Sub-Surface Log

Test Hole TH19-03

Client:	Blumetric Environmental	**Project Number:**	[redacted]
Project Name:	Former Wellgreen Mill and Tailings Area	**Location:**	UTM 7V, 6820464 m N, 589152 m E (Tailings Dam)
Contractor:	Midnight Sun Drilling Inc.	**Ground Elevation:**	791.31 m
Method:	100 mm sonic core in 152 mm casing hole, Rig 9 Terrasonic track mounted	**Date Drilled:**	9 October 2019 - 9 October 2019

Sample Type: Grab (G) | Shelby Tube (T) | Split Spoon (SS) | Split Barrel (SB) | Core (C)

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Backfill Legend: Bentonite | Cement | Drill Cuttings | Filter Pack Sand | Grout | Slough

Elevation (m)	Depth (m)	Soil Symbol	SP-03	MATERIAL DESCRIPTION	Sample Type	Sample Number	SPT (N)	Temperature (°C)
	0			GRAVEL (FILL) - sandy, trace clay, trace silt, trace organics and trace rootlets to depth of 150 mm - grey - frozen to 0.3 m depth, moist when thawed, loose - well-graded, fine sand to coarse gravel - sub-rounded		G145		0.6
	0.5							4.3
	1.0			- compact below 0.8 m - trace cobbles (<130 mm diam.) below 0.9 m		SS146	16	
	1.5			- light grey, moist to wet below 1.5 m		SS147	6	8.2
789.0	2.0			- trace clay, no plasticity below 1.8 m SILT - some sand, trace clay, trace organics - grey - moist, loose - no to low plasticity		SS148	6	9.6
	2.5							10
	3.0			- trace wood debris (<50 mm thick) at 3.0 m		SS149	7	
787.5	3.5			SAND AND GRAVEL - trace fines - brown, wet, compact - well-graded fine sand to coarse gravel - sub-rounded		SS150	15	9.9
	4.0			- fine sand seam (300 mm thick) at 4.3 m, trace cobbles (<130 mm diam.) below 4.3 m		G151		
	4.5					SS152	16	
	5.0					G153		7.5
	5.5						22	
								8.6

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21

Particle Size (%): 0 20 40 60 80 100

PL MC LL: 0 20 40 60 80 100

Undrained Shear Strength (kPa)

Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○

0 50 100 150 200 250

Logged By: [redacted] **Reviewed By:** [redacted] **Project Engineer:** [redacted]

SUB-SURFACE LOG LOGS 2019-11-08 WELLGREEN WORKPLAN SITE (TEST HOLES)_FINAL_BT 0154-015-00.GPJ TREK GEOTECHNICAL.GDT 28/11/19

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Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Type	Sample Number	SPT (N)	Temperature (°C)
785.2	0					
	6.5	SILT - trace clay, trace fine sand, trace organics, trace wood debris (<15 mm thick) to 6.4 m - mottled black and grey - moist, compact - no to low plasticity		SS154	16	10.3
	7.0				19	10.6
	7.5	- 0.3 m thick organic seam (Von Post H9) at 7.3 m		G155		
783.2	8.0	- trace gravel (<25 mm diam.) below 7.9 m			48	
		SAND AND GRAVEL - trace fines - brown - wet, very dense - well-graded, fine sand to coarse gravel - sub-rounded		G156		8.6
	8.5	- trace clay, no plasticity below 8.4 m			39	9.9
	9.0	- some silt below 9.0 m				
	9.5			SS157	53	
781.3	10.0	SILT - some sand, trace clay - dark grey - moist, compact - no plasticity		G158		10.3
	10.5				13	
	11.0	- trace gravel (<20 mm diam.) below 11.0 m				10.6
779.7	11.5	SAND AND GRAVEL - trace fines, trace cobbles (<100 mm diam.) - reddish brown - moist, dense - poorly-graded, fine sand to coarse gravel - sub-rounded		G159		11.6
	12.0	- moist to wet below 12.2 m			41 / 122mm	
	12.5					11.2
	13.0					10.3

Soil Symbol: SP-03

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21

Particle Size (%): 0 20 40 60 80 100

PL MC LL: 0 20 40 60 80 100

Undrained Shear Strength (kPa)

Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○

0 50 100 150 200 250

Logged By: [redacted] Reviewed By: [redacted] Project Engineer: [redacted]

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Elevation (m)	Depth (m)	Soil Symbol	SP-03	MATERIAL DESCRIPTION	Sample Type	Sample Number	SPT (N)	Temperature (°C)
	13.5							
	14.0			- grey below 13.7 m		SS160	100 / 274mm	
	14.5							13.2
	15.0					G161		
776.0							50 / 122mm	

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21

Particle Size (%): 0 20 40 60 80 100

PL MC LL: 0 20 40 60 80 100

Undrained Shear Strength (kPa)

Test Type
△ Torvane △
✤ Pocket Pen. ✤
☒ Qu ☒
○ Field Vane ○

0 50 100 150 200 250

END OF TEST HOLE AT 15.4 m IN SAND AND GRAVEL

Notes:

1. Seepage between between 1.5 m and 2.7 m depth, between 3.8 m and 6.1 m depth, between 8.1 m and 10.0 m depth and below 12.2 m below ground surface.
2. Sloughing could not be observed due to drilling method.
3. Standpipe SP-03 (50 mm diameter) installed at 4.6 m below ground surface.
4. Test Hole backfilled with cuttings from the bottom of test hole to 4.6 m depth, sand from 4.6 m to 2.4 m depth, and bentonite chips from 2.4 m depth to surface.
5. Groundwater level measured in SP-03 at elevation 787.911 m on October 10, 2019.

Logged By: [redacted] **Reviewed By:** [redacted] **Project Engineer:** [redacted]