	2	2.5YR 2.5/2	S.L	5	—	—	21% slope
B	12	10YR 6/6	S.L	20	—	—	
B	16	10YR 5/6	S.L	45	—	—	
		Refusal					

Notes:

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Dadiis
 Rettew Job # : 089962000

Date: 06/14/16
 Section: E 9067-071

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-067A-160614-1552-5dd

Slope & Aspect:	10 240	Position:	Shoulder	PM:	res		
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	2	5YR ^{2.5} / ₁	-	ch 40	-	-	
A	4	5YR ³ / ₂	s.l	ch 30	-	-	
Bw	20	5YR ⁴ / ₆	s.l	f1 60	-	-	

Notes:

Transect Point ID: +071A160614-1618-5dd

Slope & Aspect:	32 320	Position:	Upper bs	PM:	coll		
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	2	7.5YR ^{7.5} / ₁	-	ch 20	-	-	
A	4	7.5YR ³ / ₂	1		-	-	
Bw	16	7.5YR ⁸ / ₂	1	ch 76	-	-	

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Dadio

Retnew Job #: 089962000

Date: 6/16/16

Section: E 0-073-076

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-075A160616-1614-5dd

Slope & Aspect:		Position:		PM:		Notes	
		<u>backstop</u>		<u>coll</u>			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>O_g</u>	<u>2</u>	<u>7.5YR 3/2</u>	<u>-</u>	<u>40ch</u>			
<u>A</u>	<u>4</u>	<u>10YR 2/2</u>	<u>sil</u>	<u>40ch</u>			
<u>Bw</u>	<u>20</u>	<u>10YR 5/6</u>	<u>sil</u>	<u>65ch</u>			

Notes:

Transect Point ID: +076A160616-1628

Slope & Aspect:		Position:		PM:		Notes	
		<u>parking area</u>		<u>coll</u>			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>A</u>	<u>6</u>	<u>10YR 3/2</u>	<u>sil</u>	<u>-</u>			<u>Platy</u>

Notes:

landfill/parking area, needs remediation from compaction

Transect Point ID: T-073A160616-1645-5dd

Slope & Aspect:		Position:		PM:		Notes	
		<u>saddle</u>		<u>coll</u>			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>O_e</u>	<u>2</u>	<u>7.5YR 2.5/1</u>	<u>-</u>	<u>25</u>			
<u>A</u>	<u>4</u>	<u>10YR 3/2</u>	<u>sil</u>	<u>30</u>			
<u>B+</u>	<u>18+</u>	<u>10YR 5/6</u>		<u>25</u>			

Notes:

argill. likely deep soil in saddle

Transect Point ID: ?

Slope & Aspect:		Position:		PM:		Notes	
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: Steve Radzio
 Rettew Job #: 089962000

Date: 6/17/16
 Section: E P-079

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T079A 160617 - 1341-500

Slope & Aspect:		Position:			PM:		Notes
Slope	Aspect	Depth (in)	Color	Texture	CoF	Redox Color	
	48				65	res	
Horizon		Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.
Oe		2	7.5YR ^{2.5} / ₁	s.l	ch ₅₀	-	-
A		6	7.5YR ^{7.5} / ₂	s.l	ch ₅₀	-	-
Cr		16					
R		16+					

Notes: _____

Transect Point ID: _____

Slope & Aspect:		Position:			PM:		Notes
Slope	Aspect	Depth (in)	Color	Texture	CoF	Redox Color	
Horizon		Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.

Notes: _____

Transect Point ID: _____

Slope & Aspect:		Position:			PM:		Notes
Slope	Aspect	Depth (in)	Color	Texture	CoF	Redox Color	
Horizon		Depth (in)	Color	Texture <td>CoF</td> <td>Redox Color</td> <td>Redox Descr.</td>	CoF	Redox Color	Redox Descr.

Notes: _____

Transect Point ID: _____

Slope & Aspect:		Position:			PM:		Notes
Slope	Aspect	Depth (in)	Color	Texture	CoF	Redox Color	
Horizon		Depth (in)	Color	Texture <td>CoF</td> <td>Redox Color</td> <td>Redox Descr.</td>	CoF	Redox Color	Redox Descr.

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Dadio, John Galbraith
 Rettew Job #: 089962000

Date: 6-9-16
 Section: A P-093

RETTEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-093A-160909-1550-500
 Slope & Aspect: 190° 40% Position: Shoulder PM: Residuum

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0a</u>	<u>1</u>	<u>7.5YR 2.5/2</u>	<u>loamy</u>		-	-	
<u>A</u>	<u>3</u>	<u>7.5YR 3/2</u>	<u>SIL</u>	<u>15%</u>	-	-	
<u>Bw</u>	<u>12</u>	<u>10YR 5/6</u>	<u>SIL</u>	<u>40%</u>	-	-	
<u>R</u>	<u>712</u>	-					<u>Siltstone</u>

Notes: chestnut oak

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: JOHN WARR
Rettew Job #: 089962000

Date: 6/13/16
Section: A P-103

RETTAW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-103A-160613-1328-59W

Slope & Aspect: S12.145° Position: BACKSLOPE PM: RESIDUUM?

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	0-1	5YR2.5/1	-	-	-	-	
A	1-2	10YR3/1	GR SIL	20	-	-	
Bw	2-9	10YR5/6	VCH SIL	40	-	-	

Notes: at BACKSLOPE NEAR SUMMIT, ABOVE SANDSTONE OUTCROPPING

Transect Point ID:

Slope & Aspect: Position: PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID: T-103B-160613-1329-59W

Slope & Aspect: S12.145° Position: BACKSLOPE PM: COLLUVIAL

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	0-1	5YR2.5/1	-	-	-	-	
A	1-2	10YR3/1	GR SIL	15	-	-	
Bt	2-12	7.5YR4/6	GR SIL	25	-	-	
Bbc	12-16	7.5YR4/6	VCH SIL	65	-	-	

Notes: above P-103 below 55 outcrop, 59 COLLUVIAL OVER SILTSTONE RESIDUUM

Transect Point ID:

Slope & Aspect: Position: PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Sohn C Roberts
Rettew Job #: 089962000

Date: 6-13-2016
Section: P-114 to P-11Z

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-114A-160613-1427-5CR

Slope & Aspect:	Position:	PM:	Colluvium				
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>1</u>	<u>5YR2.5/1</u>					
<u>A</u>	<u>3</u>	<u>10YR3/2</u>	<u>S1L</u>				
<u>Bw1</u>	<u>11</u>	<u>10YR5/6</u>	<u>S1C</u>				<u>30% CH</u>
<u>Bw2</u>	<u>23+</u>	<u>10YR5/6</u>	<u>S1L</u>				<u>40% CH & 20% Flagstone</u>

Notes: Colluvium

Transect Point ID: T-112A-160613-1645-5CR

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>1</u>	<u>5YR2.5/1</u>					
<u>A</u>	<u>5</u>	<u>10YR3/2</u>	<u>S1L</u>				
<u>Bw</u>	<u>17</u>	<u>10YR5/6</u>	<u>S1C</u>				

Notes: Horizonte, Red slope

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: M. Wood
 Retnew Job #: 089962000

Date: 6/16/16
 Section: P121

RETNEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-121A 60616-1250-MGW
 Slope & Aspect: 98% 244 Position: LAT SLOPE PM: COLLUVIUM

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0.5</u>	<u>0a</u>	<u>7.5 YR</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>0.5-2</u>	<u>1A</u>	<u>10 YR 5/3</u>	<u>S</u>	<u>415</u>	<u>-</u>	<u>-</u>	
<u>2-10</u>	<u>B₁</u>	<u>10 YR 5/6</u>	<u>S</u>	<u>20%</u>	<u>-</u>	<u>-</u>	
<u>10-17</u>	<u>B₂</u>	<u>10 YR 5/6</u>	<u>S</u>	<u>50%</u>	<u>-</u>	<u>-</u>	
<u>17+</u>	<u>C_r</u>						

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Dadio
Rettew Job #: 089962000

Date: 6/15/16
Section: A P-135

RETTW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: +135A 160615-1391-5D
Slope & Aspect: 75 60° Position: Upper b5 PMI: coll/res

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
O	0-5	7.5YR 2.5/1	-	ch 30	-	-	
A	2	10YR 7/6	s.l	ch 30	-	-	
Bw	10	10YR 5/6	s.l	ch 60	-	-	
2C	16	10YR 5/6	s.l	ch 85	-	-	
2R	16+						

Notes: 22° S dip 100° strike

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PMI: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PMI: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PMI: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Soil Scientist: Steve Dadio

Steve Dadio

Rettew Job # : 089962000

Date: 6/6/16

6/6/16

Section: B

B

P-151

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: 0 T-151A-160606-1157-5d

Slope & Aspect: 38/190 Position: B5 PM: cellarum

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>2</u>	<u>4.5R^{2.5}</u>	<u>g</u>	<u>50f1</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>46</u>	<u>4R^{2.5}</u>	<u>sl</u>	<u>50f1</u>	<u>-</u>	<u>-</u>	
<u>Bw</u>	<u>16</u>	<u>6/6</u>	<u>sl</u>	<u>25gr</u>	<u>-</u>	<u>-</u>	

Notes: wet in hole bottom.

735% slope seepage

Transect Point ID:

Slope & Aspect: Position: PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect: Position: PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect: Position: PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: D. Marx
Rettew Job #: 089962000

Date: 6-6-2016
Section: P-155 to P-158

RETTew Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T154⁺ - 160606-1711^{DR} 121°E
Slope & Aspect: 369°/E Position: BARNSBORO PM: Coluvium

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	0-1	7.5YR 2.5/1	-	-	-	-	
A	1-4	7.5YR 3/2	Loam	Cl+	-	-	
Bw1	4-12	5YR 5/4	Loam	YCH	-	-	
Bw2	12-20	5YR 5/4	Loam	YCH	-	-	

Notes: VERY SIMILAR TO P-155

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: John Wain
Rettew Job #: 089962000

Date: 10/6/07
Section: GNFW-D P-187

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-187a-160607-1436-35W
Slope & Aspect: S49°270 Position: LC PM: colluvium over residuum?

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>0-3</u>	<u>5YR2.5/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bw1</u>	<u>3-11</u>	<u>10YR5/6</u>	<u>NQRSL</u>	<u>55</u>	<u>-</u>	<u>-</u>	
<u>Bw2</u>	<u>11-21</u>	<u>10YR4/6</u>	<u>NQRSL</u>	<u>60</u>	<u>-</u>	<u>-</u>	
<u>2Bt</u>	<u>21-25</u>	<u>5YR5/6</u>	<u>NQRSL</u>	<u>45</u>	<u>-</u>	<u>-</u>	<u>clay skins</u>

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Radio
Retnew Job #: 089962000

Date: 06/07/16
Section: D P-185-191

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-189A 160607-112-500

Slope & Aspect: 5° 300 Position: Saddle/beam PM: 25 (at slope crest)

Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
O _a	1	10YR 2/1	-	10 gr	-	-	
B+1	12	7.5YR 5/6	S.1	70 gr	-	-	15 105 75 s.1
B2	20	7.5YR 5/6	S.1	25 gr	-	-	↓
		Fe + soil on					large rocks

Notes:

white pine dominant
rocks 2.5YR 5/6 s.1 + stone

Transect Point ID: T-191B 160607-1533-50

Slope & Aspect: 22 200 Position: sh / upper bank PM: coll/res

Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
O _e	2	5YR 2-5/1	-	20 gr	-	-	
B+1	13	10YR 4/6	S.1	30 gr	-	-	
B+2	24	10YR 4/6	S.1	50 ch	-	-	
2R							

Notes:

10YR 7/1, 7/3 5YR/8 clay washed on rocks

Transect Point ID: T-191A-160607-1611-50

Slope & Aspect: 25 80 Position: backslope PM: coll/res

Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
O _a	2	10YR 3/1	-	20	-	-	
B+E1	3	6/6	VFS1		-	-	
B+1	15	6/6	VFS1	10 gr	-	-	
2BC	26	5YR 6/4	VFS1	40 ch	-	-	

Notes:

Transect Point ID:

Slope & Aspect:

Position:

PM:

Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Steve Radice
Rettew Job # : 089962000

Date: 06/03/16
Section: E P-203

RETTW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T 263A-160603-1137-5d

Slope & Aspect: 9° 35' Position: Upper B5 PM: residuum

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oa</u>	<u>2</u>	<u>7.5R²</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bw1</u>	<u>14</u>	<u>10YR 5/6</u>	<u>1</u>	<u>40%</u>	<u>-</u>	<u>-</u>	<u>high silt</u>
<u>Bw2</u>	<u>22</u>	<u>10YR 5/6</u>	<u>51</u>	<u>40%</u>	<u>-</u>	<u>-</u>	<u>higher sand</u>

Notes: convex slope near 703-centerline

Transect Point ID:

Slope & Aspect:

Position:

PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:

Position:

PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:

Position:

PM:

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: STEVE DADIO
 Rettew Job #: 0899962000

Date: 6/1/16
 Section: P-226

RETTW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-226A-160601-1419-5DD
 Slope & Aspect: 13% 269 Position: BACKSLOPE PM: CALCULUM

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	0-1	gray	-	-	-	-	
A	1-3	gray	silt	10	-	-	
Bw	3-12	gray	silt	15	-	-	

Notes: BACKSLOPE BENCH; SASSIFERAS,
WHITE FINE, WHITE ORE; RED WARE

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: T-226B-160601-1445-5DD
 Slope & Aspect: 24% 180 Position: BACKSLOPE PM: RESIDUAL

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Oe	0-0.5	gray	-	-	-	-	
A	0.5-2	gray	silt	20	-	-	
Bw	2-12	gray	silt	30	-	-	

Notes: LINER BACKSLOPE, STEEP
above road; SILTSTONE

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Michael Lane
Rettew Job #: 089962000

Date: 6/7/16
Section: P-234 - P-239

RETTAW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-238A-160607-1505-MEL
Slope & Aspect: 30°/110° Position: side slope head slope PM: calceolum

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>0-0.5</u>	<u>5YR2.5/1</u>					
<u>A</u>	<u>0.5-2.5</u>	<u>10YR3/2</u>	<u>GR</u>	<u>15</u>			
<u>BE</u>	<u>2.5-8</u>	<u>10YR5/6</u>	<u>GL</u>	<u>30</u>			
<u>BC</u>	<u>8-13</u>	<u>10YR5/6</u>	<u>VGR</u>	<u>60</u>			

Notes: Corollate to 238

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: P. Fenstermacher
Retnew Job #: 089962000

Date: 6/8/10
Section: P-247

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-247A-160608-1347-DEF							
Slope & Aspect: 34°/40°		Position: Backslope		PM: Residuum			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
A	0-1	10YR3/2	SIL	30% CN	-	-	
Bw1	1-6	10YR5/4	SIL	38% CN	-	-	Angled Edges on CoF
Bw2	6-8+	10YR5/4	SIL	50% CoF	-	-	Small CoF

Notes:

Transect Point ID: T-247B-160608-1358-DEF							
Slope & Aspect: 35°/64°		Position: Backslope		PM: Residuum			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
A	0-2	10YR3/2	SIL	25% CN	-	-	
Bw	2-7+	10YR5/4	SIL	38% CN	-	-	Angled CoF Mottled mottled Stall

Notes:

Transect Point ID: T-247C-160608-1404-DEF							
Slope & Aspect: 35°/49°		Position: Backslope		PM: Olivine			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
Os	0-1	2.5YR 2.5/1	-	-	-	-	
A	1-4	7.5YR 3/3	SIL	20% CoF	-	-	Mixed's Rounded CoF
Bw	4-7+	5YR5/4	SIL	20% CoF	-	-	

Notes:

Transect Point ID:							
Slope & Aspect:		Position:		PM:			
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: Michael Lane

Retnew Job #: 089962000

Date: 6/8/16

Section: P-250 - P-255

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-253A-160608-1150-MEL

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>37°/350°</u>							<u>headslope</u>
	Horizon						
	<u>0-2</u>	<u>5YR2.5/1</u>					
	<u>A</u>	<u>2-3</u>	<u>10YR4/3</u>	<u>35%</u>			
	<u>Bu1</u>	<u>3-8</u>	<u>10YR4/6</u>	<u>25%</u>			
	<u>Bu2</u>	<u>8-18</u>	<u>10YR5/6</u>	<u><10%</u>			

Notes: In concave, narrow headslope, Bu2 w/very few coarse fragments compared to surrounding sideslopes

Transect Point ID: T-250A-160608-1416-MEL

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>179°/330°</u>							<u>sideslope</u>
	Horizon						
	<u>0-2</u>	<u>5YR2.5/1</u>					
	<u>BE</u>	<u>2-6</u>	<u>10YR5/4</u>	<u>410</u>			
	<u>Bu</u>	<u>6-23</u>	<u>10YR5/6</u>	<u>410</u>			

Notes: Few c.f. - surface sandstone < 1" chestnut, sandstone - increasing c.f. with depth

Transect Point ID:

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Horizon						

Notes:

Transect Point ID:

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Horizon						

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: JOHN WARR
Rettew Job #: 089962000

Date: 6/8/16
Section: H P-256

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-256A-160608-0945-SSW
Slope & Aspect: 43°/190° Position: BACKSLOPE PM: RESIDUAL

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>0-1</u>	<u>5YR5/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>1-2</u>	<u>10YR3/1</u>	<u>SR</u>	<u>30</u>	<u>-</u>	<u>-</u>	
<u>Bw</u>	<u>2-6</u>	<u>10YR4/6</u>	<u>VCU</u>	<u>55</u>	<u>-</u>	<u>-</u>	
<u>R</u>	<u>6+</u>	<u>SAND</u>	<u>STONE</u>	<u>BEFORE</u>			

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: SS BEDROCK DIPPING INTO SLOPE LITTLE
OUTCROPPING ON BACKSLOPE URBAN
DIP 25° NNE(20°) STRIKE: 290°, REUSED AT 23"
VARIABILITY IN DEPTH TO ROCK

Notes: _____

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Transect Point ID: _____
Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Jordan W. H. T.
Retnew Job # : 089962000

Date: 6/8/12
Section: A P-258

RETTEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T258A-160608-1257-05W

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>44°/35°</u>	<u>0-2</u>	<u>5YR5/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
	<u>2-4</u>	<u>10YR2/2</u>	<u>9R</u>	<u>15</u>	<u>-</u>	<u>-</u>	
	<u>4-12</u>	<u>10YR5/6</u>	<u>9R</u>	<u>30</u>	<u>-</u>	<u>-</u>	
	<u>12-25</u>	<u>10YR5/6</u>	<u>9R</u>	<u>50</u>	<u>-</u>	<u>-</u>	

Notes: SILT CLAY 25 P-255

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: Michael Lave

Retnew Job #: 089962000

Date: 6/9/16
Section: P 265 - P 269

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-269A-160609-1405-MEL

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u><58/90°</u>			<u>ridge summit</u>				
	A	<u>0-3 10YR3/2</u>	<u>GR SIL</u>	<u>15%</u>	<u>1</u>	<u>1</u>	
	Bw	<u>3-8 10YR5/6</u>	<u>VEG SIL</u>	<u>50%</u>	<u>1</u>	<u>1</u>	
	Cr	<u>8-20</u>		<u>85%</u>			

Notes: Thin O horizon < 1/2 in, chestnut oak, white pine
c.f. in Bw vary to chunky siltstone shale

Transect Point ID: T-266A-160609-1525-MEL

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>45°/85°</u>			<u>side slope</u>				
	0-0.5	<u>0_e</u>	<u>5YR2.5/1</u>				
	0.5-2	<u>A</u>	<u>10YR3/6</u>	<u>20</u>			
	2-7	<u>Bw1</u>	<u>10YR5/6</u>	<u>25</u>			<u>2 1/4 CF</u>
	7-13	<u>Bw2</u>	<u>10YR5/6</u>	<u>25</u>			<u>1 1/2 + CF</u>
	13-20	<u>C</u>	<u>10YR5/6</u>	<u>75</u>			

Notes: Compare to P-267, T-266A higher on
landscape, some surface sandstone gravels

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: P. Fenstermaker

Retnew Job #: 089962000

Date:

6/6/16

Section:

283-228

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-285A-160606-1833-DEF

Slope & Aspect:	Position:	PM:	Notes				
<u>161.33°</u>	<u>Shoolder</u>	<u>Residuum</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0a</u>	<u>0-2</u>	<u>5YR2/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>2-3</u>	<u>10YR1/1</u>	<u>Sic</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bt</u>	<u>3-14+</u>	<u>10YR6/1</u>	<u>Sic</u>	<u>10%</u>	<u>CH</u>	<u>-</u>	<u>Clay films on surface</u>

Notes: Same as P-285

Transect Point ID: T-283A-1601006-1558-DEF

Slope & Aspect:	Position:	PM:	Notes				
<u>161.33°</u>	<u>Shoolder</u>	<u>Residuum</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>0a</u>	<u>0-2</u>	<u>5YR2/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>A</u>	<u>2-25</u>	<u>10YR2/1</u>	<u>Sic</u>	<u>-</u>	<u>-</u>	<u>-</u>	
<u>Bw</u>	<u>25-16+</u>	<u>10YR6/1</u>	<u>Sic</u>	<u>25%</u>	<u>-</u>	<u>-</u>	

Notes: Similar to 284 in a more stable bank

Transect Point ID:

Slope & Aspect:	Position:	PM:	Notes				
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Position:	PM:	Notes				
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Michael Linn
 Rettew Job #: 089962000

Date: 06/06/16
 Section: P-289- P-291

RETTAW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: P-291B-16606-1657-16E2

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>4° 210°</u>							
	<u>0-1</u>						
	<u>1-2</u>	<u>10YR4/3</u>	<u>slt</u>	<u>15</u>			
	<u>2-7</u>	<u>6YR5/6</u>	<u>5M</u>	<u>20</u>			
	<u>7-16</u>	<u>10YR5/8</u>	<u>slt</u>	<u>35</u>			

Notes: conclude to P-291, no argillite horizon

Transect Point ID:

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: Michael Lane
Retnew Job #: 089962000

Date: 6/6/10
Section: P-299 - P-298

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-291A-160606-0819-MEL		Position: <u>Side slope</u>		PM: <u>Calcium</u>		Notes	
Slope & Aspect: <u>22°/160°</u>	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Oe	0-2					
	A	2-3	10YR5/4 sil	10%	—	—	
	BE	3-8	10YR5/4 sil	10%	—	—	
	Bw	8-16	10YR5/6 sil	15%	—	—	

Notes: No argillic subsurface horizon

Transect Point ID: T-292A-160606-1037-MEL		Position: <u>Summer Road</u>		PM: <u>Shale Calcium</u>		Notes	
Slope & Aspect: <u>47°/345°</u>	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Oe	0-1.5					
	A	1.5-2	10YR5/2 sil	—	—	—	
	BE	2-6	10YR5/4 sil	30%	—	—	
	Bw	6-16	10YR5/6 sil	40%	—	—	<u>3' gravels coarse grained shale</u>

Notes: Near sandstone/shale geologic boundary similar to P-294 P-297

Transect Point ID: T-293A-160606-1177-MEL		Position: <u>Side Slope</u>		PM: <u>Shale Calcium</u>		Notes	
Slope & Aspect: <u>18°/120°</u>	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Oe	0-1.5					
	A	1.5-2.5	10YR5/2 L	<10%			
	BE	2.5-6	10YR5/4 sil	20%			
	Btd	6-16	10YR5/6 sil	20%			

Notes: Similar to T-293A

Transect Point ID: T-291A-160606-1625-MEL		Position: <u>Shoulder</u>		PM: <u>Calcium</u>		Notes	
Slope & Aspect: <u>23°/80°</u>	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	Oe	0-1					
	A	1-2	10YR3/2 sil	15%			
	BE	2-8	10YR5/4 sil	20%			
	Bt	8-16	10YR5/6 sil	50%			

Notes: Correlate to P-291

argillic subsurface horizon

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Michael Lane

Retnew Job #: 089962000

Date: 10/3/16
Section: P-299 -

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-299A-160003-1040-MEL

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
	<u>0-3</u>	<u>10R/2/2</u>	<u>GR</u>	<u>20%</u>	<u>---</u>	<u>---</u>	
	<u>3-4</u>	<u>10YR4/3</u>	<u>GR</u>	<u>20%</u>	<u>---</u>	<u>---</u>	
	<u>4-10</u>	<u>10YR 5/4</u>	<u>GR</u>	<u>20%</u>	<u>---</u>	<u>---</u>	
	<u>10-18</u>	<u>10YR 6/4</u>	<u>GR</u>	<u>30%+</u>	<u>---</u>	<u>---</u>	

Notes: Correlate to P-299, C slope to D slope

between P-299, P-298, Bu GR to YGR

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: M. Woods

Retnew Job #: 089962000

Date: 6/3/16

Section: 301

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T 301/16/03-135D-M6W
 Slope & Aspect: 32/278 Position: S78W/60N/BA4 PM: COLCUMEN/As

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Bp</u>	<u>0-1</u>	<u>10YR2/1</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>BA</u>	<u>1-2</u>	<u>10YR2.5/4</u>	<u>Sil</u>	<u>sil</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>Bu1</u>	<u>2-7</u>	<u>10YR2.5/6</u>	<u>S, L</u>	<u>1/6R</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>Bu2</u>	<u>7-19</u>	<u>10YR2.5/6</u>	<u>S, L</u>	<u>1/6R</u>	<u>-</u>	<u>-</u>	<u>-</u>
<u>Cv</u>	<u>19+</u>	<u>10YR2/6</u>	<u>S, L</u>	<u>ExtR</u>	<u>-</u>	<u>-</u>	<u>-</u>

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Transect Point ID: _____
 Slope & Aspect: _____ Position: _____ PM: _____

Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes: _____

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Michael Woods
 Retnew Job # : 089962000

Date: 6/2/16
 Section: 307

RETNEW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

1430 - M611

Transect Point ID: T-307A-160602- A60		Position: BACKSLOPE		PM: RESIDUAL			
Slope & Aspect: 48/74							
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes
De	1-5	-	S.L.				
A	0-1	7.5YR 3/2	S.L.		-	-	
Bw1	0-12	10YR 6/6	S.L.		-	-	
Bw2	12-22	7.5YR 6/6	S.L.		-	-	

Notes: JIMMIEAN TO PROF

Transect Point ID:		Position:		PM:			
Slope & Aspect:							
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:		Position:		PM:			
Slope & Aspect:							
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:		Position:		PM:			
Slope & Aspect:							
Horizon	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: John Roberts

Retnew Job #: 089962000

Date: 6-2-2016

Section: P-309 - P-310

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-309B 160602-125-5CR

Slope & Aspect:	Position:	PM:	Notes				
<u>35° 120°</u>	<u>North slope</u>	<u>S14 Stone Res.</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>A</u>	<u>2</u>	<u>10YR 3/2</u>	<u>S1L</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>Bw</u>	<u>7</u>	<u>10YR 5/6</u>	<u>S1L</u>	<u>1CN</u>	<u>—</u>	<u>—</u>	<u>n-c fine</u>
<u>Cr</u>	<u>7+</u>	<u>—</u>	<u>—</u>	<u>1/2CN</u>	<u>—</u>	<u>—</u>	

Notes: Dip 10°-21° Strike 111° + Base slope

Residuum

Transect Point ID: T-309A-160602-1436-5CR

Slope & Aspect:	Position:	PM:	Notes				
<u>25° 170°</u>	<u>Head slope</u>	<u>S14 Stone Res.</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>2</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>Ae</u>	<u>9</u>	<u>10YR 5/6</u>	<u>S1L</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>Bw</u>	<u>16+</u>	<u>10YR 5/6</u>	<u>S1L</u>	<u>CR</u>	<u>—</u>	<u>—</u>	

Notes: Residuum

Transect Point ID: T-310A-160602-1532-5CR

Slope & Aspect:	Position:	PM:	Notes				
<u>—</u>	<u>Back slope</u>	<u>Col. Residuum</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>Oe</u>	<u>1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	
<u>Ae</u>	<u>6</u>	<u>10YR 5/4</u>	<u>S1L</u>	<u>10YR 10/6</u>	<u>—</u>	<u>—</u>	<u>Coarse rock</u>
<u>2Bw</u>	<u>14</u>	<u>10YR 5/6</u>	<u>S1L</u>	<u>35% CN</u>	<u>—</u>	<u>—</u>	<u>interum red</u>

Notes: Colluvium / Residuum

Transect Point ID: —

Slope & Aspect:	Position:	PM:	Notes				
<u>—</u>	<u>—</u>	<u>—</u>					
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	

Notes: —

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: John C Roberts

Rettew Job #: 089962000

T-310C-160603-0938-JCR

Date: 06-03-2016

Section: P-310

RETEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: ~~T-310A-160603-0938-SLR~~

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	PM:	Notes
<u>6% S42°E</u>	<u>0.5</u>	<u>10YR 5/1</u>	<u>-</u>	<u>GR 20%</u>	<u>-</u>	<u>-</u>	<u>Residuum</u>	
	<u>1</u>	<u>10YR 4/2</u>	<u>SIL</u>	<u>GR 10%</u>	<u>-</u>	<u>-</u>		<u>Gravel size</u>
	<u>14</u>	<u>10YR 6/6</u>	<u>SR SIL</u>	<u>GR 15%</u>	<u>-</u>	<u>-</u>		<u>Gravel size</u>

Notes: Silt stone

Transect Point ID: T-310B-160603-0937-SCC

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	PM:	Notes
<u>9% S38°E</u>	<u>0.75</u>	<u>10YR 2/1</u>	<u>-</u>	<u>GC 2%</u>	<u>-</u>	<u>-</u>	<u>Residuum</u>	
	<u>1.25</u>	<u>10YR 4/2</u>	<u>SIL</u>	<u>GR 10%</u>	<u>-</u>	<u>-</u>		
	<u>12</u>	<u>10YR 6/6</u>	<u>SR SIL</u>	<u>GR 20%</u>	<u>-</u>	<u>-</u>		

Notes: Silt stone

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	PM:	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	Cof	Redox Color	Redox Descr.	PM:	Notes

Notes:

Dominion ACP - Soil Survey
Soil Transect Log

Soil Scientist: Michael Leart

Retnew Job #: 089962000

Date: 6/2/16

Section: D 314 - D 311

RETNEW Associates, Inc.
3020 Columbia Avenue
Lancaster, PA 17603
Phone: 717-394-3721
Fax: 717-394-1063

Transect Point ID: T-311A-160603-0837-MEL

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>127/150</u>	<u>0-2</u>	<u>10YR 3/2</u>	<u>sil</u>	<u>10%</u>			
	<u>2-16</u>	<u>10YR 5/6</u>	<u>clayey sil</u>	<u>20%</u>			
	<u>16-20</u>	<u>10YR 5/6</u>	<u>sil</u>	<u>85%</u>			
	<u>20-38</u>						

Notes: Road cut Rock @ 16" Shale @ 20° Dip 75° E

Transect Point ID: T-311B-160603-0837-MEL

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes
<u>326/150</u>	<u>0-4</u>	<u>10YR 3/2</u>	<u>sil</u>	<u><10%</u>			
	<u>4-8</u>	<u>10YR 5/4</u>	<u>sil</u>	<u>40%</u>			
	<u>8-14</u>	<u>10YR 5/6</u>	<u>sil</u>	<u>40%</u>			
	<u>14-18</u>	<u>10YR 5/6</u>	<u>sil</u>	<u>70%</u>			

Notes: Stepslope down to stream bottom

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Transect Point ID:

Slope & Aspect:	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	Notes

Notes:

Soil Scientist: Michael Lane
 Rettew Job #: 089962000

Date: 6/2/16
 Section: P311-P314

RETTAW Associates, Inc.
 3020 Columbia Avenue
 Lancaster, PA 17603
 Phone: 717-394-3721
 Fax: 717-394-1063

Transect Point ID: T-312 16002-1412-MEL

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	
<u>Ap</u>	<u>0-3</u>	<u>10YR5/3</u>	<u>sl</u>	<u><10%</u>			<u>mixed A horizon</u>
<u>Bw</u>	<u>3-10</u>	<u>10YR5/4</u>	<u>sl</u>	<u>15%</u>			
<u>Bt</u>	<u>10-19</u>	<u>10YR5/6</u>	<u>sl</u>	<u>20%</u>			

Notes: Correlate to R-013-160510-1505-MPC

Leaching w/in slide area poorly drained depression
See Radwell Hill photo

Transect Point ID:

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	

Notes:

Transect Point ID:

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	

Notes:

Transect Point ID:

Slope & Aspect:		Position:			PM:		Notes
Horizon	Depth (in)	Color	Texture	CoF	Redox Color	Redox Descr.	

Notes:

Attachment 6
ACP Soil Mapping Key

Attachment 7
Laboratory Results Summary

Attachment 7
Laboratory Results Summary

Sample ID	Soil pH	P (ppm)	K (ppm)	Mg (ppm)	Reccomendations		Ca (ppm)	Acidity (meq/100g)	CEC (meq/100g)	% Saturation of CEC			Zn (ppm)	Cu (ppm)	S (ppm)	Total Volatile Solids (%)	TOC (mg/kg)	TOC (%)	Particle Size Analysis			Texture Class
					Limestone (lb/Ac)	Mg (lb/Ac)				K	Mg	Ca							% Sand	% Silt	% Clay	
P-003-160620-1025-rll-S1A	4.0	9	107	113	20,000	0	1400	20.7	23.2	1.2	4.1	30.1	3.3	1.2	8.9	53.6	374,000	37.4	N/A	N/A	N/A	N/A
P-003-160620-1025-rll-S2A	3.7	12	74	54	20,000	20	549	21.3	18.4	1.0	2.4	14.9	1.8	0.9	12.0	15.8	100,000	10	33.0	38.8	28.2	Clay Loam
P-003-160620-1025-rll-S3A	4.6	3	34	26	14,000	80	157	15.9	16.1	0.5	1.3	4.9	1.8	1.0	15.6	5.0	8,780	0.878	16.9	42.6	40.5	Silty Clay
P-003-160620-1025-rll-S4A	4.5	3	37	35	12,000	50	120	13.5	14.5	0.7	2.0	4.2	1.1	1.0	9.1	3.4	2,270	0.227	22.8	47.2	29.9	Clay Loam
P-010-160620-1315-mgw-S1A	4.8	8	152	128	9,000	0	832	10.5	16.1	2.4	6.6	25.8	4.2	1.3	7.0	86.3	476,000	47.6	N/A	N/A	N/A	N/A
P-010-160620-1315-mgw-S2A	3.6	17	64	33	18,000	50	225	20.1	16.6	1.0	1.7	6.8	2.8	1.4	10.0	41.4	185,000	18.5	64.3	17.2	18.5	Sandy Loam
P-010-160620-1315-mgw-S3A	4.1	7	46	17	18,000	100	72	19.5	15.6	0.8	0.9	2.3	2.4	1.4	21.4	14.8	67,200	6.72	45.4	25.1	29.5	Sandy Clay Loam
P-010-160620-1315-mgw-S4A	4.7	7	25	11	9,000	110	45	11.1	11.5	0.6	0.8	2.0	2.2	1.0	25.5	8.1	30,500	3.05	42.6	25.0	32.4	Clay Loam
P-010-160620-1315-mgw-S5A	4.7	2	17	8	8,000	110	36	9.9	10.2	0.4	0.7	1.8	1.9	1.1	37.4	5.1	7,200	0.72	43.3	22.9	33.8	Clay Loam
P-010-160620-1315-mgw-S6A	4.7	1	25	9	9,000	110	44	10.5	10.9	0.6	0.7	2.0	1.6	1.1	24.3	4.3	3,280	0.328	43.3	21.0	35.7	Clay Loam
P-010-160620-1315-mgw-S7A	4.6	1	23	9	9,000	110	48	10.5	10.9	0.5	0.7	2.2	1.1	1.1	25.5	5.9	2,360	0.236	41.4	20.7	37.9	Clay Loam
P-010-160620-1315-mgw-S8A	4.6	1	30	14	15,000	100	55	17.1	15.5	0.5	0.8	1.8	1.0	0.9	33.3	5.0	2,810	0.281	23.5	19.8	56.7	Clay
P-012-160620-1115-mgw-S1A	5.1	8	158	113	9,000	0	627	11.1	15.6	2.6	6.0	20.1	3.2	1.2	6.7	96.9	484,000	48.4	N/A	N/A	N/A	N/A
P-012-160620-1115-mgw-S2A	3.9	11	119	56	20,000	20	360	21.3	17.6	1.7	2.7	10.2	3.2	1.1	21.1	18.1	147,000	14.7	54.9	27.3	17.8	Sandy Loam
P-012-160620-1115-mgw-S3A	4.3	16	49	22	15,000	80	107	17.1	15.8	0.8	1.2	3.4	3.4	1.0	28.7	16.4	92,400	9.24	55.9	25.5	18.6	Sandy Loam
P-012-160620-1115-mgw-S4A	4.9	7	18	13	8,000	100	54	9.9	10.3	0.4	1.0	2.6	2.4	1.0	37.6	8.7	49,800	4.98	53.7	31.0	15.3	Sandy Loam
P-012-160620-1115-mgw-S5A	4.9	7	20	10	8,000	110	52	9.3	9.7	0.5	0.9	2.7	2.9	1.1	42.6	6.4	21,600	2.16	49.2	24.6	26.2	Sandy Clay Loam
P-022-160614-1050-jsw-S1A	3.3	7	139	37	24,000	50	51	26.1	15.9	2.2	1.9	1.6	2.7	0.9	12.4	64.6	473,000	47.3	N/A	N/A	N/A	N/A
P-022-160614-1050-jsw-S2A	3.5	18	66	18	23,000	80	51	24.3	15.6	1.1	1.0	1.6	2.2	0.9	6.1	33.3	238,000	23.8	57.5	19.4	23.1	Sandy Clay Loam
P-022-160614-1050-jsw-S3A	4.2	5	18	10	4,000	110	41	5.7	6	0.8	1.4	3.4	1.1	0.7	3.6	1.3	5,540	0.554	79.6	12.2	8.2	Loamy Sand
P-022-160614-1050-jsw-S4A	4.3	21	27	9	9,000	110	28	10.5	10.8	0.6	0.7	1.3	1.3	1.2	18.9	4.1	13,000	1.3	66.8	11.4	21.8	Sandy Clay Loam
P-022-160614-1050-jsw-S5A	4.4	7	37	10	6,000	110	48	8.1	8.5	1.1	1.0	2.8	1.2	1.0	18.7	3.2	2,230	0.223	13.6	59.6	26.8	Silt Loam
P-022-160614-1050-jsw-S6A	4.5	1	59	14	11,000	100	31	12.9	13.3	1.1	0.9	1.2	1.0	1.2	24.3	4.3	710	0.071	22.9	31.1	45.9	Clay
P-022-160614-1050-jsw-S7A	4.4	1	53	16	11,000	100	31	12.3	12.7	1.1	1.0	1.2	0.9	1.3	17.3	6.0	1,110	0.111	8.8	37.2	54.0	Clay
P-040-160615-1119-jcr-S1A	4.5	11	147	63	12,000	0	424	13.5	16.5	2.3	3.2	12.8	3.3	1.0	19.8	38.8	411,000	41.1	N/A	N/A	N/A	N/A
P-040-160615-1119-jcr-S2A	4.0	5	92	31	17,000	60	57	18.9	15.8	1.5	1.6	1.8	2.2	1.0	15.5	10.1	75,700	7.57	35.9	46.0	18.1	Loam
P-040-160615-1119-jcr-S3A	4.8	3	49	13	6,000	100	43	8.1	8.5	1.5	1.3	2.5	2.2	1.2	25.7	3.7	7,880	0.788	18.4	51.4	30.2	Silty Clay Loam
P-040-160615-1119-jcr-S4A	4.6	1	53	18	8,000	80	51	9.9	10.4	1.3	1.4	2.4	1.4	0.9	23.2	3.7	1,790	0.179	29.2	39.0	31.8	Clay Loam
P-040-160615-1119-jcr-S5A	4.7	1	44	23	6,000	80	35	8.1	8.6	1.3	2.2	2.0	1.3	1.1	19.6	2.5	1,400	0.14	19.6	44.0	36.4	Silty Clay Loam
P-045-160614-1019-jcr-S1A	4.4	8	127	54	12,000	20	313	13.5	15.8	2.1	2.8	9.9	2.8	1.1	12.0	49.4	273,000	27.3	N/A	N/A	N/A	N/A
P-045-160614-1019-jcr-S2A	4.5	3	63	33	11,000	50	131	12.3	13.4	1.2	2.1	4.9	1.9	1.1	9.1	9.6	53,700	5.37	32.1	42.7	25.2	Loam
P-045-160614-1019-jcr-S3A	4.9	3	65	34	8,000	50	80	9.9	10.7	1.6	2.6	3.7	1.9	1.2	7.1	3.2	4,230	0.423	24.3	51.2	24.5	Silt Loam
P-045-160614-1019-jcr-S4A	5.3	2	83	122	7,000	0	443	8.7	12.1	1.8	8.4	18.2	1.3	1.2	5.2	3.8	3,480	0.348	27.0	45.4	27.6	Clay Loam
P-063-160614-0950-rll-S1A	6.5	57	151	97	0	0	2,839	3.9	19.3	2.0	4.2	73.6	2.8	1.9	10.6	11.1	49,800	4.98	34.8	41.0	24.2	Loam
P-063-160614-0950-rll-S2A	5.8	2	43	66	3,000	0	1,092	4.5	10.6	1.0	5.2	51.4	1.1	0.9	7.3	3.5	2,470	0.247	21.7	37.6	40.7	Clay
P-063-160614-0950-rll-S3A	4.8	1	75	207	9,000	0	76	10.5	12.8	1.5	13.5	3.0	2.2	1.9	5.6	2.7	1,100	0.11	8.8	48.7	42.4	Silty Clay
P-068-160614-1338-sdd-S1A	6.1	119	139	232	4,000	0	3,230	5.1	22.4	1.6	8.6	67.0	15.8	1.3	17.0	60.3	270,000	27	N/A	N/A	N/A	N/A
P-068-160614-1338-sdd-S2A	5.3	263	67	60	8,000	0	952	9.9	15.3	1.1	3.3	31.0	6.8	1.2	23.1	8.8	62,900	6.29	74.1	16.6	9.3	Sandy Loam
P-068-160614-1338-sdd-S3A	4.8	85	39	23	8,000	80	87	93	10	1.0	1.9	4.3	1.3	0.7	9.6	1.9	2,280	0.228	53.5	25.1	21.4	Sandy Clay Loam
P-068-160614-1338-sdd-S4A	5.2	10	46	44	7,000	30	414	8.7	11.3	1.0	3.3	18.4	1.4	0.9	8.6	2.7	4,200	0.42	37.3	32.7	30.0	Clay Loam
P-069-160614-1158-sdd-S1A	4.9	67	154	127	10,000	0	1,289	11.7	19.6	2.0	5.4	32.9	6.8	1.9	23.6	47.3	123,000	12.3	N/A	N/A	N/A	N/A
P-069-160614-1158-sdd-S2A	4.2	35	75	27	14,000	80	79	15.9	15.8	1.2	1.4	2.5	2.7	1.9	22.6	11.4	72,000	7.2	48.7	36.0	15.3	Loam
P-069-160614-1158-sdd-S3A	4.6	27	51	21	9,000	80	77	10.5	11.2	1.2	1.6	3.4	3.2	0.8	24.1	5.5	37,600	3.76	40.9	39.0	20.1	Loam

Attachment 7
Laboratory Results Summary

Sample ID	Soil pH	P (ppm)	K (ppm)	Mg (ppm)	Reccomendations		Ca (ppm)	Acidity (meq/100g)	CEC (meq/100g)	% Saturation of CEC			Zn (ppm)	Cu (ppm)	S (ppm)	Total Volatile Solids (%)	TOC (mg/kg)	TOC (%)	Particle Size Analysis			Texture Class
					Limestone (lb/Ac)	Mg (lb/Ac)				K	Mg	Ca							% Sand	% Silt	% Clay	
P-069-160614-1158-sdd-S4A	4.6	10	27	16	7,000	100	52	8.7	9.2	0.8	1.5	2.8	1.5	0.8	17.6	2.2	1,630	0.163	50.3	31.1	18.6	Loam
P-069-160614-1158-sdd-S5A	4.7	3	39	35	7,000	50	62	8.7	9.4	1.1	3.1	3.3	1.4	0.8	20.3	2.5	1,530	0.153	64.3	22.4	13.2	Sandy Loam
P-077-160617-1035-sdd-S1A	5.1	34	144	188	11,000	0	1,497	12.3	21.7	1.7	7.2	34.5	10.3	1.5	17.1	87.2	194,000	19.4	N/A	N/A	N/A	N/A
P-077-160617-1035-sdd-S2A	4.9	25	60	28	10,000	60	103	11.7	12.6	1.2	1.9	4.1	4.1	1.5	14.1	8.7	68,700	6.87	50.3	32.5	17.1	Loam
P-077-160617-1035-sdd-S3A	5.1	3	38	57	10,000	20	281	11.7	13.7	0.7	3.5	10.3	1.3	1.3	7.4	3.6	6,160	0.616	32.9	37.0	30.2	Clay Loam
P-077-160617-1035-sdd-S4A	5.1	2	48	86	10,000	0	299	11.7	14.0	0.9	5.1	10.6	1.3	1.4	8.6	3.7	5,130	0.513	44.7	33.5	21.9	Loam
P-077-160617-1035-sdd-S5A	4.9	1	63	80	14,000	0	170	15.3	16.7	1.0	4.0	5.1	1.3	1.4	12.6	3.7	1,300	0.13	32.8	34.5	32.7	Clay Loam
P-100-160609-1105-def-S1A	3.8	8	149	101	21,000	0	445	23.1	18.4	2.1	4.6	12.1	3.7	0.9	16.3	93.0	522,000	52.2	N/A	N/A	N/A	N/A
P-100-160609-1105-def-S2A	4.0	7	177	35	18,000	80	59	19.5	16	2.8	1.8	1.8	2.0	0.7	11.6	56.5	292,000	29.2	48.8	38.7	12.5	Loam
P-100-160609-1105-def-S3A	4.8	8	61	16	11,000	100	42	12.9	13.4	1.2	1.0	1.6	3.7	1.0	23.9	12.2	17,000	1.7	25.2	37.8	37.0	Clay Loam
P-121-160616-0950-mgw-S1A	6.0	41	227	207	5,000	0	1,829	6.3	17.8	3.3	9.7	51.5	5.4	1.2	29.2	77.2	362,000	36.2	N/A	N/A	N/A	N/A
P-121-160616-0950-mgw-S2A	4.7	6	142	132	11,000	0	515	12.9	16.9	2.1	6.5	15.2	2.0	0.9	11.1	4.2	33,800	3.38	48.8	33.5	17.7	Loam
P-121-160616-0950-mgw-S3A	5.1	4	90	227	1,000	0	568	12.9	17.9	1.3	10.6	15.9	1.5	1.6	9.3	6.0	18,900	1.89	25.5	43.4	31.0	Clay Loam
P-121-160616-0950-mgw-S4A	4.8	2	74	244	9,000	0	578	10.5	15.6	1.2	13.0	18.5	1.3	1.5	8.1	4.4	13,300	1.33	39.4	34.0	26.6	Loam
P-126-160615-1410-mgw-S1A	5.1	39	161	101	9,000	0	381	11.1	14.3	2.9	5.9	13.4	4.3	0.9	24.3	59.5	322,000	32.2	N/A	N/A	N/A	N/A
P-126-160615-1410-mgw-S2A	4.1	6	92	46	18,000	30	107	20.1	16.2	1.5	2.4	3.3	2.4	0.8	17.3	10.9	106,000	10.6	39.2	38.0	22.7	Loam
P-126-160615-1410-mgw-S3A	4.5	4	49	23	11,000	80	66	12.3	12.9	1.0	1.5	2.5	2.0	0.9	18.0	4.6	14,600	1.46	21.6	51.2	27.2	Clay Loam
P-126-160615-1410-mgw-S4A	4.8	22	35	26	10,000	80	47	11.7	12.2	0.7	1.8	1.9	1.4	0.9	15.1	4.1	7,330	0.733	31.4	41.4	27.1	Clay Loam
P-126-160615-1410-mgw-S5A	4.8	4	49	45	11,000	50	106	12.3	13.3	0.9	2.8	4.0	1.2	0.8	10.9	3.7	3,310	0.331	43.2	32.8	24.1	Loam
P-134-160615-1506-sdd-S1A	3.9	8	107	95	24,000	0	392	26.1	18.0	1.5	4.4	10.9	5.9	1.2	10.8	78.2	388,000	38.8	N/A	N/A	N/A	N/A
P-134-160615-1506-sdd-S2A	4.6	6	112	53	14,000	20	380	15.9	17.6	1.6	2.5	10.8	3.5	1.1	18.6	18.4	113,000	11.3	40.0	34.4	25.6	Loam
P-134-160615-1506-sdd-S3A	4.8	2	76	30	9,000	60	54	11.1	11.8	1.6	2.1	2.3	1.7	0.8	28.4	3.8	5,700	0.57	26.0	40.4	33.6	Clay Loam
P-134-160615-1506-sdd-S4A	4.7	1	67	81	11,000	0	52	12.3	13.4	1.3	5.0	1.9	1.2	0.6	24.8	3.3	1,720	0.172	49.9	23.1	27.0	Sandy Clay Loam
P-134-160615-1506-sdd-S5A	5.0	1	89	100	9,000	0	53	10.5	11.8	1.9	7.0	2.2	1.2	0.8	20.1	3.1	1,650	0.165	55.9	22.5	21.7	Sandy Clay Loam
P-156-160606-1355-dat-S1A	3.7	5	151	62	18,000	0	169	19.5	16.7	2.3	3.1	5.0	2.4	0.7	12.5	80.2	373,000	37.3	N/A	N/A	N/A	N/A
P-156-160606-1355-dat-S2A	4.0	5	54	19	8,000	80	59	9.9	10.5	1.3	1.5	2.8	1.3	0.7	7.5	6.1	42,000	4.2	65.6	23.5	10.9	Sandy Loam
P-156-160606-1355-dat-S3A	5.0	3	29	10	4,000	110	38	5.7	6.0	1.2	1.4	3.1	2.9	0.8	36.0	1.7	2,830	0.283	56.7	22.5	20.8	Sandy Clay Loam
P-156-160606-1355-dat-S4A	4.9	2	30	11	4,000	110	36	5.7	6.0	1.3	1.5	3.0	2.4	0.8	40.4	1.5	1,610	0.161	56.9	21.9	21.2	Sandy Clay Loam
P-157-160606-1512-dat-S1A	4.1	9	151	54	14,000	20	137	15.3	16.5	2.3	2.7	4.1	2.9	0.8	12.7	78.0	355,000	35.5	N/A	N/A	N/A	N/A
P-157-160606-1512-dat-S2A	4.3	5	61	27	12,000	80	93	13.5	14.3	1.1	1.6	3.2	2.0	1.1	15.7	7.9	42,800	4.28	55.5	29.6	14.9	Sandy Loam
P-157-160606-1512-dat-S3A	4.8	4	46	13	6,000	100	35	7.5	7.9	1.5	1.4	2.2	2.4	1.0	26.2	2.9	8,340	0.834	45.6	24.7	29.7	Sandy Clay Loam
P-157-160606-1512-dat-S4A	4.6	2	62	16	7,000	100	40	8.7	9.2	1.7	1.5	2.2	1.4	1.2	33.5	2.6	4,370	0.437	37.6	26.2	36.2	Clay Loam
P-157-160606-1512-dat-S5A	4.7	1	88	28	9,000	60	34	10.5	11.1	2.0	2.1	1.5	1.1	1.8	40.9	3.4	1,540	0.154	12.1	23.3	64.6	Clay
P-157-160606-1512-dat-S6A	4.5	1	84	29	9,000	60	37	11.1	11.7	1.8	2.1	1.6	1.0	1.7	27.0	3.2	2,300	0.23	12.6	25.0	62.4	Clay
P-157-160606-1512-dat-S7A	4.7	1	50	15	8,000	100	45	9.9	10.4	1.2	1.2	2.1	0.9	1.6	18.8	3.9	2,320	0.232	28.4	18.0	53.6	Clay
P-162-160606-1040-jsw-S1A	4.4	9	161	35	15,000	80	214	17.1	16.8	2.5	1.7	6.4	2.8	1.4	15.3	84.2	501,000	50.1	N/A	N/A	N/A	N/A
P-162-160606-1040-jsw-S2A	4.4	4	82	16	14,000	100	32	15.3	15.5	1.4	0.9	1.0	2.1	1.6	20.4	9.5	42,500	4.25	48.8	26.1	25.2	Sandy Clay Loam
P-162-160606-1040-jsw-SA3	4.6	6	72	27	10,000	80	51	11.7	12.4	1.5	1.8	2.1	1.6	1.5	58.8	5.7	12,600	1.26	34.0	25.8	40.2	Clay
P-162-160606-1040-jsw-SA4	4.8	1	59	35	9,000	80	53	10.5	11.2	1.3	2.6	2.4	1.1	1.4	62.2	3.5	1,100	0.11	45.7	19.8	34.5	Sandy Clay Loam
P-162-160606-1040-jsw-SA5	4.6	5	69	30	8,000	60	61	9.9	10.6	1.7	2.4	2.9	1.2	1.4	23.9	3.0	670	0.067	43.5	22.6	33.9	Clay Loam
P-170-160620-1122-def-S1A	3.7	5	98	31	17,000	60	209	18.9	16.6	1.5	1.6	6.3	2.7	1.1	7.4	95.8	507,000	50.7	N/A	N/A	N/A	N/A
P-170-160620-1122-def-S2A	3.6	11	100	22	17,000	80	50	18.3	15.7	1.6	1.2	1.6	2.1	1.1	8.4	56.5	264,000	26.4	84.9	9.0	6.2	Loamy Sand
P-170-160620-1122-def-S3A	3.9	7	22	14	9,000	100	40	10.5	10.9	0.5	1.1	1.8	1.3	1.4	6.8	3.2	14,700	1.47	76.6	15.0	8.4	Sandy Loam

Attachment 7
Laboratory Results Summary

Sample ID	Soil pH	P (ppm)	K (ppm)	Mg (ppm)	Reccomendations		Ca (ppm)	Acidity (meq/100g)	CEC (meq/100g)	% Saturation of CEC			Zn (ppm)	Cu (ppm)	S (ppm)	Total Volatile Solids (%)	TOC (mg/kg)	TOC (%)	Particle Size Analysis			Texture Class
					Limestone (lb/Ac)	Mg (lb/Ac)				K	Mg	Ca							% Sand	% Silt	% Clay	
P-170-160620-1122-def-S4A	4.4	4	25	11	10,000	110	34	11.7	12.0	0.5	0.8	1.4	1.5	1.3	26.9	4.7	21,300	2.13	67.1	14.3	18.6	Sandy Loam
P-170-160620-1122-def-S5A	4.7	8	26	10	5,000	110	33	6.3	6.6	1.0	1.3	2.5	1.4	1.2	23.1	3.2	3,050	0.305	65.2	13.9	20.9	Sandy Clay Loam
P-170-160620-1122-def-S6A	4.8	6	20	9	4,000	110	32	5.7	6.0	0.9	1.3	2.7	1.2	1.1	22.0	1.7	2,340	0.234	75.5	8.9	15.6	Sandy Loam
P-173-160620-1112-def-S1A	6.7	5	104	128	0	0	2,224	2.2	14.7	1.8	7.3	75.9	3.1	1.5	6.8	76.3	370,000	37	N/A	N/A	N/A	N/A
P-173-160620-1112-def-S2A	5.2	4	88	87	10,000	0	1,332	11.7	19.3	1.2	3.8	34.5	3.6	1.5	12.7	9.0	48,400	4.84	28.6	37.4	34.0	Clay Loam
P-173-160620-1112-def-S3A	5.2	1	75	46	7,000	30	600	8.7	12.3	1.6	3.1	24.5	1.5	1.4	9.8	4.3	8,220	0.822	20.0	40.8	39.2	Silty Clay Loam
P-173-160620-1112-def-S4A	6.5	1	125	147	0	0	3,246	3.9	20.4	1.6	6.0	73.4	1.0	1.5	7.4	5.7	6,020	0.602	5.9	22.3	71.9	Clay
P-176-160621-1155-rll-S1A	5.8	15	161	181	4,000	0	1,844	5.7	16.8	2.5	9.0	54.7	6.9	1.6	10.3	74.7	389,000	38.9	N/A	N/A	N/A	N/A
P-176-160621-1155-rll-S2A	4.9	7	154	74	5,000	0	260	6.9	9.2	4.3	6.7	14.1	3.7	1.0	10.9	12.2	57,700	5.77	62.7	27.2	10.1	Sandy Loam
P-176-160621-1155-rll-S3A	5.6	1	60	63	2,000	0	131	3.4	4.7	3.3	11.1	13.8	1.3	1.3	4.7	1.0	1,080	0.108	65.8	18.2	16.0	Sandy Loam
P-176-160621-1155-rll-S4A	5.2	1	147	150	9,000	0	1,122	11.1	18.3	2.1	6.8	30.6	1.0	1.0	63.4	7.0	2,220	0.222	28.2	11.8	60.0	Clay
P-187-160607-1427-jsw-S1A	4.7	24	175	46	12,000	30	138	14.1	15.6	2.9	2.5	4.4	9.5	1.2	40.1	52.5	311,000	31.1	N/A	N/A	N/A	N/A
P-187-160607-1427-jsw-S2A	4.8	5	103	32	12,000	60	140	13.5	14.7	1.8	1.8	4.7	2.9	1.5	21.2	9.4	60,300	6.03	25.6	38.4	35.9	Clay Loam
P-187-160607-1427-jsw-S3A	4.8	5	64	22	8,000	80	48	9.9	10.5	1.6	1.7	2.3	1.9	1.5	15.8	5.1	14,600	1.46	37.3	39.6	23.1	Loam
P-215-160602-1037-jsw-S1A	3.8	16	148	32	17,000	60	150	18.3	16.4	2.3	1.6	4.6	2.3	1.2	9.6	82.7	505,000	50.5	N/A	N/A	N/A	N/A
P-215-160602-1037-jsw-S2A	3.8	4	49	16	12,000	100	52	13.5	14.0	0.9	1.0	1.9	1.5	1.2	12.3	4.3	35,800	3.58	58.3	22.5	19.3	Sandy Loam
P-215-160602-1037-jsw-S3A	3.8	13	45	13	12,000	100	51	13.5	14.0	0.8	0.8	1.8	1.3	1.1	8.9	6.9	39,900	3.99	64.6	23.5	11.9	Sandy Loam
P-215-160602-1037-jsw-S4A	4.6	5	33	9	6,000	110	30	8.1	8.4	1.0	0.9	1.8	1.5	0.9	28.0	4.2	13,500	1.35	49.0	23.8	27.3	Sandy Clay Loam
P-215-160602-1037-jsw-S5A	4.6	3	34	9	6,000	110	33	8.1	8.4	1.0	0.9	1.9	1.4	1.0	31.7	2.6	3,700	0.37	46.6	24.8	28.6	Sandy Clay Loam
P-215-160602-1037-jsw-S6A	4.3	1	15	8	4,000	110	36	5.7	6.0	0.6	1.1	3.0	0.9	0.8	37.5	1.1	< 500	< 0.05	75.5	9.9	14.6	Sandy Loam
P-222-160607-1055-dat-S1A	3.8	9	79	34	20,000	50	175	20.7	16.4	1.2	1.7	5.3	2.5	1.1	18.5	16.0	183,000	18.3	39.1	43.1	17.7	Loam
P-222-160607-1055-dat-S2A	4.7	4	56	16	7,000	100	66	8.7	9.3	1.5	1.4	3.6	3.2	1.5	18.8	5.4	20,300	2.03	30.0	40.2	29.8	Clay Loam
P-222-160607-1055-dat-S3A	4.7	2	44	14	6,000	100	41	8.1	8.5	1.3	1.4	2.4	1.3	1.1	23.3	4.5	5,660	0.566	33.8	36.8	29.4	Clay Loam
P-222-160607-1055-dat-S4A	4.7	1	55	32	6,000	60	56	8.1	8.8	1.6	3.0	3.2	1.1	1.0	19.6	4.2	2,790	0.279	49.1	28.6	22.3	Loam
P-222-160607-1055-dat-S5A	4.9	1	56	52	6,000	20	70	7.5	8.4	1.7	5.1	4.2	1.3	1.1	14.8	4.2	1,830	0.183	46.2	30.9	22.9	Loam
P-225-160601-1130-mel-S1A	5.0	3	75	60	8,000	0	197	9.9	11.6	1.7	4.3	8.5	1.4	1.4	15.7	8.6	34,100	3.41	23.2	43.1	33.7	Clay Loam
P-225-160601-1130-mel-S2A	5.0	3	52	111	11,000	0	164	12.3	14.2	0.9	6.5	5.8	1.2	1.1	28.1	4.3	3,960	0.396	18.6	33.7	47.6	Clay
P-225-160601-1130-mel-S3A	5.0	2	73	113	8,000	0	164	9.9	11.8	1.6	7.9	6.9	1.1	1.0	11.9	3.7	1,740	0.174	45.7	19.0	35.3	Sandy Clay
P-225-160601-1130-mel-S4A	5.0	1	66	107	11,000	0	145	12.3	14.1	1.2	6.3	5.1	1.1	1.2	24.6	4.4	3,260	0.326	32.9	28.0	39.1	Clay Loam
P-225-160601-1130-mel-S5A	4.8	1	41	105	12,000	0	83	13.5	14.9	0.7	5.9	2.8	1.1	1.1	57.9	4.1	1,910	0.191	12.0	44.2	43.9	Silty Clay
P-225-160601-1130-mel-S6A	4.9	1	37	101	11,000	0	81	12.3	13.6	0.7	6.2	3.0	1.0	1.2	66.7	3.9	2,070	0.207	20.3	43.9	35.8	Clay Loam
P-225A-160601-1130-jcr-S1A	5.1	6	141	197	7,000	0	882	8.7	15.1	2.4	10.9	29.2	40.1	2.1	7.7	10.7	55,300	5.53	41.7	33.4	24.9	Loam
P-225A-160601-1130-jcr-S2A	5.1	3	97	165	7,000	0	277	8.7	11.7	2.1	11.7	11.8	2.4	1.5	7.1	11.2	4,780	0.478	61.8	18.5	19.7	Sandy Loam
P-225A-160601-1130-jcr-S3A	5.4	2	58	167	6,000	0	382	7.5	11.0	1.4	12.7	17.4	1.3	1.3	9.5	4.2	4,040	0.404	48.6	25.1	26.3	Sandy Clay Loam
P-225B-160601-1312-sdd-S1A	4.8	17	99	148	9,000	0	608	10.5	15.0	1.7	8.2	20.2	7.4	1.4	10.5	21.8	140,000	14	40.3	36.5	23.2	Loam
P-225B-160601-1312-sdd-S2A	4.8	3	61	49	8,000	20	65	9.3	10.2	1.5	4.0	3.2	1.9	1.2	13.0	3.4	3,990	0.399	23.8	43.0	33.1	Clay Loam
P-225B-160601-1312-sdd-S3A	4.7	1	50	49	8,000	20	39	9.9	10.6	1.2	3.8	1.8	1.3	1.2	24.1	3.2	2,070	0.207	23.5	41.3	35.2	Clay Loam
P-225B-160601-1312-sdd-S4A	4.9	1	31	68	8,000	0	33	9.3	10.1	0.8	5.6	1.6	1.1	1.1	24.6	2.9	790	0.079	20.7	39.3	40.0	Clay Loam
P-227-160601-1500-jsw-S1A	4.2	7	101	85	21,000	0	664	22.5	19.3	1.3	3.7	17.2	3.5	1.4	7.8	59.1	233,000	23.3	N/A	N/A	N/A	N/A
P-227-160601-1500-jsw-S2A	4.1	8	89	39	20,000	50	103	21.3	16.1	1.4	2.0	3.2	4.2	1.5	14.6	32.5	119,000	11.9	34.3	38.4	27.3	Clay Loam
P-227-160601-1500-jsw-S3A	4.6	11	63	27	8,000	80	65	9.9	10.6	1.5	2.1	3.1	2.3	1.2	13.1	5.9	20,000	2	42.4	33.1	24.5	Loam
P-227-160601-1500-jsw-S4A	4.6	21	39	25	9,000	100	64	11.1	11.7	0.9	1.8	2.7	1.5	1.4	11.5	3.7	2,860	0.286	40.1	33.9	26.0	Loam
P-239-160607-1427-def-S1A	4.9	5	112	85	10,000	0	481	11.7	15.1	1.9	4.7	15.9	3.0	1.4	11.1	13.8	70,900	7.09	53.1	30.3	16.6	Sandy Loam

Attachment 7
Laboratory Results Summary

Sample ID	Soil pH	P (ppm)	K (ppm)	Mg (ppm)	Reccomendations		Ca (ppm)	Acidity (meq/100g)	CEC (meq/100g)	% Saturation of CEC			Zn (ppm)	Cu (ppm)	S (ppm)	Total Volatile Solids (%)	TOC (mg/kg)	TOC (%)	Particle Size Analysis			Texture Class
					Limestone (lb/Ac)	Mg (lb/Ac)				K	Mg	Ca							% Sand	% Silt	% Clay	
P-239-160607-1427-def-S2A	5.0	4	46	101	9,000	0	147	11.1	12.8	0.9	6.6	5.8	1.4	1.4	21.9	4.6	5,050	0.505	45.0	30.8	24.2	Loam
P-239-160607-1427-def-S3A	4.9	6	68	198	5,000	0	174	6.3	9.0	1.9	18.3	9.7	1.5	1.2	11.5	3.9	980	0.098	66.8	15.0	18.2	Sandy Loam
P-239-160607-1427-def-S4A	4.9	7	83	176	11,000	0	134	12.9	15.2	1.4	9.6	4.4	2.0	1.4	12.2	3.8	24,800	2.48	46.3	23.4	30.3	Sandy Clay Loam
P-239A-160607-1430-def-S1A	4.6	14	151	156	13,000	0	602	14.7	19.4	2.0	6.7	15.5	7.5	1.5	30.6	10.6	69,900	6.99	49.9	32.8	17.3	Loam
P-239A-160607-1430-def-S2A	4.8	3	119	61	9,000	0	63	10.5	11.6	2.6	4.4	2.7	2.2	1.5	12.6	4.0	6,120	0.612	38.0	32.4	29.6	Clay Loam
P-239A-160607-1430-def-S3A	4.9	2	104	111	8,000	0	75	9.9	11.5	2.3	8.1	3.3	1.3	1.2	12.4	2.6	2,990	0.299	57.9	18.6	23.6	Sandy Clay Loam
P-239A-160607-1430-def-S4A	5.4	2	93	211	5,000	0	251	6.3	9.6	2.5	18.4	13.2	1.2	1.4	6.7	4.1	4,190	0.419	35.6	32.1	32.3	Clay Loam
P-239A-160607-1430-def-S5A	5.1	2	76	145	5,000	0	130	6.9	9.0	2.2	13.5	7.2	1.2	1.6	7.8	4.3	4,350	0.435	36.5	34.1	29.4	Clay Loam
P-253-160608-0950-mel-S1A	5.6	23	144	134	7,000	0	1,539	8.7	17.9	2.1	6.2	43.0	6.2	1.5	17.4	27.6	273,000	27.3	N/A	N/A	N/A	N/A
P-253-160608-0950-mel-S2A	5.0	11	110	43	9,000	30	277	11.1	13.1	2.1	2.7	10.6	2.2	1.7	15.6	6.7	35,400	3.54	57.1	27.5	15.4	Sandy Loam
P-253-160608-0950-mel-S3A	4.6	3	40	17	8,000	100	49	9.3	9.8	1.0	1.4	2.5	1.2	1.4	17.7	4.1	9,800	0.98	62.4	17.7	19.9	Sandy Loam
P-253-160608-0950-mel-S4A	4.8	15	39	26	7,000	80	50	8.7	9.3	1.1	2.3	2.7	1.3	1.4	11.6	2.8	4,740	0.474	57.6	20.7	21.7	Sandy Clay Loam
P-254-160608-1050-mel-S1A	6.6	23	145	267	0	0	3,605	2.0	19.6	1.9	11.4	76.5	16.3	1.8	20.6	67.8	300,000	30	N/A	N/A	N/A	N/A
P-254-160608-1050-mel-S2A	5.8	17	138	162	5,000	0	1,908	6.9	18.1	2.0	7.4	52.6	9.7	1.5	16.5	8.7	29,400	2.94	45.8	33.2	21.0	Loam
P-254-160608-1050-mel-S3A	4.9	7	85	32	9,000	60	130	11.1	12.2	1.8	2.2	5.3	1.2	1.4	8.9	4.4	10,800	1.08	36.6	38.0	25.5	Loam
P-254-160608-1050-mel-S4A	5.1	19	81	83	8,000	0	359	9.9	12.6	1.6	5.5	14.3	1.2	1.4	7.7	4.4	6,940	0.694	45.0	29.4	25.6	Loam
P-276-160610-0838-jsw-S1A	5.1	4	95	187	8,000	0	943	9.9	16.4	1.5	9.5	28.7	5.1	1.9	10.3	20.8	86,500	8.65	N/A	N/A	N/A	N/A
P-276-160610-0838-jsw-S2A	5.1	4	81	235	7,000	0	648	8.7	14.1	1.5	13.9	23.0	3.0	1.7	9.0	4.5	25,700	2.57	56.3	20.8	22.8	Sandy Clay Loam
P-276-160610-0838-jsw-S3A	5.4	2	48	233	3,000	0	430	4.5	8.7	1.4	22.3	24.7	1.7	1.7	3.9	3.2	7,530	0.753	74.7	11.9	13.4	Sandy Loam
P-276-160610-0838-jsw-S4A	5.6	2	66	290	4,000	0	502	5.1	10.2	1.7	23.7	24.6	1.6	2.0	4.9	4.9	11,000	1.1	61.0	20.9	18.1	Sandy Loam
P-276-160610-0838-jsw-S5A	5.9	2	54	214	2,000	0	414	2.8	6.8	2.0	26.3	30.5	1.0	1.1	2.3	3.1	2,800	0.28	75.6	6.8	17.6	Sandy Loam
P-279-160610-1359-dat-S1A	4.7	7	140	126	13,000	0	557	14.7	18.9	1.9	5.6	14.7	5.1	1.1	15.2	36.3	212,000	21.2	N/A	N/A	N/A	N/A
P-279-160610-1359-dat-S2A	4.4	6	101	85	16,000	0	296	17.7	17.4	1.5	4.1	8.5	2.6	1.4	12.5	17.3	92,400	9.24	50.5	29.1	20.3	Loam
P-279-160610-1359-dat-S3A	4.8	5	104	64	9,000	0	80	11.1	12.3	2.2	4.3	3.3	1.4	1.6	8.5	4.5	19,400	1.94	63.7	19.9	16.4	Sandy Loam
P-279-160610-1359-dat-S4A	4.8	2	72	46	8,000	30	48	9.3	10.1	1.8	3.8	2.4	1.1	1.4	8.2	2.8	3,870	0.387	77.5	10.2	12.2	Sandy Loam
P-279-160610-1359-dat-S5A	5.0	10	80	133	5,000	0	134	6.9	8.9	2.3	12.5	7.5	2.7	4.1	6.9	2.7	2,050	0.205	77.7	10.6	11.7	Sandy Loam
P-279A-160610-1450-def-S1A	4.2	5	74	39	13,000	50	257	14.7	16.5	1.2	2.0	7.8	2.2	1.3	13.6	11.4	83,900	8.39	50.2	33.6	16.2	Loam
P-279A-160610-1450-def-S2A	4.8	2	48	22	6,000	80	61	7.5	8.1	1.5	2.3	3.8	1.4	1.1	7.6	3.2	5,870	0.587	44.1	32.1	23.8	Loam
P-279A-160610-1450-def-S3A	5.1	1	63	71	6,000	0	117	8.1	9.4	1.7	6.3	6.2	1.3	1.1	7.0	3.0	2,880	0.288	61.6	15.3	23.1	Sandy Clay Loam
P-279A-160610-1450-def-S4A	5.0	1	62	152	9,000	0	107	10.5	12.5	1.3	10.2	4.3	1.3	1.3	35.8	3.6	1,040	0.104	45.7	22.2	32.1	Sandy Clay Loam
P-283-160606-0743-def-S1A	4.7	10	149	95	12,000	0	1,071	14.1	20.6	1.9	3.8	26.0	6.5	1.5	9.6	89.8	453,000	45.3	N/A	N/A	N/A	N/A
P-283-160606-0743-def-S2A	4.5	3	40	26	13,000	80	58	14.7	15.3	0.7	1.4	1.9	1.9	1.4	18.8	7.6	35,600	3.56	31.5	44.2	24.2	Loam
P-283-160606-0743-def-S3A	4.7	2	44	30	8,000	60	55	9.3	9.9	1.1	2.5	2.8	1.5	1.3	13.8	3.8	6,890	0.689	44.9	31.0	24.1	Loam
P-283-160606-0743-def-S4A	4.9	1	62	59	8,000	0	75	9.3	10.3	1.5	4.8	3.6	1.1	1.2	13.6	4.2	1,360	0.136	52.7	23.5	23.7	Sandy Clay Loam
P-283-160606-0743-def-S5A	4.7	1	69	109	9,000	0	56	10.5	11.9	1.5	7.7	2.4	1.1	1.0	30.2	4.3	1,030	0.103	50.5	25.7	23.8	Sandy Clay Loam
P-283-160606-0743-def-S6A	5.0	2	67	105	9,000	0	48	10.5	11.8	1.5	7.4	2.0	1.2	1.2	17.1	3.7	1,610	0.161	62.2	16.3	21.5	Sandy Clay Loam
P-286-160606-0808-def-S1A	3.9	7	142	81	22,000	0	372	23.7	17.9	2.0	3.8	10.4	2.6	1.0	10.1	91.1	470,000	47	N/A	N/A	N/A	N/A
P-286-160606-0808-def-S2A	4.8	2	46	12	6,000	110	49	7.5	8.0	1.5	1.3	3.1	1.5	1.0	40.7	3.8	6,910	0.691	32.4	39.7	27.9	Clay Loam
P-286-160606-0808-def-S3A	4.7	1	71	21	9,000	80	55	10.5	11.1	1.6	1.6	2.5	1.0	1.0	49.0	1.8	1,450	0.145	31.8	37.2	31.0	Clay Loam
P-286-160606-0808-def-S4A	4.8	1	69	31	8,000	60	37	9.9	10.5	1.7	2.5	1.8	1.2	1.1	22.4	3.6	1,950	0.195	32.4	37.2	30.5	Clay Loam
P-290-160606-1445-mel-S1A	3.1	5	136	36	30,000	50	236	30.9	16.8	2.1	1.8	7.0	4.0	1.1	11.8	97.1	526,000	52.6	N/A	N/A	N/A	N/A
P-290-160606-1445-mel-S2A	3.5	9	58	20	15,000	80	111	17.1	15.9	0.9	1.1	3.5	2.0	1.1	11.1	8.2	36,800	3.68	40.9	43.5	15.7	Loam
P-290-160606-1445-mel-S3A	4.7	2	40	10	6,000	110	39	7.5	7.9	1.3	1.1	2.4	1.3	1.0	18.2	2.7	7,620	0.762	33.6	41.7	24.6	Loam

Attachment 7
Laboratory Results Summary

Sample ID	Soil pH	P (ppm)	K (ppm)	Mg (ppm)	Reccomendations		Ca (ppm)	Acidity (meq/100g)	CEC (meq/100g)	% Saturation of CEC			Zn (ppm)	Cu (ppm)	S (ppm)	Total Volatile Solids (%)	TOC (mg/kg)	TOC (%)	Particle Size Analysis			Texture Class
					Limestone (lb/Ac)	Mg (lb/Ac)				K	Mg	Ca							% Sand	% Silt	% Clay	
P-290-160606-1445-mel-S4A	4.5	1	42	11	7,000	110	44	8.7	9.1	1.2	1.0	2.4	1.0	0.9	23.7	3.4	2,730	0.273	40.0	35.9	24.1	Loam
P-291-160606-1330-mel-S1A	4.3	4	65	33	16,000	50	143	17.7	16.2	1.0	1.7	4.4	1.7	1.1	10.2	11.8	82,800	8.28	35.1	43.5	21.4	Loam
P-291-160606-1330-mel-S2A	4.5	1	37	11	9,000	110	37	11.1	11.5	0.8	0.8	1.6	1.1	1.4	12.3	4.1	10,300	1.03	24.3	40.5	35.2	Clay Loam
P-291-160606-1330-mel-S3A	4.6	3	52	36	14,000	50	95	15.9	15.9	0.8	1.9	3.0	1.8	1.6	20.2	5.5	4,500	0.45	14.8	30.9	54.3	Clay
P-291-160606-1330-mel-S4A	4.7	1	58	41	12,000	50	33	14.1	14.8	1.0	2.3	1.1	1.7	1.7	12.6	3.3	1,260	0.126	27.9	35.3	36.8	Clay Loam
P-293-160606-1056-mel-S1A	4.6	10	175	98	14,000	0	405	15.3	18.3	2.5	4.5	11.1	4.0	0.9	18.2	66.7	333,000	33.3	N/A	N/A	N/A	N/A
P-293-160606-1056-mel-S2A	3.9	6	100	33	12,000	50	54	14.1	14.9	1.7	1.8	1.8	2.1	0.9	12.4	11.5	57,100	5.71	5.5	42.0	52.4	Silty Clay
P-293-160606-1056-mel-S3A	4.7	2	27	12	6,000	110	42	8.1	8.5	0.8	1.2	2.5	1.4	0.9	12.0	4.0	9,790	0.979	61.8	28.1	10.1	Sandy Loam
P-293-160606-1056-mel-S4A	4.7	2	27	11	6,000	110	35	8.1	8.4	0.8	1.1	2.1	1.5	1.0	15.0	3.7	5,700	0.57	48.7	26.0	25.3	Sandy Clay Loam
P-293-160606-1056-mel-S5A	4.7	1	26	29	9,000	60	40	10.5	11.0	0.6	2.2	1.8	1.3	1.0	24.9	2.5	3,740	0.374	60.1	16.9	23.0	Sandy Clay Loam
P-347-160621-1409-def-S1A	4.2	8	133	131	18,000	0	378	19.5	18.3	1.9	6.0	10.3	4.6	1.5	13.2	17.9	198,000	19.8	59.2	18.4	22.4	Sandy Clay Loam
P-347-160621-1409-def-S2A	4.7	5	63	37	11,000	50	48	12.3	13.0	1.2	2.4	1.9	2.3	1.9	15.9	6.1	14,100	1.41	50.9	19.8	29.3	Sandy Clay Loam
P-352-160621-1145-def-S1A	5.0	13	155	189	12,000	0	1,217	13.5	21.6	1.8	7.3	28.2	8.9	1.7	17.7	66.8	324,000	32.4	N/A	N/A	N/A	N/A
P-352-160621-1145-def-S2A	5.0	6	94	152	9,000	0	631	11.1	15.8	1.5	8.0	20.0	2.0	1.5	11.6	10.7	54,800	5.48	37.3	31.8	30.9	Clay Loam
P-352-160621-1145-def-S3A	5.2	4	66	131	9,000	0	262	11.1	13.7	1.2	8.0	9.6	1.5	2.2	9.6	5.5	17,600	1.76	20.6	32.7	46.8	Clay
P-352-160621-1145-def-S4A	5.4	3	98	216	8,000	0	280	9.9	13.3	1.9	13.5	10.5	1.4	2.3	8.3	4.9	15,700	1.57	26.4	29.5	44.1	Clay
P-352-160621-1145-def-S5A	5.3	2	117	276	5,000	0	278	6.3	10.3	2.9	22.3	13.5	1.1	1.8	6.3	10.8	5,570	0.557	48.4	11.5	40.1	Sandy Clay
P-352-160621-1145-def-S6A	5.3	1	112	260	6,000	0	262	8.1	11.9	2.4	18.3	11.0	1.0	2.0	7.5	5.8	6,060	0.606	36.7	21.6	41.7	Clay

Attachment 8
AASLAB Nutrient Analysis Results



SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32384		Lancaster			P-003-160620-1025-rll-S1A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.0			
² Phosphorus (P)	9 ppm			
² Potassium (K)	107 ppm			
² Magnesium (Mg)	113 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 20000 lb/A for a target pH of 6.5. **Magnesium (Mg):** NONE
 *Calcium Carbonate equivalent

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
1400	20.7	23.2	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			1.2	4.1	30.1				3.3	1.2	8.9

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2. The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P₂O₅, K x 1.2=K₂O, Mg x 1.6=MgO

Below Optimum- Nutrient is deficient. There should be an economic response to adding the recommended nutrient.

Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

Above Optimum- The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

Distribution of Soil Test Results Summaries of soil test results may be used in educational programs. However, individual results will not be released outside of Penn State without permission of the client. Electronic copies of your results are available to you, contact the lab for more information.

For additional information on these topics please see the current **Penn State Agronomy Guide** or the **AASL website**: www.aasl.psu.edu. This soil test is part of an ongoing research and extension program of Penn State. If you have any questions or comments about this program or would like copies of publications referenced here, please contact your Penn State County Extension agent.



SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32385		Lancaster			P-003-160620-1025-rll-S2A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	3.7			
² Phosphorus (P)	12 ppm			
² Potassium (K)	74 ppm			
² Magnesium (Mg)	54 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 20000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 20 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .1% Mg (.2 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
			K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
549	21.3	18.4	1.0	2.4	14.9				1.8	0.9	12.0

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

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Below Optimum- Nutrient is deficient. There should be an economic response to adding the recommended nutrient.

Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

Above Optimum- The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32386		Lancaster			P-003-160620-1025-rll-S3A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.6			
² Phosphorus (P)	3 ppm			
² Potassium (K)	34 ppm			
² Magnesium (Mg)	26 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 14000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 80 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .6% Mg (.9 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
157	15.9	16.1	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			0.5	1.3	4.9				1.8	1.0	15.6

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.

Recommendation Messages

Enclosures

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Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

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Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32387		Lancaster			P-003-160620-1025-rll-S4A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.5			
² Phosphorus (P)	3 ppm			
² Potassium (K)	37 ppm			
² Magnesium (Mg)	35 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 12000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 50 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .4% Mg (.7 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
			K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
120	13.5	14.5	0.7	2.0	4.2				1.1	1.0	9.1

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

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Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32388		Lancaster			P-012-160620-1115-mgw-S1A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	5.1			
² Phosphorus (P)	8 ppm			
² Potassium (K)	158 ppm			
² Magnesium (Mg)	113 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 9000 lb/A for a target pH of 6.5. **Magnesium (Mg):** NONE
 *Calcium Carbonate equivalent

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC K Mg Ca			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments Zinc ppm Copper ppm Sulfur ppm		
627	11.1	15.6	2.6	6.0	20.1				3.2	1.2	6.7

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32389		Lancaster			P-012-160620-1115-mgw-S2A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	3.9			
² Phosphorus (P)	11 ppm			
² Potassium (K)	119 ppm			
² Magnesium (Mg)	56 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 20000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 20 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .1% Mg (.2 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC K Mg Ca			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments Zinc ppm Copper ppm Sulfur ppm		
360	21.3	17.6	1.7	2.7	10.2				3.2	1.1	21.2

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2. The elemental results in lb/A can be converted to oxide forms using the following conversions: $P \times 2.3 = P_2O_5$, $K \times 1.2 = K_2O$, $Mg \times 1.6 = MgO$

Below Optimum- Nutrient is deficient. There should be an economic response to adding the recommended nutrient.

Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

Above Optimum- The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32390		Lancaster			P-012-160620-1115-mgw-S3A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.3			
² Phosphorus (P)	16 ppm			
² Potassium (K)	49 ppm			
² Magnesium (Mg)	22 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 15000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 80 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .5% Mg (.9 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
107	17.1	15.8	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			0.8	1.2	3.4				3.4	1.0	28.7

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

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Recommendation Messages

Enclosures

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Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32391		Lancaster			P-012-160620-1115-mgw-S4A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.9			
² Phosphorus (P)	7 ppm			
² Potassium (K)	18 ppm			
² Magnesium (Mg)	13 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 8000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 100 lb/A
 *Calcium Carbonate equivalent
 Limestone containing 1.3% Mg (2 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC K Mg Ca			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments Zinc ppm Copper ppm Sulfur ppm		
54	9.9	10.3	0.4	1.0	2.6				2.4	1.0	37.6

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

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Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2. The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P₂O₅, K x 1.2=K₂O, Mg x 1.6=MgO

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Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32392		Lancaster			P-012-160620-1115-mgw-SSA	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.9			
² Phosphorus (P)	7 ppm			
² Potassium (K)	20 ppm			
² Magnesium (Mg)	10 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 8000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 110 lb/A
 *Calcium Carbonate equivalent
 Limestone containing 1.4% Mg (2.2 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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3	Other	0	0	0	0	See ST2 for other crop recommendations
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ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC K Mg Ca			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments Zinc ppm Copper ppm Sulfur ppm		
52	9.3	9.7	0.5	0.9	2.7				2.9	1.1	42.6

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

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Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

Distribution of Soil Test Results Summaries of soil test results may be used in educational programs. However, individual results will not be released outside of Penn State without permission of the client. Electronic copies of your results are available to you, contact the lab for more information.

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32393		Lancaster			P-022-160614-1050-jsw-S1A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	3.3			
² Phosphorus (P)	7 ppm			
² Potassium (K)	139 ppm			
² Magnesium (Mg)	37 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 24000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 50 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .2% Mg (.3 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
51	26.1	15.9	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			2.2	1.9	1.6				2.7	0.9	12.4

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2.

The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P₂O₅, K x 1.2=K₂O, Mg x 1.6=MgO

Below Optimum- Nutrient is deficient. There should be an economic response to adding the recommended nutrient.

Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

Above Optimum- The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

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Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32394		Lancaster			P-022-160614-1050-jsw-S2A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	3.5			
² Phosphorus (P)	18 ppm			
² Potassium (K)	66 ppm			
² Magnesium (Mg)	18 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 23000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 80 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .3% Mg (.6 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
51	24.3	15.6	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			1.1	1.0	1.6				2.2	0.9	6.1

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

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Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2.

The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P₂O₅, K x 1.2=K₂O, Mg x 1.6=MgO

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Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32395		Lancaster			P-022-160614-1050-jsw-S3A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.2			
² Phosphorus (P)	5 ppm			
² Potassium (K)	18 ppm			
² Magnesium (Mg)	10 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 4000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 110 lb/A
 *Calcium Carbonate equivalent
 Limestone containing 2.8% Mg (4.4 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
41	5.7	6.0	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			0.8	1.4	3.4				1.1	0.7	3.6

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32396		Lancaster			P-022-160614-1050-jsw-S4A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.3			
² Phosphorus (P)	21 ppm			
² Potassium (K)	27 ppm			
² Magnesium (Mg)	9 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 9000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 110 lb/A
 *Calcium Carbonate equivalent
 Limestone containing 1.2% Mg (2 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
28	10.5	10.8	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			0.6	0.7	1.3				1.3	1.2	18.9

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

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Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

Distribution of Soil Test Results Summaries of soil test results may be used in educational programs. However, individual results will not be released outside of Penn State without permission of the client. Electronic copies of your results are available to you, contact the lab for more information.

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SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32397		Lancaster			P-022-160614-1050-jsw-SSA	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.4			
² Phosphorus (P)	7 ppm			
² Potassium (K)	37 ppm			
² Magnesium (Mg)	10 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 6000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 110 lb/A
 *Calcium Carbonate equivalent
 Limestone containing 1.8% Mg (2.9 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
48	8.1	8.5	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			1.1	1.0	2.8				1.2	1.0	18.7

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops- Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K, and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2. The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P₂O₅, K x 1.2=K₂O, Mg x 1.6=MgO

Below Optimum- Nutrient is deficient. There should be an economic response to adding the recommended nutrient.

Optimum- Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.

Above Optimum- The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N, P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

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Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32398		Lancaster			P-022-160614-1050-jsw-S6A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.5			
² Phosphorus (P)	1 ppm			
² Potassium (K)	59 ppm			
² Magnesium (Mg)	14 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 11000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 100 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .9% Mg (1.5 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
31	12.9	13.3	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			1.1	0.9	1.2				1.0	1.2	24.3

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

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Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32399		Lancaster			P-022-160614-1050-jsw-S7A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.4			
² Phosphorus (P)	1 ppm			
² Potassium (K)	53 ppm			
² Magnesium (Mg)	16 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 11000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 100 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .9% Mg (1.5 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
31	12.3	12.7	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			1.1	1.0	1.2				0.9	1.3	17.3

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

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Zn (ppm)	Cu (ppm)	S (ppm)
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DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32400		Lancaster			P-040-160615-1119-jcr-S1A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.5			
² Phosphorus (P)	11 ppm			
² Potassium (K)	147 ppm			
² Magnesium (Mg)	63 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 12000 lb/A for a target pH of 6.5. **Magnesium (Mg):** NONE
 *Calcium Carbonate equivalent

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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3	Other	0	0	0	0	See ST2 for other crop recommendations
---	-------	---	---	---	---	--

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ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments		
424	13.5	16.5	K	Mg	Ca				Zinc ppm	Copper ppm	Sulfur ppm
			2.3	3.2	12.8				3.3	1.0	19.8

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

Recommendation Messages

Enclosures

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Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can result in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

Distribution of Soil Test Results Summaries of soil test results may be used in educational programs. However, individual results will not be released outside of Penn State without permission of the client. Electronic copies of your results are available to you, contact the lab for more information.

For additional information on these topics please see the current **Penn State Agronomy Guide** or the **AASL website**: www.aasl.psu.edu. This soil test is part of an ongoing research and extension program of Penn State. If you have any questions or comments about this program or would like copies of publications referenced here, please contact your Penn State County Extension agent.



SOIL TEST REPORT FOR:				ADDITIONAL COPY TO:			
DAN FENSTERMACHER RETTEW ASSOCIATES INC 3020 COLUMBIA AVE LANCASTER PA 17603				DUANE TRUAX RETTEW ASSOCIATES 3020 COLUMBIA AVE LANCASTER PA 17603			

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
7/7/2016	S16-32401		Lancaster			P-040-160615-1119-jcr-S2A	

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
¹ Soil pH	4.0			
² Phosphorus (P)	5 ppm			
² Potassium (K)	92 ppm			
² Magnesium (Mg)	31 ppm			

RECOMMENDATIONS: (See back messages for important information)

Limestone*: 17000 lb/A for a target pH of 6.5. **Magnesium (Mg):** 60 lb/A
 *Calcium Carbonate equivalent
 Limestone containing .4% Mg (.6 % MgO) will satisfy the magnesium requirement

Plant Nutrients: (If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P ₂ O ₅ /A)	Potash (lb K ₂ O/A)	
1	Other	0	0	0	0	See ST2 for other crop recommendations

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	See ST2 for other crop recommendations
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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:			Optional Tests:			² Trace Elements					
² Calcium (ppm)	³ Acidity (meq/100 g)	⁴ CEC (meq/100 g)	% Saturation of the CEC K Mg Ca			Organic Matter %	Nitrate-N ppm	Salts mmhos/cm	See back for comments Zinc ppm Copper ppm Sulfur ppm		
57	18.9	15.8	1.5	1.6	1.8				2.2	1.0	15.5

Test Methods: ¹1:1 soil:water pH, ²Mehlich 3 (ICP), ³Mehlich Buffer pH, ⁴Summation of Cations

The high acidity of this sample indicates that a portion of the acidity is not in the exchangeable form. Therefore the CEC and the percent saturations were calculated using a maximum exchangeable acidity of 15 meq/100 g.