Date: 2/2/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
0																																											Excavation Material
2		10YR 5/3 Brown	X					100			X	X					X			X	X			X				X			X	X	X	X							SP	Sand, 100% F-M sand, well sorted, angular to subangular, QFA
3		10YR 5/4 Yellowish Brown	X					trace			X	X			X	10	X			X	X	X		X				X			X	X	X	X							SP	(Sand, 100% F-M sand, angular to subrounded, well sorted, QFA trace gravel up to 10mm trace silt
5		10YR 5/3 Brown		X				80	20		X	X					X			X	X			X				X			X	X	X	X							SM	Silty Sand, 80% F-C sand, medium sorting, subangular subrounded, 20% silt, QFA
13.4		10YR 6/4 Light Yellowish Brown	X					100			X	X	X				X	X		X	X			X				X			X	X	X	X							SP	Sand, 100% F-C sand, medium F-M sand, well to medium sorted, subangular to subrounded, QFA
17																																										

Drilling Contractor: CuScale

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method: hand auger

Descriptive Location: Lemex (MW-30)

Date: 2/2/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobolak

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
17.0		10YR 5/3 Brown		X				85	15		X	X					X			X	X		X				X				X			X	X							SM	Silty sand, 85% F-M sand, medium sorting, subangular to subrounded, QFA, 15% silt,
18.0																																												
23.0		10YR 6/4 Light yellowish Brown	X	1				95	5		X	X					X			X	X		X				X				X	X		X	X							SP	Sand, 95% F-M sand, well sorted, subangular to subrounded, 5% silt, QFA
27.0		10YR 6/6 Brownish Yellow		X				100	tr		X	X	X				X			X	X		X				X				X			X	X							SP	Sand, 100% F-C sand, predominantly M and Quartz, well sorted, subangular to subrounded, trace silt
28.3		10YR 5/3 Brown		X				90	10		X	X					X			X	X		X				X				X			X	X							SP-SM	Sand with silt, 90% FM sand, 10% silt, medium sorting, subangular to subrounded QFA
37		10Y 6/3 Pale brown			X			100			X	X	X				X			X	X		X				X				X			X	X	X						SP	Sand, 100% F-C sand, predominantly F-M sand, medium sorting, angular to subangular, QFA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: SONIC

Sampling Method: Sleeves

Descriptive Location: Cemex / MW-30

Date: 2/2/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
37 52.4		10YR 6/3 Pale Brown			x			95+tr			x	x	x	x	5		x	x		x	x			x				x			x	x	x	x							SP	Sand, 95% F-C sand, 5% fine gravel, trace silt, angular to subangular 10% gravel (50.1-52.4')
60.7		5Y 6/2 Light Olive Gray			X			100+tr			x	x	x	x				x	x			x			x				x			x	x	x	x							SP	Sand, 100% F-C sand, trace silt, medium sorting, subangular, QFMA, F-M (52.4-54.6') grading from 57-60.7 Coarse
67.0		5Y 5/3 Olive		x				100+tr			x							x			x	x			x				x			x	x	x	x							SP	Sand, 100% Very fine to fine sand, + trace silt, subangular to subrounded, well sorted, QFMA, high mica and biotite content
83		2.5Y 4/3 Olive Brown			x			95+			x	tr						x				x			x				x			x	x	x	x							SP	Sand, 95+% very fine to fine sand, trace medium, 5% silt, well sorted, subrounded, QMA high mica content
90.2		10Y-5G4 5/2 grayish olive		x				tr to 10+tr			x	x	x	x	7				x		x	x			x				x			x	x	x	x							SW	Well graded sand, 100% F-C sand, poorly sorted, subangular to subrounded, trace gravel 7mm, trace silt, QFA Zircons?

Drilling Contractor:

Drilling Rig Type:

Drilling Method:

Sampling Method:

Descriptive Location:

Date: 2/3/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content			Particle % Dist.					Grain Size			Grain Size			Sorting			Grain Shape			Plasticity				Cementation				Mineral Composition						Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
			Dry	Moist	Saturated	Cobbles	Gravel	Sand	Silt	Clay	Fine	Medium	Coarse	Fine	Coarse	Max	Well	Medium	Poor	Angular	Sub-Angular	Sub-Rounded	Rounded	None	Low	Medium	High	None	Weak	Moderate	Strong	Quartz	Feldspar	Mica	Amphibole	Evaporites	Other					
90.2		2.5Y 6/4 Light Yellowish Brown			X		5	95	Fines +		X	X	X	X	X	17		X			X	X		X			X				X	X	X	X		X				SP	Sand, 95% F-C sand, predominantly M-C sand, Medium sorting, subangular to subrounded, 5% F-C gravel 4 to 17mm, trace silt
91.5																																								
95.2		2.5Y 5/3 Light Olive Brown			X			90	10		X	X					X			X	X			X			X				X	X		X	X					SP-SM	Sand w/ silt, 90% Fine sand, 10% silt, well sorted, angular to subangular QFA
104.4		2.5Y 6/3 Light Yellowish Brown			X		5	90	5		X	X	X	X	X	15		X			X			X			X				X	X		X		X				SP	Sand, 90% F-C sand, 5% gravel F-C up to 15mm, 5% silt, Medium sorting, subangular to subrounded, QFA
107		5Y 6/3 Pale Olive		X				95	5		X	X					X			X	X			X			X				X	X	X	X		X				SP	Sand, w/ silt, 95% F-M Sand, 5% silt, well sorted subangular to subrounded, QFMA
117		5Y 5/3 Olive		X				90	10		X						X			X	X			X			X				X	X	X	X		X				SP-SM	Sand w/ silt, 90% very fine to fine sand, 10% silt, well sorted, angular to subangular, QFA shells at 116-117'

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Cemex/MW-3D

Date: 2/4/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobalew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
117		2.5Y 5/3 Light Olive Brown			X			95	5		X	X					X			X	X			X			X				X	X		X		X						SP	Sand, 95% F-M sand, 5% silt, well sorted, subangular to subround QFA, 112.5-117 5Y 6/3 pale olive
127																																											
135.8		2.5Y 7/2 Light grey			X			95	5		X	X	X				X			X	X			X			X				X			X		X						SP	Sand, 95% F-M sand, trace coarse grains, 5% silt, well sorted, subangular to subrounded QA, predominantly quartz,
138		2.5Y 5/4 Light Olive Brown	X					85	15	X							X	X		X				X				X				X	X		X							SC	Clayey sand, 85% fine sand, 15% clay, medium to well sorting, subangular, QMA
139.6		5/4 6/3 Pale Olive	X					5	80	15	X	X	X	X	X	9	X	X		X	X			X				X				X	X	X	X		X						SM	Silty Sand, 80% F-C sand, 15% silt, 5% gravel up to 9 mm, poor to medium sorting, subangular to subrounded, QFMA, Oxidation 139.3-139.6 cobbles/gravel layer 30cm
141.0		2.5Y 6/3 Pale Olive						85	15	X							X			X	X			X		X		X				X	X		X							SC	Clayey sand, 85% fine sand, 15% clay, well sorted, subangular to subround low plasticity, QFA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Lemex / MW-30

-14/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Soboka

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content			Particle % Dist.					Grain Size			Grain Size			Sorting			Grain Shape				Plasticity				Cementation				Mineral Composition						Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
			Dry	Moist	Saturated	Cobbles	Gravel	Sand	Silt	Clay	Fine	Medium	Coarse	Fine	Coarse	Max	Well	Medium	Poor	Angular	Sub-Angular	Sub-Rounded	Rounded	None	Low	Medium	High	None	Weak	Moderate	Strong	Quartz	Feldspar	Mica	Amphibole	Evaporites	Other					
									Fines		Sand			Gravel																												
142 143		10YR 4/4 Brown	X				15	65	20		X	X	X	X	X	20		X		X	X				X			X				X	X	X	X					SC	Clayey Sand w/gravel, 65% F-C sand, 20% clay, 15% F-C gravel up to 20MM, poorly sorted, subangular to subrounded, low plast. QFA
143.5		2.5Y 5/3 Light olive Brown	X					85	15								X									X	X					X							CH	Fat Clay, 100% clay trace mica, high plasticity
147		5Y 6/3 Pale Olive		X				20	70	10	X	X	X	X	X	20		X	X		X	X				X		X				X	X	X	X	X				SP-SC	Sand w/clay and gravel, 70% F-C sand, 20% F-C gravel up to 20MM, 10% clay, poor to medium sorting, subangular to subrounded, QFA
149.5		5Y 6/2 Light olive Gray			X			25	75	tr	X	X	X	X	X	35		X			X	X				X		X				X	X	X	X	X				SP	Sand with gravel, 75% F-C sand, 25% F-C gravel Medium sorting, QFA
160.3		10YR 5/6 Yellowish Brown	X					90	10		X						X				X			X				X				X	X	X	X	X				SP-SM	Sand with silt, 90% very fine to fine sand, 10% silt, well sorted, subrounded QFA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Lenox/MW-30

Date: 2/4/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobsey

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
160.3 162.3		10YR 4/6 dark yellowish brown	x					95	5		x						x			x	x		x	x			x				x	x	x	x						SP	Sand, 95% very fine to fine sand, 5% silt, well sorted, subangular to subrounded, weakly, QFA
167.0		10YR 4/3 Brown	x	x						100	x						x				x					x		x					x								CH	Fat clay, 100% clay, fine mica trace, high plasticity
170.5		5Y 6/3 pale olive		x				85	15		x	x					x				x	x		x				x				x	x	x	x						SM	Silty Sand, 85% fine sand, 15% silt, well sorted, subangular to subrounded, QMA
172.5		2.5Y 5/4 light olive brown	x					95	5																x																ML	Silt, 100% silt, low plasticity Small interbedd. of sand ML 170.5-7
177		5Y 5/3 olive		x				95	5		x	x					x				x					x		x				x	x	x	x						SP	Sand, 95% F-M sand, 5% silt, well sorted, subrounded, QMA medium plasticity in interbeds of clay

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Cemex/MW-3D

Date: 2/4/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobolan

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
197 194.6		10YR 4/4 Brown		X				100			X	X					X				X	X		X				X				X		X			X					SP	Sand, 100% F-M sand, well sorted, subangular to subrounded, weakly cemented clasts, QFM high dark mineral content
197		7.5YR 4/4 Brown		X				60	40		X						X				X			X				X				X	X	X	X						SC	Clayey sand, 60% fine sand, 40% clay, well sorted, subrounded, weakly cemented clasts, QFA low plasticity
198		10YR 5/6 Yellowish Brown		X				40	60		X						X				X	X			X	X		X				X	X	X	X						CL	Sandy clay, 60% clay, 40% fine sand, subangular to subrounded, QFA, low to medium plasticity
204		10YR 4/6 Dark Yellowish Brown		X				40	60		X						X				X	X			X	X		X				X	X	X	X						CL	Sandy clay, 60% clay, 40% fine sand, well sorted, subangular to subrounded, QFA, low plasticity dark minerals
204.9		10YR 5/3 Brown		X				45	55		X						X				X	X			X			X				X		X	X						ML	Sandy silt, 55% silt, 45% fine sand, well sorted, subangular to subrounded, weakly cemented QFA high dark minerals

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Core X/MW-3D

Date: 2/5/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobdew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content			Particle % Dist.					Grain Size Sand			Grain Size Gravel			Sorting			Grain Shape				Plasticity				Cementation				Mineral Composition						Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
			Dry	Moist	Saturated	Cobbles	Gravel	Sand	Silt	Clay	Fine	Medium	Coarse	Fine	Coarse	Max	Well	Medium	Poor	Angular	Sub-Angular	Sub-Rounded	Rounded	None	Low	Medium	High	None	Weak	Moderate	Strong	Quartz	Feldspar	Mica	Amphibole	Evaporites	Other						
204.9 207		2.5Y 5/3 Light Olive Brown	X					60	40		X	X					X	X			X	X		X				X				X	X	X		X					SM	Silty Sand, 60% F-M sand, 40% silt, medium to well sorted, subangular to subrounded, weakly cemented, QFA high dark minerals
213.2		2.5Y 4/3 Olive Brown	X					90	10		X	X					X				X	X		X				X				X	X	X		X					SP-SM	Sand w/ silt, 90% F-M sand, well sorted, subangular to subrounded, weakly cemented, QFA Oxidation dark mineral content.
216.2		5Y 5/3 Olive	X					80	20		X	X					X				X	X		X			X					X	X	X		X	X				SM	Silty Sand, 80% F-M sand, 20% silt, well sorted, subangular to subrounded, QFA high abundance of mineral, last foot oxidation
218.9		5Y 5/3 olive	X						100								X								X																ML	Silt, 100% silt, low plasticity brittle
220.7		5Y 6/3 Pale Olive	X					95	5		X	X	X				X				X	X		X				X				X	X	X	X	X					SP	Sand, 95% FC sand, 5% silt, medium sorting Subangular to subrounded. QFMA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Lemex / MW-3D

Date: 2/5/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
220.3		5Y 6/3 Pale Olive			X		15	75	10		X	X	X	X	X	25			X			X	X			X			X	X	X	X	X								SP-SC	Sand w/clay and gravel, 75% F-C sand, 15% F-C gravel up to 25 mm, poor sort'g, subangular to subrounded, low plasticity, QFMA
222.4																																											
227		5Y 6/2 Light Olive Gray			X		10	85		5	X	X	X	X		7		X		X	X			X			X			X	X	X	X	X							SP	Sand, 85% F-C sand, 10% fine gravel, 5% clay, medium sorting, angular to subangular, QFMA
229.6		5Y 5/3 Olive		X				35	65		X							X			X				X			X			X	X			X						ML	Sandy silt, 65% silt, 35% fine sand, well sorted, subangular, low plasticity, QM
234		2.5Y 5/4 Light Olive Brown		X				90	10		X	X						X			X	X			X			X			X	X	X	X	X						SP-SM	Sand with silt, 10% F-M sand, 10% silt, well sorted, subangular to subrounded, QFMA
243.2		2.5Y Light Olive Brown	X						100									X							X		X	X						X								ML	F silt, 100% silt medium plasticity trace Mica

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Cemex/MW-30

Date: 2/5/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
243.2		2.5Y 4/4 Olive Brown	X							100																XX																CH	Fat clay, 100% clay medium to high plasticity
245																																											
243		Gley1 4/1 dark greenish gray	X							10																X																CH	Fat clay, 100% clay high plasticity 247-243 5Y 5/3 Olive "The Green clay"
251		5Y 4/3 Olive		X				85	10	15			X			X	X			X				X		X				X	X	X	X		X					SC SM	Clayey Sand, 85% fine sand, well sorted, subangular, weak cemented Clay to, QFMA, 15% clay
254.5		5Y 5/3 Olive		X			5	85		10	X	X	X	X	X	19	X			X	X			X		X		X		X		X	X	X	X		X				SP-SC	Sand with clay, 85% F-C sand, 10% clay, 5% fine gravel up to 12mm, Medium sorting, subangular to subrounded, QMA
257		5Y 5/2 Olive Gray		X				10	80	10	X	X		X	X	12	X			X	X			X		X			X			X	X	X	X		X				SP-SC	Sand, 85% M-C sand, 10% F-C gravel, 5% clay, medium sorting, subangular to subrounded, QFMA

Drilling Contractor:

Drilling Rig Type:

Drilling Method:

Sampling Method:

Descriptive Location: Cemex / MW-3D

Date: 2/6/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
257		2.5Y 6/2 Light Brownish Gray			X		15	80	5	X	X	X	X	X	28		X			X	X		X				X				X	X	X	X		X					SP	Sand with gravel, 80% F-C sand, 15% F-C gravel, 5% clay, Medium sorting, Subangular to subrounded, QFMA
264																																											
264		5Y 5/3 Olive	X						10								X										X															CH	Fat clay, 100% clay high plasticity
273.5																																											
275.5		5Y 5/2 Olive	X				5	15	60	X	X	X	X	X	X	15		X	X		X	X			X	X			X			X	X		X	X						CL	Lean clay, 80% clay, 15% F-C sand, 5% F-C gravel, poor to medium sorting, subangular to subrounded, low to medium plasticity, QFA
277		5Y 6/3 Pale Olive	X				30	10	60	X	X	X	X	X	X	45		X			X				X	X			X			X	X		X	X						CL	Gravelly clay, 60% clay, 30% F-C gravel, 10% F-C sand, subrounded, poor sorting, low to medium plasticity, QFA
277.5		5Y 5/2 Olive gray		X				90	10	X	X						X	X			X	X			X	X			X			X		X	X						SP-SC	Sand with clay, 90% Fine sand, trace medium, 10% clay, Medium to well sorting, subangular to subrounded, none to low plasticity, QMA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Cerex / MW-3D

Date: 2/6/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobeke

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
2793		5Y 6/3 Pale Olive	x				15	30		55	x	x	x	x	x	60			x	x	x			x			x				x		x	x	x							CL	Sandy lean clay w/ gravel, 55% clay, 30% F-C sand, 15% F-C gravel, poor sorting, subangular to subrounded, low plasticity, QMA, fining with depth 2832 - 2832 gravel > sand
2832																																									
284		2.5Y 5/4 Light Olive Brown	x							100							x								x	x																	Fat clay, 100% clay, medium to high plasticity
287		2.5Y 5/4 Light Olive Brown			x			95		5	x	x	x				x			x	x			x				x				x	x	x	x							SP	Sand, 95% F-M sand, well sorted, subangular to subrounded, QFMA, 5% clay
290.7		2.5Y 5/2 Grayish Brown			x			95		5	x	x	x	x	x	40	x			x	x			x				x				x	x	x	x							SP	Sand, 95% F-C sand, 5% F-C gravel, 40 mm, well sorted, subangular to subrounded, QFMA
294.4		2.5Y 6/3 Light Yellowish Brown			x			25		5	x	x	x	x	x	35	x			x	x			x				x				x	x	x	x							SP	Sand with gravel, 70% M-C sand, 25% F-C gravel, 5% clay, well sorted, subangular to subrounded, QFMA

Drilling Contractor: Cascade

Drilling Rig Type: Mosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Clark/MW-30

Date: 2/6/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J Sobden

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
294.4		10YR 5/6 Yellowish Brown	x					8		100							x									x																CH	Fat clay, 100% clay, medium plasticity, interbeds of fine sand
297																																											
300		2.5Y 5/3 Light olive Brown			x			25	65	10	x	x	x	x	x	22		x			x	x			x			x					x	x	x		x						SP-SC	Sand with clay and gravel, 65% F-C sand, 25% F-C gravel, 10% clay, medium sorting, subangular to subrounded, QFMA
307		2.5Y 5/6 Light Olive Brown			x			95		5	x	x						x			x	x			x			x					x	x	x		x						SP	Sand, 95% F-M sand, 5% clay, well sorted, subangular to subrounded, QFMA
311.5		2.5Y 4/3 Olive Brown		x				10	85	5	x	x	x	x		6		x			x	x			x			x					x	x	x	x	x						SP	Sand, 85% F-C sand, 10% fine gravel, 5% clay, medium sorting, QFMA
312.2		2.5Y 4/4 Olive Brown		x				15	80	5	x	x	x	x	x	15		x			x	x			x			x					x	x	x		x						SP	Sand with gravel, 80% F-C sand, 15% F-C gravel, 5% clay, medium sorting, angular to subangular, QFMA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Lemex/MW-3D

Date: 2/6/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-30

Name: J. Sobolew

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content: Dry	Moisture Content: Moist	Moisture Content: Saturated	Particle % Dist.: Cobbles	Particle % Dist.: Gravel	Particle % Dist.: Sand	Particle % Dist.: Fines: Silt	Particle % Dist.: Fines: Clay	Grain Size: Sand: Fine	Grain Size: Sand: Medium	Grain Size: Sand: Coarse	Grain Size: Gravel: Fine	Grain Size: Gravel: Coarse	Grain Size: Gravel: Max	Sorting: Well	Sorting: Medium	Sorting: Poor	Grain Shape: Angular	Grain Shape: Sub-Angular	Grain Shape: Sub-Rounded	Grain Shape: Rounded	Plasticity: None	Plasticity: Low	Plasticity: Medium	Plasticity: High	Cementation: None	Cementation: Weak	Cementation: Moderate	Cementation: Strong	Mineral Composition: Quartz	Mineral Composition: Feldspar	Mineral Composition: Mica	Mineral Composition: Amphibole	Mineral Composition: Evaporites	Mineral Composition: Other	Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
312.2		2.5Y 5/4 Light Olive Brown	X				45	25	30		X	X	X	X	X	15		X			X			X				X			X	X		X		X						GC	Clayey gravel with sand, 45% gravel, 30% clay, 25% F-C sand, poor sorting, subrounded, medium plasticity, QFA
313																																											
315		2.5Y 5/3 Light Olive Brown		X			085	5			X	X	X	X		7		X			X	X		X		X		X			X	X	X	X		X					SP	Sand, 85% F-C sand, 10% fine gravel, 5% clay, medium sorting, subangular to subrounded, low plasticity, QFMA 315.2 - 315.5 GC gravel up seam
320.8		2.5Y 5/4 light olive Brown		X			2035	5			X	X	X	X	X	10	X	X			X	X		X		X		X			X	X	X	X		X					SP	Sand w/ gravel, 75% F-C sand, 20% F-C gravel, 5% clay, well sorted, subangular to subrounded, QFMR
322.2		5Y 6/2 Pale Olive		X			5535	10			X	X	X	X	X	29		X	X		X	X		X		X		X			X	X	X	X		X					GP-GC	Gravel w/ clay and sand, 55% F-C gravel, 35% F-C sand, 10% clay, medium to poor sorting, low plasticity, QFMA
327		5Y 6/3 Pale Olive		X			10	85	5		X	X	X	X		7	X	X			X	X		X		X		X			X	X	X	X		X					SP	Sand, 85% F-C sand, 10% gravel, 5% clay, well to medium sorting, QFMA

Drilling Contractor: Cascade

Drilling Rig Type: Prosonic 6000T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Camex / MW-30

Date: 2/6/15

BOREHOLE LITHOLOGICAL LOG

Well Number/Name: MW-3D

Name: J. Sobolak

Sample Depth (ft)	Drilling Rate (ft/hr)	Color: Munsell Name and Class	Moisture Content			Particle % Dist.					Grain Size			Grain Size			Sorting			Grain Shape				Plasticity				Cementation				Mineral Composition						Alteration Visible	Grading Analysis	Well Graded	Fat Clay	Rock Type (USCS Group)	Comment
			Dry	Moist	Saturated	Cobbles	Gravel	Sand	Fines: Silt	Fines: Clay	Sand: Fine	Sand: Medium	Sand: Coarse	Gravel: Fine	Gravel: Coarse	Gravel: Max	Well	Medium	Poor	Angular	Sub-Angular	Sub-Rounded	Rounded	None	Low	Medium	High	None	Weak	Moderate	Strong	Quartz	Feldspar	Mica	Amphibole	Evaporites	Other					
327 332		2.5Y 5/3 Light Olive Brown			✓		95	5		✓	✓						✓				✓	✓				✓			✓			✓	✓	✓	✓		✓				SP	Sand, 95% F-M sand, 5% clay, well sorted, subangular to subrounded, QFMA.

Drilling Contractor: Labcore

Drilling Rig Type: Prosonic 600T

Drilling Method: Sonic

Sampling Method:

Descriptive Location: Near MW-3D