

MP00068

<b>TO: KP VANCOUVER</b> <b>cc: George Headley, MHI</b> <b>604-932-8491</b>  <b>DESTINATION FAX NO: 604-685-8147</b>	<b>FROM: Knight Piesold Ltd.</b> <span style="float: right;">149</span> <b>Mount Pelley Site</b> <b>Box 12, Liberty B.C.</b> <b>Tel: 604-517-0439</b>  <b>APPROVED BY: [Signature]</b> <b>ORIGIN FAX NO: 604-517-8256</b>
<b>ATTENTION: Graham Greenaway</b>	<b>SENDER: Peter Procter</b>
<b>SUBJECT: Borehole Logs for</b> <b>FRW 96-1 to 4</b>  <b>PAGE 1 OF 8</b>	<b>DATE: July 30, 1996</b> <b>TIME: 12:00</b> <b>FILE NO: 1027.F01/F05</b> <b>REFERENCE NO: 96/001</b> <b>OPERATOR: [Signature]</b>

Graham:

Here are the borehole logs for the holes drilled for Pressure Relief Walls along the foundation drain of the main embankment. They seem to correlate fairly well to the CPT logs, except for the apparently low densities observed in the "sensitive silt unit" which appeared loose on sugar flights but the CPT indicated that the unit was in fact very stiff.

Regards,

Peter Procter  
Knight Piesold Ltd.

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		TEST HOLE LOG					TEST HOLE No. <u>PRW 96-7</u> SHEET <u>1 of 2</u>
PROJECT <u>MT POLLEY</u>				PROJECT No. <u>1657</u>			
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - EAST</u>				GROUND ELEVATION _____			
DATE BEGUN <u>JULY 28/96</u>				DATE FINISHED <u>JULY 28/96</u>		LOGGED BY <u>RJP</u>	
NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	POCKET PENETROMETER (kg/cm <sup>2</sup> )	TORVANE (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Solid Stem AUGER METHOD - very good to excellent recovery.					0.2		ORGANICS / TOPSOIL - Already stripped off
	1.5						SILT (Till) - stiff, sandy and gravelly, trace to some clay, massive, well graded, low to mod plasticity, moist to very moist, medium brown.
	1.75						
	1.5					0.6	- becoming stiff to very stiff and moist. Natural m/c & p.
	1.6						
						3.0	- becoming finer grained with some gravel, sand and clay to clayey, stiff, mod plasticity and moist,
						4.5	CLAY & SILT (Glaciolacustrine) - interbedded with till-like coarse material, firm, brown.
	0.5	3.0				5.4	SAND (TILL) - very dense, some gravel to gravelly, silty, trace clay, massive, low plasticity, moist, grey.
	0.7	4.0					
	4.0					6.7	SAND (Glaciofluvial) - dense, trace silt, fine to med grained, weakly stratified, saturated, brown
	4.5					7.0	- becoming very dense, finer grained and some silt.
	4.5					7.3	
2.25					8.4	SILT (Glaciolacustrine) - very stiff, some fine sand to sandy, irregular bedded (laminated) to massive, moist, highly consolidated, grey, non to low plastic.	
2.25							- becoming interbedded with gradations of some clay to some sand, low plastic
3.5	4.0				10.3		
3.6							SAND (Glaciofluvial) - loose on flights but dense to drill, trace silt, fine to med grained, weakly cohesive, saturated, brown
					11.0		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		TEST HOLE LOG						TEST HOLE No. PRW 76-1 SHEET 2 of 2
PROJECT <u>MT POLLEY</u>				PROJECT No. <u>1627</u>				
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - EAST</u>				GROUND ELEVATION _____				
DATE BEGUN <u>JULY 28/96</u>				DATE FINISHED <u>JULY 28/96</u>		LOGGED BY <u>RJP</u>		
NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	PERKLEY PENETROMETER (kg/cm <sup>2</sup> )	TORVANE (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL	
	>4.5				11.0	+	SILT (Glaciolacustrine) - very stiff, trace to some fine grained sand, weakly irregular bedded, highly consolidated, low plastic, moist, grey.	
					11.4	+	SAND (Glaciofluvial) (Glaciolacustrine) - dense, some silt, fine to med grained, non plastic, moderate permeability, wet to saturated, grey.	
	>4.5				11.7	+	CLAY (Glaciolacustrine) - stiff to very stiff, some silt, trace fine grained sand, weakly laminated, moderate plasticity, moist, grey.	
	4.2				13.7	+	- becoming interbedded with silt and fine grained sand layers. For irregular laminations.	
	3.5	15.0						
	4.0							
	3.6	17.5						
	2.2							
	2.0				14.7	+	SAND (Glaciofluvial) - loose on augers due to reworking on augers but dense to drill, fine to med grained, saturated, grey.	
	2.7							
	2.25				15.2	+	CLAY (Glaciolacustrine) - firm to stiff, trace silt, massive to irregular laminations of dark color, moist to very moist, grey-brown.	
	1.75				16.0	+	- becoming stiff and silty to some silt,	
	2.7	2.5						
	1.5	7.0						
	1.6							
	2.6							
	2.3				19.2	+	SILT (Glaciolacustrine) - very stiff to drill but soft to firm on auger flights, trace to no clay or sand, non plastic, sensitive to vibration (liquefiable), micaceous platy when dries on hands, saturated, grey, massive.	
	2.5							
	20.5				19.5	+	- becoming more compact on flights	
					21	+		
					22.1	+	EQH	

SLAUGHT to  
17' w sand  
- put in 15  
buckets of  
filter sand

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		TEST HOLE LOG						TEST HOLE No. PRW06-2 SHEET 1 of 2
PROJECT <u>MT POLLEY</u>						PROJECT No. <u>1627</u>		
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - EAST CENTRE</u>						GROUND ELEVATION _____		
DATE BEGUN <u>JULY 27/96</u> DATE FINISHED <u>JULY 27/96</u>						LOGGED BY <u>PJP</u>		
NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	POCKET REVENOMER (kg/cm <sup>2</sup> )	TORVANE (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL	
SOLID STEM AUGER					0.2		ORGANICS (TOPSOIL) - soft, silt, some woody debris, roots, moist to wet, brown	
					0.7		SAND (TILL) - medium dense to dense, silty, some gravel, massive, mottled, low plasticity, moderate to highly consolidated, low permeability, moist to very moist, brown.  - becoming dense	
					2.4		SAND (Glaciofluvial) - dense, fine to med grained, interbedded with irregular, narrow layers of silty clay (stiff to very stiff), wet to saturated, sand-grey; clay-brown.	
	4.5 4.0	13.0 13.8 14.0			3.0		CLAY (Glaciolacustrine) - very stiff, silty with rare narrow, saturated, fine to medium grained sand seams, highly consolidated, clay-moist, grey-brown.	
	3.2 3.5 2.8	10.0 12.5 16.0			3.7		SILT (Glaciolacustrine) - stiff to very stiff, irregularly interbedded with narrow discontinuous fine sand laminations and clayey zones, highly consolidated, clayey layers are moderate plasticity, moist, grey to grey-brown.	
	3.2 2.8 3.0				6.0		- becoming sandy silt to silty sand with depth, trace clay, low plasticity, stiff, very weakly laminated, low to moderate permeability.	
					6.9		SAND (Glaciofluvial) - very dense, fine to med grained, some silt, non plastic, low to moderate permeability, highly consolidated, contains occasional silt - some clay rich layers, wet, grey.	
					7.6			



KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		TEST HOLE LOG						TEST HOLE No. PRW 26-2 SHEET 1 of 1	
PROJECT <u>MT POLLEY</u>						PROJECT No. <u>1627</u>			
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - WEST CENTER</u>						GROUND ELEVATION _____			
DATE BEGUN <u>JULY 27/96</u>						DATE FINISHED <u>JULY 27/96</u>		LOGGED BY <u>PJP</u>	
NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	POCKET PENETROMETER (kg/cm <sup>2</sup> )	TORVANE (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL		
SOLID STEM AUGER					0	+	Organics (topsoil) - soft, silty and woody debris, roots, brown, very moist.		
	2 1/2'	1.5			0.8	+	SILT (Till) - stiff, sandy, clayey, some gravel, trace cobbles, massive, moderately well graded, low permeability, mottled texture, very moist, light brown.		
		1.7							
	5'	2.5			1.5	+	-becoming very stiff		
		3.0							
	7 1/2'				2.3	+	SAND (FILL) - dense, silty, gravelly, trace clay, massive, very moist, grey-green.		
	11'	2.5			3.4	+	SILT (Glaciolacustrine) - stiff to very stiff, clayey, trace fine grained sand laminations, and lesser narrow silty sand lenses, very moist, light green-brown.		
		3.0							
		3.0							
	3.5								
20 1/2'	3.8	13.0			6.3	+	CLAY (Glaciolacustrine) - stiff, some silt to silty, moderate to high plasticity, natural m/c < PL, moist, light brown.		
	4.5	14.0							
	4.2	14.2							
22 1/2'					6.9	+	SAND (Glaciolacustrine / Glaciofluvial) - dense to drill but loose on flights, silty, liquefies under vibration, non plastic, no visible fabric, saturated, light brown.		
27'					8.2	+	SILT (Glaciolacustrine) - loose to medium dense on flights but dense to drill, trace fine grained sand, liquefies under vibration, massive, non plastic, saturated, grey.		
Hole sloughed with fine grained sand to 28' 16'. Filled to grade with 7 buckets of silt and.			17%		8.5	+	SAND (Basal Till) - very dense, gravelly, some silt, trace clay, massive, highly consolidated, low permeability, moist to very moist, grey-brown		
					9.9	+	EOH		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS		TEST HOLE LOG					TEST HOLE No. <u>PRW 96-4</u> SHEET 1 of 2	
PROJECT <u>MT POLLEY</u>				PROJECT No. <u>1627</u>				
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - WEST</u>				GROUND ELEVATION _____				
DATE BEGUN <u>JULY 27/96</u>				DATE FINISHED <u>JULY 27/96</u>		LOGGED BY <u>PJP</u>		
NOTES Water loss, type and size of hole, drilling method, groundwater level, etc.	POLLEY PENETROMETER (kg/cm <sup>2</sup> )	TORVANE (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH (3)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL	
SOLID STEM LUGER					0.3		ORGANICS (Topsoil) - soft, silty, some woody debris and roots, wet, brown.	
					0.9		SILT (Till) - soft to firm, sandy, some gravel and clay, weakly consolidated, moderately low plasticity, mottled to massive texture, very moist to wet, blue-brown. - becoming stiff, very moist and brown.	
					1.2		- becoming stiff to very stiff, mottled orange-brown to grey-brown.	
					2.0		SAND (Transition Till to Glaciolacustrine) - stiff silt intruded with irregular fine to med grained sand layers, base on flights, saturated, brown.	
		1.5 2.0	0.4 7.7			2.4		- sand is becoming interbedded with some thick stiff, silty clay layers, sand is medium grained loose on flights and saturated
						3.0		SAND (Glacioluvial) - base on flights but dense to drill, fine to med grained, massive to very weakly stratified, saturated, brown.
						4.0		- becoming interbedded with glaciolacustrine stiff silt, some clay layers with moderate plasticity and thicknesses up to 100mm, irregular
		1.8 1.8 1.6 1.8	10.0 10.5 12.0			5.5		CLAY (Glaciolacustrine) - stiff, highly irregular inter beds of clay some silt with silt, some clay, with silt some fine sand, looks like soft sediment deformation, clay rich areas moderate plasticity, discontinuous, moist, brown.
		1.2 1.8 1.5 2.3	4.6 5.6 5.3			7.3		SILT (Glaciolacustrine) - stiff to firm fine grained sand, non plastic, laminated, periodic more clay rich layers, very moist to saturated, grey.
						8.2		SILT (Glaciolacustrine) - soft on open flights but dense to drill, liquifies easily upon shaking, massive, appears saturated, grey, trace sand?, nonplastic
						8.8		

KNIGHT AND PIESOLD LTD. CONSULTING ENGINEERS	<b>TEST HOLE LOG</b>	TEST HOLE No. <u>PRW 96-4</u> SHEET 2 of 2
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PROJECT <u>MT POLLEY</u>	PROJECT No. <u>1627</u>
LOCATION OF TEST HOLE <u>MAIN EMBANKMENT - WEST</u>	GROUND ELEVATION _____
DATE BEGUN <u>JULY 27/96</u> DATE FINISHED <u>JULY 27/96</u>	LOGGED BY <u>PJP</u>

NOTES	PROJECT DEPTH (m)	TORSION (kg/cm <sup>2</sup> )	MOISTURE CONTENT %	SAMPLES FOR TESTING	DEPTH (m)	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION OF MATERIAL
Water loss, type and size of hole, drilling method, groundwater level, etc.  Hole sloughed to 11.5m, with typically fine grained sand, back-filled to grade with 6 buckets (x200 pile) of filter sand. - hole is seeping.	29'				8.8	+	SILT (Transition from Guelphian to till) - stiff on flights but still somewhat sensitive to vibration → liquefiable, grades into sand, some silt and gravel with depth, moderately consolidated, massive, wet, grey - becoming more compact on flights and not sensitive to vibration (liquefaction weathered till?)
	30'				9.1	+	
	32'				9.7	+	SAND (Till) - very dense, gravelly, some silt to silty, trace clay, massive, moderate to highly consolidated, low plasticity, very moist, grey.
	30'				11.6	+	