



STATE OF VERMONT
 AGENCY OF TRANSPORTATION
 CONSTRUCTION AND
 MATERIALS BUREAU
 CENTRAL LABORATORY

BORING LOG

**Londonderry-Chester
 STP PS19(10)
 VT-11**

Boring No.: **B-171b**
 Page No.: 1 of 1
 Pin No.: 16v121
 Checked By: SPM

Boring Crew: Gonyaw, Judkins, Olden
 Date Started: 7/25/17 Date Finished: 7/25/17
 VTSPG NAD83: N 279759.57 ft E 1609508.18 ft
 Station: mm 3.97 Offset: -11.60
 Ground Elevation: _____

Casing: WB Sampler: SS
 I.D.: 4 in 1.5 in
 Hammer Wt: N.A. 140 lb.
 Hammer Fall: N.A. 30 in.
 Hammer/Rod Type: Auto/AWJ
 Rig: CME 45C SKID CE = 1.42

Groundwater Observations		
Date	Depth (ft)	Notes
07/25/17	1.0	W.T. during drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	% Core Rec. (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 0.95		Asphalt Pavement, 0.0 ft - 0.95 ft								
2.5		A-1-b, SaGr, brn, Moist, Rec. = 1.0 ft, Lab Note: Broken and weathered rock was within sample				9-7-8-7 (15)	11.1	46.3	43.0	10.7
		A-1-b, SaGr, brn, Moist, Rec. = 0.7 ft, Lab Note: Broken and weathered rock was within sample				20-R@3.5" (R)	10.2	49.6	38.4	12.0
		Field Note:, NXDC, Cleaned out casing								
5.0		A-1-a, SaGr, gry, Moist, Rec. = 0.2 ft, Lab Note: Broken and weathered rock was within sample Field Note:, NXDC, Cleaned out casing				R@3.5" (R)	7.3	67.6	26.0	6.4
7.5		A-1-b, SaGr, gry, Moist, Lab Note: Broken and weathered rock was within sample	1 (70)	98 (67)	5	R@2.5" (R)	8.8	49.8	37.1	13.1
		7.2 ft - 11.2 ft, Dark gray-black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. At 7.8 feet, a 0.75 inch thick band of quartz and carbonate cuts through core. Joints are rough. Very hard, Unweathered, Good rock, NX, RMR=61			3					
					3					
					6					
12.5		11.2 ft - 12.2 ft, Dark gray-black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. Joints are rough. Very hard, Unweathered, Good rock, NX, RMR=61	2 (70)	100 (100)	4					
		12.2 ft - 15.8 ft, Black, Biotite GNEISS, with zones of biotite that are thinly banded with zones of quartz+/-carbonate and biotite. Very hard, Unweathered, Good rock, NX, RMR=64	3 (70)	100 (94)	4					
					4					
					4					
15.0		15.8 ft - 17.2 ft, Dark gray, Quartz-biotite GNEISS, with a roughly 0.75 inch thick band of carbonate bearing quartz that cuts across the core. Very hard, Unweathered, Good rock, RMR=64			7					
					6					
17.5		Hole stopped @ 17.2 ft								
20.0		Remarks: Hole collapsed at 5.9 feet.								

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
 <<SUB>><<SUB>> is the hammer energy correction factor.
 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG - LONDONDERRY-CHESTER STP PS19(10), SITE 3, VERMONT ROUTE 102, ST-17



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BORING LOG

Londonderry-Chester
STP PS19(10)
VT-11

Boring No.: **B-173b**
Page No.: 1 of 1
Pin No.: 16v121
Checked By: SPM

Boring Crew: Goyve, Judkins, E. Olson
Date Started: 7/25/17 Date Finished: 7/25/17
VTSPG NAD83: N 279889.88 ft E 1609608.10 ft
Station: mm 4.91 Offset: -201.500
Ground Elevation: _____

Type: _____
I.D.: _____
Hammer Wt: _____
Hammer Fall: _____
Hammer/Rod Type: _____
Rig: _____

Casing: WB
Sampler: SS
4 in
1.5 in
N.A.
140 lb.
N.A.
30 in.
Auto/AWJ
CME 45C SKID
CE = 1.42

Groundwater Observations		
Date	Depth (ft)	Notes
07/25/17	5.0	W.T. during drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 0.5		Asphalt concrete, Rec. = 0.95 ft				1-1-3-5 (4)	14.7	16.0	58.1	25.9
2.5		A-1-b, SaGr, brn, Moist, Rec. = 1.0 ft, Lab Note: Broken and weathered rock was within sample				9-7-8-7 (15)	11.1	46.3	43.0	10.7
		A-2-4, SiSa, brn, Moist, Rec. = 1.1 ft				4-2-2-2 (6)	12.3	10.8	69.2	20.0
		A-1-b, SaGr, brn, Moist, Rec. = 0.7 ft, Lab Note: Broken and weathered rock was within sample				20-R@3.5" (R)	10.2	49.6	38.4	12.0
		Field Note: NXDC, Cleaned out casing				3-5-7-8 (12)	14.5	28.1	52.4	19.5
5.0		A-1-a, SaGr, gry, Moist, Rec. = 0.2 ft, Lab Note: Broken and weathered rock was within sample				R@3.5" (R)	7.3	67.6	26.0	6.4
		Field Note: NXDC, Cleaned out casing				13-18-24-29 (42)	12.2	27.8	52.6	19.6
		A-2-4, GrSa, brn, Moist, Rec. = 1.4 ft, Lab Note: Broken rock was within sample				Field Note: NXDC, Cleaned out casing				
		A-1-b, SaGr, gry, Moist, Lab Note: Broken and weathered rock was within sample	1 (70)	98 (67)	5	R@2.5" (R)	8.8	49.8	37.1	13.1
7.5		A-1-b, GrSa, brn, Moist, Lab Note: Broken rock was within sample				15-19-24-30 (43)	9.8	42.8	43.7	13.5
		7.2 ft - 11.2 ft, Dark gray black, Biotite-quartz GNEISS with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. At 7.8 feet, a 0.75 inch thick band of quartz and carbonate cuts through core. Joints are rough. Very hard, Unweathered, Good rock, NX, RMR=61				Field Note: NXDC, Cleaned out casing				
		A-1-b, SaGr, gry, Moist, Lab Note: Broken rock was within sample				12-R@2.5" (R)	10.9	39.3	43.7	17.0
10.0		10.7 ft - 11.5 ft, Light gray, Sugary QUARTZITE, with small size grains that host sulfidic, thin bands of biotite, dipping at ~50 degrees.	1 (80)	100 (68)	5	Top of Bedrock @ 10.7 ft				
		11.5 ft - 12.2 ft, Dark gray black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. Joints are rough. Very hard, Unweathered, Good rock, NX, RMR=49								
		12.2 ft - 12.3 ft, Dark gray black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. Soft, Moderately weathered, Fair rock, RMR=49	3 (70)	100 (94)	4					
		12.3 ft - 13.0 ft, Bluggy quartz PEGMATITE, with significant bright orange oxidation. Soft, Moderately weathered, Fair rock, RMR=49								
12.5		13.0 ft - 15.7 ft, Black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. Joints are rough with moderate oxidation surrounding the biotite. Soft, Moderately weathered, Fair rock, RMR=49								
		15.7 ft - 17.2 ft, Black, Biotite-quartz GNEISS, with zones of biotite and quartz that are thinly banded with zones of quartz and biotite. At 16.5 ft, a 0.75 inch thick band of carbonate bearing quartz cuts across the hole. Joints are rough with light orange oxidation surrounding the biotite. Soft, Moderately weathered, Fair rock, NX, RMR=59	2 (70)	70 (95)	5					
		Hole stopped @ 17.2 ft								
		Hole stopped @ 18.7 ft								
17.5		Hole stopped @ 17.2 ft								
		Hole stopped @ 18.7 ft								
20.0		Remarks: Hole collapsed at 5.9 feet.								
		Remarks: Hole collapsed at 7.8 feet.								

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BORING LOG

Londonderry-Chester
STP PS19(10)
VT-11

Boring No.: B-174b
Page No.: 1 of 1
Pin No.: 16v121
Checked By: SPM

Boring Crew: Garrow, Judkins, Mazzei
Date Started: 7/21/17 Date Finished: 7/21/17
VTSPG NAD83: N 279719.54 ft E 1609653.22 ft
Station: mm 4.00 Offset: -10.20
Ground Elevation: _____

Type: WB SS
I.D.: 4 in 1.5 in
Hammer Wt: N.A. 140 lb.
Hammer Fall: N.A. 30 in.
Hammer/Rod Type: Auto/AWJ
Rig: CME 45C SKID CE = 1.42

Groundwater Observations		
Date	Depth (ft)	Notes
07/21/17	4.2	W.T. during drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 1.15		Asphalt Pavement, 0.0 ft - 1.15 ft								
2.5		A-2-4, GrSiSa, brn, Moist, Rec. = 0.8 ft				6-6-6-5 (12)	16.3	25.8	39.8	34.4
5.0		A-1-b, GrSa, brn, Moist, Rec. = 1.3 ft, Lab Note: Broken rock was within sample Field Note: NXDC, Cleaned out casing, Cobbles				13-23-36-24 (59)	8.7	35.0	50.0	15.0
5.0		A-1-a, SaGr, gry, Moist, Rec. = 0.4 ft, Lab Note: Broken and weathered rock was within sample				R@5" (R)	10.8	66.3	29.5	4.2
7.5		6.4 ft - 8.4 ft, Light gray, Quartz-biotite-muscovite GNEISS, with zones of quartz and biotite that are banded with wide zones of sulfidic muscovite-biotite and quartz. Joints are rough with a light orange oxidation. Very hard, Unweathered, Good rock, NX, RMR=64	1 (80)	70 (93)	10 10					
10.0		8.8 ft - 11.8 ft, Light gray, Quartz-biotite-muscovite GNEISS, with zones of quartz and biotite that are banded with zones of sulfidic muscovite-biotite and quartz. Joints are rough with a light orange oxidation. Very hard, Unweathered, Good rock, NX, RMR=61	2 (70)	83 (88)	3 3 3					
12.5		11.8 ft - 14.8 ft, Dark gray, Quartz-biotite GNEISS, with zones of quartz and biotite that are banded with zones of quartz and low concentrations of carbonate. Very hard, Unweathered, Good rock, NX, RMR=61	3 (70)	100 (70)	5 11 7					
15.0		14.8 ft - 16.8 ft, Dark gray-black, Biotite-quartz GNEISS, with zones of biotite +/- muscovite that are thinly banded with wider zones of biotite and quartz. Joints are slightly open and rough. Very hard, Unweathered, Good rock, RMR=61			3 5					
17.5		Hole stopped @ 16.8 ft								
20.0		Remarks: Hole collapsed at 9.9 feet.								

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Londonderry-Chester
STP PS19(10)
VT-11

Boring No.: **B-176b**

Page No.: 1 of 1

Pin No.: 16v121

Checked By: SPM

Boring Crew: Emerson, Judkins, Mazzei

Date Started: 7/20/17 Date Finished: 7/20/17

VTSPG NAD83: N 279704.40 ft E 1609751.26 ft

Station: mm 4.02 Offset: -10.00

Ground Elevation: _____

Casing Sampler
Type: WB SS
I.D.: 4 in 1.5 in
Hammer Wt: N.A. 140 lb.
Hammer Fall: N.A. 30 in.
Hammer/Rod Type: Auto/AWJ
Rig: CME 45C SKID CE = 1.42

Groundwater Observations

Date	Depth (ft)	Notes
07/20/17	7.3	W.T. during drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 0.94		Asphalt Pavement, 0.0 ft - 0.94 ft								
2.5		A-1-b, SaGr, brn, Moist, Rec. = 0.6 ft				9-11-8-16 (19)	7.7	52.1	37.9	10.0
		A-1-b, GrSa, brn, Moist, Rec. = 0.5 ft				R@5" (R)	16.3	31.0	59.9	9.1
		Field Note:, NXDC, Cleaned out casing								
5.0		A-1-b, SaGr, Lt/brn, Moist, Rec. = 1.2 ft				9-18-25-R@5" (43)	8.2	52.5	34.7	12.8
		Field Note:, NXDC, Cleaned out casing, cobbles								
7.5		7.5 ft - 9.5 ft, Light gray, Quartz-muscovite-biotite-plagioclase GNEISS, with zones of quartz +/- plagioclase are banded with zones of muscovite and biotite. Joints are rough with a light orange oxidation. Very hard, Unweathered, Good rock, NX, RMR=61	1 (90)	90 (89)	5					
		Field Note:, NXDC, Cleaned out casing								
12.5		11.0 ft - 16.0 ft, Light gray, Biotite-quartz-muscovite-plagioclase GNEISS, with zones of quartz +/- plagioclase are banded with zones of muscovite and biotite. Pegmatic zones locally increase quartz-plagioclase content and grain size. Joints are rough with a light orange oxidation. Very hard, Unweathered, Fair rock, NX, RMR=57	2 (70)	100 (58)	7					
					6					
					4					
					6					
					4					
17.5		16.0 ft - 21.0 ft, Light gray, Quartz-muscovite-biotite-plagioclase GNEISS, with zones of quartz +/- plagioclase are banded with zones of muscovite and biotite. Joints are rough with a light orange oxidation. Very hard, Unweathered, Fair rock, NX, RMR=57	3 (70)	84 (71)	4					
					4					
					4					
					10					
					6					
22.5		Hole stopped @ 21.0 ft								
		Remarks: Hole collapsed at 9.9 feet.								

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 <<SUB>><<SUB>> is the hammer energy correction factor.
 3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 2 LONDONDERRY-CHESTER ST19(10).GPJ VERMONT AOT.GDI 8/24/17