



PROJECT 11-1191-0007

RECORD OF BOREHOLE No H2-40

1 OF 2 METRIC

G.W.P. 156-98-00

LOCATION N 5136342.7; E 274086.8

ORIGINATED BY EHS

DIST

HWY 17

BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers

COMPILED BY EC

DATUM Geodetic

DATE March 16, 2012

CHECKED BY SEMP

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
240.0	GROUND SURFACE												
0.0	PEAT (Fibrous to amorphous) Very soft Black Frozen to wet	1	SS	3									
		2	SS	WH									
		3	SS	WH									
237.8													
2.2	CLAY, trace sand Soft to firm Grey to brown Wet	4	SS	5									
		5	SS	2									
	Varved below 4.6 m depth.	6	SS	WH									
		7	SS	WH									
232.7													
7.3	Augers grinding at 7.2 m depth. SAND and SILT, trace clay Very loose to loose Grey Wet	8	SS	4									
		9	SS	WH									
229.9													
10.1	Silty SAND and GRAVEL, trace clay Compact Grey Wet	10	SS	13									
	Approximately 0.3 m of heave encountered at 12.2 m depth.	11	SS	21									
		12	SS	24									
225.7													
14.3													

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+ 3, x 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MSS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007

G.W.P. 156-98-00

DIST

DATUM Geodetic

LOCATION N 5136327.3; E 274078.6

BOREHOLE TYPE Portable Equipment, NW Casing, Wash Boring

DATE May 4 and 7, 2012

1 OF 2 METRIC

ORIGINATED BY GM

COMPILED BY EC

CHECKED BY SEMP

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			20	40	60	80	100			
239.8 0.0	GROUND SURFACE PEAT (Fibrous to Amorphous) Very soft Black Frozen to wet		1	SS	11									
			2	SS	1									
			3	SS	WH									
237.6 2.2	CLAYEY SILT, trace organics Soft Grey to black Wet		4	SS	WH									
236.6 3.2	SILTY CLAY, varved Soft to firm Grey Wet		5	SS	2									
			6	SS	2									
			7	SS	WH									
			8	SS	1									
232.3 7.5	CLAYEY SILT, varved Firm Grey Wet		9	SS	4									
230.9 8.9	SAND and SILT, trace clay Very loose Grey to brown Wet Between 0.2 m and 0.9 m of heave encountered below depth of 9.7 m.		10	SS	3									
229.6 10.2	Gravelly SAND Compact to dense Brown Wet		11	SS	8									
			12	SS	24									
225.9 13.9			13	SS	36/0.15									

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-38		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136313.2; E 274071.8		ORIGINATED BY GM	
DIST _____ HWY 17		BOREHOLE TYPE Portable Equipment, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE May 7 and 8, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
239.8	GROUND SURFACE												
0.0	PEAT (Fibrous to Amorphous) Very soft Black Frozen to wet	1	SS	5									
		2	SS	WH									
		3	SS	WH									
		4	SS	1									
		5	SS	1									
236.4	CLAY, varved Very soft to stiff Grey Wet	6	SS	6									
3.4		7	SS	WH									
		8	SS	WH									
232.6	SILT, some clay Very loose Grey Wet	9	SS	2									
7.2													
231.1	SAND and SILT, trace to some gravel, trace clay Loose Grey Wet	10	SS	4									
8.7	Between 0.2 m and 1.5 m of heave encountered below depth of 9.9 m.	11	SS	5									
		12	SS	8									
226.5	Gravelly SAND Compact Grey to brown Wet	13	SS	22									
13.3													
225.5													
14.3													

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+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SUD-WTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+³, ×³: Numbers refer to Sensitivity ○^{3%} STRAIN AT FAILURE



+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-35		1 OF 2 METRIC								
G.W.P. 156-98-00		LOCATION N 5136310.1; E 274032.3		ORIGINATED BY GM								
DIST _____ HWY 17		BOREHOLE TYPE Portable Equipment, NW Casing, Wash Boring		COMPILED BY EC								
DATUM Geodetic		DATE May 1 and 2, 2012		CHECKED BY SEMP								
SOIL PROFILE		SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE			*N* VALUES	SHEAR STRENGTH kPa					
239.7	GROUND SURFACE											
0.0	PEAT (Fibrous to Amorphous) Very soft Black Frozen to wet	1	SS	8								
		2	SS	1								
		3	SS	WH								
		4	SS	WH								
236.3		5	SS	WH								
3.4	CLAYEY SILT, some sand, trace to some gravel Very soft Grey Wet	6	SS	WH								
235.0		7A										
4.7	CLAY, varved Soft Grey Wet	7B	SS	7								
		8	SS	WH								
		9	SS	WH								
229.0		10	SS	2								
10.7	SILT, trace to some clay, trace sand Very loose to loose Grey Wet	11	SS	8								
		12	SS	10								
224.9												
14.8												

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+ 3, × 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-33		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136300.2; E 274007.1		ORIGINATED BY AC	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE March 27, 2012		CHECKED BY SEMP	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED	PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
239.8 0.0	GROUND SURFACE PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	1		239						
			2	AS	WH			238					
			3	SS	WH			237					
			4	SS	WH			236					
			5	SS	WH			235					
236.2 3.6	CLAYEY SILT, some sand, some gravel Very stiff Grey Wet		6	SS	WH			234					
234.8 5.0	SILTY CLAY, varved Soft to firm Grey to brown Wet		7	SS	WH			233					
			8	SS	WH			232					
								231					
			9	SS	WH			230					
			10	SS	WH			229					
231.4 8.4	CLAYEY SILT Firm Grey Wet		11	SS	6			228					
						227							
226.5 13.3	SILT, trace to some sand, trace clay Very loose to compact Grey Wet		12	SS	7		226						
						225							

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-32		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136307.3; E 273993.6		ORIGINATED BY AC	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE March 27 and 28, 2012		CHECKED BY SEMP	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100					
239.8	GROUND SURFACE														
0.0	PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	12										
			2	SS	WH										
			3	SS	WH										
			4	SS	WH										
			5	SS	WH										
236.2															
3.6	CLAYEY SILT, some gravel, some sand Soft Grey Wet		6	SS	2										
235.3															
4.5	SILTY CLAY Soft to firm Grey to brown Wet		7	SS	5										
			8	SS	WH										
			9	SS	WH										
			10	SS	WH										
229.6															
10.2	CLAYEY SILT Firm Grey Wet		11	SS	WH										
228.1															
11.7	SILT, trace to some clay Very loose Grey Wet		12	SS	4										
			13	SS	2										
225.0															
14.8															

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+ 3, x 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



SOIL PROFILE						SAMPLES		DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L			
239.7 0.0	PEAT (Fibrous) Very soft Black Frozen to wet	[Pattern]	1	SS	1		239						
			2	SS	WH		238						
			3	SS	WH		237						
			4	SS	WH		236						
236.2 3.5	CLAYEY SILT Soft Grey Wet	[Pattern]	5	SS	WH		235						
			6	SS	5		234						
			7	SS	3		233						
234.1 5.6	SILT CLAY to CLAY, varved Firm Grey to brown Wet	[Pattern]	8	SS	WH		232						
			9	SS	WH		231						
			10	SS	WH		230						
			11	SS	WH		229						
227.7 12.0	SILT, trace to some sand, trace clay Very loose to compact Grey Wet	[Pattern]	12	SS	WH		228						
			13	SS	5		227						
							226						
							225						

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-29		1 OF 2 METRIC			
G.W.P. 156-98-00		LOCATION N 5136285.6; E 273970.8		ORIGINATED BY EHS			
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC			
DATUM Geodetic		DATE April 13 and 16, 2012		CHECKED BY SEMP			
SOIL PROFILE		SAMPLES		DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER TYPE "N" VALUES				
239.8 0.0	GROUND SURFACE						
	PEAT (Fibrous) Very soft Black Frozen to wet		1 SS 9				
			2 SS WH				
			3 SS WH				
			4 SS WH				
236.4 3.4	SILTY CLAY Soft to stiff Grey to brown Wet		5 SS WH				
			6 SS 5				
			7 SS WH				
			8 TO WH				
			9 SS WH				
			10 SS WH				
			11 SS WH				
227.9 11.9	SILT, trace to some clay, trace sand Very loose to loose Grey Wet		12 SS WH				
			13 SS 9				

Varved below 5.6 m depth.

0 2 90 8

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+ 3, x 3: Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-28		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136292.2; E 273957.6		ORIGINATED BY EHS	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE April 12 and 13, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
239.8	GROUND SURFACE												
0.0	PEAT (Fibrous) Very soft Black Frozen to wet	1	SS	2									
		2	SS	WH									
		3	SS	WH									
		4	SS	WH									
		5	SS	WH									
236.1													
3.7	CLAY to SILTY CLAY Soft to stiff Grey to brown Wet Varved between 3.7 m depth and 5.9 m depth.	6	SS	4									
		7	SS	WH									
		8	SS	WH									
		9	SS	WH									
229.6													
10.2	SILT, trace to some clay, trace sand Very loose Grey Wet	10	SS	WH									
		11	SS	3									
		12	SS	1									
225.0													
14.8													

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-26		1 OF 1 METRIC	
G.W.P. 156-98-00		LOCATION N 5136275.4; E 273944.9		ORIGINATED BY EHS	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE April 18, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
239.7	GROUND SURFACE												
0.0	PEAT (Fibrous to amorphous) Very soft Black Frozen to wet	1	SS	4									
		2	SS	WH									
		3	SS	WH									
237.2		4	SS	WH									
2.5	CLAY, varved Soft to firm Grey to brown Wet Trace organics above 3.0 m depth.	5	SS	.2									
		6	SS	WH									
		7	TO	PH									
232.6													
7.1	CLAYEY SILT, trace sand Firm Grey Wet	8	SS	WH									
230.5		9	SS	8/0.05									
9.2	END OF BOREHOLE SPOON REFUSAL (HAMMER BOUNCING) Note: 1. Water level at a depth of 0.8 m below ground surface (Elev. 238.9 m) upon completion of drilling.												

+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007

RECORD OF BOREHOLE No H2-24

1 OF 1 METRIC

G.W.P. 156-98-00

LOCATION N 5136264.2; E 273916.0

ORIGINATED BY EHS

DIST HWY 17

BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers

COMPILED BY EC

DATUM Geodetic

DATE April 19, 2012

CHECKED BY SEMP

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE								
239.6 0.0	GROUND SURFACE											
	PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	6							
			2	SS	WH							
			3	SS	WH							
237.4 2.2	SILT, trace to some sand, trace clay Loose Grey Wet		4	SS	6							
			5	SS	8							
235.9 3.7	SAND and GRAVEL, some silt Compact Grey Wet		6	SS	16							
			7	SS	25							
234.4 5.2	END OF BOREHOLE											
233.8 5.8	END OF DCPT REFUSAL TO FUTHER PENETRATION (HAMMER BOUNCING) Notes: 1. Water level at a depth of 0.3 m below ground surface (Elev. 239.3 m) upon completion of drilling. 2. Augers sliding north at a depth of 4.3 m below existing ground surface.											

+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MSS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-22		1 OF 1 METRIC	
G.W.P. 156-98-00		LOCATION N 5136255.2; E 273892.6		ORIGINATED BY AC	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers		COMPILED BY EC	
DATUM Geodetic		DATE April 10, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa								WATER CONTENT (%)	
							20	40	60	80	100						
240.3	GROUND SURFACE																
0.0	ORGANICS																
0.1	SILT, trace to some sand, trace clay Loose to compact Brown Moist to wet		1	SS	6												
			2	SS	15												
			3	SS	12												
			4	SS	17												
237.1			5	SS	5/0.2												
3.2	END OF BOREHOLE SPOON REFUSAL (HAMMER BOUNCING) AND AUGER REFUSAL Note: 1. Borehole dry upon completion of drilling.																



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-21		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136381.4; E 274112.1		ORIGINATED BY EHS	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers		COMPILED BY EC	
DATUM Geodetic		DATE March 7, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED	PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER TYPE "N" VALUES						
240.3 0.0	GROUND SURFACE CLAYEY SILT, some sand Brown Wet		1 AS -	▽	240				NP
239.5 0.8	SILTY CLAY Firm to stiff Grey to brown Wet Varved below 2.3 m depth.		2 SS 11		239				
			3 SS 9		238				
			4 SS 1		237				
			5 SS 1		236				
236.0 4.3	SILT, trace to some clay Very loose Grey Wet		6 SS 4		235				
234.7 5.6	Sandy SILT, trace clay Very loose Grey Wet Between 0.9 m and 1.2 m of heave encountered below depth of 6.7 m		7 SS WH		234				
			8 SS WH		233				
231.6 8.7	SAND, trace to some silt, trace gravel Very loose to compact Grey Wet		9 SS 2		232				
			10 SS 17		231				
229.0 11.3	END OF BOREHOLE			230					
				229					
				228					
				227					
				226					

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+ 3, × 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007

RECORD OF BOREHOLE No H2-19

2 OF 2 METRIC

G.W.P. 156-98-00

LOCATION N 5136372.0; E 274089.0

ORIGINATED BY EHS

DIST HWY 17

BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers

COMPILED BY EC

DATUM Geodetic

DATE March 8 and 9, 2012

CHECKED BY SEMP

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)			
	--- CONTINUED FROM PREVIOUS PAGE ---															
224.4	Gravelly SAND, some silt, trace clay Loose to compact Grey Wet		13	SS	17		225									
15.8	END OF BOREHOLE Note: 1. Water level at a depth of 2.0 m below ground surface (Elev. 238.2 m) upon completion of drilling.															

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-18				2 OF 2		METRIC									
G.W.P. 156-98-00		LOCATION N 5136356.7; E 274081.7				ORIGINATED BY EHS											
DIST HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers				COMPILED BY EC											
DATUM Geodetic		DATE March 9, 2012				CHECKED BY SEMP											
SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa								WATER CONTENT (%)	
	— CONTINUED FROM PREVIOUS PAGE —						20	40	60	80	100						
	END OF BOREHOLE																
222.0																	
18.1	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)																
	Notes: 1. Water level at a depth of 0.9 m below ground surface (Elev. 239.2 m) upon completion of drilling.																

PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-17		1 OF 1 METRIC					
G.W.P. 156-98-00		LOCATION N 5136363.0; E 274065.6		ORIGINATED BY EHS					
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers		COMPILED BY EC					
DATUM Geodetic		DATE March 19, 2012		CHECKED BY SEMP					
SOIL PROFILE		SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p W W _L WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER						
239.9 0.0	GROUND SURFACE								
	PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	31				
			2	SS	WH				
			3	SS	WH				
237.8 2.1	SILTY CLAY Soft to stiff Grey to brown Wet		4	SS	6				
	Varved below 3.8 m depth.		5	SS	WH				
			6	SS	WH				
232.5 7.4	SILT, trace sand, trace clay Very loose Grey Wet		7	SS	3				
	Between 0.3 m and 2.4 m of heave encountered below a depth of 8.2 m.		8	SS	WH				
229.2 10.7	SAND, some silt, some gravel Very loose		9	SS	1				
228.6 11.3	END OF BOREHOLE								
227.8 12.1	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)								
	Notes: 1. Water level at a depth of 1.8 m below ground surface (Elev. 238.1 m) upon completion of drilling.								

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



PROJECT	11-1191-0007	RECORD OF BOREHOLE No H2-15	1 OF 1	METRIC
G.W.P.	156-98-00	LOCATION	N 5136353.5; E 274042.1	ORIGINATED BY EHS
DIST	HWY 17	BOREHOLE TYPE	108 mm I.D. Continuous Flight Hollow Stem Augers	COMPILED BY EC
DATUM	Geodetic	DATE	March 20, 2012	CHECKED BY SEMP

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × REMOULDED							
239.9	GROUND SURFACE															
0.0	PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	27											
			2	SS	1											
			3	SS	WH											
237.6	SILTY CLAY Soft to firm Grey Wet		4	SS	3											
2.3			5	SS	WH											
	Varved below 5.3 m depth.		6	SS	WH											
232.9	SILT, trace sand Very Loose Grey Wet		7	SS	1											
7.0	Between 0.9 m and 2.4 m of heave encountered below 8.2 m.															
231.2	SAND, some silt, trace gravel Very loose to loose Grey Wet		8	SS	WH											
8.7			9	SS	7											
228.6	END OF BOREHOLE															
11.3																
226.2	END OF DCPT															
13.7	Notes: 1. Water level at a depth of 1.4 m below ground surface (Elev. 238.5 m) upon completion of drilling.															

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-14		1 OF 2 METRIC	
G.W.P. 156-98-00	LOCATION N 5136338.5; E 274035.1	ORIGINATED BY EHS			
DIST _____ HWY 17	BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers	COMPILED BY EC			
DATUM Geodetic	DATE March 20 and 21, 2012	CHECKED BY SEMP			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa								WATER CONTENT (%)
							○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × REMOULDED							
239.8 0.0	GROUND SURFACE PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	15										
			2	SS	WH										
			3	SS	WH										
			4	SS	WH										
			5	SS	WH										
235.8 4.0	SILTY CLAY, trace sand, varved Soft to firm Grey to brown Wet		6	SS	WH										
			7	SS	WH										
			8	SS	WH										
231.3 8.5	SILT, some sand, trace clay Very loose Grey Wet		9	SS	WH										
	Between 0.5 m and 2.1 m of heave encountered below 9.7 m.														
229.7 10.1	Silty SAND, trace gravel Very loose Grey Wet		10	SS	1										
			11	AS	-										
227.6 12.2	END OF BOREHOLE														

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT 11-1191-0007

RECORD OF BOREHOLE No H2-13

1 OF 2 METRIC

G.W.P. 156-98-00

LOCATION N 5136344.5; E 274018.8

ORIGINATED BY EHS

DIST HWY 17

BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers

COMPILED BY EC

DATUM Geodetic

DATE March 21, 2012

CHECKED BY SEMP

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE								
239.9 0.0	GROUND SURFACE PEAT (Fibrous to amorphous) Very soft Black Frozen to wet		1	SS	13							
			2	SS	WH							
			3	SS	WH							
			4	SS	WH							
236.5 3.4	SILTY CLAY, trace sand, varved Soft to firm Grey to brown Wet		5	SS	WH							
			6	SS	WH							
			7	SS	WH							
			8	SS	3							
231.1 8.8	SILT, trace to some sand, trace clay Very loose Grey Wet Between 1.5 and 4.6 m of heave encountered below 9.1 m.		9	SS	WH							
			10	SS	WH							
228.6 11.3	END OF BOREHOLE											

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 1703/14 DATA INPUT:

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+ 3, × 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-12		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136351.0; E 274003.6		ORIGINATED BY EHS	
DIST HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers		COMPILED BY EC	
DATUM Geodetic		DATE March 21, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER TYPE "N" VALUES											
239.9 0.0	GROUND SURFACE PEAT (Fibrous) Very soft Black Frozen to wet		1 SS 18		239				GR SA SI CL					
			2 SS WH		238									
	No recovery in sample from 1.5 m to 2.1 m depth.		- SS WH											
237.2 2.7	SILTY CLAY, trace sand, varved Soft to firm Grey to brown Wet	3A SS WH	237											
		3B SS 2												
		4 SS 2	236											
		5 SS WH	235											
		6 SS WH	234											
232.5 7.4	SILT, trace to some clay, trace sand Very loose to loose Grey Wet		7 SS 5		233				0 1 88 11					
					232									
					231									
			8 SS 5		230									
	Between 0.6 m and 4.0 m of heave encountered below 9.8 m depth.									229				
		9 SS WH								228				
227.7 12.2	END OF BOREHOLE	10 AS -								227				
										226				
										225				

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+ 3, x 3: Numbers refer to Sensitivity
o 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-10		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136320.7; E 273988.4		ORIGINATED BY AC	
DIST HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing and Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE March 23, 2012		CHECKED BY SEMP	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)	
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL							× REMOULDED
239.8	GROUND SURFACE					20 40 60 80 100	20 40 60 80 100	20 40 60 80 100									
0.0	PEAT (Fibrous) Very soft Black Frozen to wet		1	SS	3	▽	239										
			2	SS	WH		238										
			3	SS	WH		237										
			4	SS	WH		236										
			5	SS	WH		235										
236.3	CLAY Soft to firm Grey Wet						234	7 +									
3.5			6	SS	3		233	8 +									
			7	SS	WH		232	5 +									
			8	SS	WH		231	5 +									
							230										
230.9	SILT, trace sand, trace clay Loose Grey Wet		9	SS	4		229										
8.9			10	SS	8		228										
			11	SS	9		227										
							226										
							225										
226.6	Sandy SILT, trace clay Very loose to loose Grey Wet		12	SS	3												
13.3																	

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE



PROJECT 11-1191-0007		RECORD OF BOREHOLE No H2-9		1 OF 2 METRIC	
G.W.P. 156-98-00		LOCATION N 5136326.6; E 273972.2		ORIGINATED BY AC	
DIST _____ HWY 17		BOREHOLE TYPE 108 mm I.D. Continuous Flight Hollow Stem Augers, NW Casing, Wash Boring		COMPILED BY EC	
DATUM Geodetic		DATE April 2, 2012		CHECKED BY SEMP	

SOIL PROFILE		SAMPLES		GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p W W _L WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER TYPE "N" VALUES						
239.8 0.0	GROUND SURFACE								
	PEAT (Fibrous) Very soft Black Frozen to wet		1 SS 2		239				
			2 SS 1					574.6	
			3 SS WH		238				
			4 SS WH		237				
236.4 3.4	SILTY CLAY Soft to stiff Grey Wet		5 SS WH		236				2 18 39 41
			6 SS WH		235				
					234				
			7 SS WH		233				
					232				
			8 SS WH		231				
					230				
			9 SS 3		229				
					228				
			10 SS 6		227				
					226				
			11 SS 7		225				
			12 SS 2						
229.6 10.2	SILT, trace to some sand, trace clay Very loose to compact Grey Wet								0 8 89 3

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+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

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SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE