January 18, 2011

REPORT ON

Phase 1 - Tailings Investigation Giant Mine Remediation Project

Submitted to:

Northern Contaminated Sites, Western Region Public Works and Government Services Canada 4th Floor Greenstone Building, 5101 – 50th Ave P.O. Box 518 Yellowknife, NT X1A 2N4

REPORT

Project Number: AECOM Doc. No.: 09-1427-0006/2100 7-R.014204.307-RPT-0001-Rev0_20110118 034

GAL Doc. No.:

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1.0 INTRODUCTION

As part of the Giant Mine Remediation, Golder Associates Ltd. (Golder) undertook an investigation to supplement previous studies of the tailings pond facilities. The purpose of the investigation was to confirm conditions and further characterize the upper surface of the tailings ponds to assist in the Giant Mine Remediation Project.

This study, as well as previous investigation programs of the tailings ponds, is limited to the upper 6 m of the tailings, in areas that are accessible for mobile equipment. Thus, the areas of the ponds with permanently ponded water and the deeper areas of the ponds have not been investigated to date. It has been proposed to complete these investigations using auger drilling techniques in the winter of 2011.

The investigation included the advancement of test pits and collection of samples for laboratory testing. The following factual report details the findings of the investigation.



2.0 PREVIOUS INVESTIGATIONS

2.1 Tailings and Settling Pond Field Investigations, Giant Mine Yellowknife, NWT, Canada (SRK 2007)

A field investigation program of the tailings and settling ponds incorporating test pits, penetration and shear vane and Guelph permeameter testing, and drilling (within the settling pond) was completed. Laboratory testing included grain size, standard Proctor testing, specific gravity, constant head permeability, Atterberg limits, as well as triaxial, consolidation and geochemical testing of the sludge from the settling pond. For the tailings ponds, the investigation was limited to the upper surface of the tailings (generally 2 to 6 m depth), due to equipment restrictions and in areas accessible for the excavator.



3.0 FIELD PROGRAM

The geotechnical field investigation was completed in the Fall of 2010. The investigation consisted of a series of test pits advanced in the Northwest, North, Central and South tailings ponds to identify and characterize the materials present. A total of 11 test pits were advanced using a rubber-tired SK100W excavator provided and operated by Weatherby Trucking Ltd. The test pits were completed as follows:

- In the Northwest Tailings Pond, four test pits were advanced to depths ranging from 3.1 m to 3.5 m below ground level (m bgl);
- In the North Tailings Pond, two test pits were advanced to depths of 3.0 m and 3.1 m bgl;
- In the Central Tailings Pond, one test pit was advanced to a depth of 3.1 m bgl; and
- In the South Tailings Pond, three test pits were advanced to depths ranging from 1.9 m to 3.6 m bgl.

Test pits were generally advanced to the practical reach of the excavator which was limited by the soft tailings surface. Samples were collected for grain size testing at regular intervals and as necessary to distinguish stratigraphy. Select photographs of test pits are provided in Appendix B.

Prior to mobilization, the preferred locations of the test pits were identified based on the availability of information from previous investigations. Due to access restrictions at the time of the investigation and the limitations of the excavator equipment, several locations could not be investigated. The locations of each test pit are provided in Figures 1, 2, and 3.



4.0 **RESULTS**

Detailed descriptions of the subsurface conditions encountered in each of the test pits are presented in the Record of Test Pit sheets provided in Appendix A.

The stratigraphic boundaries shown on the Record of Test Pit sheets represent transitions between soil types rather than distinct lithological boundaries. It should be recognized that subsurface conditions often vary both with depth and laterally between individual test pit locations.

Laboratory testing consisted of wash sieves, to determine sand size and percent silt/clay sizes, primarily to confirm that the upper tailings material in areas not previously investigated was of similar grain size to that previously investigated.

Previous investigations within the tailings ponds indicated that the upper tailings materials were predominantly fine grained sands and silts. The distribution of sand sized particles ranged from 0% to 74% and silt sized particles ranged from 24% to 99% (SRK 2007). The particle size distribution testing completed on 16 samples collected during the supplemental investigation indicated sand sized particles from 0% to 86% and silt/clay sized particles from 14% to 100%. The results of the particle size distribution tests are provided in Appendix C and shown on the Record of Test Pit sheets.

Comparisons of visual descriptions for the SRK investigation and this investigation program are generally similar for each of the tailings ponds. There are minor variations in the visual descriptions provided for secondary and minor constituents. This may be attributed to the variability of the material or the methods of classification.

Frozen materials were not encountered in any of the test pits during this investigation. Comparison with findings of previous investigations indicates that the depth to frozen material likely exceeded the reach of the available excavator.

As discussed above, the flooded zones and the intermediate zones were not accessible with the available equipment or the equipment used during the previous investigations. As a result, limited information is available for the tailings in these areas.





5.0 **DISCUSSION**

Additional investigations will be required to adequately characterize and delineate the materials in the tailings ponds. Future investigations should be completed with equipment capable of reaching the base of the tailings deposits in the ponds. The use of amphibious capable equipment for accessing and working in soft, saturated and/or fully flooded areas may be worth consideration. Alternatively, investigations may be completed when the thickness of ice cover in the winter is capable of supporting heavy equipment.





6.0 CLOSURE

We trust the information presented in this report meets your present requirements. Should you have any questions or need further assistance regarding foundation design, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

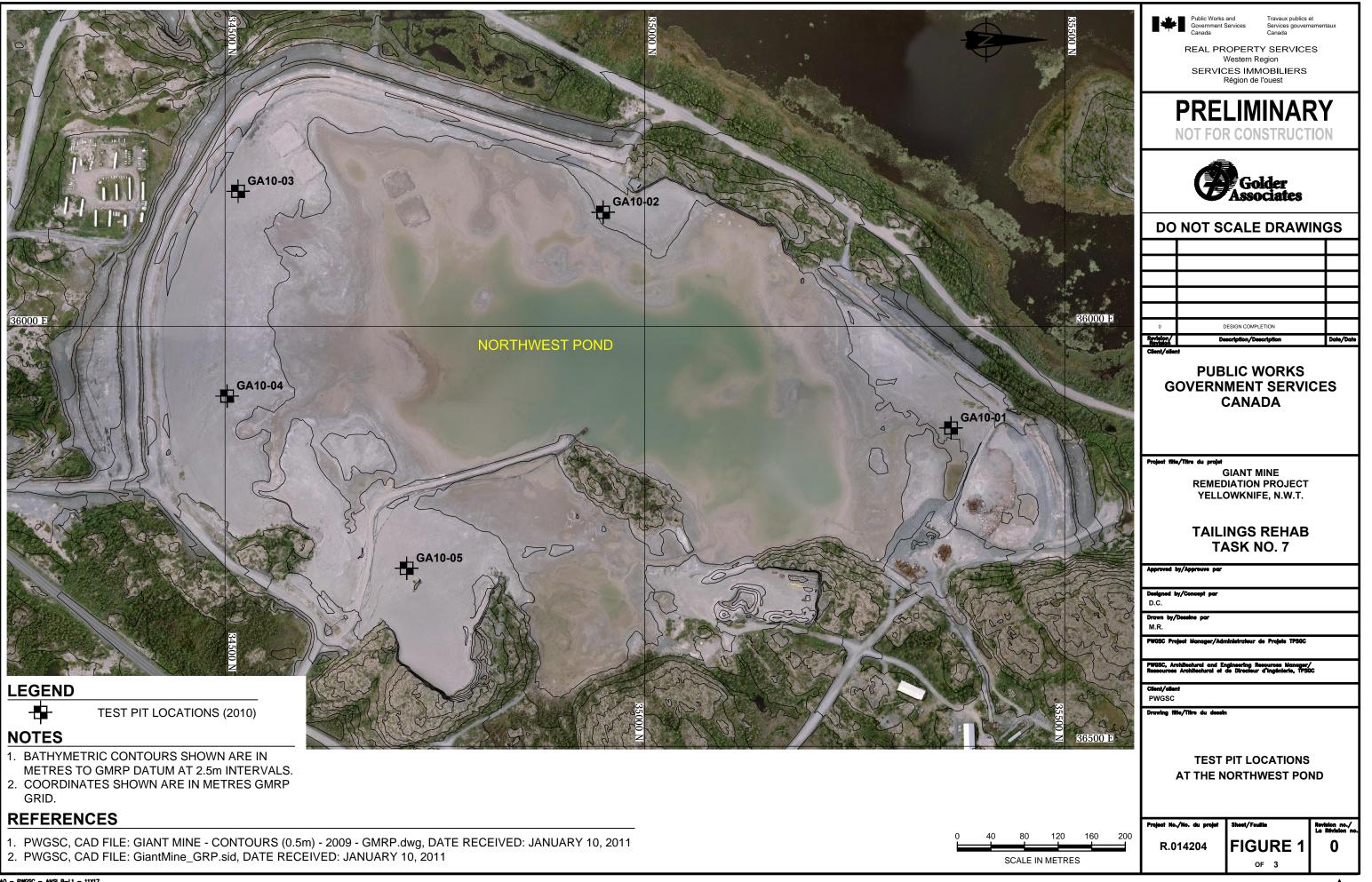
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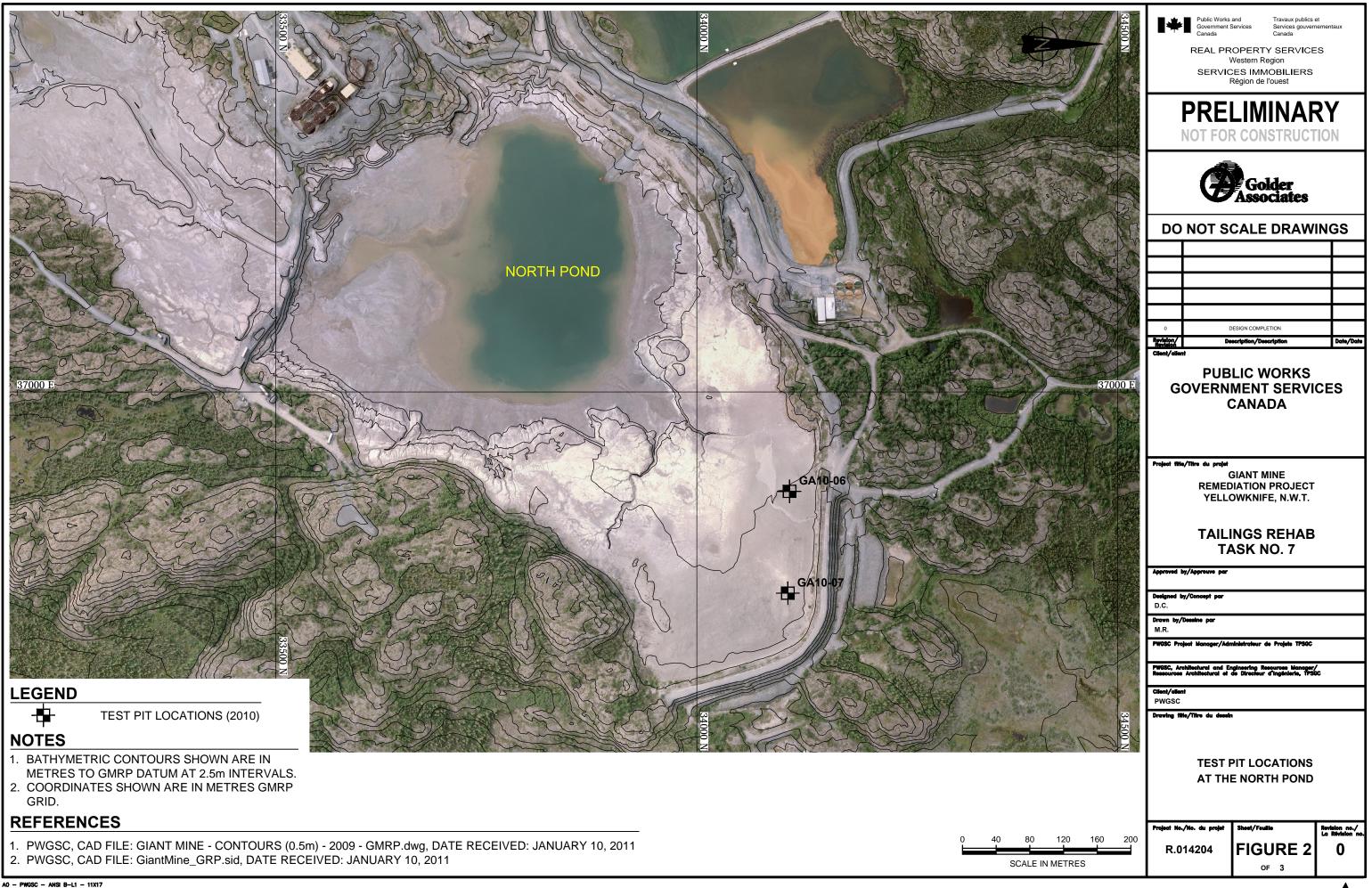
Dave Caughill, P.Eng. Associate, Senior Engineer John Hull, P.Eng. Principal, Senior Engineer

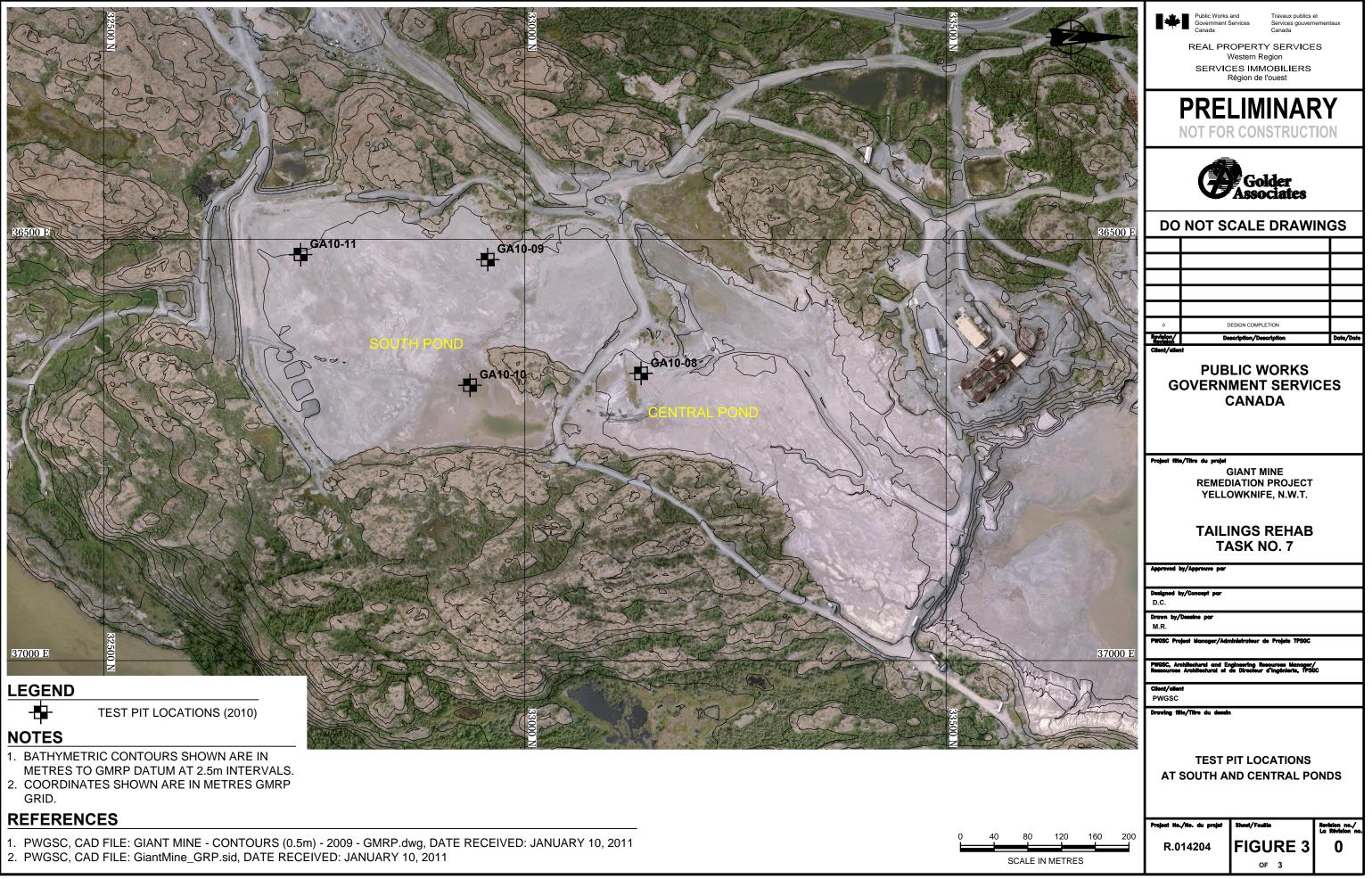
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APPENDIX A Record of Test Pit Sheets



PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-01

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6935365 E: 636121

EXCAVATION DATE: October 26, 2010

DATUM: UTM Zone 11 (Nad 83)

SS	ТНОВ	SOIL PROFILE	Ц			MPLES	RESISTA					HYDRA 10	ULIC CO k, cm/s			ы. З	20 A C	PIEZOMETE OR STANDPIPE
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.3m	20 SHEAR S Cu, kPa		re	atV.+ mV.⊕	U - O	W/ Wp			0 ⁻⁴ 1	NT WI	ADDITIONAL LAB. TESTING	INSTALLATIC
	-	Ground Surface	٥ ٥				10	20	30) 4	10	20) 4	06	50 8	80		
- 0 -		Loose, moist, grey, silty SAND (TAILINGS)		0.00		GS												
1	Weatherby Trucking Ltd.	Loose to compact, wet, grey, SILT, little sand, trace clay (TAILINGS)		0.80		GS											9% Sand 91% Silt/Clay	
× 2	Weatherby					GS												
. 3		End of TEST PIT. NOTES: EOH at practical extent of excavator		3.10														
· 4		reach. No ponded water observed upon completion.																
5 DEP ⁻ 1 : 2		CALE					Ð	Go	lde	r							Logged: JP Checked: D	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-02

EXCAVATION DATE: October 26, 2010

SHEET 1 OF 1

DATUM: UTM Zone 11 (Nad 83)

LOCATION: See Location Plan

N: 6934950 E: 635864

S		THOD	SOIL PROFILE	 ⊢			IPLES		MIC PEN STANCE,			λ				Ī	<u>م</u> ـ	PIEZOMETER OR STANDPIPE
DEPTH SCALE METRES		BORING ME	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.3m	SHEA Cu, kF	R STREM Pa	IGTH	i nat V. + rem V. ⊕	30 · Q - ● · U - ○ 40	10 W/ Wp 20	ATER C	PERCE		ADDITIONAL LAB. TESTING	INSTALLATION
- 0		\square	Ground Surface Loose, moist, grey, silty SAND (TAILINGS)		0.00		-											
- 1						1 (3S											
· 2	SK100W	Weatherby Trucking Ltd.				2 (35											
2		-	Loose to compact, wet, grey, SILT and SAND, trace clay (TAILINGS)		2.30	3 (GS											
3																		
			End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.10													
4																		
5																		
DE			CALE		. 1		I	Â	G	olde	r						.ogged: JF Checked: D	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-03

SHEET 1 OF 1

EXCAVATION DATE: October 26, 2010

DATUM: UTM Zone 11 (Nad 83)

LOCATION: See Location Plan

N: 6934516 E: 635839

ALE 0	DOH		SOIL PROFILE		1	SA	MPLE		DYNAMI RESISTA				λ	HYDRA			T	.0	PIEZOMETER OR
DEPTH SCALE METRES	BORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	ТҮРЕ	BLOWS/0.3m	20 SHEAR S Cu, kPa 10		IGTH I	i nat V. + em V. €	30 · Q - ● · U - ○ 40	10 WA Wp 20		PERCE		ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATION
1			Ground Surface Loose, moist, brown to grey, SILT and SAND (TAILINGS)		0.00	1	GS												
- 2	SK100W	Weatherby Trucking Ltd.				2	GS											45% Sand 55% Silt/Clay	
3			pockets of light grey silty SAND, trace to little clay from 2.4 m bgl			3	GS												
4			End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.20														
5																			
DEF 1 :			CALE					(Ð	G	olde	r ates						Logged: JF Checked: D	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-04

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6934503 E: 636083

EXCAVATION DATE: October 26, 2010

DATUM: UTM Zone 11 (Nad 83)

	Τ	g	SOIL PROFILE			SA	MPLE	ES	DYNAMIC RESISTAN)N 10.3m)	HYDR	AULIC C k, cm/s	ONDUCT	IVITY,	Т		PIEZOMETER
DEPTH SCALE	ES.	BORING METHOD		01		~		Зп	20	40 40			30	1			0-4 1	_{0³} ⊥	ADDITIONAL LAB. TESTING	OR STANDPIPE
PTH S	METR	NG N	DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR ST Cu, kPa	RENG	iTH r			N		ONTENT	PERCE		TEST	INSTALLATION
DEF	-	BORI		TRA	DEPTH (m)	Ĩ	-	BLOV						v	р — —	O ^W		WI	ADD -AB.	
			Ground Surface	0)				_	10	20	2	0 4	10		20 4	10 E	60 E	0	_	
	0		Cemented, dry, light grey, silty SAND (SOIL CEMENT)		0.00															
-																				-
-						1A	GS													
-			Loose to compact, moist, brown to		0.50		GS												1% Sand	
-			grey, silty SAND, contains layers of brown SILT (TAILINGS)																99% Silt/Clay	-
-																				
	1																			_
-																				-
-																				
		Ę																		
-		00W Trucking Ltd.																		
-		SK100W erby Trucki																		
-		SK1 Weatherby	Compact, dry to moist, light brown to brown, SILT, trace sand (TAILINGS)		1.70															
		Ň	brown, SILT, trace sand (TAILINGS)																	-
_	2					2	GS													-
-																				-
-																				-
																				-
_																				
+																				-
-																				-
_	3					3	GS												2% Sand	_
_																			98% Silt/Clay	
╞			End of TEST PIT. NOTES:		3.20															-
_+			EOH at practical extent of excavator reach.																	-
14/11			No ponded water observed upon completion.																	-
≓ -																				
N.G																				
2 2																				
GLD	4																			-
GP																				
1006.																				-
427-(
- TES																				
D LAB																				
- EXP ADD LAB TESTING 09-1427-0006.GPJ GLDR_CAN.GDT 1/14/11	5																			-
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E I	DEF 1 :		SCALE							Go	olde	r							logged: Jf Checked: D	
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PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-05

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6934716 E: 636288

EXCAVATION DATE: October 27, 2010

DATUM: UTM Zone 11 (Nad 83)

Ш 7.,	DOH.	SOIL PROFILE			SA	MPL		DYNAMIC PENETRATIO RESISTANCE, BLOWS/0	N).3m	HYDRAULIC CONDUCTIVITY, k, cm/s	T o	PIEZOMETE OR
DEP IN SUALE METRES	BORING METHOD		STRATA PLOT	ELEV.	ËR	_	(0.3m	20 40 60			ADDITIONAL LAB. TESTING	STANDPIPE
E H H	RING	DESCRIPTION	RATA	DEPTH	NUMBER	түре	BLOWS/0.3m	SHEAR STRENGTH na Cu, kPa re	atv. + Q - ● m V. ⊕ U - O	WATER CONTENT PERCENT	DDITI(B. TE;	
-	BC		STF	(m)			В	10 20 30) 40	20 40 60 80		
0		Ground Surface Loose to compact, moist, brown to		0.00	\vdash							
		grey, silty SAND to SAND some silt, contains layers of brown SILT (TAILINGS)										
		(TAILINGS)										
					1	GS						
1												
]								
]	⊢							
	Ltd.]	2	GS					86% Sand 14% Silt/Clay	
	0W ucking											
	SK100W Weatherby Trucking Ltd.											
	Weath											
2												
				1	3	GS						
				1								
				1								
]								
3												
		Compact, moist, brown, sandy SILT		3.10								
		(TAILINGS)										
					4	GS						
		End of TEST PIT.		3.50	\vdash	$\left - \right $						
		NOTES: EOH at practical extent of excavator										
		reach. No ponded water observed upon completion.										
		completion.										
4												
5												
J												
								B Associa				
DE	PIHS	SCALE						Golde	r		LOGGED: JP	Ή

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-06

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6934110 E: 637118

EXCAVATION DATE: October 27, 2010

LE	ПОН	SOIL PROFILE			SÆ	MPLE	s DY RE	NAMIC PE SISTANC	ENETRA E, BLOV	TION VS/0.3m	1	HYDRAU	JLIC COI k, cm/s	NDUCT	TVITY,	T		PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	SH Cu	20 EAR STR , kPa 10	40 ENGTH 20	60 nat V. rem V. 30	80 + Q - ● ⊕ U - ○ 40		TER CO	NTENT	PERCE		ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATION
— 0		Ground Surface Loose, moist, brown to grey, sandy SILT to SILT some sand, contains layers of brown SILT (TAILINGS)		0.00														
		Compact, moist, brown and grey, SILT, trace sand, trace clay (TAILINGS)		0.80	1	GS											27% Sand 73% Silt/Clay	
- 1	kina Ltd.																	
	SK100W Weatherby Trucking Ltd				2	GS											1% Sand 99% Silt/Clay	
- 2		Compact, moist to wet, brown and grey, SILT, trace sand, little clay (TAILINGS)		1.90														
					3	GS											100% Silt/Clay	
- 3		End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.00														
- 4																		
- 5																		
	PTH : 25	SCALE					G	Ø A	Gold Ssoc	ler iates							logged: Jp Checked: D	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-07

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6934108 E: 637239

EXCAVATION DATE: October 27, 2010

DATUM: UTM Zone 11 (Nad 83)

ÅLE V	DOH-	SOIL PROFILE		1	S	AMPI	1	DYNAMIC PER RESISTANCE	NETRAT	10N S/0.3m	λ	HYDRAU k			TIVITY,	T	. (7	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV DEPTI (m)		TYPE	BLOWS/0.3m	SHEAR STRE Cu, kPa		nat V. + rem V. ∉	30 · Q - ● · U - ○ 40		TER CC			NT	ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATIOI
- 0		Ground Surface Loose to compact, moist, brown to grey, SAND, some silt, contains layers of brown SILT (TAILINGS)		0.0	10				20	30 4				<u>, (</u>	30 <u>8</u>			
- 1					1	GS												
- 2	SK100W Weatherby Trucking Ltd				2	GS											85% Sand 15% Silt/Clay	
- 3					3	GS												
		End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.1	0													
- 4																		
- 5																		
DE 1 :		SCALE						D As	old soci	er <u>ates</u>							logged: JP Checked: D	

TESTPIT - EXP ADD LAB TESTING 09-1427-0006.GPJ GLDR_CAN.GDT 1/14/11

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-08

SHEET 1 OF 1

LOCATION: See Location Plan

EXCAVATION DATE: October 27, 2010

	LU	CATIC	N: 6933138 E: 636659					EXCA	ATION D	ATE: OC	tober 27	, 2010				DATUM	(Nad 83)
	ш	QO	SOIL PROFILE		SA	MPL	ES	DYNAMIC F		ION S/0.3m	1	HYDRAUL	IC CONDU	CTIVITY,	Т		PIEZOMETER
	DEPTH SCALE METRES	BORING METHOD			R		0.3m	20	40	60 E	30	10-6	10-5	10 ⁻⁴ 10 ⁻¹		ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	DEPTH	ORING	DESCRIPTION	LUTATA PLOT DEDLH (m)	NUMBER	түре	BLOWS/0.3m	SHEAR ST Cu, kPa	RENGTH	nat V. + rem V. ⊕	Q - ● U - O	WATE Wp H				DDITIO B. TES	
		BG		(m)	-		BL	10	20	30 4	40	20	40	60 80		LA	
· · · · · · · · · · · · · · · · · · ·	- 0 	SK100W Weatherby Trucking Ltd.	Ground Surface Compact, moist, brown to grey, silty SAND to SAND and SILT, contains layers of brown SILT (TAILINGS)		1	65										56% Sand 44% Silt/Clay	
	- - - - - - - 3 -		Compact, wet, brown to grey, SILT, trace sand, trace clay (TAILINGS)	2.90	3	GS											-
	-					GS										100% Silt/Clay	
	- - - - - - - - - - - - - - - - - - -		End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.	3.60													-
-	DF	PTH 9	SCALE						<u> </u>						1	.ogged: Jp	н
		25						Ð.	Gold ssoci	er ates						HECKED: D	
· L																	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-09

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6932956 E: 636524

EXCAVATION DATE: October 28, 2010

DATUM: UTM Zone 11 (Nad 83)

S	тнор	SOIL PROFILE	Ŀ			AMPL		DYNAMIC PER RESISTANCE			λ	k, cm/s			PIEZOMETER OR STANDPIPE
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)		түре	BLOWS/0.3m	SHEAR STRE Cu, kPa	NGTH	⊥ nat V. + rem V. ⊕	30 · Q - ● • U - ○ 40	TER CON	ITENT PE	ADDITIONAL LAB. TESTING	INSTALLATIO
- 0		Ground Surface							20	1		 		-	
- 1		Loose to compact, moist, brown to grey, silty SAND, contains layers of brown SILT (TAILINGS)		0.00		GS									
- 2	SK100W Weatherby Trucking Ltd.				2	GS								77% Sand 23% Silt/Clay	
		increased moisture content			3	GS									
- 3 -		End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.00)										
- 4															
- 5															
DEF 1 :		CALE						D As	old soci	er ates		 		 Logged: JF Checked: D	

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-10

LOCATION: See Location Plan N: 6932935 E: 636673 EXCAVATION DATE: October 28, 2010

SHEET 1 OF 1

		Ď	SOIL PROFILE			SA	MPLE	s	DYNAM RESIST			ON)	HYDR	AULIC C		TIVITY,	т		PIEZOMETER
	DEPTH SCALE METRES	BORING METHOD		OT			- 1		RESIST 20				80	1	k, cm/s 0 ⁻⁶ 1		0 ⁻⁴ 1	0 ⁻³	ING	OR STANDPIPE
L L L L L L L L L L L L L L L L L L L	METR	МQN	DESCRIPTION	TA PL	ELEV.	NUMBER	TYPE	BLOWS/0.3m			1		- Q - ● 9 U - O	w	ATER C	ONTENT	PERCE		ITION	INSTALLATION
Ĺ	ä	BOR		STRATA PLOT	DEPTH (m)	N		BLO	10				40	vv	p			WI 0	ADDITIONAL LAB. TESTING	
	0		Ground Surface								20		+0							
_	. 0		Loose to compact, moist, brown to grey, SILT, some sand (TAILINGS)		0.00															-
-																				-
-																				-
						1	GS												44% Sand	-
_						Ľ													64% Silt/Clay	-
-		3	ġ																	-
-		V Visc	Soft, brown, CLAYEY SILT (TAILINGS)		0.80															-
_	1	K100V	oy Truc	ľ.																_
-		SK100W Woothoday Trucking Ltd	Loose to compact, moist, brown to	H	1.10															-
-			grey, silty SAND, contains layers of brown SILT (TAILINGS)																	-
			Loose, wet, brown and grey, SILT, trace sand, trace clay (TAILINGS)		1.30															-
_			Sand, trace day (TAILINGO)			2	GS												100% Silt/Clay	-
-																				-
-																				-
_	2		End of TEST PIT. NOTES:		1.90															-
-			EOH due to extremely soft conditions under excavator.																	-
																				-
-																				-
-																				-
																				-
_																				-
-																				
_	3																			-
																				-
-																				
_																				-
14/1																				-
DT 1													1							-
AN.G													1							-
CR C													1							-
	4												1							
6.GP,													1							-
-000													1							-
9-142.													1							-
10 00													1							-
ESTIN													1							-
ABTE													1							-
	5																			_
- EXP ADD LAB TESTING 09-1427-0006.GPJ GLDR_CAN.GDT 1/14/11																				
- TIC	DE	РТН	ISCALE								. 1 1	er ates							LOGGED: JF	Н
TESTPIT	1:								Í	⊫ G Ase	1 010 1000	er ates							CHECKED: D	

펍
_,
ENTRY:
DATA

PROJECT No.: 09-1427-0006

RECORD OF TEST PIT: GA10-11

SHEET 1 OF 1

LOCATION: See Location Plan

N: 6932734 E: 636518

EXCAVATION DATE: October 28, 2010

sЧЕ	BORING METHOD		SOIL PROFILE	⊢ ⊢	r	SA	MPL		DYNAMIC PENETR RESISTANCE, BLO		٦,		CONDUCTIVITY,		JO	PIEZOMETER OR
DEPTH SCALE METRES	IG ME		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	ТҮРЕ	BLOWS/0.3m	20 40 I I SHEAR STRENGTH Cu, kPa		80 - Q - ●		10 ⁻⁵ 10 ⁻⁴	10 ⁻³	ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATIO
DEP	BORIN		DESCRIPTION	TRAT	DEPTH (m)	NUN	₽	BLOW				Wp I		WI	ADDI -AB. T	
	_	+	Ground Surface	0				-	10 20	30	40	20	40 60	80		
- 0 -			Compact, moist, brown and grey, SILT, trace sand, contains layers of grey silty SAND (TAILINGS)		0.00	1	GS								6% Sand 94% Silt/Clay	
1	SK100W	Weatherby Trucking Ltd.				2	GS								15% Sand 85% Sitt/Clay	
- 2		-	Compact, moist, light brown, SILT, some sand (TAILINGS) becoming sifty SAND		1.80	3	GS									
						4	GS									
- 3			End of TEST PIT. NOTES: EOH at practical extent of excavator reach. No ponded water observed upon completion.		3.10											
· 4																
· 5																
DE	PTH	H SC	CALE					(Gol	Jan					LOGGED: JP	н

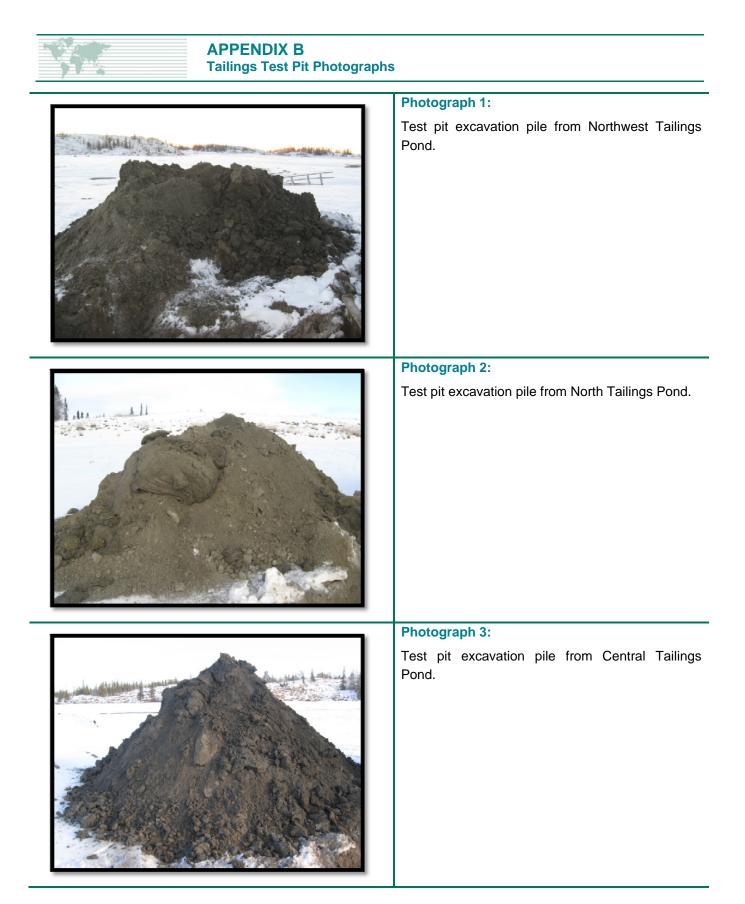


TAILINGS INVESTIGATION - GIANT MINE REMEDIATION



Test Pit Photos











Photograph 4:

Test pit excavation pile from South Tailings Pond.

\bur1-s-filesrv2\final\2009\1427\09-1427\09-1427-0006\3. correspondence\2 issued documents\word\phase 2\doc 034 rep 0118_11\appendix b - tailings test pit photographs.docx











Project #:	09-14	27-0006			Pha	ase:			Report N	lumbe	r: A2590)
Short Title: Sampled by:	JH				Dat	e Samp	led:					
Sample Locat Source Sample Descr		GA10	-01 GS02	@1.5m		F	Sieve (m	e Size m)	Percen Passing		Specific _{Custo}	
Fractured Fac In situ Water (Date Tested Tested By		Nover IK	mber 29, 2	010								
Remarks: Washed S	ieve											
Distribution							0.3 0.	63 315 16 08	100.0 99.9 99.2 91.3			
100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10		1 in Size (mm)	0.1		0.01		0.001
	Boulder	Cobbles	Gra	ivel		Ş	Sand			Silt		Clay
	Gravel %		Coarse 0.0		Coarse		n 8.7 eviewe		ilt/Clay %		91.:	

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Proje		09-1	427-0006			Ph	ase:		F	Report Num	ber: A259	0
	t Title: pled by:	JH				Da	te Samp	led:				
Sour	ple Loca ce ple Desc		GA10)-03 GS02	@1.5m		F	Sieve Size (mm)		Percent Passing	Specifi	
In sit Date	tured Fac u Water Tested ed By			mber 29, 2	2010							
Rem W	arks: /ashed S	Sieve						1.25		100.0		
Distri	bution							0.63 0.315 0.16 0.08		99.9 97.2 83.0 54.8		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0				10							0.00
	10					Gra	ain Size (r	nm)		0.0	• 	
		Boulder	Cobbles	Gra Coarse	Fin	Coarse	Medium	Sand Fine	_	Silt		Clay
		Gravel	%	0.0	S	and %		45.2	Silt/C	Clay %	54	.8
							R	eviewed By:				
					G	older Assoc	iates Ltd					

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Proje		09-1	427-0006			Pha	ase:			Rep	ort Numb	er: A259	0
	t Title: pled by:	JH				Dat	te Samp	oled:					
Sour	ple Loca ce ple Dese		GA10	-04 GS 1E	3@1.0m		-		e Size nm)		cent sing	Specific Custo	
In sit Date	ured Fa u Water Tested ed By	ce Content	Novei IK	mber 29, 2	2010								
Rem W	arks: /ashed \$	Sieve					-						
Distri	bution						-	0	315 .16 .08	99	0.0 9.8 9.4		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10						0.01		
	I.		100		10	Gra	1 i n Size (mm)	0.1	1	0.01		0.00
		Boulder	Cobbles	Gra Coarse	Fin	Coarse	Mediu	Sand	Fine	_	Silt		Clay
		Gravel %	6	0.0	1	and %	Mediu	0.6		Silt/Clay	%	99.	.4
							R	eviewe	ed By:				
					G	older Associ	iates I td						

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09-14	27-0006			Ph	ase:			Repo	rt Numbe	er: A259	90
JH				Da	te Samp	led:					
	GA10	-04 GS03	@3.0m		F						ication .tom
	Nove IK	mber 29, 2	2010								
eve					-						
						0.	16	99	.9		
	100		10	Gra		mm)	0.1		0.01		0.00
oulder	Cobbles	Gra	avel		:	Sand			Cil+		Clay
	0000169	Coarse	Fin	Coarse	Mediur	n	Fine		SIIL		Cidy
ravel %		0.0	S	and %		1.5		Silt/Clay 9	%	98	3.5
					R	eviewe	d By: _				
	JH phi phion ph	on GA10 otion ontent Nove IK eve	JH on GA10-04 GS03 otion November 29, 2 in November 29, 2 ik Ik ive Ik	JH on GA10-04 GS03 @3.0m ontent November 29, 2010 IK IK ove IK IK IK <tdik< td=""> <td< td=""><td>JH GA10-04 GS03 @3.0m otion </td><td>JH GA10-04 GS03 @ 3.0m ontent November 29, 2010 IK IK ove IK IV IV <t< td=""><td>JH Date Sampled: on GA10-04 GS03 @3.0m Sieve ontent November 29, 2010 III ive III IIII ove IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>JI Date Sampled: on GA10-04 GS03 @3.0m Sieve Size (mm) ontent November 29, 2010 III we 0.315 0.16 0.0315 0.16 0.08 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016</td><td>JH Date Samplet: on GA10-04 GS03 @3.0m ontent November 29, 2010 IK IN ove IN IN November 29, 2010 IK IN IN IN</td><td>J.H Cate Sample: an GA10-04 GS03 @3.0m brinn Anter Sample: anter Sample: Anter Sample:</td><td>JH Date Sampled: and a construction of the second secon</td></t<></td></td<></tdik<>	JH GA10-04 GS03 @3.0m otion	JH GA10-04 GS03 @ 3.0m ontent November 29, 2010 IK IK ove IK IV IV IV IV <t< td=""><td>JH Date Sampled: on GA10-04 GS03 @3.0m Sieve ontent November 29, 2010 III ive III IIII ove IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td><td>JI Date Sampled: on GA10-04 GS03 @3.0m Sieve Size (mm) ontent November 29, 2010 III we 0.315 0.16 0.0315 0.16 0.08 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016</td><td>JH Date Samplet: on GA10-04 GS03 @3.0m ontent November 29, 2010 IK IN ove IN IN November 29, 2010 IK IN IN IN</td><td>J.H Cate Sample: an GA10-04 GS03 @3.0m brinn Anter Sample: anter Sample: Anter Sample:</td><td>JH Date Sampled: and a construction of the second secon</td></t<>	JH Date Sampled: on GA10-04 GS03 @3.0m Sieve ontent November 29, 2010 III ive III IIII ove IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	JI Date Sampled: on GA10-04 GS03 @3.0m Sieve Size (mm) ontent November 29, 2010 III we 0.315 0.16 0.0315 0.16 0.08 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016 0.016	JH Date Samplet: on GA10-04 GS03 @3.0m ontent November 29, 2010 IK IN ove IN IN November 29, 2010 IK IN IN IN	J.H Cate Sample: an GA10-04 GS03 @3.0m brinn Anter Sample: anter Sample: Anter Sample:	JH Date Sampled: and a construction of the second secon

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Proje		09-14	127-0006			Ph	ase:			Report	Numbe	er: A25	90
	t Title: pled by:	JH				Da	te Samp	led:					
Sour	ole Loca ce ole Desc		GA10	-05 GS02	@1.5m		E	Sieve S (mm		Percer Passin		-	fication stom
In sit Date	ured Fa u Water Tested ed By	ce Content	Nove IK	mber 29, 2	2010								
Rem W	arks: /ashed \$	Sieve						1.25		100.0			
Distri	bution							0.63 0.319 0.16 0.08	5	99.9 93.1 47.9 14.1			
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10				0.1		0.01		0.00
						Gra	in Size (ı	mm)	0.1				0.00
		Boulder	Cobbles			0		Sand			Silt		Clay
		Gravel %	6	Coarse	Fin S	Coarse	Mediun	85.9		ilt/Clay %		1	4.1
							R	eviewed	By:				
					G	older Assoc	iatos I td						

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Proje		09-14	27-0006			Pha	ase:			Report Num	ber: A259	0
	t Title: pled by:	JH				Dat	te Samp	oled:				
Sour	ple Locat ce ple Descr		GA10	-06 GS01	@0.5m		[Sieve Siz (mm)	e	Percent Passing	Specific Custo	
In sit Date	tured Fac u Water (Tested ed By		Novei IK	mber 29, 2	2010							
Rem W	arks: /ashed S	ieve					-	1.25		100.0		
Distr	ibution							0.63 0.315 0.16 0.08		99.9 99.6 95.6 73.2		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 20.0 10.0 0.0				10				0.1			0.00
	Γ			Gr	avel	Gra	in Size (mm) Sand				
		Boulder	Cobbles	Coarse	Fin	Coarse	Mediu			Silt		Clay
	(Gravel %	Ď	0.0	S	and %		26.8	Silt/	Clay %	73.	2
							R	eviewed By	/:			
					G	older Associ	iates I td					

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Proje		C)9-14	427-(0006	6									Pha	ase	:									R	Rep	or	t Ni	um	be	er:	A2	259	0	_
	t Title: pled by:	J	ΙH												Dat	te S	San	np	leo	d:																
Sour	ple Loca ce ple Desc		on		GA	10-	06	GS	2	@1.	5m							F	ç	Sie (ve mn		ze						ent ng		F	S		Custo	catioi	۱
In sit Date	tured Fac u Water Tested ed By		ent		Nov IK	/en	nbe	er 29	9, 2	2010)																									
Rem W	arks: /ashed S	Sieve																																		
Distri	bution																			(0.6).3 0.1 0.0	15 6					9 9	00. 9.9 9.2 8.7	9 2							
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0				10						10												0,0							0.0						
													_		Gra	in S	Size																			
		Boul	der	Col	bbles	-	C	oars			Fin		C	oars	e	N	/ledi		San n	ld	F	ine		_					s	ilt					Clay	'
		Grav	/el %	6				0.0		1	-	S		nd						1.3				S	Silt	/C	lay	1 %	, D					98.	.7	
																		R	ev	iev	vec	B	y:	-												
												0	old	or A		iates	l td																			

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Sample Desc Fractured Fa In situ Water Date Tested Tested By Remarks: Washed S	ation cription ice Content		0-06 GS(ember 29			ו]	Date S	Sam		Siev	ve \$ mm	Size)				erce ssi			~	ŝpe	Cus	cation ^{tom}
Source Sample Desc Fractured Fa In situ Water Date Tested Tested By Remarks: Washed S Distribution 100.0 90.0 80.0	cription Ice Content	Nove				ı															Spe		
In situ Water Date Tested Tested By Remarks: Washed S Distribution 100.0 90.0 80.0	Content		ember 29), 201	0																		
Washed S Distribution 100.0 90.0 80.0	Sieve																						
100.0 90.0 80.0																							
90.0 80.0												0.16 0.08					00. 99.9						
30.0 20.0 10.0 0.0													• · · · · · · · · · · · · · · · · · · ·										
	000	100	•		10		G	Grain S	1 Size	(mr	n)		0	. I					0.01				0.00
	Boulder	Cobbles		Gravel			Coarse		/lediu	Sa	nd	Fi	ne					Sil	t				Clay
	Gravel %	,)	Coarse		Fin	S	and %		neuit		0.1			S	Silt/	Cla	y %	, 0				99	.9
									F	Rev	view	/ed	By:	_									

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Proje		09-1	427-0006			Ph	ase:		F	Report Num	ber: A259	90
	t Title: pled by:	JH				Da	te Sampl	ed:				
Sour	ple Loca ce ple Desc		GA10	-07 GS02	@1.5m		E	Sieve Size (mm)		Percent Passing	Specifi _{Cus}	
In sit Date	tured Fa u Water Tested ed By	ce Content		mber 29, 2	2010							
Rem W	arks: /ashed \$	Sieve					_					
Distri	bution							0.63 0.315 0.16 0.08		100.0 99.5 63.1 15.0		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0				10				0.1			0.00
						Gra	ain Size (m	nm)				
		Boulder	Cobbles	Gra Coarse	Fin	Coarse	Sa	and Fine		Silt		Clay
		Gravel	%	0.0		and %		85.0	Silt/C	Clay %	15	5.0
							Re	viewed By:				
					G	older Assoc	iatos I td					

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Proje		09-14	427-0006			Pha	ase:			Repor	t Numb	er: A2	590
	t Title: pled by:	JH				Dat	te Samp	led:					
Sour	ple Locat ce ple Desci		GA10	-08 GS01	@0.5m		F	Sieve (m		Perce Pass		-	ification
In sit Date	tured Fac u Water (Tested ed By		Novei IK	nber 29, 2	010								
Rem W	arks: /ashed S	ieve						2.	25	100 99.	6		
Distri	bution							0.0 0.3 0.7 0.0	15 16	99. 98. 89. 43.	8 2		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10				0.1		0.01		0.00
	Γ			Gra	vel	Gra	in Size (
		Boulder	Cobbles	Coarse	Fin	Coarse	Mediur	Sand	Fine		Silt		Clay
		Gravel %	/o	0.0	S	and %		56.2	S	lilt/Clay %	6	2	13.8
							R	eviewe	d By: _				
					Go	lder Associ	ates Ltd						

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Proje		09-14	427-0006			Pha	ase:			F	Report Num	oer: A25	90
	t Title: pled by:	JH				Dat	te Sam	pled	:				
Sour	ole Loca ce ole Dese		GA10	-08 GS04	@3.0m			Si	ieve Size (mm)		Percent Passing	-	fication stom
In sit Date	ured Fa u Water Tested ed By	ce Content	Nove IK	mber 29, 2	2010								
Rem W	arks: /ashed \$	Sieve											
Distri	bution								0.16 0.08		100.0 99.4		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0 10		100		10				0.	1	0.0		0.00
				Gra	avel	Gra	in Size	(mm) Sand					
		Boulder	Cobbles	Coarse	Fin	Coarse	Mediu	m	Fine		Silt		Clay
		Gravel %	6	0.0	S	and %		0	.6	Silt/C	Clay %	99	9.4
							F	Revie	ewed By:				
					6	older Associ	iates I td						

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Proje		09-14	427-0006			Ph	ase:		F	Report Num	ber: A25	90
	t Title: pled by:	JH				Da	te Sampl	ed:				
Sour	ple Loca ce ple Desc		GA10	0-09 GS02	@1.5m		F	Sieve Size (mm)		Percent Passing		fication Istom
Fractured Face In situ Water Content Date Tested Nove Tested By IK				mber 29, 2	2010							
Rem W	arks: /ashed \$	Sieve					Ē					
Distri	bution							0.63 0.315 0.16 0.08		100.0 95.8 64.0 23.4		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10							0.00
						Gra	ain Size (n	nm)				
		Boulder	Cobbles	Gra Coarse	Fin	Coarse	S Medium	and Fine		Silt		Clay
		Gravel %	6	0.0		and %		76.6	Silt/C	Clay %	2	3.4
							Re	viewed By:				
					G	older Assoc	viatos I td					

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Proje		09-14	27-0006			Ph	ase:			Report Num	ber: A259	0
	t Title: oled by:	JH				Da	te Samp	led:				
Sour	ole Locati ce ole Descr		GA10	-10 GS 0	1 @ 0.5m		F	Sieve Size (mm)	•	Percent Passing	Specific	
Fractured Face In situ Water Content Date Tested Nove Tested By IK				mber 29, 2	2010							
Rem W	arks: /ashed Si	eve						1.25		100.0		
Distri	bution						-	0.63 0.315 0.16 0.08		99.9 99.8 97.7 63.6		
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 20.0 10.0 0.0				10				0.1			0.00
						Gra	ain Size (mm)				
		Boulder	Cobbles	Gra Coarse	Fin	Coarse	Mediur	Sand n Fine		Silt		Clay
	(Gravel %)	0.0	S	and %		36.4	Silt/	Clay %	63.	.6
							R	eviewed By	:			
					Go	older Assoc	iates I td					

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Proje							427-0006								Phase:								Report Number: A2590									0				
	Title: bled by:		JH													D	ate	e Sa	m	ple	ed:															
Sourc	Sample LocationGA10-10 GS02 @1.5mSourceSample Description																eve (m		ize						ent ing		F	S		Cifi Custo	cation					
Fractured Face In situ Water Content Date Tested Nov Tested By IK					November 29, 2010 IK																															
Remarks: Washed Sieve																		ł																		
Distri	bution																		•			0.							00. 99.9							
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0																							•												
	10	000				10	0					10)			G	rair	1 n Sia		(m	m)			().1						0.0)1				0.0
		Boulder Cobble			les					avel										Ind									s	ilt					Clay	
	Gravel %						С	oar: 0.0			Fir	1	S		arse d %	, D	Me		ium Fine					Silt/Clay %							99.9					
																Ass				(e)	vie	we	a	By:												

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Proje		09-1	427-0006			Pha	ase:				Report Nur	nbe	r: A	2590	
	t Title: pled by:	JH				Da	te Sam	pled	:						
Sour	ple Loca ce ple Desc		GA10	-11 GS1 @	20.5m			Si	ieve Size (mm)		Percent Passing	ł	Spe	Cific Custor	ation
Fractured Face In situ Water Content Date Tested Nov Tested By IK				mber 29, 2	010										
Rem W	arks: /ashed \$	Sieve													
Distri	bution								0.63 0.315 0.16 0.08		100.0 99.9 99.6 93.6				
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0 0.0				10				0.			.01			0.00
				Gra	avel	Gra	in Size	(mm) Sand							
		Boulder	Cobbles	Coarse	Fin	Coarse	Mediu		Fine		Silt				Clay
		Gravel 9	6	0.0	S	and %		6	.4	Silt/	Clay %			93.6	;
							F	Revie	ewed By:						
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Proje		09-1	427-0006			Pha	ase:				R	eport N	umb	er:	A259	90
	t Title: pled by:	JH				Da	te Sam	plec	d:							
Sour	ole Loca ce ole Desc		GA10	-11 GS02	@1.5m			S	Sieve S (mm			Percent Passing		Sp	Cus	tom
Fractured Face In situ Water Content Date Tested Nove Tested By IK				mber 29, 2	2010											
Rem W	arks: /ashed \$	Sieve														
Distri	bution								0.63 0.319 0.16 0.08	5		100.0 99.9 99.4 85.1				
Percent Finer Than	100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0		100		10					0.1			0.01			0.00
				0.00		Gra	in Size									
		Boulder	Cobbles	Coarse	avel Fin	Coarse	Mediu	San Im	d Fir	ne	-	S	ilt			Clay
		Gravel %	%	0.0		and %			4.9	:	Silt/C	lay %			85	i.1
					F	Revi	iewed	By:								
					G	older Assoc	iates I td									

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