Minto Explorations Ltd. Whitehorse, Yukon

ISSUED FOR USE

GEOTECHNICAL DESIGN PROPOSED SOUTHWEST WASTE DUMP MINTO MINE, YUKON

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- Appendix A General Conditions
- Appendix B Site Characterization Programs Borehole and Testpit Logs



1.0 INTRODUCTION

1.1 GENERAL

The Minto Mine is a copper-gold mine located about 240 km north of Whitehorse, Yukon and is owned and operated by Minto Explorations Ltd. (Minto). The general location of the Minto Mine, along with its specific structures, is shown in Figure 1. The mine is being developed as an open pit mining operation and has been in production since June 2007. Development of the Area 1 Open Pit commenced with stripping in April 2006, and currently operates on an ongoing basis with either ore being stockpiled for processing and/or waste materials being disposed of at one of the waste dumps. There are currently three waste dumps permitted at the Minto Mine - the Main Waste Dump (MWD), the Reclamation Overburden Dump (ROD), and the Ice-Rich Overburden Dump (IROD). The MWD is used to store both non ice-rich overburden and waste rock materials while the ROD is used to store non ice-rich overburden. To date, Minto has only used the MWD and ROD for waste from the open pit.

To facilitate future reclamation and optimize current operations, Minto has proposed the design and construction of a fourth waste dump for the storage of non ice-rich overburden and waste rock materials. Consequently, EBA Engineering Consultants Ltd. (EBA) was retained by Minto to undertake the geotechnical design of this fourth waste dump, the Southwest Waste Dump (SWD).

This report presents the detailed geotechnical design of the proposed SWD and supersedes the Preliminary Design report dated May 2008. Background information involving the proposed SWD, findings of several geotechnical characterization programs, which were conducted in 1996, 1997, 2005, and 2008, the layout and geometry of the proposed SWD, and analytical work associated with the geotechnical design of the SWD will be summarized within this detailed design report. Furthermore, construction and monitoring recommendations for the SWD are also included.

EBA received approval from Minto to proceed with the geotechnical design of the SWD in May 2008.

This report is subject to the General Conditions provided in Appendix A.

1.2 SCOPE OF WORK

EBA's scope of work for this report was specifically the geotechnical design of the proposed SWD, and did not include detailed waste deposition planning or evaluating waste rock geochemical testwork and characterization data.



1.3 REPORT FORMAT

This geotechnical design report is contained in one volume and presents the main text together with the figures and appendices.

2.0 BACKGROUND INFORMATION

2.1 DESIGN INFORMATION

EBA developed the geotechnical design for the proposed SWD from the following background information.

- A drawing supplied by Minto on May 12, 2008 that detailed the Stage 1 dump layout and geometry.
- A drawing supplied by Minto on May 21, 2008 that detailed the proposed footprint limit.
- An email by Minto on May 29, 2008 that stipulated the proposed 2008 waste volumes to be excavated from the Area 1 Open Pit.
- A 2008 report (SRK, 2008) entitled "Waste Dump Overburden Drilling, Minto Mine, Yukon" detailing the 2008 geotechnical investigation.
- An email by Minto on August 22, 2008 that presented the proposed 2009 to 2011 waste volumes to be excavated from the Area 1 Open Pit.
- Several conversations, meetings, and site visits with Minto involving the SWD's construction and intended use.

In addition, EBA also used the following information from EBA's files.

- A 1997 report (EBA, 1997) entitled "1996 Geotechnical Drilling Program" detailing the 1996 geotechnical investigation.
- A 1998 report (EBA, 1998a) entitled "1997 Geotechnical Program and Construction Inspection Reports" detailing the 1997 geotechnical investigations.
- A 1998 report (EBA, 1998b) entitled "Geotechnical Evaluation, Proposed Main Waste Dump" summarizing the geotechnical design of the MWD.
- A 2006 report (EBA, 2006) entitled "Geotechnical Design, Ice-Rich Overburden Dump" summarizing the geotechnical design of the IROD.
- A 2007 report (EBA, 2007) entitled "Geotechnical Design Report, "Dry" Stack Tailings Storage Facility" summarizing the geotechnical design of the DSTSF.
- A 2008 report (EBA, 2008a) entitled "Geotechnical Design, Proposed Reclamation Overburden Dump" summarizing the geotechnical design of the ROD.



• A 2008 letter report (EBA, 2008b) entitled "Dry Stack Tailings Storage Facility – 2007/2008 Annual Review" summarizing the construction quality assurance data collected between May 1, 2007 and April 30, 2008 for the DSTSF.

3.0 SITE CHARACTERIZATION

3.1 SITE CHARACTERIZATION PROGRAMS

Four separate site characterization programs have been completed within the proposed SWD footprint. The first three programs were completed by EBA while the fourth was completed by SRK Consulting Inc. (SRK). The first program was completed in July 1996 (EBA, 1997) and was comprised of investigating various areas of the mine site to evaluate future development. The second was completed in September and October 1997 (EBA, 1998a) and formed part of the geotechnical evaluation of the MWD (EBA, 1998b). The third program was completed in October 2005 and formed part of the geotechnical evaluation of the IROD (EBA, 2006). The fourth program was completed in March and April 2008 to conduct condemnation drilling within the proposed area and supplement the data required for the SWD design (SRK, 2008).

3.1.1 1996 Site Characterization Program

The 1996 site characterization program included three boreholes drilled within the vicinity of the proposed SWD location. Only one (96-G05) of the three boreholes is located within the proposed SWD footprint while one (96-G04) is located north and the another (96-G06) is located east of the footprint. Figure 2 shows the location of these three boreholes. Borehole logs summarizing the soil and ground ice descriptions, as well as the laboratory index testing (moisture content and particle size distribution tests) are presented in Appendix B. Individual particle size distribution results are also presented in Appendix B with the associated borehole log.

3.1.2 1997 Site Characterization Program

The 1997 site characterization program included thirteen boreholes drilled within the vicinity of the proposed SWD location. Nine of the thirteen boreholes are located within the proposed SWD footprint while the remaining four (97-G09, -G18, -G19, and -G23) are located north of the footprint. Figure 2 shows the location of these thirteen boreholes, 97-G09 through -G19, -G23 and -G24. Borehole logs summarizing the soil and ground ice descriptions, as well as the laboratory index testing (moisture content and particle size distribution tests) are presented in Appendix B. Individual particle size distribution results are also presented in Appendix B with the associated borehole log.



3.1.3 2005 Site Characterization Program

The 2005 site characterization program included ten testpits excavated within the proposed SWD location along the design toe of the IROD. Figure 2 shows the location of these testpits, 1200179-TP100 through –TP109. Testpit logs summarizing the soil descriptions, as well as the laboratory index testing (moisture content and particle size distribution tests) are presented in Appendix B. Individual particle size distribution results are also presented in Appendix B with the associated testpit log.

3.1.4 2008 Site Characterization Program

The 2008 site characterization program was completed to conduct condemnation drilling and provide additional subsurface information within the vicinity of the proposed SWD. The program included nine boreholes, three of the nine are located within the proposed SWD footprint while the remaining six are located east of the footprint. Figure 2 shows the location of these nine boreholes, 08SWC270 through -280, excluding -276 and -279. Borehole logs summarizing the soil descriptions, as well as the laboratory index testing (moisture content and Atterberg limits tests) are presented in Appendix B. Individual particle size distribution and Atterberg limits results are also presented in Appendix B.

4.0 SITE CONDITIONS

4.1 SURFACE FEATURES

The proposed SWD site is located over gently sloping terrain in the upper portion of a valley, and is directly south of the MWD and east of the IROD. The proposed footprint limit, presented in Figure 2, is enclosed by the main MWD haul road, the IROD and Dyno access road, the IROD and a 30 m offset from the main drainage of this valley that forms part of the upper extent of Minto Creek.

The proposed footprint is located on an east facing slope on the west side of the upper valley. The terrain steepens to the east, south and west of the proposed SWD site. Topographic information indicates the presence of several small ephemeral creeks that converge to the middle of this upper valley into the main drainage. A few small ephemeral creeks enter the proposed footprint from the northwest between the IROD and Pelly laydown pad. These also converge to the middle of this upper valley into the main drainage. These creeks collect the surface run-off water and route it down the mountain side.

The site and adjacent area has sparse to locally dense tree cover. The area was subject to a forest fire in 1995 that has resulted in areas of fallen trees with deciduous species regrowth.



4.2 SUBSURFACE CONDITIONS

The geotechnical site characterizations indicate that the subsurface conditions within the majority of the proposed SWD footprint generally comprise a thin veneer of peat and vegetation overlying a silty sand to sandy silt colluvium overlying residual soil (residuum), which in turn overlies weathered bedrock (granodiorite).

Within the direct vicinity of the IROD, the subsurface conditions generally comprise a thin veneer of peat and vegetation overlying residual soil (residuum), which in turn overlies weathered bedrock (granodiorite).

4.2.1 Groundwater

Groundwater was noted at a depth of 0.5 m at 97-G12 and 2.4 m at 97-G16 during the site characterization. No other borehole or testpit completed within the vicinity of the proposed SWD site during the 1996, 1997, or 2005 characterizations identified groundwater.

Shallow groundwater was noted in SRK, 2008 (up to 2.6 m deep based on short-term data) for each borehole; however, this could be the result of the drilling and soil conditions. Additional monitoring of these instruments is required to better define groundwater conditions at these locations.

4.2.2 Permafrost

Permafrost was encountered in the majority of boreholes drilled during the 1996 and 1997 site characterization programs that are located within the proposed SWD footprint. The observed ice contents in these boreholes were logged as Nbe (Ice not visible – well bonded, excess ice) to Vx (Visible ice – individual ice crystals or inclusions) 5% to 20%. The active layer at the time of drilling varied between 0.3 m and 3.1 m.

Permafrost was not encountered in any of the testpits completed during the 2005 program and is not present beneath or upgradient of the IROD.

Permafrost was encountered in the majority of boreholes drilled during the 2008 site characterization program. The observed ice contents in these boreholes were logged as Nbn (Ice not visible – well bonded) to Ice and Soil. SRK, 2008 noted that distinct permafrost layers were difficult to delineate during the program as not all of the core was recovered in a frozen state. Recent readings from ground temperature cables installed during the program indicate near surface permafrost conditions similar to those observed in the 1996 and 1997 programs. These readings indicate ground temperatures ranging between -0.5 °C and -1.3 °C.





4.2.3 Bedrock

Depth to competent bedrock (granodiorite) at the design toe of the IROD was determined to range between 2.0 m and 3.1 m during the 2005 site characterization program. Weathered bedrock outcrops are present upgradient of the IROD.

All boreholes completed during the 2008 program were terminated within bedrock. Table 1 presents depths to bedrock in these boreholes.

TABLE 1: DEPTH TO BEDROCK – 2008 SITE CHARACTERIZATION				
Borehole	Depth to Bedrock (m)			
08SWC270	10.7			
08SWC271	39.6			
08SWC272	42.7			
08SWC273	51.8			
08SWC274	45.7			
08SWC275	26.2			
08SWC277	22.3			
08SWC278	45.7			
08SWC280	19.8			



5.0 WASTE SOURCING AND CHARACTERIZATION

5.1 WASTE SOURCING AND CHARACTERIZATION

Waste will be sourced from the Area 1 Open Pit and consist of predominately waste rock; however, some non ice-rich overburden will also require storage within the SWD. This waste material is currently scheduled to be stored at the MWD and is consistent with the material placed to date within the MWD.

The volume of waste to be sourced from the Area 1 Open Pit and ultimately stored within the SWD and/or MWD has been forecasted by Minto as listed in Table 2. These volumes include a 30% swell factor (recommended by Minto based on historic data).

TABLE 2: FORECASTED VOLUMES OF WASTE							
Year	Waste Rock Volume (m ³)	Non Ice-Rich Overburden Volume (m ³)					
2008	1,027,000 ⁽¹⁾						
2009 1st Quarter	888,680	151,115					
2009 2nd Quarter	1,054,025	81,055					
2009 3rd Quarter	1,269,725	75,420					
2009 4th Quarter	1,283,200	126,365					
2010 1 st Quarter	784,410	105,300					
2010 2 nd Quarter	195,880	824,890					
2010 3rd Quarter	308,820	1,100,055					
2010 4th Quarter	746,105	181,015					
2011 1 st Quarter	238,235	0					
TOTAL	7,796,080	2,645,215					

Note: ⁽¹⁾ Volume for September to December only



6.0 SOUTHWEST WASTE DUMP DESIGN

6.1 DESIGN CONSIDERATIONS

The design considerations for the proposed SWD are summarized below.

- The proposed dump must be geotechnically stable at all stages of construction, with particular attention required to evaluate the effects of permafrost foundation conditions.
- It is Minto's intent to construct the dump in the same manner as the MWD, with a series of setbacks and benches to allow for continued progressive reclamation.
- Surface water management and control of both run-on and run-off water must be incorporated into the design.
- The proposed SWD footprint has been offset 30 m from the main ephemeral creek southeast of the dump.
- Field observation and performance monitoring must be incorporated into the design.
- A design capacity of 12,450,000 m³ has been assumed for the SWD. This capacity is reduced by approximately 135,000 m³ because of material already located at the toe of the IROD. This material was stripped from the IROD footprint during its construction and has remained in its current location. This resulting design capacity is roughly 15% larger than the forecasted waste volume from Table 2.

6.2 LAYOUT AND GEOMETRY

The proposed SWD footprint limit is presented in Figure 2 while the overall layout and geometry is shown in Figure 3 and 4. It is Minto's intent to construct the dump by placing the waste material at its angle of repose (approximately 1.5H:1V) with 15 m benches or setbacks at 10 m (vertical) intervals. The only deviation to the 1.5H:1V sideslopes is the bottom bench of the dump, which has been stipulated at 2.5H:1V at all locations around the dump. The ultimate ramp will have 3H:1V sideslopes.

Figure 5 shows the SWD at several stages of construction. Stage 1 consists of the ramp from the haul road and the portion of the SWD directly east of the IROD. Stage 2 fills in the remainder of the north portion of the footprint while Stage 3 fills in the remainder of the south. During construction of Stage 3, Minto will need to address the required protocol of working adjacent to the Dyno site.



6.3 THERMAL EVALUATION

6.3.1 Analysis Methodology

Thermal analyses were carried out using EBA's proprietary two-dimensional finite element computer model, GEOTHERM. The model simulates transient, two-dimensional heat conduction with change of phase for a variety of boundary conditions. The heat exchange at the ground surface is modelled with an energy balance equation considering air temperatures, wind velocity, snow depth, and solar radiation. The model facilitates the inclusion of temperature phase change relationships for soils, such that any freezing depression and unfrozen water content variations can be explicitly modelled. The model has been verified by comparing its results with closed-form analytical solutions and many different field observations. The model has successfully formed the basis for thermal evaluations and designs of tailings dykes, dams, foundations, pipelines, utilidor systems, landfills, and ground freezing systems in arctic and sub-arctic regions.

6.3.2 Analyzed Profile

The purpose of the thermal analyses was to evaluate the impacts of the proposed waste rock placement on the thermal regime of the underlying foundation soils. The foundation soils used in the analyses were inferred to be silt and sand with varying percentages of gravel, grading into residuum and weathered granodiorite bedrock at depth.

The analysis considered waste rock placement to three final heights, 10 m, 20 m and 30 m. The 10 m lifts were assumed to be placed in two month intervals starting at the beginning of July 2008. In addition, waste rock placement to a final height of 10 m was analyzed assuming a January 2009 start date.

6.3.3 Climatic Data for Analyses

Climatic data required for the thermal analyses includes monthly air temperature, wind speed, solar radiation, and snow cover. Minto Mine's meteorological station collects monthly air temperatures, wind speed, and solar radiation at the site; however, the data is limited to the time period between October 2005 and May 2008. Mine specific snow surveys are limited to 6 years, 1994, 1995, 1998 and 2006 through 2008.

Long term data is required for the analyses; therefore, climatic data from relevant meteorological stations were also used.

Table 3 summarizes the climatic data estimated for the Minto site for the base case model.



TABLE 3: MEAN CLIMATIC CONDITIONS AT MINTO USED IN BASE CASE THERMAL ANALYSES							
Month	Estimated Mean Air Temperatures at Minto ^(a) (°C)	Monthly Wind Speed ^(b) (km/h)	Month-End Snow Cover ^(c) (m)	Daily Solar Radiation ^(d) (W/m2)			
January	-21.3	7.5	0.40	10.2			
February	-15.6	8.9	0.44	39.0			
March	-10.6	10.0	0.48	102.0			
April	0.5	11.7	0.08	180.7			
May	8.0	11.8	0.00	229.9			
June	14.7	10.8	0.00	255.4			
July	16.3	9.5	0.00	225.8			
August	13.4	9.6	0.00	170.1			
September	6.7	10.7	0.00	99.1			
October	-2.3	11.9	0.10	41.5			
November	-13.5	8.9	0.23	14.2			
December	-18.4	7.8	0.31	5.3			

Notes:

(a) Based on Climate Normals 1973-2003 for Carmacks and Pelly Ranch (Environment Canada website) and estimated air temperature changes between 1988-2008. Values presented consider the change observed temperature rate change and are prorated to reflect the temperatures at 2008.

- ^(b) Based on Climate Normals 1971-2000 for Burwash, Mayo, Watson Lake, and Whitehorse (Environment Canada website) and measured data at Minto.
- ^(c) Based on Climate Normals 1971-2000 mean month-end snow data for Mayo (Environment Canada website) and snow depth survey data at Minto.
- ^(d) Based on Climatic Normals 1951-1980 at Norman Wells and Whitehorse (Environment Canada, 1982) and measured data at Minto.

6.3.3.1 Future Climate Change (Global Warming) Conditions

Climate change, global warming conditions, have been incorporated into the analyses to consider potential long-term global warming of the air temperatures at the Minto site area. These climate changes were predicted by Global Circulation Models (GCMs).

GCMs, are mathematical representation of the atmosphere, land surfaces, and oceans that have been developed to predict future climate behaviour in response to changes in the composition of the atmosphere. Several scenarios have been developed to estimate the likely range of future emissions that may affect climate (IPCC, 2000). Different GCMs have been developed, resulting in different degrees of projected global warming. In this study, using results from the Canadian Climate Impact Scenario project (http://www.cics.uvic.ca/scenarios/index.cgi), seasonal temperature changes for the mine site area were estimated from four GCMs: a) CGCM2 (Canadian Centre for Climate Modelling and Analysis, Canada); b) GFDL-R30 (Geophysical Fluid Dynamics Laboratory,



United States); c) ECHAM4 (Max-Planck Institute of Meteorology, Germany), and d) HadCM3 (Hadley Centre for Climate Prediction and Research, United Kingdom).

The average seasonal changes in temperature over 110 years estimated from the four GCM models for the Minto site area are summarized in Table 4. The thermal analyses considering the long-term global warming conditions were conducted for some of the cases in this study.

TABLE 4: MEAN AIR TEMPERATURE CHANGE (°C) OVER 110 YEARS PREDICTED BY GCMS									
	December January February	March April May	June July August	September October November	Annual				
Average of Four GCM Models	4.2	2.6	3.3	3.1	3.3				

6.3.3.2 Air Temperatures for Sensitivity Analyses

Measured air temperatures at Minto differ from the estimated mean air temperatures. A sensitivity analysis was conducted using recent site specific mean monthly air temperatures at Minto Mine to determine the impact on the thermal regime. The estimated air temperatures for the sensitivity analysis are listed in Table 5.

TABLE 5: MINTO 2008 TEMPERATURES USED FOR SENSITIVITY THERMAL ANALYSIS						
Month	Difference between Estimated Mean Air Temperatures and Measured 2008 Site Temperatures for the Sensitivity Case and for Base Cases (°C)	Air Temperatures for the Sensitivity Analysis (°C)				
January	4.3 (warmer)	-17.0				
February	4.0 (warmer)	-11.6				
March	1.5 (warmer)	-9.1				
April	0.8(colder)	-0.3				
May	0.6 (coder)	7.4				
June	0.3 (colder)	14.4				
July	0.9 (colder)	15.4				
August	0.6 (warmer)	14.0				
September	1.4 (colder)	5.3				
October	1.4 (colder)	-3.7				
November	3.8 (warmer)	-9.7				
December	2.9 (warmer)	-15.5				
Average	1.0 (warmer)	-0.9				



6.3.4 Soil Index and Thermal Properties

Soil index and thermal properties chosen for the waste rock and foundation material in the thermal analyses are presented in Table 6. These properties were selected based on data from the DSTSF geotechnical design and the 2008 site characterization. Thermal properties of the soils were determined indirectly from well-established correlations with soil index properties (Farouki, 1986; Johnston, 1981).

It was assumed that the top moss layer under the waste rock would be compressed by the waste rock placement.

TABLE 6: MATERIAL PROPERTIES USED IN WASTE ROCK THERMAL ANALYSIS							
Material	Water Content	Bulk Density	Thermal Conductivity (W/m-°C)		Specific Heat (kJ/kg°C)		Latent Heat
	(%)	(Mg/m ³)	Frozen	Unfrozen	Frozen	Unfrozen	(INI)(M ³)
Waste Rock	3	2.06	1.22	1.42	0.77	0.83	20
Moss/Organics (for cases without waste rock placement)	100	1.00	0.81	0.47	1.89	2.94	167
Compressed Moss/Organics (for cases with waste rock placement)	60	1.60	2.36	1.02	1.24	2.03	200
Organic Silt/Sand	60	1.60	2.36	1.02	1.24	2.03	200
Sand/Gravel	8	2.35	2.61	2.12	0.83	0.99	58
Sand/Silt	28	1.96	2.40	1.34	1.03	1.49	143
Bedrock	1	2.68	3.00	3.00	0.75	0.77	9

6.3.5 Thermal Calibration Analysis

Thermal calibration analysis was performed to calibrate the thermal model and then establish initial ground temperature profiles for each case of the thermal analyses. Borehole 96-G08, located within the DSTSF, was selected for the calibration because of the consistent soil conditions with the SWD area and that it had recent ground temperature measurements.

Results of the calibration, as listed in Table 7, show a good agreement between the modelled and measured ground temperatures in Borehole 96-G08 on September 7, 2007. The predicted active layer thickness is 1.2 m in 2007.



TABLE 7: MEASURED AND PREDICTED GROUND TEMPERATURES AT BH 96-G08							
Depth below Ground Surface (m)	Measured on Sep 7, 2007 (°C)	Predicted on Sep 7, 2007 (°C)					
1	2.3	0.2					
2	-0.4	-0.5					
3	-0.9	-0.7					
4	-1.2	-0.9					
5	-1.2	-1.0					
7.5	-1.1	-1.2					
10	-1.0	-0.9					

6.3.6 Thermal Analyses

One-dimensional thermal analyses were conducted for two original ground cases (without waste rock placement) and six waste rock placement cases. The detailed climatic data and waste rock placement assumptions for each of the eight cases are summarized in Table 8.

TABLE 8: THERMAL ANALYSIS CASES SIMULATED							
Case	Snow	Time of First 10 m Waste Rock Lift	Time of Second 10 m Waste Rock Lift	Time of Third 10 m Waste Rock Lift	Air Temperatures at Placement	Air Temperatures after Placement	
1 (original ground without waste rock placement)	Mean	No waste rock			Mean ⁽¹⁾	Mean ⁽¹⁾	
2 (original ground without waste rock placement, snow sensitivity)	Three times mean	No waste rock			Mean ⁽¹⁾	Mean ⁽¹⁾	
3 (10 m waste rock placed in summer)	Mean	Jul 1 2008			Mean (1)	Mean ⁽¹⁾	
4 (10 m waste rock placed in summer, GW)	Mean	Jul 1 2008			Mean ⁽¹⁾	Mean ⁽¹⁾ plus Global Warming	
5 (10 m waste rock placed in summer, air temperature sensitivity, GW)	Mean	Jul 1 2008			Sensitivity ⁽²⁾	Sensitivity ⁽²⁾ plus Global Warming	



6 (10 m waste rock placed in winter)MeanJan 1 2009Mean (1)Mean (1)7 (20 m (two 10 m lifts) waste rock placed in summer, GW)MeanJul 1 2008Sep 1 2008Mean (1)Mean (1)8 (30 m (three 10 m lifts) waste rock placed in summer, GW)MeanJul 1 2008Sep 1 2008Nov 1 2008Mean (1)Mean (1)	TABLE 8: THERMAL ANALYSIS CASES SIMULATED CONT/D						
7 (20 m (two 10 m lifts) waste rock placed in summer, GW)MeanJul 1 2008Sep 1 2008Mean (1)Mean (1)Mean (1) plus Global Warming8 (30 m (three 10 m lifts) waste rock placed inMeanJul 1 2008Sep 1 2008Nov 1 2008Mean (1)Mean (1) plus Global Warming	6 (10 m waste rock placed in winter)	Mean	Jan 1 2009			Mean ⁽¹⁾	Mean (1)
8 Nov 1 Mean Mean Jul 1 2008 Sep 1 2008 Nov 1 Mean (1) Mean (1) waste rock placed in Mean Jul 1 2008 Sep 1 2008 Mov 1 Mean (1) Mean (1)	7 (20 m (two 10 m lifts) waste rock placed in summer, GW)	Mean	Jul 1 2008	Sep 1 2008		Mean ⁽¹⁾	Mean ⁽¹⁾ plus Global Warming
summer, GW)	8 (30 m (three 10 m lifts) waste rock placed in summer, GW)	Mean	Jul 1 2008	Sep 1 2008	Nov 1 2008	Mean ⁽¹⁾	Mean ⁽¹⁾ plus Global Warming

⁽²⁾ Sensitivity temperatures from Table 5

Cases 1 and 2 simulated the original ground adjacent to the toe of the waste rock dump slopes. Case 1 assumed the mean snow thicknesses estimated for the Minto site. Case 2 tripled the Minto mean snow thicknesses to simulate potential snow accumulation at the toe of the waste rock dump slope after waste rock placement.

Cases 3, 4 and 5 assumed summer placement, July 1, 2008, of only one 10 m lift of waste rock during the mine life. The three cases differ with respect to air temperatures assumed. Case 3 assumed the estimated Minto 2008 mean air temperatures (as listed in Table 3). Case 4 assumed the estimated Minto 2008 mean air temperatures plus potential air temperature changes with time, following long-term GCM's global warming trends. Case 5 considered the estimated Minto 2008 sensitivity air temperatures (as listed in Table 5) plus potential air temperature changes following the long-term GCM's global warming trends. The snow conditions were consistent for each case.

Cases 6 assumed winter placement, January 1, 2009, of only one 10 m lift of waste rock for the duration of the mine life. The air temperature and snow conditions for Case 6 were assumed to be the same as Case 3.

Cases 7 and 8 assume summer placement of multiple 10 m lifts of waste rock with Case 7 modelled a final height of 20 m and Case 8 a final height of 30 m. The air temperature and snow conditions for these cases were consistent with Case 3.



6.3.7 Results and Discussions

Table 9 summarizes the predicted maximum thaw depth below the original ground surface after five and ten years for each of the cases analyzed.

TABLE 10: PREDICTED MAXIMUM THAW PENETRATION INTO ORIGINAL GROUND FOR CASES SIMULATED					
Case	Predicted Maximum Thaw Depth Penetration into the Original Ground (m)		Comments Based on Thermal Analysis Results		
	After Five After Ten Years Years				
1 (original ground without waste rock placement)	1.6	2.0	Predicted active layer thickness under mean snow conditions		
2 (original ground without waste rock placement, snow sensitivity)	2.4	3.6	Thaw depth increased under tripled mean snow conditions (Case 2 vs. 1)		
3 (10 m waste rock placed in summer)	1.0	1.3	Thaw depth into original ground increases from initial 0.7 to 1 m after five years		
4 (10 m waste rock placed in summer, GW) ⁽¹⁾	1.0	1.3	Effects of global warming on the predicted thaw depth are negligible for time period (Case 4 vs. 3)		
5 (10 m waste rock placed in summer, air temperature sensitivity, GW) ⁽¹⁾	1.1	1.6	Effects of air temperature sensitivity on the predicted thaw depth indicates a deeper thaw (Case 5 vs. 3)		
6 (10 m waste rock placed in winter)	1.3	1.3	Effects of initial winter placement show slightly deeper thaw within five years (Case 6 vs. 3)		
7 (20 m (two 10 m lifts) waste rock placed in summer, GW) ⁽¹⁾	1.3	1.6	Similar to Case 5		
8 (30 m (three 10 m lifts) waste rock placed in summer, GW) ⁽¹⁾	1.3	1.3	Similar to Case 6		

Note: (1) Considers GCM's global warming

In general terms, the thermal analyses results indicate that the original ground temperatures of the foundation soils would warm up with time for all cases analyzed and the original ground surface which experienced seasonal freezing and thawing would no longer do so with the placement of the waste rock fill. This seasonal frost depth will be maintained within the waste rock once the dump is constructed. Waste rock fill located below the seasonal frost depth would remain unfrozen year round for all the summer waste rock placement cases (Case 3, 4, 5, 7, and 8). A frozen waste rock zone, sandwiched between the top seasonal frozen/thaw waste rock zone and the top unfrozen foundation soil prior to

waste rock placement, would exist in waste rock placed in winter in the initial several years before it thawed entirely later.

Snow depth significantly affects the thaw depth of the original ground (Case 1 vs. 2). If three times the mean snow cover is assumed over the original ground surface, the predicted thaw depth increases 0.8 m after five years and 1.6 m after ten years.

In five years, the predicted maximum thaw depth into the original ground ranges from 1 m to 1.3 m for all waste rock placement cases. In ten years, the maximum thaw depth is predicted to be either the same or increase by 0.3 m. The exception to this is Case 5 that indicated a maximum thaw depth increase of 0.5 m.

The effects of global warming on the predicted thaw depth are negligible for the 5 year and 10 year study periods (Case 3 vs. 4).

The effects of the air temperature sensitivity on the predicted thaw depth indicates an increase of 0.1 m and 0.3 m for 5 years and 10 years, respectively (Case 3 vs. 5).

Comparing Case 3 and Case 6, the results indicate that starting construction in January 2009 as oppose to July 2008 would result in a slight increase of thaw depth by Year 5 but similar effect by Year 10.

The effects of placing additional 10 m lifts of waste rock (Cases 7 and 8 vs. 4) on the predicted thaw depth indicates an increase of 0.3 m after 5 years and negligible to 0.3 m after 10 years.

6.3.8 Limitations

The thermal analyses in this study were based on limited available site-specific climatic data and estimated long-term climatic conditions and a number of assumptions were applied. It is expected that the soil profiles and properties will be different from one location to another over the SWD footprint, and climatic conditions over the mine life could be different from those estimated. Therefore, although reasonable assumptions and estimates have been made, the actual thermal conditions may differ from those predicted in this study.

Additional analyses must be completed during final closure design of the dump. The results from this study cannot be directly used for the closure design for the following reasons:

- Long term climatic data, specifically mean air temperatures, at the Minto Mine are still unknown. The future climatic data collected at the Minto site will be used to complete the closure design.
- The actual thermal conditions in the SWD may be different from those predicted in this study due to differences in actual waste rock placement rates and construction schedules. Actual waste rock/ground temperature monitoring data should be regularly monitored to confirm the predicted ground/waste rock thermal conditions and to provide additional information for future mine closure design.



• The design criteria for the long-term closure design would be different from those for the current dump design, the latter mainly focuses on the short term during the remaining mine life and several years after the mine closure. Long-term closure design must take into consideration the performance of the dump and final configuration of the mine and related components (open pits, dumps, etc.).

6.4 STABILITY EVALUATION

6.4.1 Analysis Methodology

Limit equilibrium analyses were conducted to determine the factor of safety against slope failure during construction of the dump. All analyses were conducted using the commercially available two-dimensional, limit equilibrium software, SLOPE/W (Geo-Slope International Ltd., GeoStudio 2007 (Version 7.03)). The principles underlying the method of limit equilibrium analyses of slope stability are as follows:

- A slip mechanism is postulated;
- The shear resistance required to equilibrate the assumed slip mechanism is calculated by means of statics;
- The calculated shear resistance required for equilibrium is compared with the available shear strength in terms of factor of safety; and
- The slip surface with the lowest factor of safety is determined through iteration.

A factor of safety is used to account for the uncertainty and variability in the strength and porewater pressure parameters, and to limit deformations.

Earthquake loading has been modeled using pseudostatic peak horizontal ground acceleration.

6.4.2 Analyzed Profile

Stability analyses were carried out for a typical profile, shown in Figure 6, of the proposed SWD. The foundation soils at this location were inferred to be silt and sand with varying percentages of gravel, grading into residuum and weathered granodiorite bedrock at depth. The presence of permafrost was incorporated into the stability evaluation. The depth to permafrost was assumed to be 1.6 m based on the thermal analyses and 2008 site characterization data.

6.4.3 Failure Scenario

It has been postulated for the stability analyses that some thaw at the base of the current active layer will occur and that the shear strength acting along the thawed frozen interface will be a controlling factor in the overall dump design; although it is the design intent to retain the permafrost within the foundation. A slow thaw rate would allow dissipation of pore pressure resulting from thaw.



The failure scenario assessed for overall dump stability was based on a deeper failure plane cutting through the dump to the permafrost interface in the foundation soil. The failure would then follow the permafrost interface and exit below the toe of the slope.

The underlying permafrost is considered much stronger than the unfrozen soil; therefore, the risk of shear failure through the frozen ground was not analysed.

The potential for creep displacements occurring deep within the permafrost has not been specifically analysed. Creep displacements, if they were to occur would be identified in the deformation monitoring system and by manifestation of cracking in the slope. These movements are slow, seldom resulting in substantial earth movement and there would be adequate time for mitigative measures.

6.4.4 Design Criteria

The guidelines for minimum design factor of safety have been adopted from the British Columbia Interim Guidelines for Investigation and Design of Mine Dumps (Waste Rock Design Manual).

The design criteria adopted from the guidelines are included in Table 11.

TABLE 11: DESIGN FACTORS OF SAFETY		
Stability Condition	Minimum Design Factor of Safety	
Long Term Stability	1.3	
Seismic (Pseudostatic) Stability	1.1	

The Waste Rock Design Manual recommends that seismic stability should be evaluated using pseudostatic horizontal accelerations that correspond to a 10% probability of exceedance in 50 years. When work was originally undertaken on the MWD in the mid 1990's, the Canadian Geological Survey Pacific Geosciences Centre provided a value for the peak horizontal acceleration for the project site of 0.15 g. An updated value for the site has been provided by the Pacific Geosciences Centre and the current peak horizontal acceleration that corresponds to a 10% probability of exceedance in 50 years is 0.055 g. The reasoning for the decrease in the peak ground acceleration provided by the Pacific Geosciences Centre is that seismic data collection has increased substantially in the Yukon in recent years. A better understanding of ground motion and improved modelling has resulted in revised predictions, which are considered to be more accurate and representative for the project area.



6.4.5 Material Properties

The material properties chosen for the waste rock and foundation materials in the stability analyses are presented in Table 12. The properties for the materials were selected based on the completed laboratory testing, and properties used in the design of the existing facilities on the site as detailed below.

TABLE 12: MATERIAL PROPERTIES USED IN STABILITY ANALYSES				
Material	Angle of Internal Friction	Cohesion	Unit Weight	
	(°)	(kPa)	(kN/m³)	
Waste Rock	35		20.0	
Unfrozen Foundation Soils	28		18.4	
Permafrost				

6.4.5.1 Waste Rock

It is anticipated that the majority of the waste rock from the open pit will be "rock like" with a friction angle of 37° to 38° ; however, some of the waste rock excavated may not be as competent. Therefore, the waste rock parameters have been treated as "soil like" waste rock with a friction angle of 35° .

6.4.5.2 Unfrozen Foundation Soils

The active layer soils are typically a silty sand or silt and sand with trace to some gravel. This material is believed to be representative of the colluvium found at Testpit 97-TP01 (location shown in Figure 2). Direct shear testing of a silty sand colluvium sample from Testpit 97-TP01 indicates this material could exhibit strain-softening behaviour with a peak friction angle of 35° and a residual friction angle of 28°. Based on these results, strength parameters of $\theta' = 28^{\circ}$ and c' = 0 kPa were used for the stability analyses.

6.4.5.3 Permafrost

For the purpose of these analyses, the frozen foundation soil has been modelled to behave as bedrock. This forces the critical failure surface to the contact of the thawed and frozen material.





6.4.6 Porewater Pressure Conditions

6.4.6.1 Natural Stratigraphy

The geotechnical drilling and testpitting at this site suggests that the existing active layer was relatively dry; however, free flowing water was noted at two locations. Therefore, it is possible that a shallow perched groundwater table may exist for short periods of the year.

A groundwater table at the original ground surface was used for the stability analyses.

6.4.6.2 Waste Rock

The potential for a phreatic surface developing within the dump slope was not considered due to the coarse gradation of the material will allow for any free water within the dump or its foundation to drain away from the facility. Should non ice-rich overburden be stored within the dump it will be located away from the overall slope of the dump.

6.4.7 Stability Analyses

The static and pseudostatic analyses have been evaluated assuming that a thin layer at the top of the existing permafrost will thaw with some porewater liberated, resulting in reduced shear strength. To analyse this reduction in shear strength, the unfrozen foundation soils (0-1.6 m) have been assigned a pore pressure parameter (Ru) from zero for a fully drained condition up to 0.2 to account for the possibility of porewater pressure build-up within the thawed foundation soil.

As expected, the stability of the dump is governed by the case where Ru = 0.2. Based on the thermal analyses predictions, the expected actual site conditions will be closer to Ru = 0 due to the slow rate of thaw, if any.

6.4.7.1 Static Cases

The results of the minimum factors of safety calculated during the static stability analyses are summarized in Table 13. Figure 6 presents the typical profile used for the analyses and the resulting critical slip surfaces.



TABLE	13: SUMMARY OF STATIC STABILITY ANALYSES RESULTS	
Case		Minimum Factor of Safety of the ROD
	Bench 1 Failure	
1	Static, groundwater table at original grade, Ru=0	1.60
2	Static, groundwater table at original grade, Ru=0.2	1.36
	Bench 2 Failure	
3	Static, groundwater table at original grade, Ru=0	2.03
4	Static, groundwater table at original grade, Ru=0.2	1.71
	Bench 5 Failure	
5	Static, groundwater table at original grade, Ru=0	2.43
6	Static, groundwater table at original grade, Ru=0.2	2.16

6.4.7.2 Pseudostatic (Earthquake) Cases

The results of the minimum factors of safety calculated during the pseudostatic stability analyses are summarized in Table 14. Figure 6 presents the typical profile used for the analyses and the resulting critical slip surfaces.

TABLE	14: SUMMARY OF PSEUDOSTATIC STABILITY ANALYSES RESULTS	
Case		Minimum Factor of Safety of the ROD
	Bench 1 Failure	
7	Pseudostatic (0.055g), groundwater table at original grade, Ru=0	1.32
8	Pseudostatic (0.055g), groundwater table at original grade, Ru=0.2	1.14
	Bench 2 Failure	
9	Pseudostatic (0.055g), groundwater table at original grade, Ru=0	1.70
10	Pseudostatic (0.055g), groundwater table at original grade, Ru=0.2	1.42
	Bench 5 Failure	
11	Pseudostatic (0.055g), groundwater table at original grade, Ru=0	1.98
12	Pseudostatic (0.055g), groundwater table at original grade, Ru=0.2	1.74



6.4.7.3 Results and Discussion

A porewater pressure parameter of Ru=0 is expected for the unfrozen foundation soils. For Ru=0, static cases 1, 3, and 5 indicate a factor of safety of 1.60 for Bench 1, 2.03 for Bench 2, to 2.43 for Bench 5. Pseudostatic cases 7, 9, 11 indicate a factor of safety of 1.32 for Bench 1, 1.70 for Bench 2, to 1.98 for Bench 5. These results indicate that the factor of safety for the overall dump stability exceed the design criteria in both the static and pseudostatic condition based on the expected porewater pressure parameter.

The sensitivity analyses assessing the effects of a porewater pressure parameter of Ru was utilized to account for the potential of excessive porewater pressure build up in the unfrozen foundation soils. Static cases 2, 4, and 6 assume a porewater pressure parameter of Ru=0.2 and had factor of safety ranges from 1.36 for Bench 1, 1.71 for Bench 2, to 2.16 for Bench 5. Pseudostatic cases 8, 10, 12 had a factor of safety of 1.14 for Bench 1, 1.42 for Bench 2, to 1.74 for Bench 5 assuming Ru=0.2. These results indicate that the factor of safety for the overall dump stability exceed the design criteria in both the static and pseudostatic condition for Ru=0.2.

A critical zone for slope stability within the placed waste material is the overall slope of the dump. This zone has been analyzed assuming waste rock material without a phreatic surface. Ensuring that pore pressures do not build-up in this area is critical to the overall stability of the dump; therefore, it is recommended that only free-draining waste rock be placed within this zone. This zone should extent from the design toe to a 30 m offset from the ultimate design crest. Finer grained waste rock and non ice-rich overburden must be placed upslope of this zone.



7.0 SURFACE WATER MANAGEMENT

There are several small ephemeral creeks that converge to the middle of this upper valley into the main drainage as shown in Figures 2 and 5. The majority of these ephemeral creeks originate with the proposed SWD footprint; however, a few enter the proposed footprint from the northwest between the IROD and Pelly laydown area. These also converge to the middle of this upper valley into the main drainage. These creeks collect the surface run-off water and route it down to and through the main haul road and into the Area 1 Open Pit area.

Surface water management has been considered for the following conditions; the main drainage that forms part of upper Minto creek, small ephemeral creeks that originate within the dump perimeter, and run-on water from ephemeral creeks entering the proposed footprint from the northwest.

To account for the main ephemeral drainage that forms a part of upper Minto creek, the SWD footprint limit includes a 30 m setback from this drainage. This will allow unaffected areas, specifically those east of the footprint, to continue to report to this drainage and minimize the impact of the proposed dump.

The ephemeral creeks originating within the dump will not pose any significant issues within the dump as they will be covered with waste material (Stage 1 and 3). Direct precipitation will then filter through the waste and report to the main drainage in the similar fashion it previously did. The construction of the overall dump slope with free draining waste rock (design toe to 30 m set back from design crest) will allow for this runoff water to flow through this portion of the dump relatively freely. Short term management of non icerich overburden slopes within the dump should include the construction of a waste rock shell cover immediately following the completion of overburden placed in the given area to reduce the potential for erosion to occur.

The few small ephemeral creeks entering the proposed footprint from the northwest between the IROD and Pelly laydown will be addressed with the staged construction. The Stage 1 dump footprint does not infringe on these water courses with the exception of the ramp. To enable run-on water to pass through the ramp and not pond within or in the vicinity of the dump, the waste rock used for construction must be coarse graded. This coarse material will act similar to a French drain through the ramp and allow for water flow. This practice was utilized during the construction of the main haul road.

During the 2009 freshet event, or any other high precipitation event, the effectiveness of the ramp material must be evaluated prior to the construction of Stage 2. Once it is confirmed that the ramp material is able to pass the run-on water effectively, the Pelly laydown extension can be infilled with coarse waster rock along with the remainder of the Stage 2 dump.



8.0 CONSTRUCTION RECOMMENDATIONS

Construction recommendations for the SWD are summarized below.

- Subgrade preparation for the proposed SWD is not required. The organic mat should remain undisturbed.
- Only coarse waste rock material sourced during pit development should be used within the exterior slope of the dump (design toe to 30 m setback from ultimate design crest). Finer grained waste rock and non ice-rich overburden must be placed within the interior of the dump.
- Minto must monitor the overburden material to determine whether it should be stored within the SWD (non ice-rich) or IROD (ice-rich).
- Regular visual inspections by Minto and EBA should be completed to note potential areas of instability.
- A monitoring program must be incorporated to provide photographs and record (as built) information of the construction progress. This information should include the division of waste rock and non ice-rich overburden material.
- Placement planning must account for the storage of non ice-rich overburden specifically in the 2nd and 3rd quarter of 2010 when a large volume will be excavated compared to the waste rock. A waste rock shell should be placed on the overburden slope immediately after its completion. Alternatively, an interior waste rock berm could be constructed prior to the placement of the overburden.
- The base of the ramp must be constructed with coarse waste rock along the zone of the ultimate side slope of the dump to allow for water movement away from the facility. The effectiveness of the ramp to allow for surface water runoff must be evaluated by EBA prior to the construction of Stage 2.
- Stage 3 construction can be completed in conjunction with Stage 1 and prior to Stage 2.



9.0 PERFORMANCE MONITORING

Performance monitoring is an integral part of the design, construction, and operation of the SWD. This section describes a recommended minimum monitoring program for the construction and operation phases of the dump.

The results of the monitoring program can be the basis of an adaptive management process that continually reviews the operation of the dump and will provide data for the final closure plan.

9.1 OVERBURDEN MATERIAL MONITORING

Monitoring of the overburden waste soils should be completed during open pit development to ensure only non ice-rich overburden waste is placed in the proposed SWD. Ice-rich waste should be placed in the IROD.

9.2 VISUAL MONITORING

Visual monitoring should be completed by Minto personnel daily and include the following:

- Inspection of the external slopes for any signs of distress;
- Inspection of the crest of the dump for any signs of transverse cracking;
- Inspection of the dump toe for any signs of seepage from the base: and
- Inspection of the dump toe for any signs of distress resulting from snow accumulation during the winter months. Snow accumulation depth at the dump toe should be noted with respect to surrounding area.

9.3 DEFORMATION SURVEYS

The breaklines (crest and toes) of the SWD should be surveyed at the completion of each main construction phase to determine the record (as built) geometry and to establish a basis for determining future deformations. These same breaklines should be resurveyed and reviewed in the summer of each year, or periodically at the discretion of the Geotechnical Engineer, to monitor deformation movements.

9.4 EXISTING INSTRUMENTATION MONITORING

During the 2008 site characterization program, four ground temperature cables and six Casagrande piezometers were installed. The location of these instruments is presented in Figure 7. One of the ground temperature cables and three of the piezometers are located within the proposed footprint will the remaining instruments are located east of the SWD.

These instruments should be monitored on a monthly basis or periodically at the discretion of the Geotechnical Engineer.



9.5 PROPOSED INSTRUMENTATION MONITORING

The installation of five instrumentation locations is recommended for additional monitoring of the SWD. Each location is to be installed through Bench 1 of the given area. Three locations are situated within Stage 1 while the remaining two are scheduled for Stage 3. Each location will have a vibrating wire piezometer, ground temperature cable and survey hub installed.

9.5.1 Vibrating Wire Piezometers

Vibrating wire piezometers are to be installed to confirm the assumed phreatic surfaces used for the stability analyses and monitor any build up of porewater pressure.

The piezometers shall have a 19 mm diameter steel housing with high air entry filter and integrated thermistor. The pressure rating for the piezometers will range from 0 - 170 kPa and 0 - 350 kPa. The electrical cable shall be PVC jacketed and rated for direct burial. The electrical cable shall be of sufficient length to reduce the need for field splicing.

9.5.2 Ground Temperature Cables

Ground temperature cables are to be installed to monitor the thermal regime of the foundation soils and waste rock fill.

The ground temperature cables will be prefabricated by EBA using 10 mm diameter, 20 conductor cable with a water block component included within the insulating sheath. The thermistor beads will be located along the cable and surrounded by a polyurethane protective moulding. The thermistor beads will be calibrated prior to installation.

9.5.3 Survey Hubs

The survey hubs will be constructed into the waste rock fill to monitor horizontal and vertical displacement within the instrumentation location.

The hubs will be comprised of a piece of rebar grouted into drill steel installed into the waste rock fill.





9.5.4 Monitoring Plan

Table 15 summarizes the minimum monitoring requirements for the proposed instrumentation.

TABLE 15: SCHEDULE FOR MONITORING				
Item	Frequency			
Vibrating Wire Piezometer	Biweekly (May through October)			
	Monthly (November through April)			
Ground Temperature Cable	Monthly			
Survey Hubs	Monthly			

9.5.5 Threshold Warning Levels

Threshold warning levels (triggers for action) for each type of instrumentation are specified in Table 16.

TABLE 16: THRESHOLD WARNING LEVELS		
Item	Threshold Warning Level	
Vibrating Wire Piezometer		
P1, P2, P3, P4, P5	Porewater pressure parameter (Ru) exceeds 0.2	
Ground Temperature Cable		
T1, T2, T3, T4, T5	Temperatures greater than 0°C for thermistor beads at depths greater	
	than 1.5 m below original ground. (1)	
Survey Hub		
SH1, SH2, SH3, SH4, SH5	Displacements greater than 150 mm in any given direction.	

Note: ⁽¹⁾ Assumes all beads below 1.5 m are located in permafrost at time of installation



9.5.6 Adaptive Management Approaches

Adaptive management approaches may be required should the threshold warning levels be exceeded. Each situation will vary depending on the severity and rate of the exceedance. Table 17 summarizes adaptive management approaches given a specific exceedance for a given monitoring function.

TABLE 17: ADAPTIVE MANAGEMENT APPROACHES	3		
Item	Adaptive Management Approaches (1)		
Vibrating Wire Piezometer			
Porewater pressure parameter (Ru) exceeds 0.2	 EBA will review existing piezometer, temperature, and survey data. Monitoring and review will be increased to semi-weekly until determined unnecessary. 		
Porewater pressure parameter (Ru) exceeds 0.4	 EBA will review of existing piezometer, temperature, and survey data. EBA will conduct a site visit and determine if waste placement and/or construction plan requires modification. Monitoring and review will be increased to daily until determined unnecessary. EBA will determine if additional instrumentation is required. EBA will complete analysis of mitigative measures should avagedness continue. 		
Ground Temperature Cable			
Thaw at 1.5 m depth	- EBA will review existing piezometer, temperature, and survey data.		
Thaw at 2.0 m depth and greater	 EBA will review existing piezometer, temperature, and survey data. EBA will conduct a site visit and determine if waste placement and/or construction plan requires modification. EBA will determine requirement for increased monitoring and review. EBA will determine if additional instrumentation or analysis is required. EBA will complete analysis of mitigative measures should exceedance continue. Minto to complete survey of area of interest to monitor any future displacement, if any. 		



TABLE 17: ADAPTIVE MANAGEMENT APPROACHES (CONT'D)				
Survey Hub				
Displacements between 150 mm and 500 mm	-	EBA will review existing piezometer, temperature, and survey data.		
		Monitoring and review will be increased to bi-weekly until determined unnecessary.		
Displacements greater than 500 mm	-	Minto to complete survey of area of interest to monitor any future displacement, if any.		
	-	EBA will determine if waste placement and/or construction plan requires modification.		
	-	EBA will determine if additional instrumentation is required.		
	-	EBA will review existing piezometer, temperature, and survey data.		
	-	EBA will conduct a site visit and determine if waste placement and/or construction plan requires modification.		
	-	Monitoring and review will be increased to semi-weekly until determined unnecessary.		
	-	Minto to complete survey of area of interest to monitor any future displacement, if any		
	-	EBA will determine if additional instrumentation is required.		
	-	EBA will complete analysis of mitigative measures should exceedance continue.		
	-	exceedance continue.		

Note: ⁽¹⁾ Adaptive management approaches are subject to change depending on the severity and rate of the exceedance

10.0 ANNUAL INSPECTION

It is recommended that an annual site inspection be conducted by the Geotechnical Engineer during the operational period to document the performance of the SWD. The specific tasks of these visits include:

- Inspection of the external slopes for any signs of distress;
- Inspection of the crest of the dump for any signs of transverse cracking;
- Inspection of the dump for any signs of seepage from the base;
- Review of survey data to confirm conformance with design assumptions; and
- Preparation of an annual report that summarizes the data and provides recommendations for maintenance or modification to the dump.



11.0 LIMITATIONS

Geological conditions are innately variable and are seldom spatially uniform. At the time of this report, information on stratigraphy at the project was at identified borehole locations from past studies. In order to develop recommendations from this information, it is necessary to make some assumptions concerning conditions other than at the specifically tested locations. Adequate monitoring should be provided during construction to check that these assumptions are reasonable.

The recommendations prepared and presented in this report are based on the geotechnical data gathered by EBA from previous reports and site characterization programs and SRK in 2008. The provided data, in the form of geotechnical boreholes and associated laboratory index property test results, has been supplemented by EBA's direct observations of the site.

This report and the recommendations contained in it are intended for the sole use of Minto Explorations Ltd. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report if the information presented in this report is used or relied upon by any party other than that specified above for the proposed SWD. Any such unauthorized use of this report is at the sole risk of the user. Additional information regarding the use of this report is presented in the attached General Conditions, which form a part of this report.



12.0 CLOSURE

EBA trusts that this report satisfies your requirements. Please do not hesitate to contact the undersigned should you have any questions or comments.

Respectfully Submitted, EBA Engineering Consultants Ltd.



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FIGURES







Q:Whitehorse/Data/0201drawings/Minto/Mine Site/Phase 005 Valley Waste Dump/Geo Design Rpt/W14101058005 Geo Rpt Figure 2.dwg [FIGURE 2] September 19, 2008 - 2:35-28 pm (BY: KEN TOMCZYK)



C:Whitehoree/Data/OS1drawings/Minto/Minto Mine Site/Phase 005 Valley Waste Dump/Geo Deagon Rpt/Wri4101068005 Geo Rpt figure 3-5.dwg [FIGURE 3] September 16, 2008 - 11:04:16 am (BY: KEN TOMCZYK)













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C.Whitehorse/Data/Minto

Figure 6

DWN CKD KJT JPB DATE SEPTEMBER 4, 2008

PROJECT NO. W14101068.005 OFFICE WHSE

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EBA Engineering Consultants Ltd.

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APPENDIX

APPENDIX A GENERAL CONDITIONS



PROJECT DESIGN REPORT – GENERAL CONDITIONS

This Design Report incorporates and is subject to these "General Conditions".

1.0 PURPOSE

These General Conditions apply to this Design Report that EBA has prepared in fulfillment of certain project specific requirements that have been previously agreed to by EBA and its Client. The Design Report may include plans, drawings, profiles and other support documents that collectively constitute the Design Report.

2.0 USE OF REPORT

This Design Report pertains to a specific site, a specific development, and a specific scope of work. The Report and all supporting documents are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, analyses or other contents of the Design Report when it is used or relied upon by any party other than EBA's Client, unless authorized in writing by EBA. Any unauthorized use of the Design Report is at the sole risk of the user.

3.0 CALCULATIONS AND DESIGNS

EBA has undertaken design calculations and has prepared project specific designs in accordance with terms of reference that were previously set out in consultation with, and agreement of, EBA's client. These designs have been prepared to a standard that is consistent with industry practice. Notwithstanding, if any error or omission is detected by EBA's client or any party that is authorized to use the Design Report, the error or omission should be immediately drawn to the attention of EBA.

4.0 GEOTECHNICAL CONDITIONS

A Geotechnical Report is commonly the basis upon which the specific project design has been completed. It is incumbent upon EBA's Client, and any other authorized party, to be knowledgeable of the level of risk that has been incorporated into the project design, in consideration of the level of the geotechnical information that was reasonably acquired to facilitate completion of the design.

If the Geotechnical Report for the project was prepared by EBA, it would have been included in the Project Design Report. That Report contains General Conditions that should be read in conjunction with these General Conditions.

5.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless so stipulated in the Project Design Report, EBA was not retained to investigate, address or consider, and has not investigated, addressed or considered any environmental or regulatory issues associated with the project specific design.

6.0 STANDARD OF CARE

Services that EBA provided to complete this Design Report have been undertaken in a manner that is consistent with the approach ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services were provided. Engineering judgement has been applied in developing design elements that are integral to this Project Design Report. No other warranty or guarantee, expressed or implied, is made concerning the content of this Project Design Report.

6.0 ALTERNATIVE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.



APPENDIX

APPENDIX B SITE CHARACTERIZATION PROGRAMS - BOREHOLE AND TESTPIT LOGS



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Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held kable, for use made of this report by any other party, with or without the knowledge of EBA

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Ē	57			SILT & SAND - some clay, trai	ce of gravel,	IUNFRUZEN													F 0.0
				fine grained sand, low to n	on-plastic,			.,				·						ļ	E.
Ē				sort, very moist, olive brow	n														F
- 1.0 E	1																	ļ	<u> </u>
	58			- hole slounbing															Ē
ΕΓ				- becomes come gravel to a	anus lise din s			$\left \right $									·		E
F 20				to med. grained sub-round	raveny rine ed below														F
E ²⁰				1.8 m						•••••						<u> </u>	+		- 2.0
E				 admp to moist below 1.8 r silt content decreases belo 	n w1.8m														E
				- sand content increases bel	ow 1.8 m														F-
E	59													z 4					
E																			F
				 grinding and hard drilling b 	elow 3.4														F
				to 3.7 m		PERMAFROST													Ē
- 4.0				 coarse grained sand, some gravel fine to med, argined 	silt, some	Nf													Ē
F				3.7 m															- 4.0
- 🗖	60			 some sand below 3.7 m silt content increases trace 	of alm	0.0.1						,							-
				below 3.7 m		-0.8 degree C.													-
- 5.0			-	- no gravel below 3.7 m							-								:
				grinding below 5.2 m	/														
			5	AND — gravelly, some silt, coar sand fine to med arrived o	se grained						· · · ·								-
				gravel, compact, moist, brow	nish													f	
- 0.0	01		Ē	grey		.0 degree C.		•										E	- 6.0
-			۲ -	NO OF BOREHULE 10 6.1 M (RE) • sloughing from ton of hole	USAL)	3													:
:			N	OTE: Mine Coordinates N 10280	.00													·	-
- 7.0				E 8310.00														Ē	:
											Ť								-
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																	•••••••		-
- 8.0																		ŀ	
																		Ē	- 0.0
-															ļ			Ē	.
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- 9.0																		Ē	-
-																		<u>E</u>	.
10.0						9 2												Ē	
Line and the second s	 ₹ \ ['n ai	$\frac{1}{n}$	oring Congultar		LOGGED BY: JSB	:	<u>. i</u>	•		<u> </u>		MPL	FTION		<u>: </u> РТИ-	61 n	<u> </u>	10.0
ЦЦ	n I	angi	11C(117	ting Consultan	us Lia.	REVIEWED BY: CF	łΗ					CO	VPL	ETE:	97/	09/1	1	1	
/02/17 11:47AK	MIK-PT1	<u>n)</u>	ΨŊ	<u>ulenorse, Yukon</u>		Fig. No:											Page	ə 1 /	ofi



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THE	MINT	0 PI	ROJEC	<u>.</u>		·	CLIENT: MINTO E	XPLORATI	ONS	LTD	<u></u>			BC)REH	OLE N	10:	97-	G10	
GEO	IECH	NICA	L EVA	<u>. </u>	WAS	TE DUMP AREA	DRILL: CME-75	c/w SOL	ID S	HAFT	AUG	ERS		PF	(OJE(CT NO	: 020	11-97	7-115	509
MINT		REEK	, YUK	ON			UTM ZONE: -	N - E -	-					EL	EVAT	ION: 2	2768.	81		
SAM			-	See GF	AB S	AMPLE NO RECOVE	RY 🔯 STANDARD	PEN. E	75	mm S	SP00	N		REL BA	RREL					
BACH		<u>. N</u>	(PE	BE BE	NTON	ITEPEA GRAVEL	. [[[]]SLOUGH	[GR	OUT			DRil	LL CVI	TINGS	5	SAN	D		
DEPTH(m)	SAMPLE TYPE	SAMPLE NO	SPT(N)	nsc	SOIL SYMBOI	DESC	SOIL RIPTION		PLAS	ELCONE 20	PEN 40	ETRATI 60	0N ■ 80 LIQUID	,	20 • P 20 PERCI 20 20	RCENT 40 ERCEN 40 ENT SIL 40	GRAVE 60 T SAND 60 T OR 1 60	1. III 80 80 7NES A 80	RUMENTATION	DATA DEPTH(ft)
										10	® 20	30	40		€ 20	ERCEN	T CLAY	\$	ISN	
- 1.0 - 1.0 - 2.0 - 3.0 - 4.0 - 5.0 - 6.0 - 7.0		62 63 64 6 7		SM c		MOSS AND ROOT MA SILT - sandy, well g plastic, soft, ver - trace of fine gn 0.5 m - color changes t around 0.9 m - becomes gravell below 2.2 m - 0.0 degree C. at - some visable ice 10% various dept - dense hard drilin SAND - silty, some g sand, fine to med gravel, moist, den brown - grinding and hard - broke off fish tail END OF BOREHOLE @ - major slough thrown NOTE: Mine Coordinat E 8357.00	T raded sand, low y moist, olive bro- ained gravel below o light greyish bro- y, fine to med. gr t 3.0 m t 3.0 m t 3.0 m t 3.0 m t inclusion Vr > hs from 3.2 m ravel, coarse grai l, grained sub-an lse, light greyish l drilling below 6.7 bit, lost in hole 7.0 m (REFUSAL) pughaut es N 10169.00	wn # swn 4.5 m ned gular 												
9.0																				28.0 30.0
ريز ريز	D A	17	 			<u>(</u>)	f T 1 7			d CD	<u></u>		<u> i l </u>		1 67			R 1 7	<u> </u>	= <u>34.0</u>
Ľ	ЪA	E.	ngı	ne	eri	ng Consultai	nts Ltd.	REVIEW	ט טו: /FD P	VOU VOU	H			-12	UMPL		UEP	111: / 5/11	m	
				Wł	ite	horse, Yukon		Fig. No	<u></u>):			·			JMPL		21/05	<u>711</u> r		
8/01/14 09:54	MH (TUK	ON10						1.19. 11										٢	<u>uye</u> 1	OT



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BY: RS



T	HE I	AINT	'O PR	OJEC	T		CLIENT: MINT() EXPLORATIONS LTD			BOREH		<u>Λ· α</u>	7_01	1	
0	SEOT	ECH	NICAL	. EVA	L	WASTE DUMP AREA	DRILL: CME-	75 c/w SOLID SHAFT	AUGERS		PROJEC	T NO	0201	-97-1	1	
h	IINTO) CF	REEK,	YUK	NC		UTM ZONE: ·	- N - E -			ELEVAT	ON: 2	798.7	1	1003	
<u>s</u>	SAMP	LE	TYPE		GR GR	AB SAMPLE NO RECOVERI	(STAND	ARD PEN. 75 mm	SPOON	CRREL	BARREL			<u> </u>		
	_	٣			1				A GROUND	TEMPERA	TURE (C)	I	PERCENT	GRAVEL		
	E	E	ž	~ `	M	SOIL				0 1	2	20	40 PERCEN	60 8		-
	E.	Ш	đ	nS	2		.011	GROUND ICE				20	40	60 8		
	Ш	SAM	SAI		SQI	DESCRIPTI	.UN	DESCRIPTION	PLASTIC	M.C.	Liquid	▲P£R0 20	JENT SIL	.1 OR FIN 60 8	NES▲ I II 10	ī
	<u> </u>								10	20 30	40	20	PERCEN			2
Ē	v.u	÷۲.	68			MOSS AND ROOT MAT	<u></u>	UNFROZEN		ĪĪ				00 0	- 0.	0
È						arained sand, very moist	nne to med. I prevish								Ē	
Ē						brown	d groyion								E	
F	1.0			i		 trace of fine grained su 	b-rounded								Ē	
F			20			 gravel below 0.4 m sand content increases 	eliabtly balance									
F			09			0.4m	andunà nema		۲						ļ,	
Ē															E	
Ē	2.0															a
Ē															Ē	1
F															Ē	
Ē.			70												F	
Ē	5.0 						-	PERMAEROST	-						E	
F								-0.6 degree C.							Ē	
E								Nf								
Ē	n				.	 moisture content decreas 	ses around								Ē	
†	°				.	J./ M — course argined sand held	w 37 m					· · · · · · · ·				
E		w -	n			Compa diana and par	J# J.7 III								-	
Ē		88 '	`						•••••	···				·····		
E- 5.	0				-	- silt content decreases to	some silt								Ē	
Ē						below 4.8 m								÷	i f	
È.															Ē	
E		}												<u></u>		
E 6.()	7	2			- becomes silty, clayey belo	w 5.9 m								E.	ļ
F					E	ND OF BOREHOLE @ 6.1 m (REFUSAL)				12	¥ A			E 6.0	
F					-	- major slough throughout									F	
È					N	OTE: Mine Coordinates N 103	06.00								Ē	ļ
- 7.0						E 7968.00									Ē	
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	EI	3A	Er	ıgiı	nee	ering Consultan	ts Itd	LOCCED BY: JSB		·	COMPLE	TION I	DEPTH:	6.1 m	1 10.0	
				0	Wh	itehorse Yukon	чо пол.	REVIEWED BY: CR	'H		COMPLE	TE: 97	<u>'/09/</u>	12		
162717	11:48-	(MUK	-9710)					P1Q, HQ,			1			Pooe	1 of 1	1



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BY: JSB



THE MINTO PROJEC	Т	CLIENT: MINTO EXPLORATIONS LTD		BOREHO	1 E NO. 97-01	7
GEOTECHNICAL EVA	L – WASTE DUMP AREA	DRILL: CME-75 c/w SOLID SHAFT	AUGERS	PROFE	I NO: 0201-97-1	<u>/</u> 1500
MINTO CREEK, YUK	ON	UTM ZONE: - N - E -		ELEVATIO	DN: 27939	1003
SAMPLE TYPE	GRAB SAMPLE ON RECOVER	Y STANDARD PEN. 75 mm	SPOON CRRE	L BARREL	27.00.0	
DEPTH(m) SAMPLE TYPE SAMPLE NO USC	SOIL	GROUND ICE ION DESCRIPTION	PLASTIC M.C.	TURE (C) A 2 LIQUID	■PERCENT GRAVEL 20 40 60 80 ●PERCENT SAND 20 40 60 80 ▲PERCENT SILT OR FINE 20 40 60 80	
			10 00 70	[♦PERCENT CLAY♦	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	 MOSS AND ROOTMAT SILT & SAND - fine ta med. Iow plastic, soft, moist, g brown water at 0.5 m trace of fine grained gra 0.5 m SAND - some silt, med. grain sand, soft, wet, light grey - drill slightly firmer below 3 - trace of some gravel fine grained below 4.9 m - unfrazen below 5.2 m END OF BOREHOLE @ 6.1 m - major slough throughout water at 0.5 m NOTE: Mine Coordinate N 1017 E 7858 	grained sand, preyish UNFROZEN vel below Idea uniform ish brown Judd uniform ish brown PERMAFROST -0.8 degree C. Nf Vx, <5%				
()	- £ .					F 107
	•	Li Agazza atta				[] [BD
EBA Engir	neering Consultan	ts I.t.d. LOGGED BY: JSB	······································	COMPLET	ION DEPTH: 6.1 m	<u>10,1</u>
EBA Engir	neering Consultan	ts Ltd. LOGGED BY: JSB REVIEWED BY: CRF	4	COMPLET	<u>ION DEPTH: 6.1 m</u> E: 97/09/12	

THE	MIN	ro pr	OJEC	Ţ		CLIENT: MINT	O EXPLORATIO	NS LTD					BOR	EHO	LE N	0:	97		3	
GEO	TECH	NICAL	EVAL		WASTE DUMP AREA	DRILL: CME	-75 c/w SOLI) SHAFT /	AUGE	RS			PRO	IECT	NO:	02(<u>)</u>)1-1	97-	115	09
MINI		REEK,	YUK)N		UTM ZONE:	- N - E -						ELEV	ATIC	N: 2	851.	71		+	
SAM				GF	AB SAMPLE INO RECOV	ERY 🛛 STAN	DARD PEN.	75 mm S	POON			CRREL	BARR	EL.						
	Ц			5					A GF	XOUN	D TEN 0	IPERAT	TURE (I		20	ERCE	NT Ç	RAVEL		1
L E	7	IZ Щ	ò	WB	SOIL	I	GROUN	DICE		·····i -	⁻		<u>~</u>			PERC	ENT	SAND	<u>10</u>	- ~e
EPI	PLE	MP	SN	N L	ΠΓΩΟΤΟ	τιωτ	dioon	DICE		сті о				_	20 ▲PER) <u>6</u> Silt		<u>10</u> NESJ	- E
	SAI	5		S		TION	DESCRI	PTION	FLA 1			l.Ç. ●		ᇉ	20	40) 6	0 8	10	
- 0.0			·		WOSS AND ROOTHAT					10	20	30	40	_	20		сян (<u>6</u>	ULAT 0 {	30	
Ē	¢.	78			SILT & SAND - well grade	d sand. low														- 0.
-					plastic, wet, brownish	black	PERMAFROST													E
					 Trace of fine to med, helow 0.4 m 	grained gravel	VX, 10 - 13%													E
- 1.0										•••••		-	·						,	Ē
F	142	79					I D daaraa C													E
Ē							1-1.0 degree (ja		·										
È ,					SAND (RESIDUM) - gravelly	, some silt, well	-													Ę
F 2.0					graded sond, fine to m	ed. grained									÷					2.0
E					angular gravel, moist b	rownish grey,														Ę
È							-													F
- 3.0		80					0.9 dagrad 0			•										Ē
E		81			- arinding and hard drilli	na helow 31 m	-v.o degree C.	•												Ē
F		~			- fish tail replaced with t	outton bit at				€										Ę
F					3.15 m — slow bard drilling contin															-
- 4.0					 easier drilling below 3.5 	m														È IA
Ē		82			- grinding at 4.0 to 4.3 i	n				•										F 7.0
					Note: sample silty with grou unable to determine ten	nd up grovel, up at depth		-				·····				.	ļļ.			F
Ē						ih ar a c hai														F
5.0											·						;			Ē
-																				Ē
Ē																				-
				Ē	ND OF BOREHOLE @ 5.8 m	(REFUSAL)														-
- 0.0				-	- some sloughing													+		- 6.0
				- N	• no water table encounte IOTE: Nine Coordinates N 81	red og no														-
					E 7022.00	00.00				••••		Î								-
- 7.0								1												-
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			~5**		itabaraa Vistaan	шы шtu.	REVIEWEI	D BY: CRH	ł .				COM	PLET	E: 9	7/09	1/12		<u> </u>	
103747 13-50	67.04			11 11	Trenouze' Inkou		Fig. No:					_						Page	1	AF 1

THE MINTO PROJECT		CLIENT: MINTO EXPLORATIONS I TD		BOREHO	1E NO: 07 014	
GEOTECHNICAL EVAL.	- WASTE DUMP AREA	DRILL: CME-75 C/W SOLID SHAFT	AUGERS	PROIFC	NO: 0201-07-115	<u></u>
MINTO CREEK, YUKON		UTM ZONE: - N - E -		FI EVATIO	N· 2824.5 #	09
SAMPLE TYPE	GRAB SAMPLE 🛛 NO RECOVER	Y STANDARD PEN. 75 mm		L BARREL		
TH(m) LLE TYPE PLE NO ISC	SOIL	GROUND ICE	▲ GROUND TEMPER	ATURE (C)▲ 2	■PERCENT GRAVEL 20 40 60 80 ● PERCENT SAND 20 40 60 80	(Ê
DEP SAMP SAMP	DESCRIPT	ON DESCRIPTION	PLASTIC N.C.		20 40 50 80	DFPTH
0.0	MOSS AND ROOT MAT		10 20 30	40	20 40 60 80	
• 1.0	SILT & SAND - well graded so plastic, wet, brownish brow - color changes to greyish t 0.3 m - trace of fine to med. grain sub-provular gradel	n PERMAFROST wrown at Vx, 10 - 15%				- 0.7
85	ang ang ang gravers	Vx, 10 -15%, Nf	•			
2.0	— grinding below 1.8 m	vx, <5% poorly bonded				
3.0 86	SAND (RESIDUUM) — same grave med. to coarse grained sand med. grained angular gravels greyish brown	I, some silt, I, fine to s, moist,	•			
.0	- change fish tail bit to CRREI	- barrel				4.0
88	- large cobble in CRREL barrel END OF BOREHOLE @ 5.5 m (REF - little to no slough	USAL)				
	NOTE: Mine Coordinates N 8535. E 7365.00	×				- 6.0
						-
						- 8.0
FRA Engine	porting Committee					10.0
PDF PUBLIC	ering consultant	S Ltd. REVIEWED BY: CR	Η	COMPLET	UN DEPTH: 5.5 m	

THE	MIN	TO PI	ROJEC	T		CLIENT: MINT) EXPLORATIONS LTD						BOR	EHC	LE N	10:	97	-G	15	
GEO	ECH	INICA	L EVAI		WASTE DUMP AREA	DRILL: CME-	75 c/w SOLID SHAFT	AUG	ERS	3			PRO	JEC	T NO	: 02	201-	97-	115	09
MINI		REEK	, YUKO)N		UTM ZONE:	- N - E						ELEV	/ATK	DN: 2	2795	; •		·	
SAM		TYPE	_	GR	AB SAMPLE NO RECOVER	Y 🛛 STAND	ARD PEN. 75 mm	SP00	N	Π		REL	BARF	₹EL		·		*****		
)EPTH(m)	MPLE TYPE	AMPLE NO	USC	IL SYMBOL	SOIL	ION	GROUND ICE	P		JND 1 KC	Temp 0	ERATI	JRE (2	C) A	20 20 20 • PER	PERC	ENT (10 CENT 10 SILT	GRAVE 60 SAND 60 OR F	1 80 80 80 1NES	PTH(m)
	S	S		SC		1011	DESCRIPTION				e	30	40		20	PER	CENT	CLAY	<u>80</u> ♠	- 8
- 0.0					MOSS AND ROOT MAT		UNFROZEN								- 20			00		- 0.0
Ē	24	89			SILI - sandy, fine to med.	proined sand,	DEDUARDACT													E
F					SAND - some silt, trace of	aravel, med, to	ILEKWAFRUSI		·····	···;···	Ì			·				<u>+</u>		
E ₁₀					coarse grained sand, find	e groined	N 159													Ē
†					angular gravel, soft, moi	st, grey	Vx, <5%				···· ·									
E	194 194	90									•									E
È							-0.3 degree C.								·			†		
- 2.0							V. 10 15%													E
E							¥X, 10 - 13%													2.0 E
F																				-
F	dz. 1.					Í														<u>–</u>
- 3.0		91					-02 degree C			٠										
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																				F
- 4.0								ļ,		ļ					ļ					E 40
[1999	92										ļļ								E
				Ŀ	 hard drilling at 4.6 m – 	4.9 m														F
5.0				E	ND OF BOREHOLE @ 4.9 m							ļ	ļ							E
					- some slough - no water table encountered															Ē
-				١	IOTE: Mine Coordinates N 914	7.00														
					E 7550.00															
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			J	Wh	itehorse Yukon		INEVIEWED BY: CR	(H	. <u></u>				COM	PLE	TE: 9	7/0	9/1	2		
02/17 11:53	AH (YU	K-P110)																Pag	e 1	of 1

		CLIENT: MINTO EXPLORA	ATIONS LTD	BOREHOLE NO: 97-G16	6
GEOTECHNICAL E	VAL. – WASTE DUMP AREA	DRILL: CME-75 c/w S	OLID SHAFT AUGERS	PROJECT NO: 0201-97-11	1509
SAMPLE TYPE		UTM ZONE: - N - E		ELEVATION: 2814.3	
BACKEILL TYPE	BENTONTE	KY STANDARD PEN.		EL BARREL	
		L [[[]]SLOUGH		L CUTTINGS 🔤 SAND	
~ 변위		2011	20 40 60 80	PERCENT GRAVEL	5
		SOIL		PERCENT SAND	Š
		יDIDTION		A PERCENT SILT OR FINES A	MIA MIA
S N D					
- 0.0	NOSS AND DOOT UN	7	10 20 30 40	$\begin{array}{c c} \bullet PERCENT CLAY \bullet & \textcircled{22}\\ 20 & 40 & 60 & 80 \end{array}$	2
E 93	ISIT & SAND - WAL	araded cond low	-/ •		E
	plastic, wet, dar	k olive bown			ļ
E.	SAND - silty, fine g	rained uniform sand.			Ē
	non-plastic, sof	t, moist, light			F
E 🚺 94	greyish brown				Ē
			· · · · · · · · · · · · · · · · · · ·		Ē
E-2.0					Ē
					Ē
	- trace of fine or	and annular arrival			-
	below 2.4 m	anea angalar gruver			Ē
- 3.0	- sand becomes w	vell graded below 2,4 m	•		
	- moisture conten	t increases to very			Ē
-	moist below 2,7	m			÷ ا
	- + 3.9 degree C.	at 3.0 m			Ē
- 4.0		inie atonua 2.2 m			Ē
					Ē
- 95					Ē
50					Ę
					E
97					Ŀ
	END OF BOREHOLE	5.5 m (REFUSAL)			E
6.0	- major slough thr	pughout			F
	NOTE: Mine Coorindate	DIE OT 2.4 m			E
	E 7376.00	5 N 5344,00			Ē
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L ERA ENÉ	gineering Consultai	nts Ltd.	EN RX+ CPH	COMPLETION DEPTH: +,+	
1	Whitehorse Vukon			100MPLETE: 97/09/16	

TH	e min	ITO P	ROJEC	T		CLIENT: MINT	D EXPLORATIONS LT	D.	BOREH	OLE NO:	97-G1	7
GE	OTEC	HNICA	L EVA		WASTE SUMP AREA	DRILL: CME-	-75 c/w SOLID SHAI	FT AUGERS	PROJEC	T NO: 02	01-97-1	<u>/</u> 1509
MI	410 (REEK	,YUKO -	N		UTM ZONE:	- N - E -		ELEVAT	ON: 2827	.2 /	
SA	MPLE			царана Т	AB SAMPLE VINO RECOVER	Y 🛛 STAND	ARD PEN. 75 m	m SPOON	el barrel			
	- 10	10		2	COT			GROUND TEMPER	ATURE (C)	PERCE	NT CRAVEL	0
		ļΨ	UN N	XWB	SOIL		GROUND IC	E.		PERC	Ê (E	
La La		L L	S			ION			1101110	A PERCENT	SILT OR FIN	
		3		SO		ION	DESCRIPTIO			20 4() 60 8	
- 0.	0				MOSS AND ROOT MAT			10 20 3	0 40	20 40) 60 8	0
Ē		98 98			SAND & SILT - trace of fine	grained	JUNI NOZLIN	•				
Ē				gravel, well graded sand,	brownish	PERMAFROST	····	···{···}···{···				
E.					 grey become some silt to silt 	v helow 0.3 m	Vx. <5%					
	0											
F	1	100										Ē
F					- silt content increases to	ally bolau	Vx, 15 to 20%					
F 21	,				1.6 m	Sarty Derow						-
ļ ``	ĺ				- trace of clay below 1.6 r	n .						
E					 grover becomes fine to n below 1.6 m 	ned grained						Ē
Ē					- color becomes grey below	v 1.6 m						
- 3.0		101					Vv <5%					E
þ			1		- some gravel below 3.0 m		VA, COM					2
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F 4.0											·····	
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F- 6.0		103										
E	AGE S			E	ND OF BOREHOLE @ 6.1 m			•••••••••••••••••••••••••••••••••••••••			••••	6.0
F				-	no water table encountered	d l						Ē
Ē					• some slough throughout OTE: Mine Coordinates N 1041	6.00						E
7.0					E 7347.00	0.00						E '
F												E 1
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- 8.0												
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- 9.0												
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- 10.0												F
]	EB/	E	noii	nee	ering Consultan	ta Ita	LOGGED BY: JS	<u>B</u>	COMPLE	TION DEPT	<u>.::::</u> H: +,+	<u>F 10.0</u>
			o	Wh	itehorse Vukon	vo utu.	REVIEWED BY: (CRH .	COMPLE	TE 97/09	/12	
6/02/17 11	544H M	K-PTIO			TUDIDO, TUDUI		[riq. no:				Page	1 of 1

					CLIENT: MINT() EXPLORAT	TIONS	LTD				BOR	EHO	LE N	0; (37-(<u>G18</u>	
UNITO (HNU		<u>4L. –</u>	WAS	E DUMP AREA DRILL: CME-	·75 c/w SC)LID S	HAFT	AUG	ERS		PRO	JECT	NO:	020	1-97	'-1150	9
SANDIE					UTM ZONE:	- N - E	_					ELEN	/ATIO	N: 2	841.	51.		
BACKEI			GR GR	AB SI	MPLE VINO RECOVERY STAND	ard pen.	75	mm	SP00	N		EL BARI	₹EL.					
			BŁ.		IE [.]PEA GRAVEL []]SLOUG	Н	GF.	OVT				L CUTTI	NGS		SAN]		
	t o			5				CON	E PEN	ETRATI	ONM		PER	CENT (GRAVE		z	Г
	- Z	E	0	1 M M	SOIL			20	<u>40</u>	00	0	20] 4 • PEF	<u>HO</u> RCENT	60 SAND	<u> </u>		
	길로	SPTI	SU	5	DECONDERAN							2() 4	Ю	60	60	A EN-	
	15	ļ Ť.]		DESCRIPTION		PLAS	nc	M.C		Liquid	▲ PE 20	RCENI) 4	t silt 1 0	0R Fi 60	NES A	MUS	
		ļ	ļ	Ľ					8 20	70			♦ PER	CENT	CLAY	•	-ISV	۲ ۲
	104				MOSS AND ROOT MAT		A			<u></u>	40	20	4	<u>U (</u>	60	80		
.					SILI & SAND - trace of gravel, we	l graded												
					and out rounded arranged ang	ular		1		1					·	-		-
- 1.0	105				motiled brown and area	t, loose,												
					SAND - silty some gravel well are		•					- T					-	-
					sand, fine to med, argined and	ular and												- 4
					sub-rounded gravel, loose, moi	et.						····					-	-
.0					light greyish brown	Jej												- - 6
		1	ĺ		- sand becomes course argined	pelaw i							·					-
346	106		u	JUJU	2.1 m													-
		ľ	. – Jink	มน	 some silt below 2.1 m 							A R			۲	1	l F	- 8 -
0					- some fine grained gravel below	2.1 m											ΙĒ	-
					- trace of silt below 2.1 m													- 11
					- very wet below 2.1 m, possible	water												
			1		10176								1				Ē	- 12
) 200																		
1925	107						•										Ē	
					 sand becomes fine to med. grai 	ned												•14
					troca of fina grained and the	[Ê	
					4.3 m	₩											Ē	16
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	ł		" pa	F	ND OF BOREHOLE @ 73 m			0				•	۵				Ē,	
		ł		_	major slovahing												Ē	<u>'</u> 4,(
	}	1		N	DTE: Mine Coordinates N 10730.00	[L L	
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EBA	Er	ıgir	nee	rin	ig Consultants Ltd	LOGGED) BY: .	ISB		<u> </u>	<u> </u>	COMP	LETIO	N DE	PTH:	<u>نات.</u> *,*	<u>+</u> ,	•4
		\cup	Whit	teh	orse Yukon	REVIEW	D BY:	CRH				COMP	ETE	97/	'09/1	3		
IL: ISAN (YUK	ON-10)				STUD, IUNUH	IFIQ. NO:										Paa	e 1 of	1



Project: 0201-97-11509

Date Tested: 97/10/20

BY: RS

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THE	MIN	ro p	ROJE	CT		CLIENT: MINTO EXPLO	RATIO	ons LTD	•••••••			BORF	HOLE	NO C	7-0	10					
GEOTECHNICAL EVAL. – WASTE DUMP AREA DRILL: CME-75 c/w SOUD SHAFT AUGERS PROJECT NO: 0201-97-11 MINTO CREEK, YUKON UTM ZONE: – N – E – FLEVATION: 2857.7 / 11													-1150	<u>.</u>							
MINTO) CI	REEK	, YUK	(ON		UTM ZONE: - N -	Ε-	-				FI FVA	TEVATION: 2857 7								
SAMF	YE	TYP	Ε	GR	AB SA	MPLE NO RECOVERY STANDARD PEN.	E	∃75 mn	n SPOO	N	MCRRF	BARRE									
BACK	FIL	L T	YPE	BE	NTONI			IGROUT		<u> </u>		CUTTIN	<u>-</u>	SAN							
					Τ,		<u> </u>	CONE PENETRATIO			NE		PERCEN	C GRAVEL			1				
12	M	2			B	SUIUS		20	40	60	80	20 40 60 80 PERCENT SAND				10					
H	j.	Ш	1 S	S S	SYM							20	40	80	NIA NIA	E H					
	MP	AMF	5		1	DESCRIPTION	RIPTION			<u>).</u>	LIQUID	▲ PER 20	CENT SI	Mn A							
	3	0			۵.							•	PERCEN	IT CLAY		뒚					
- 0.0		110			+	MOSS AND ROOTMAT		10	20	30	40	20	40	60	80	<u> </u>					
E		110				SILT & SAND - trace of aravel, well arade	/									1	- 0.V				
E						sand, fine to med. grained sub-round	ed										E 20				
ŧ.						gravel, soft, moist, dark olive brown	_/														
F 1.0		111				SAND — silty, trace of gravel, well graded		۲									- '				
						sand, the to med. grained sub-round	ed										E 4.0				
F						- water table at 1.2 m possibly lower at	F I			11					·						
E 2.0						sand seam below 2.1 m											E-6.0 '				
E		112				- 0.3 m thick layer of med, to charse	ľ	•													
-		117				grained sand, trace of silt, loose,											-8.0				
Ē		1131				very wet, grey		•									-				
- 3.0		1															-				
E																	- 10.0				
F											ļļ						_				
E						- sand becomes med to course argined											- 12.0				
- 4.0	-				1000	below 3.7 m				·							<u> </u>				
E		114		SM	3333	- some silt below 3.7 m		•						٠			- 14.0				
E		Ì			.	 trace of fine grained sub-rounded 				· (·····											
		ĺ	[gravels															
E- 5.0						 gravel content increases below 4.1 m becomes silty below 4.4 m 										Ē	- 16.0				
E		1	l			Decomes say Delow 4.4 m											-				
	覹 1	15			[Ē	- 18.0				
E ₆₀ [Ì			¢								Ē	-				
₽ [™]				Í	-	- drilling slightly barder below 6.1 m					····					Ē	- 20.0				
E I						arming anging harder berow out the										Ē	- I.				
E I																Ē	- 22 6				
- 7.0																F	- 22.0				
	颲 1	16	1		1			0								E	-				
				ĺ			ļ					ļļ.				E	- 24.0				
																Ē	.				
- 8.0							ļ	ļ	<u>]</u>			ļļļ.				Ē	- 26.0				
				[Ē					
	1	7										.				Ē	- 28.0				
		1			F			٩								Ē					
- 9.0					-	borehole slauching										E					
					_	water around 1.2 m										Ę.	- 30.0				
					N	OTE: Mine Coordinates N 10837.00										Ē	{				
: _ I0.0			1			E 7237.00										Ē	32.0				
	1		l		1											E					
																Ē	34.0				
E	EBA Engineering Consultants Itd LOGGED BY: JSB COMPLETION DEPTH: **																				
			0·	Wh	أعازر	Norse Vulton	VIEW	ED BY:	CRH			COMF	NETE:	97/09	/13						
3/01/14 10:46	AH (M	KON-1)	111	11001	1015C, 1UKUH	g. No	»:							Pa	ge 1 c	of 1				



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THE	MINT	O PR	OJECT	[CLIENT: MINT	O EXPLORATIONS LTD	······································	BOREH	OLE N	0: Q	17-C	23	
GEOT	ECH	VICAL	EVAL	. —	WASTE DUMP AREA	DRILL: CME-	-75 c/w SOLID SHAFT	AUGERS	PROJEC	T NO:	0201	1-97-	<u>20</u> 1150	30
MINT		EEK,	YUKC	N		UTM ZONE:	- N - E -		ELEVAT	ION: 2	885			
SAM	' <u>ቢ</u> ይ ተተተገ		ļ	GR	AB SAMPLE NO RECOVER	Y 🛛 STANI	DARD PEN. 75 mm		EL BARREL					Hanna
	Ы			Ы				GROUND TEMPER	ATURE (C)	₩P 20	ERCEN	T GRAVE	1	1
	\geq	<u>ч</u>	Ŋ	ΥMB	SOIL		GROUND ICE		4	20	PERCEN	VT SAND	80 •	╡╔
EPI	Ę	MP	9	ري لـ	ייסוסיסיזת	ίων				20 ▲ PERC	40 FNT SI	60 11 00 c	80 INEC -	불
	S	S		SOI		IUN	DESCRIPTION		LIQUID	20	40	60	80	- H
- 0.0					MOSS AND ROOT WAT			10 20 30) 40	20	PERCEN	T CLAY 60	♠ 80	
Ē		141			SAND - some silt, trace of a	aravel, med, to	JUNFRUZEN	•						- 0.0
Ē					coarse grained sand, fine	grained								Ē
-					liaht arevish brown	se, moist,								F
					- harder drilling below 0.3	m								<u>F</u>
-	5 <u>(</u>)	142												Ė
F	Π				- nrovel content increases	nliabtly and								<u>}</u>
- - 20					becomes fine to med, and	signay and ined below								E
					1.6 m									E 2.0
Ē														F
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- 3.0	1	43					-	•						-
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- 4.0													-	
EL														- 4.0
	<u>م</u> ا 14	14						•••••		ļ			Ē	
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F							PERMAFROST						ŀ	
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- 7.0													ŀ	
-										•••				
_	140	3			transformed dignet in the								Ē	
-				-	7.7 m	ing below	i						E	
- 8.0				EN	D OF BOREHOLE 7.9 m (REFL	ISAL)								
				-	very little slough	·								8.0
					TIG water table encountered TE: Mine Coordinates N 1093	2 00							F	
					E 6560.00								F	
- 9.0													Ē	
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-	1	1											E	
10.0						1							Ē	
E.	RA	Fr	noir	ופר	pring Congulton	ta Ita	LOGGED BY: JSB				FPTH.	<u> </u>	<u>- </u>	10.0
. تب	4 4 V.	1.11.	811	ւսն ԾՄԴ	itebaras Vulsa	is Liu.	REVIEWED BY: CR	RH	COMPLET	IE: 97,	/09/1	4		
702/17 11:55	MMK	PTIN		11 11	itenorse, jukon		Fig. No:	·	1		<i>4</i>	Page	1 of	1

CEOT	ECU	NICI	1 52		144 OT		CLIENT: MINTO ED	(PLORAT	IONS	LTD				BC	DREH	IOLE	NO:	97	7-6	24
				AL -	WASI	e dump area	DRILL: CME-75	c/w SO	LID S	SHAFT	AUG	SERS		PF	ROIE	CT N	0: 0	201-	-97-	-1150
CALLE			, IUN		10.04		UTM ZONE: - N	∀ - E						EL	EVAT	NON:	275	2.8		
				GK	AB SA	MPLE NO RECOVERY		Pen.	7	5 mm	SPOO)N	CRF	EL BA	RREL	~~~~~ <u>~</u>			· · · · · · · · · · · · · · · · · · ·	
JACK		- <u> </u>		BE	NTON	EPEA GRAVEL	[[]]SLOUGH	[G	ROUT		·		LCU	TING	s f	<u></u>	NI		·
~	HH I	0							T	CONI	E PEN	ETRAT	ION D	1	P	ERCEN	IT CRA	VEL.	 F	1
<u> </u>	μ	Z ш	Î	0	₩ ₩	S(DIL.		<u> </u>	20	40	0()			20	40 PERCEI	60 NT SAI	<u>8</u> una	0	
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Ē	N.	18	S S		등	DESCH	21PTION -		PLA	STIC	Ж.	С.	Liquid		PERC 20	ENT SI 40	LT OR	Fine R	S▲	M
	Ľ									10	••••				•	ERCE	NT CU	.Y∳	<u></u>	齿
0.0		147				MOSS AND ROOT MAT			\vdash	10	<u>20</u>		40		20	40	60	8	<u>}</u>	<u> </u> ≝
	\square					SILT — sandy, trace of	f gravel, well gra	ded			•									
						sand, fine grained	sub-rounded gr	avel,		·†···†···				<u> </u>						
1.0						moist, soft, dark c	live brown													
	22	148				SAND & SILT - trace (of gravel, well ar	aded			+				+					
						sand, fine grained	sub-rounded gr	avei,												Ē
						soft, maist, browni	sh grey			÷								.		Ē
2.0						- trace of clay below	w 1.5 m													
						 becomes sandy, si 	ilt, trace of clay,	ſ		•••••	·····	•••		••••				<u>.</u>		
	<u>i</u> 1	49				trace fine grained	gravel below 2.0	m												
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0						 clay content decre 	ases below 2.8m	, 1												Ę
				ļ		 gravel becomes we 	Il graded below :	2.8 m												Ē
							N													Ē
1																	1			Ē
				1	.	- hard drilling some	arinding holow													Ē
	15	ю				3.9 m	grinding below			•				Î			11			Ē
Γ	7																			Ē
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				[nn water table and	(REFUSAL)													Ē
					-	some minor sloughin	nuered				<u> </u>				$\left \cdot \right $					Ē
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			011	1971.20	⊾ ⊥⊥́́́. [<i>"</i>]	8 Consultant	s Liu.	REVIEWE	D BY	: CRH	i .	···-		COM		IF. a	7/00)/14)/14	.*	
				TV (1) 1	6.657	Vrda Villian						~		1	ا مطلقه ا	2				

Minto	Mine	e De	velop	oment 2005	Client: Sherwood N	lining (Corp).				TEST PIT NO: 1200173-TP100											
Minto	Сор	per	Mine		Excavator: CAT 41	6 C Ru	bbe	r Ti	re				PROJECT NO: 1200173										
Propo	sed		burc	den Dump	6944700 N, 3834	73.6 E	8				ELEVATION: 0 m												
Depth(m)		SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPT	'ION	P		iC	м	.C.	LII	QUID H											
0.0				SAND (RESIDIUUM) – silty, trac	e of aravel		20	<u>)</u>	40	60	80			20	40	60	80		- 0.0				
	- 1.0			- becomes some gravel, grained, angular 0.5 m - trace to some silt below	vel, fine to medium n below 1.0 m																		
				BEDROCK (GRANITE) – poor qua	lity, frìable						· · · · · · · · · · · · · · · · · · ·												
-				- becomes more competer	nt with depth																		
- 3.0 				END OF TESTPIT 3.0 m (REFUSAI	.)														10.0				
F	BA	E	ne	ineering Consulta	nts Ltd	LOGGED BY: JSB								COMPLETION DEPTH: 3 m									
-								REVIEWED BY: JRT								COMPLETE: 05/10/16							
35/11/28 D2:5	7PM TYL	K~1P4)				jing i	VU,						Poge 1 of										


Project: 0201-1200173

Date Tested: 05/11/02

BY: JP

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Minto Mine Dev	elopment 2005	Client: Sherwood M	ent: Sherwood Mining Corp. TEST PIT NO: 1200173-TP10									² 101	
Minto Copper N	Aine	Excavator: CAT 416	C Rub	ber T	ire			PRO	JECT	NO: 1	20017	'3	
Proposed Overl	burden Dump	6944709 N, 38355	3.1 E	Z 8				ELEV	ATION	<u>l: 0 m</u>	1		
Depth(m) SolL SYMBOL SAMPLE TYPE	CRAB SO DESCRI	IL PTION	Pl	ASTIC	Ŵ	I.C.	LIQUID		10 20 20 20	PERCEN 20 PERCEN 40 PERCEN 40 PERCENT	IT CLAY 30 JT SILT 60 IT SAND 60 GRAVEI		Depth(ft)
0.0	ORGANIC ROOT MAT			20	40	60	80		20	40	60	80	- 0.0
	SAND (RESIDIUUM) - silty,	trace of gravel											
-	- trace to some silt I	below 0.3 m											
													بيدير أردين أحبين أيب
													والمتعالية والمتعالية والم
													- 5.0
- 2.0	— coarser gravels, son below 1.8 m	ne cobbles present											ليديرا يسيا
	BEDROCK (GRANITE) – poor	quolity, frioble											
	- more competent with END OF TESTPIT 2.7 m (REF	h depth USAL)											م م الم يدير أو ي
- 3.0													E E E E E 10.0
4.0													
ERA F	ngineering Consul	tants Ltd	LOGG	ED B	Y: JSB			00	: Mple	TION [)EPTH:	2.7 m	
	ingineering oonsul	LIGHTED THE	REVIE	WED	BY: JR	ſ		CO	MPLE	TE: 05	5/10/1	16	
05711728 D2:57PH (YUK-1P4))		Fig. No; Pa									Page 1	1 10

Minto Copper Mine Excavator: CAT 416C Rubber Tire PROJECT NC NW of Minto, YT 6944697 N, 383635.9 E, Z 8 ELEVATION: SAMPLE TYPE GRAB Image: Comparison of the second se	IO: 1200173 20 m PERCENT CLAY • 20 30 40 PERCENT SILT • 40 40 ERCENT SAND ■ 40 40 40 60 80 RCENT GRAVEL • 40 60 40 60 80 40 60 80 10 10 10
NW of Minto, YI 6944697 N, 383635.9 E, 2 8 ELEVATION: SAMPLE TYPE C CRAB C CRAB DESCRIPTION PLASTIC MC LIQUID 20 40 60 80 20 40 60 80 20 40 60 80	$\begin{array}{c c} U \\ \hline \\ & \\ \hline \\ \\ & \\ \hline \\ \\ & \\ \hline \\ \\ \hline \\ \\ & \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \hline \\ \hline \hline \hline \\ \hline \hline \\ \hline \hline \\ \hline \hline \hline \hline \\ \hline \hline \hline \\ \hline \hline \hline \hline \\ \hline \hline \hline \\ \hline \hline \hline \hline \hline \\ \hline \hline \hline \hline \hline \\ \hline \hline \hline \hline \hline \hline \hline \hline \\ \hline
SAMPLE TIPE ORAB (E) 10 20 (E) 20 40	20 30 40 $2ERCENT$ $SILT \blacktriangle$ 40 40 60 80 40 40 60 80 40 40 60 80 60 40 60 80 60 40 60 80 60 40 60 80 60 40 60 80 60 40 60 80 60
0.0 SAND (RESIDIUUM) - silty, trace of gravel 20 40 60 80 20 40	<u>40 60 80</u>
 - trace to some silt below 0.4 m - some gravel, fine to medium grained, angular to 0.4 m - 10 - 10 - 10 - 10 - 5000000000000000000000000000000000000	
EDA Enging Congultanta Ital LOGGED BY: JSB COMPLET	TION DEPTH: 2.8 m
EDA Engineering Consultants Ltd. REVIEWED BY: JRT COMPLET	TE: 05/10/16
Fig. No:	Page 1 of 1

Minto Mine Development 2005	Client: Sherwood Mi	ning (orp.				TEST PI	Γ NO:	1200	173-T	P103
Minto Copper Mine	Excavator: CAT 416	C Rub	ber T	ire			PROJEC	T NO: 1	20017.	3	
	6944651 N, 383701	1.1 E	, Z 8				ELEVATIO	<u> </u>	1		
SAMPLE TYPE GRAB GRAB GRAB GRAB GRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB CRAB COLL SOII COLL SOII COLL SOII CRAB	, TION	PI	ASTIC	ł	4.C. ●		10 20 20	PERCEN 20 A PERCEN 40 PERCEN 40 PERCEN	IT CLAY 30 1T SILT ▲ 60 T SAND ■ 60	40 80 80	Depth(ft)
			20	40	60	80	20	40	60	80	- 00
0.0 ORGANIC ROOT MAT SAND (RESIDIUUM) - silty, tro - trace to some silt be - becomes gravelly, we angular below 0.4 m - 1.0 - 1.0 - cobbles encountered - some boulders present - BEDROCK (GRANITE) - poor q around 1.6 m	ace of gravel elow 0.4 m Il groded, below 1.0 m nt below 1.0 m uality, friable				60	80				80	5.0
											10.0
EBA Engineering Consulta	ants Ltd.	LOGGI	D BY	': JSB 3YIPT	,		COMPL	ETION D	EPTH: 2	<u>? m</u>	
		Fig. N	0:					LIL. UJ	/ 10/ 10	Page 1	of 1

Minto	Mine	e D	evelo	pment 2005	Client: Sherwood Minir	ng C	orp.					TES	T PIT	NO:		200	173-1	P104
Minto	Сор	per	Mine	3	Excovator: CAT 416C	Rubl	ber	Tire				PRO	JECT	NO:	120	0173	>	
NW of	f Min	to,	YT		6944573 N, 383721.6	ЗE,	Ζ8	8				ELE	VATIO	N: 0	m			
SAMP		YP L	E ! o	GRAB		1							10	PERO 20	CENT (CLAY © 30	40	
h(m)	YMB			SOIL									20	N PER 40	CENT	SILT 🛦 60	80	(ft)
eptl	L S	MP	MP		NOI	PL	ASTIC	, ,	М.	C.	LIQUID		20	I PERC	ENT S		80	epth
	S	AS.	5				}			•			•	PERCE	INT G	RAVEL	\$	
0.0	+			ORGANIC ROOT MAT			20		40	60	80		20	40	(<u>50</u>	80	- 0.0
- 1.0				SAND (RESIDIUUM) — silty, trac well graded sand, fine to angular grovel, compact, brown — trace to some silt belo — becomes gravelly, well below 0.4 m — cobbles below 0.7 m	e of gravel, medium grained damp, reddish w 0.4 m graded, angular													· · · · · · · · · · · · · · · · · · ·
- - 2.0 -																		
-																		
				BEDROCK (GRANITE) - poor quo - more competent with de	olity, friable													
-				END OF TESTPIT 3.1 m (REFUSA	L)													
<u>4.0</u> т	 ירזיד	<u> </u>	<u>.</u> .			000	ED F	₹Y•	JSR) MPI	ETION	1 DEt	лн.	31 m	Ē
tt	אר BF	ł	Ľn	gineering Consulta	nts Ltd.	REVIE	WED	BY	: JRT		······	C()MPL	ETE:	05/	10/16	B Page	1 of 1

Lation Logistic Anne Esconariz (2A 4160 Rubber Tre PPOLIST NO: 100 //3 SMMPLE TYPE Bowe Elevation (2) Elevation (2) Elevation (2) SMMPLE TYPE Bowe Elevation (2) Elevation (2) Elevation (2) Elevation (2) SMPLE TYPE Bowe SOIL Pussic ALC UDUD Elevation (2) ALC	Minto	Mine	Dev	elop	oment 2005	Client: Sherwood	Mining C	orp.				TEST	PIT	NO:	120	0173-	TP105
Bit Di unito, 11 E844494 N. 363705.1 F. Z.8 ELEMENT CM • m Suffle TYPE Grad SOIL 0 • 0000000000000000000000000000000000	Minto	Copp	Der N			Excavator: CAT 41	16C Rub	ber Ti	ге			PROJ	ECT	NO: 1	2001	73	
Description Operation Operation			$\frac{10, 1}{\sqrt{0}}$		0010	6944494 N, 3837	705.1 E	, Z 8				ELEVA	TION	l: 0 m	1		
0.0 ORCANIC REOF LANT 20 40 60 90 60 <	Depth(m)	SOIL SYMBOL	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPT	ION	PL	ASTIC	м	.C.	LIQUID	1	0 10 10 10	PERCEN 20 PERCEN 40 PERCEN 40	T CLAY 30 IT SILT 60 T SAND 60	◆ <u>40</u> ▲ <u>80</u> ■ 80	Depth(ft)
Cost December 2000 SAND (RESNULWA) - trace to some growel, compact, domp, medium grovel, compact, domp, medium grovel, compact, domp, medium grovel, - trace to some site below 0.4 m - becomes gravely, well graded, angular below 0.4 m - cobbles encountered below 0.6 m -1.0 BEDROCK (GRANITE) - poor quality, friable -1.0 BEDROCK (GRANITE) - poor quality, friable -2.0 END OF TESIPIT 2.0 m (REFUSAL) -3.0 Cove_LETION DEPTH 2.m (REFUSAL) -3.0 EBA Engineering Consultants Ltd.					0.0011110.0000			20	40	60	80	2	• • Pi :0	ERCENT 40	GRAVE 60	L 💠 80	
EBA Engineering Consultants Ltd.					UKGANIC ROOT MAT SAND (RESIDIUUM) - trace to s well graded sand, fine and compact, damp, medium of - trace to some silt below - becomes gravelly, well g below 0.4 m	some grovel, jular grovel, grey v 0.4 m graded, angular	•										- 0.0
BEDROCK (GRANITE) - poor quality, friable 20 END OF TESTPIT 2.0 m (REFUSAL) - 30 - 30 - 40 EBA Engineering Consultants Ltd. COMPLETION DEPTH: 2 m COMPLETION DEPTH: 2 m COMPLETE 05/10/16	- - - 1.0 -				- cobbles encountered be	low 0.6 m											
EBA Engineering Consultants Ltd.	- 2.0				BEDROCK (GRANITE) – poor quo END OF TESTPIT 2.0 m (REFUSA	lity, friable _)											5.0
4.0 EBA Engineering Consultants Ltd.																	يدينها ويستلقه ومقا ومعاليه
EBA Engineering Consultants Ltd. LOGGED BY: JSB COMPLETION DEPTH: 2 m REVIEWED BY: JRT COMPLETE: 05/10/16																	
IFig. No.	E	EBA Engineering Consultants Ltd.															

Minto	Mine) D	evelo	pment 2005	Client: Sherwood Mir	ning (Cor).					-	rest	PIT	NO:		120	017	3-TI	P106
Minto	Сор	per	Mine	3	Excovotor: CAT 4160	C Rut	bei	Tir	e					PROJ	JECT	NO	: 12	0017	73		
Propo	sed	Ove	erbur	den Dump	6944439 N, 383645	Ε,	Ζ ξ	;						ELEV	ATIO	N: 0) m				
Depth(m)	SOIL SYMBOL	SAMPLE TYPE 1	SAMPLE NO	GRAB SOIL DESCRIPT	ION	F	'LAS'	10		М.С. •		(JQ)			10 20 20	PER 20 PER 40 PER 40 PERC	CENT CENT CENT	CLAY 30 SILT 60 SAND 60 GRAVE	41 81 81 81 81 81 81 81 81 81 8	0 0 0	Depth(ft)
0.0				ORGANIC ROOTMAT			:	0	40		60 	80			20 :	4(i i) i	60	8	0	E 0.0
-				SAND (RESIDIUUM) — silty, trac	e of gravel																
~				– trace to some silt belo below 0.5 m – becomes gravelly, well	w 0.5 m graded, angular																ي
1.0				— gravel content increas around 1.0 m	es with depth																
				– cobble sized pieces end 1.5 m BEDROCK (GRANITE) – poor qu	pieces encountered around — poor quality, friable									A			•				5.0
- 2.0				, , , , , , , , , , , , , , , , , , ,																	
				END OF TESTPIT 2.7 m (REFUS)	NL)																
<u>4.0</u>	ΓD.	L A	 []~	ainopping Conquits	nto Itd		: GEI) BY	: JSE	<u>; i</u> 3			:		<u>.</u> DMPI	i Letic	:) N () EPTH	<u>: i</u> 1: 2.	: 7 m	<u> </u>
]	۵DL	1	ĿП	gmeering consulta	unts Lta.	REV	1EW	ED (3Y: J	RT				C(OMPI	ETE	: 05	/10/	/16		
						Fig.	No	:											F	'age	1 of 1



Project: 0201-1200173

Date Tested: 11/02/05

BY: JP

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Minto	Mine	Develo	ppment 2005	Client: Sherwood Mi	ining C	orp.					T	'EST I	PIT N	0:	120	0173	-TP107
Minto	Copp	er Min	е	Excavator: CAT 416	SC Rub	ber 1	ire				F	PROJE	CT N	0: 1	2001	73	
Propo	sed O	verbu	den Dump	6944403 N, 38357	0 E, Z	78					E	LEVA	TION:	0 m	ı		
Depth(m)	SOIL SYMBOL	SAMPLE 17PL THE THE SAMPLE NO	SOIL DESCRIPT	TION	Pl	ASTIC		м.с			лр	1 2 2	● P 0 ▲ F 0 10 P 0	ERCEN 20 ERCEN 40 ERCEN 40 RCENT	T CLAY 30 IT SILT 60 T SANC 60 GRAVE		Depth(ft)
0.0			ORGANIC ROOTMAT			20	4		<u>60</u>	80		2	0	40	60	80	- 0.0
-			SAND – silty, gravelly, well gravel well graded angular grave damp, reddish brown	ided sand, Is, compact,	•												
-			- trace of silt around 0.5	òm													
- - - 1.0			 becomes trace to some grained angular gravels a 	e fine to medium round 0.7 m													
-			BEDROCK (GRANITE) – poor qu	ality, frioble	•						•	۵					
			– becomes more compete	ent with depth	0												- 5.0
-																	
			END OF TESTPIT 2.5 m (REFUS/	AL)													
- 3.0																	10.0
- 4.0	4																
Ĩ	EBA	En	gineering Consults	ants Ltd	LOGO	ED E	3Y: J	SB		····· · · · · · · · · · · · · · · · ·	, I			ION (DEPTH	: 2.5	m
		4-1 - 1		ATTON TICK.	Fig. 1	WED Vo:	BY:	JRT					APLET	<u>t: 0</u>	<u>)/10/</u>	<u>16</u> Par	ge 1 of 1



Project: 0201-1200173

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Minto	Mine	Dev	elop	oment 2005	Client: Sherwood M	lining	Со	rp.					1	EST	PIT	NO:	12	20017	/3-T	P108
Minto	Сор	ber M	line	-	Excovotor: CAT 416	6Ç Ri	ippe	er Ti	re				f	PROJ	ECT	NO:	1200	173		
Propo	Sed	Over	burc	len Dump	6944360 N, <u>6</u> 9443	322	E, Z	28		·			E	LEV	ATIO	V: 0	m			
Depth(m)	SOIL SYMBOL	SAMPLE TYPE	SAMPLE NO	SOIL DESCRIPT	TION	550	PLA:	STIC		M.C.			ND		10 20 20 20	PERC 20 PERC 40 PERCE	ENT CL 30 ENT SII 60 ENT SAI 60 VT GRA	AY ● _T ▲ _8 ND ■ 8 VEL ●	0 0 0	Depth(ft)
0.0	1			ORGANIC ROOT MAT				20	40	(50 	<u>80</u> !			20	40	60	8	0	- 0.0
				SAND (RESIDIUUM) - silty, trac well graded sand, fine to angular gravels, reddish b	e of gravel, medium grained rown		6													
- - - 1.0 -	- trace to some silt below 0.5 m - some gravel to gravelly around 1.0 m - 1.5 m																			ير والجريم والمحرم والمحد والم
- - - - - - - - - - - - - - - - - - -				BEDROCK (GRANITE) – poor quo below 2.0 m	lity, friable	•														5.0
				END OF TESTPIT 2.4 m (REFUSA	_)															ي و المحصل محصل م
																-				10.0
~ 							·····													
<u>,</u> T	 R۸۲	 קר	<u> </u>	incoring Conquite		LOG	: CED	BY:			:	<u> </u>			I IPI F	TION	i DEPTH	t: 2 n	<u> </u> 0	-
£. 5/11/28.02-5		-124)	.1g	meering consulta.	uus LtQ.	REVI Fig.	EWE No:	D 8	ſ:			-		COM	IPLE	TE: 0	5/10,	/ <u>16</u> Po	ige 1	of 1

Minto	Mine	De	velo	pment 2005	Client: Sherwood M	lining (orp.						TEST	ΡΠ	NO:	1	200	173-	-TP	109
Minto	Сорр	ber	Mine)	Excavator: CAT 416	SC Rub	ber	Tire					PRO	JECT	NO:	120	017.	3		
Propo	sed (Ove	rbur	den Dump	6944322 N, 38342	27.8 E	, Z	3					ELEV	ATIO	N: 0	m				
Depth(m)	SOIL SYMBOL	SAMPLE TYPE	SAMPLE NO	GRAB SOIL DESCRIPT	ION	PI	 ASTI(;	М.	C.	£10)UID		10 20 20	PERC 20 PER 40 PERC 9	CENT C CENT C ENT S	SILT A SO SILT A SO SAVEL	 40 80 80 		Depth(ft)
0.0				ORGANIC ROOT MAT			20	;	40	60	80			20	40	(50 	80		- 0.0
- 				SAND (RESIDUUM) — silty, trace grovel, well groded sand,	e to some fine reddish brown															
- 1.0				- less silt with depth and	ser argined									×			3			
				around 1.2 m	ravelly, coarser grained - HIGHLY FRACTURED -															- 5.0
				BEDROCK (GRANITE) - HIGHLY F cobble sized pieces, coars	RACTURED – ser with depth															-
- 3.0				END OF TESTPIT 2.7 m (REFUSA	L)															- 10.0 - 10.0
4.0 F	BA	<u>к-тр</u>	 Eng	gineering Consulta	nts Ltd.	LOGG REVIE Fig. 1	ED E WED Io:	BY: J BY:	isb Jrt				C0 C0	MPL MPL	etion ete:	1 DEF 05/1	2TH: 0/1	2.7 n 6 Page)) ; 1 (of 1



Project: 0201-1200173

Date Tested: 05/11/02

BY: JP

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				PR	OJEC.	T : Minto	Overt	burder	n Driiling	Program 2008	BORE	HOLE : 08SWC270
889 8/980	W.	srk 📂	Consultina	SI	TE :	Minto	Mine	Yuko	n Canad	la	PAGE	1 OF 1
	F	r.	Engineers and Scientists	FIL	.E NO	: MINT	0 (24	CM02:	? 003)		DRILI	Air Rolary
	,.			вс	RING	DATE :		2008	02-27	TO 2008-0	3-06 CORE	BARREL : Tople tube (HQ)
		BORIN	G LOG	DA	TUM :	NAD	83 Zo	ne 8V		COORDINATE	S: 6944333	00 N 384181 00 E
SAA	IPLE CO	NDITION	TYPE OF SAMPLER				RATO	RY A	ND IN SI	TU TEST	Torvane	(Su) : intact
1279 1177	Rem 2 Undr	ouided sturbed	SS Spat spoon ST Thin walled shelby tubi	e		w W	anocie /ater c	size a	toaiysis t			(Sur) 🔶 remoulded
	Lost		PS Piston sampler			D U	n:t we	ight (k	N/m³)		Ground Temp	erature 💑 🗸
	Soil o	core STR/	ATIGRAPHY				same:		(cm/s)			GROUND
DEPTH - m	EVATION - m DEPTH - m	DE	SCRIPTION	SYMBOL	.ER רבעבר - ש	YPE AND JUMBER	NDITION	COVERY %	l or RQD	WATER CONTENT and LIMITS (%)	BORATORY and SITU TESTS	TEMPERATURE (°C) -5 0 5 UNDRAINED SHEAR
	<u> </u>				WAT		Ŭ	ы Ш	~	1 1 20 40 60 80	N L	STRENGTH (kPa) 25 50 75
	865-40 0-00	dark brown, da	mp_sliff. organic sandy									
1		SIET with grave	el topsoil non-plastic		artace	CT-1	1000000	9	0			**
2	863 88 1 52	brown, damp, v gravel and wea non-plastic	rory stiff sandy SILT with thered bedrock.		s puncifi m	CT-2	And the second second	16	0			• • • • • • • • • • • • • • • • • • •
3	862 35	brown moist s	of to moderaties stiff		n brite						w = 17.8%	
4		sandy SILT with particles non-p	n weathered bedrock sastic		oren 0.12	CT-3		25	0	· · ·	PS (42 5% < 0 08mm)	♦
5	860 83 4 57	gray saturated gravet non-pla	stiff, sandy SIL1 with stic		β	CT-4	an a strady and	33	Q			
6	859 30 6 ±0	orav saturated	very soft, sandy SILT									
7	or: "0	non-plastic with granite cobble	a 2" thick weathered		L	C1-5	1	42	0			
8	7 62	brown saturate with gravel, nor cobbles	d very soft sandy SILT plastic, with some	4		CT-6	estas anteresto	50	Q			
9	856-26 9-14	brown morst s	oft, loose sifty SAND with	-			111111					· ·
10	854 73	gravei non-plat	NFC			CT-7	1000	58	0		PS (7 5% < 0.08mm) w = 17 1%	
11	10 67	bedrock (switch	ned to NO)			CT-8	Service Services	100	Ø	. · .		· · ·
12	853 21 12 19	bedrock								· · ·		
13				- 		СТ-9		100	0			· · ·
14												
						CT-10		100	υ			
15	850-16 15-24	END OF LOGG	ING at 15 24m (Borehole									
16		depth = 359 66	m)									· ·
17												
18												× .
19												
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F 006 REFERENCE MATERIALS by other logicarial attaction Minuto in Juny PLOTTEC 2008-05-22 11 00mm

				PR	OJEC	T · Minte	; Oved	burden	Destina	Prooram	2008			808	ENOLE · D		
1855	anna 🛛	eene cov	· Comerceltinan		r⊑ .	Muste	Mine	Yukor	Canar	10				0.00	. 1	00110	3
253	V		Eponeers and Scientists		. <u>.</u> .				- 00:100	10				PAG		Ur	U.
	the second se			₽IL	E NO	; MINI	0 {2	CM022	003)					DRIL	L: A# Rol	9:À	
		DODING	0.1.0.0	80	RING	DATE :		2008-	03-06	T	D	2008-03	10	CORI	E BARREL	:Tople ti	ibe (HQ)
		ROKING	G LOG	DA	TUM :	NAC)83 Zo	ne 8V			cool	RDINATE	5: 61	944455	00 N	383901	00 E
SAN	APLE CO	ONDITION	TYPE OF SAMPLER			LABO	RATO	RY AN	D IN SI	TU TEST			Torvar	10	(Su)	inta	ct
	Rem ⊡⊟ladi	oulded sturbed	SS Split spoon ST Thin walled shelby tab	n		PS F	Particle Mater r	: size à Conlard	nalysis						(Sur)	 fem 	noulded
- Statis	Lost	staroca	PS Piston sampler			DU	Ind we	sght (ki	Vanh				Groun	d Tenu	perature v		χ,
	Soil	core	CT Core tube sample			k F	ermea	ability (cm∕s)								
		STRA	ATIGRAPHY	·····	٤		SAM	PLES							G	ROUNE)
ε	і <u></u> Е				::			%		WATI	ERCC	NTENT	JRΥ	STS	1 E.MI	*ERATI (*C)	URE
- E	о т			Ы	ЕЛЕ	UN A	10 I	Ϋ́	8	and	LIMI	rs (%)	ATC	цщ	-5	0	5
E E	L A T	05	CONDICAN	М В Ю	RL	− ₩ BMB	ā	No No	or R	14/	1.17	10/	OR	ITU I			
Ö	L L L L		SCRIP HUN	ŝ	ATE	Σīž	00	Ŭ Ŭ	z	l "P		" L 	LAB	s Z	STRE	NGTH (kPa)
	849.20				≷ ₩			œ		20	40 E	50 80			25	50	75
	0.00	very dark brown sandy Sitt Finol	n saturated soft organic n-plastic (topsoli)		500								PS (83	3 0% <			
1	848 01				ct pi	CT-1	1.465	97					0 08m	m) 11%	\$	4	
	847.68	very dark gray with gravel inon	moist dense sity SAND Eplastic		a: to;		1000 March 1000								•		
2	847 58	very dark gray with gravel ner	moist, stiff, sitty SANO Entastic		n tra	CT-2	12.25	6								ł	
3	846 15	Not Recovered			From		100										
	3 05	very dark gray SILT_low-plast-	staurated soft clayey city				1000								*		
4	845 09	dark aray move	t loseg city SAND with			CT-3	Charles .	94					-			eter.	
	844 63	sub-angular gra	ivel non-plastic				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						1				
5	844 23 4 97	Very dark gray SILT with sub-a	saturated firm clayey ingular gravel tow		$\left - \right $	CT-4		88					50.00		\$		
6	843 10	plasticity drak brown, sati	urated soft clavey SH T				State Bar			•			PS (38 0.08m	10%;≺ m}			
	6 10	with sub-angula	ir gravel tow plasticity										w ≈ 10	1%	٠		
7	842 22 6 98	with sub-angula	indist soft sandy Sitt i If gravel and cobbles	· · · ·		CT 5	5 V V	100									
		non-plastic with dark brown sati	an 8' rock core urated soft clavey SILT				-5 9 J = 10										
8		with sub-angola plashody	r gravel and cobbles llow			CTS	100	92							•••	1	
ą		plasticity					A CANER										
10						CT-7	and the second	92									
İ	838 53 10 67	dark brown, mo	st to saturated soft														
11		clayey SILT with complex for nic	sub-angular gravel and			CT-S		96							•		
12		connes invitra	anoty				1.12								•	*	
ļ																	
13				,		CT-9	an an an	96									
	835 48 13 72	Dark orey moist	dense silly CLAY with				Constraints										
7-4		subangular grav	el and cobbles			CT-10		100									
15	833 96			S &													
. I	15 24	Not Recovered		~ ·													
16						CT-11	100	0								*	
	832 44 16 76	Dark grey moist	dense silly SAND with				ana de se										
14		traces subangul	ar gravel and clay. Very			CT-12		100									
18		row prasicity ind	n (~ 0175										ł				
																	1
19			a de anterior de la companya de la companya de la companya de la companya de la companya de la companya de la c			CT-13		100									
	829 39	***														<u> </u>	

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			PRO	JECT	: Mente	Overt	ourder	V Detting (Program 2008	BORE	HOLE: 08SWC271
88 200	Ŵ	SRK Consulting	SITE	:	Minto	Mine	Yuko	n, Canad	ja	PAGE	:: ² OF ³
	Y	Engineers and Scientists	FILE	NO :	MINTO) (20	CM022	≥003)		DRILL	; Ad Rotary
			BOR	UNG E	DATE		2008-	03-06	TO 2008-03-1	0 CORF	BARREL : Tople tube (HQ)
		BORING LOG	DAT	UM :	NAD	33 Zoi	ne 8V		COORDINATES	: 6944455	00 N 383901 00 E
SAI	Rem	ONDITION TYPE OF SAMPLER			LABOR PS Pa	RATO	RY AN size a	ID IN SIT	TUTEST	Torvane	(Su) intact
	🗍 Undi	sturbed ST. Thin walled shelby tube			w W	later c	onten	- L			(Su) 🕈 iemoordeo
	Losi Soili	core CT Core tube sample			D Ur k Pe	nt wei Ermea	ight (s. Ibility (N/m²) cm/s)		Ground Temp	erature k
		STRATIGRAPHY		۶		SAM	PLES				GROUND
E	ι 						%		WATER CONTENT	oRY STS	TEMPERATURE (°C)
TH -	1 E H		žõL	EVE	AND BER	10IT	ERΥ	go	and LIMITS (%)	ATC nd J TE:	-5 0 5
DEP	EVA	DESCRIPTION	3YME	- N 3.	YPE UMI	IONO	NO:	lorF	w _p w w _l	BOR al SITL	UNDRAINED SHEAR
-	ц Ц		<i>"</i>	WAT	í «	ŏ	RE(Z		L L	STRENGTH (kPa)
		Dark grey moist dense clayey SILT with	-	-							20 00 10 1 7
21		traces of sand and subangular gravel Very tow plasicity. Non <5%			CT-14	Constant of the second s	100				
22											
- 44	826 34				CT-15		100	•		Ĵ	
23	22 86	Dark grey moist dense clayey Sit, T with traces of sand and subangular grave!				10- 15-25			-		
24	234.83	Very low plasicity. No ice content observed			C1-16	SSCORE LAN	100				. :
	24 38	Dark grey morst dense sandy SILT with				and the second					
25		plasicity. No ice content observed			CT-17	d and all	100		· · · ·	w = 13%	
26		 								PS (46.5% < 0.08mm)	
27			*		CT-18		t00				
	82177 2743	Dark grey moist dense clayey SILT with									
28	onn 44	traces of sand and subangular gravel Low plasticity	*		CT-19	100	100		·		
29	28 65 820 24	ICE and SOIL 50% clear ice Dark may more dense playey SILT with									
	28 96	traces of sand and subangular gravel			CT-20	2012/01/2014	100			, constant and common and common and common and common and common and common and common and common and common a	
30	818 72	ice				1. S. S. S.					
31	30 40	Dark grey moist dense diayey Sit, I with traces of sand and subangular grave!			OT.91	1	100				
22	817 65 31 55 817 20	Dark grey moist dense clayey SILT with			Q1 27	14 A. 14	100				
	32 00 816 89	Low plastery Vs 10%	•			200					· · ·
33	32 31	traces of sand and subangular gravei			C1-22	te state of the	100				· · · ·
34	33 53	Dark grey moist dense silly CLAY	v*. * .			1.100			× • •		
		clear ice			CT-23	Sec. Sec.	100				
35	35 05	clay and subangular gravel. Non plastic				1. 1. 1. 1. 1.					
36	813 23 35 97	No ice content observed	. •. •		CT-24	an to de la constant	100				
37	812 62 36 58	Dark grey moist dense fine SAND with	Т			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1					
21		content	5 2, 2		ст-25	and the second	100				
38	811-10 -38-10	with silt and traces of silt. No visible ice	. 0.			and the second					
39	810 34 38 86	Grey moist firm SAND and GRAVEL No	а Ф		CT-26	and the	100				
*****	809 58 39 62	Broken Bedrock Bedrock				1					

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P 406 PEFERENCE MATERIALS CONTROL

			PROJE	CT : Minto	Overi	burder	Doling	Program 2008	BORI	HOLE : 08SWC	271
199 2		SRK Cons		Minto	Mine	Yuko	n. Canad	a	PAGE	3 OF	3
	B	, Engineers ar	Id Scientists FILE N	Q: MINTO	D (2)	CM022	2003)		DRIL	: Air Rotary	
	-		BORIN	G DATE :		2008-	03-06	TO 2008-03	10 CORE	BARREL :Tople to	be (HQ)
]	BORING LOO		A: NADE	33 Zo	ne 8V		COORDINATES	6944455	00 N 383901	00 E
SAN	IPLE CC	NDITION TYPE OF SA	MPLER	LABOR PS P	NTAS	RY AN	IN SI	TU TEST	Torvane	(Su) inta	cl
公司	Unde	slurbed ST Thin wai	iled sheiby tube	w W	later o	conten	li i di y ala l			(Sur) 🔶 ren	noulded
	Lost Sori d	PS Piston sa ore C1 Core tub	ampler he sample	D Ui k Pe	nit we ermea	ight (k sbility (N/m²) cm/s)		Ground Terns	erature 👫 🛁	K _e r
		STRATIGRAPHY	······································		SAM	PLES	i			GROUNE	>
ε	Е Е				7	%		WATER CONTENT	ory sts	TEMPERATI ('C)	JRE
Ť	TION -		BOL	AND	LUI	ЕRҮ	RQD	and LIMITS (%)	ATC nd J TE	-5 0	5
DEP	EVA	DESCRIPTION	SYMI FR	λ PE	ano	S S	۷ or ا	w _p w w _L	ABOI a SITI	UNDRAINED S	HEAR
	ដ		A M		Ō	8		20 40 60 80	S C	25 50	кна) 75
	<u> </u>			CT-27		100					
41	808 05		(Borahoja					; ; ;		1 1	1
42		Depth = 242 30m)	(borenove								
43											
44								· · · ·			
45											·
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	192 2	Ŵ	s s s s s s s s s s s s s s s s s s s	Consulting	i sr	TE :	Minto	Mate	Yuko	n. Canad	a				PAG	Ε:	1	OF	3
				Engineers and Scientists	FI	LE NO	: MINT(D (20	CM022	2003}					DRIL	.L.: A	n Rolan	ş	
					80	DRING	DATE :		2008-	03-10	Ť	D	2008	.03 <i>.</i>	14 COR	E BAR	REL (T	nple tub	be (HQ)
		1	BORIN	G LOG	DA	ATUM :	NAD	33 Zoi	ne 8V			coo	RDINA	TES	694473	0 00 N	3/	33881.0	00 E
S	AM	IPLE CO	NDITION	TYPE OF SAMPLER			LABOR	RATO	RY AN	ID IN SI	TU TEST				Torvane	(§	Su)	intac	:
	-	Rem	oulded	SS Split spcon			PS P	article	size a	malysis						(8	sur) 🔶	remo	wided
150		3 Undis Lost	sturbed	PS Piston sampler	e		D U	ater c ht we	ight (k	l N/m³)					Ground Tem	neratur	e "J., .	X	
		Soil c	2078	CT Core tube sample	•	T	k Pe	ermea	- Ibility (cav/s)	······································								
		e	STR	ATIGRAPHY	Ŧ	٤		SAM	PLES							т	GRO	ONUC	oc
1	-	zε				L.	0	z	%	~	WATE	ER CO	ONTEN TS (%)	1T	ORY STS		Com C	°C}	114.
Ę	:	E E			BOL	LE V	ANI BER	110	ERY	Rac	anu	L. 19871	13 (70)		RATI Rational And		-5	0	5
u c		E V A D E P	DE	SCRIPTION	λW	ER	χΡΕ VUM	and	00	or	W _P	w	w	٤	BOI a SITI	UN	DRAIN	ED SH	IEAR
		ជ				WAT	<u> </u>	ŭ	ж Ш	۷.	1	40	 60 80		2 2	S	FRENC	57H (k 50 : :	.Pa} 75
		849 90	very dark brow	n saturated soft, organic	و. د د د	Ť.										•			
		0 18	sandy SILT ino brownish red is	n-plastic (topsoil) aturated.soft. sity SAND	1	urtabi	ст.		65										
		0.24 849 35	non-plastic dark drown to b	nack, saturated, soft		5 JU 2					14				PS (23 5% <				
	2	0 55 849 21	organic sandy (reducts brown	SILT with traces of roots	 #	1 610	CT.2	2	28						0 08mm) w = 23 2%				
		0 69	with sitt non-pli Not Recovered	astic		0.1010 v	0.12	26.4											
	3	848 07	dark brown, we	t soft SAND with silt		22							•						
	4	847 95 1 95	dark grey mois	L unconsolidated silly			CT-3	100	0										
		847 64 2 26	SAND dark grey, mois	t soft clayey SILT with				A.415 C.5.5.											
	5	3 05 845 33	subrounded col Not Recovered	bbles, non-plastic	÷	Land	CT-4	19.250	55								•		•
	6	4 57 844 54	 Not Recovered dark grey mois 	t firm clayey SILT with	-:			A STATE											1
		5 36 843 80	subrounded coa Not Recovered	arse gravel, low plasticity			CT.5	1	75										
	7	6 10 842 28	same as above	Ice in corecatcher. Nbe			6113	1.05	1.0							ب			
	8	7 82	dark grey wet.	soft, sandy gravelly SILT	* *					-									
		8 23	observed				CT-6		90										
	9	840 76 9 14	sand higly plas	soft stilly CLAY with line tro. No visible ice	્ય														
1	0	975 839.72	dark grey wet with clay, non-p	soft gravelly sitty SAND lastic No visible ice	* 		CT-7	1000	80										
		10 18 839 23	dark grey mist. with subrounder	soft_gravely silty SAND d pebbles, non-plastic_No	1997 1997											\$	·		
1	1	10 67 838 87	visible ice dark grev mois	t stiff clavey silty SAND	- m 		ста	1	100		. 1.1				110 (05.5% -			•	
; 1	2	11 03 837 71	with subrounder	d coarse gravet plastic				and reality			* 1				(mm80.0	۰			
		12 19	pinkish white bo	oulder Irm situ CLAY with				20 V.C 4			•				W = 137% Pl = 5%				
1	3	836 79	subrounded coa	arse gravel, medium			СТ-9	4	97						w = 15 1% PS (27 5% <				
1	4	836 49 13 41	plasitoity. Nbn dark grey wet, I	firm, sety SAND with											0 08mm)				
		830-18 13-72 835-96	subangular larg dark grey moist	e gravel inch-plastic, Non Lifirm, sandy GRAVEL			CT-10		100										
1	5	13 94 834 66	non-plastic, Nbi dark grey moist	i firm silty SAND									· ·						
	6	15 24	non-plastic Vs dark drev moist	10% hard consolidated	* :a		OT 11		100										
['	~~~~~	833 14	sandy silty GRA	VEL rounded	9		Ç1~11		100									•	•
1	7	16 78	dark grey moist	stiff sity SAND with															
	8	832 13 17 77	50% subangulai 50%	r gravel, non-plastic. Vx	9 		CI-12	4	90										
	° 1	83161 18 29	dark grey moist subrounded gra	e stiff, sandy SILT with vel. Non 80%. Vs20%				1.1.1					•					•	
1	9	830 85	dark grey moist subangular cobr	stiff, silty SAND with eles non-plastic Vbn	 , [.]		CT-13	1997 - A.	95								-		
		830 09	dark grey moist	firm sandy SILT with	-			10.00 A.C.											

OFTER

P OG REPERENCE MATERIA, SWO

				PR	OJEC	T : Minto	Overt	burden	Drilling	Program 2	2008		BOR	HOLE : (285WC	272
8		SRK	Consulting	sr	re:	Minto	Mine	Yuko	n Canad	la			PAGE	5: 2	OF	3
		~ 	Engineers and Scientists	ศแ	E NO	: MINT) (S	CM022	2 003)				DRILI	L : Air Ro	otary	
	4			вс	RING	DATE :		2008-	03-10	то	2	008-03	14 CORE	BARREL	. :Topie t	ube (HQ)
]	BORIN	G LOG	DA	TUM :	NAD	83 Zor	ıe 8∨		1	COORD	INATES	6944730	00 N	383881	00 E
SA	MPLE CC	NDITION	TYPE OF SAMPLER			LABOR	RATO	RY AN	ID IN SI	TU TEST			Torvane	(Su)	intr	act
	Rem	oulded	SS Split speen			PS P	article	size a	nalysis					(Sur)	🔶 ren	noulded
	Lost	suubed	PS Piston sampler	e		DU	ot wei	ight (k	l N/m²)				Ground Temp	erature	•¥	vř
	Sol	core	CT Core tube sample		,	k Pi	ermea	bility (cm/s)	Ŧ						
	e	STR.	ATIGRAPHY		Ξ		SAM	PLES					N	G TEM	ROUN	D URE
E	ż E				ដ្ឋ	0~	Z	%/	0	and		1ENI (%)	OR) STS		(°C)	
E	EH			BOI	ĻΕV	ANBEF	OLLI	ĒR	RQI			(197	RAT Ind U TE	-5	0	5
DEP	DEP	DE	SCRIPTION	γW	ЦЦ	YPE VUM	DND	Š	l or	Wp	w	wε	BO SIT	UNDR/	AINED S	SHEAR
	Ш			0,	MAT	<u>⊢</u> •	ŭ	ш Ш	2	1 20 /	40 60	1 80	N R	STRE 25	INGTH 50	(kPa) 75
		dark grey mon	st stiff sandy clayey SiLT													
,		non-plastic 50	% clear ice			CT-14	2	95								
	828 56	dark grey, mois	st firm clayey SILT with													
2	2	sand weakly p	lastic Vs 25%			CT-15	2000	100		3:4			w = 24.6%			
	827 04	and a she								ĺ			PI = 7% PS (89.0% <			
	826 43	dadi orovi more	t sandu davay SB Tusta			CT 18	2002	05					0.08mm)			·
2	825 52	subangular gra	wel weakly plastic. Non			GIND	N.C.	50			`					
	24 38	dark grey mois subaonidar ora	st firm sandy SILT with well Nhy				1.52									
2	25 15 824 30	dark grey mois	st stiff sandy SILT with			CT-17	a second	100		-11			PS (4) 5% <	-		:
2	25.60	subrounded gra	avel, non-plastic. Non	9 W							:		0.08mm) wisi 13.4%			
	25 91	Not Recovered				CT-18		0					PI = 4%			
2	822.42	ded and store	t fan anderen als													
2	821 98	SILT, non-plast	ic, Nbn	** * * ! . : *		CT.10		24								
	821 65 28 35	same as above subrounded an	e d subangular coarse	S^		01113	21/22/20	0.0								
2	820 94 28 96	gravel and cobi dark grey, mois	bles, no fines at firm silty CLAY with				195 A 192							-		
31	819 72	sand and subai plasticity. Nbn	ngular gravel medium	-		CT-20	6.92 <i>1</i> 1.02	95						-		
10	30 18 819 42	same as above same as above	+ 10% Vx + Nbh				be despired									
2.65-5	30 48			4		CT-21	41.50	85								
ଞ୍ଚ ୁ ଅ	817 90	dark arou more	t yerv bard silv/CL≜Y				area a la									
2011	817 59	with sand non-	plastic, Nbn	\$ e		CT.22		100								
3	816 98 32 92	CLAY 15% gra	avel non-plastic Nbn				and the second									
ຊ ຊີ 3.	815 37	dark grey mois medium plastic	it, firm, sandy silty GEAY ity, not frozen	9			1.1.1									
Nut Sa	33 83 815 76	 dark grey mois non-plastic 	it hard clayey SILT			CT-23		100						•		
3	34 14 815 15	dark grey mois with 15% grave	it very hard gravelly SILT I non-plastic							:	· ·			•	÷	
5 S 30	34 75 814 85	dark grey mois with subanoida	it very hard sandy SILT			CT-24	Sec. 2	100								
2020	35 05 814 36 35 54	dark grey mois	t stiff sandy SILT with													
8 laik	813 63	dark grey mois	t hard sandy SILT 10%			CT.25		100						-		
3142 n	813 32 36 58	sanu, medium j dark grey mois	plasticity it stiff sandy SIU1 with			01.60										
SUCE SACE	81180 3810	clay, 10% sand dark grey mois	medium plasticity Thard sandy SILT 10%										-			
39	38 71	sand medium j dark grey mois	plasticity it very hard sandy SILT			C1-26		100			• •			}		
S.	810-28 39-62	(5 to 10% sand) with occasional	s .5												

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				PI	ROJEC	T : Minto	Over	burde	n Dalling	Program 2008	BORE	EHOLE : 08SWC272
8	anan y	SRK	(Consulting) si	TE :	Minto	Mine	Yuk	m Çanad	Ja	PAGE	5: 3 OF 3
	and the second s		Engineers and Scientist	S FI	LE NO	: MINT	O (2	CM02	2 003}		DRIL	: Air Rotary
				8	ORING	DATE :		2008	03-10	TO 2008-03	14 CORE	BARREL :Tople tube (HQ)
		BORIN	G LOG	D,	ATUM :	NAD	83 Zo	na 8V		COORDINATES	\$: 6944730	.00 N 383881.00 E
SA	MPLE C	NDITION oulded	TYPE OF SAMPLER			LABO	RATC	RY A	ND IN SI	TU TEST	Torvane	(Su) intact
	Und	sturbed	ST Thin walled shelby tu	be		w v	/ater (conter	nt			(Sur) 🔶 remoulded
	Lost Saií	lore	CT Core tube sample			LD U K P	nit we ermei	eight (1 ability	(N/m²) (cm/s)		Ground Tenic	perature 😽 😽
		STR	ATIGRAPHY		E		SAM	IPLE	3			GROUND
ε	E N E				- L	0	z	%	_	WATER CONTENT	ORY STS	TEMPERATURE (°C)
Ë	THOIL			BOL	LEV	ANI BER	ITIO	ERY	RQD		RAT(ind UTE	5 0 5
DEP	ELEVA	DE	ESCRIPTION	sΥM	WATER	TYPE	COND	RECOV	N or	W _P W W L · 20 40 60 80	LABOI a IN SITI	UNDRAINED SHEAR STRENGTH (kPa) 25 50 75
	40.23	5% gravel nor dark grey wet	-plastic unconsolidated gravelly	1141		GT-27		100				· · · · · · · · · · · · · · · · · · ·
4	40 54 808 75	SAND with sull gravel 25% cc	pangular cobbies 10% abbies	\$			11000					
47	41 15 2 807 84	weathered bed weathered bed	kock Kock			CT-28	1940	100				
	42.06 807.23 42.67	black well co-	nsolidated SAND				1.10					
43	3 42.07	mean-cred act	roux - ordearius	07 0 10 0		CT-29		100				
44	805 70	CHE OF LOOK		8			100					
45	1 494 202	Depth = 249.94	ani) ani)									
46										· · ·		
47												
4.9												
-41				Annual Annual								
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				PR	OJEC	T : Mieto	Overt	burder	Dailing	Program	2008		BOR	EHOLE : 0	8SWC273
1	CAR D	Ŵ	SRK Consultina	SIT	E :	Minto	Mine.	Yuko	n. Canad	ła			PAG	£: 1	OF 3
			Engineers and Scientists	FIL	E NO	: MINT	O (20	CM022	2 003)				DRIL	L: Ar Roti	ary
		h.,		80	RING	DATE :		2008-	03-14	то	1	2008-03-	18 008	E BABBEL -	Tunia tuto (HO)
		1	SORING LOG	0.4	71145 -	ΝΔΩ	83.74	no 817			0000		. 604475	LOANNEL.	384150.00 E
						1000	00 200		0.0100	THE TROT		JUNATE:	1-	· · · · · · · · · · · · · · · · · · ·	
5/	AWN -	Remo	ulded SS Spiil spoon			PS P	article	size a	nalysis	10 1651		****	Torvane	(Su) (Sur)	 intact remoulded
	s.	Undis	turbed ST Thin waited shelby tube	;		w V	vater c	onten	t					(/	•
		Lost	PS Piston sampler				Inst we	ight (k saas 7	N/m²) nm/e)				Ground Tem	perature 🗳	* ····································
		304 0	STRATIGRAPHY	1			SAM	PLES						GI	ROUND
		ε			Е.]			WATE	RCON	TENT	× ∽	TEMP	ERATURE
E		z ε		ب	VEL	₽ĸ	Z	% ⊁	۵	and	LIMITS	5 (%)	TOR		(°C)
H L		E E		180	Ű,	A A A) III	л ЕR	RQ				RA and U T	-5	0 5
L L L L L L L L L L L L L L L L L L L			DESCRIPTION	λX	ш К	A P	ONC	б С	۲ or	Wp	w	W L	NBO SIT	UNDRA	INED SHEAR
	i	<u></u>			VAT	} *	ŭ	ш Ш	2.	1 20	40 60	80	<u></u> 2	STRE!	VGTH (kPa) 50 75
	8	135 80 0 00	dark brown saturated stiff organic		Ý		_			~~		~~~			
		ļ	sandy SILT non-plastic temp 1 deg C		rtace	CT-1	and the second	50							
	1 8	34 28			nd sun		ALC: NO				•		P\$ (56 5% < 0 08mm)		
	28	1 52	Same as above brown wat still gravativisity SANG		hour								w = 27.2%		
		183	non-plastic	8 8 1 6 1	- an 00	CT-2	1. A.M.	70							
	38	3 05	ont recoverable		the ar		1005								
					0.0	CT.3	and a set	0	:						
	4 8	21.22			0703		10.00	Ŭ							
	5	4 57	not recoverable				No.								
	Ĩ	-				CT-4	100	0							
	63	29 70					N.S.S.								
		010	INTERPORTATION			ors									
	7	26.18				01.0		Ŭ		-					•
	8	7 62	not recoverable												
				an non manada		CT-6	100	Û							
	9 8	26 66	Back area wat firm sandy alway Sti T				ALC: NO								
		214	weakly plastic temp 8 to 12 deg C			er 7		30							
Ster.	0	06.10				1010		30	:		• •			&	
10	1	10.67	dark grey wet soft gravelly sandy Sit T				and a								
178.42			10% gravel moderately plastic temp 8 to 12 deg C	* 4		CT-8	No.	50							
4 622	2 8	23 61	Cause to above town 2 to 0 to 0	*											
NO Id		92 IV	parecias anove rempilizind a degic	e		OTA		20							
2	3	00.00				1019		36						¢.	
8 2	8. 4	22.08	dark grey stiff moist graveliy sandy												
11.2	8	21 17	SILT 15-20 ½ subangular medium gravel, non-plastic	* * }		CT 10	100 C	50							
1000	5 8	20 56	dark grey moist hard sandy SILT	·									PS (63.5% < 0.08mm)		
o'tem	8	15 24 20 4 1	gray sub-rounded cobbles	•									w ≂ 16 6%		
2 Jac	6 1	15 39	Not Recovered			CT 11	1	10					1		
	8 7 1	19 04 16 76	gray brown sub-rounded cobbles				5. A.								
1595	8	18 58	dark gray moist stiff sandy SILT with			CT-12	1	60							
	8 18	8 12 17 68	sub-rounded gravel and coobles non-plastic												
24382	8	17 51 18 29	Not Recovered gray moist soft sand SILT with	* *				Ì						٠	
1330	98	18 96	sub-rounded gravel and cobbles			CT-13		64		-	•				
\$6) J	ප 1	19 26	dark gray moist very hard clayey Sit,T												

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8		n SRK	Consultine	y si	ŤΕ:	Minto	Mine.	Yuko	n Canac	ia			P	AGE	: 2	OF	3
	×.	7	Engineers and Scientists	5 FII	LE NO	: MINT	O (2)	CM02:	2 003)				c	RIL	. : Air F	Rotary	
				во	DRING	DATE :		2008-	03-14	τc	Э	2008-03	-18 C	ORE	BARRE	EL :Tople	tube (HQ)
		BORIN	G LOG	DA	ATUM :	NAD	83 Zo	ne 8V			COOR	DINATES	5: 694	4750	00 N	38415	50 00 E
S.	AMPLE C	ONDITION	TYPE OF SAMPLER			LABO	RATO	RY AN	ID IN SI	TU TEST			Torvane		(Su)		itaci
	Ren	noulded	SS Split spoon			PS P	article	size a	maiysis						(Sur	') 🔶 re	moulded
	Und ليزن Los	hsturbed t	PS Piston sampler	be			/ater c nit we	:onten :aht (k	l Nami)				Cound	[ooo	oraturo	J	X.
	Soil	core	CT Core tube sample			kР	ermea	ibility (	cm/s)					i Graip	siatore	**	v •
		STR	ATIGRAPHY		٤		SAM		;	-						GROUN	10
6	: <u>-</u> :					-	-	%		WATE	ER CO	NTENT	JRΥ	S12	l te	MPERA (°C)	TURE
	É E			30L	EVE	AND BER	Ĩ	RΥ	ζαD	and	LIMIT	S (%)	ATC	μ Η	-5	0	5
	i N G	DE	SCRIPTION	ΥME	ER L	B M	ŌN	õ	or F	Wa	w	w.	30R ai	U L L L			SHEAR
6	ມ ພິ			S	VAT	ζz	8	REC	z		•	د ا	LAE	Z	STR	RENGTH	l (kPa)
		dark grav mois	hard clavey SILT with		>	 	18			20	40 60	08 0			25	50	75
	19.81	sub-rounded gr	avel and trace combles	0.0		CT-14		94									
	21 814 56 21 24	Not Recovered	prasucity indicent incon														
	814 46 22 - 21 34	dark gray moist	t stiff clayey SILT with			OT IS	1400	100								4	
	810.04	:ce at 73.51.39	avenow plasticity. Citear 5 Vx	0.5			1011	100		ł i			w = 17.5	14		•	
1	23 22 86	same as above	2% Vs. Temp range in				ABOOT AND				• •		PI = 12% PS (65.5	% <			
		70n=-0 2 -2.2 d	egrees ceicius	9		CT-16	1	90					0 08mm)		•	Þ	
	24 811 57 24 23	Not Recovered					és a cara				• •						
1	81142 25 24 38	same as 75'-79 ice, temp range	5' frozen. Non no visible ⇒ 0.6 -2.4 degrees	5		CT.17	101624	90									
	810.04	cetcius		5 - 5 8 - 1 1 - 1			a still a	50									
2	16 25 76 809 89	Not Recovered dark brown mo	ist, very haro, clayey SILT	20							· ·						
2	25.91	with sub-rounde trace sand. Nor	ed cobbles and gravel and t			CT-18		95							,	<b>*</b>	
	808 44 27 36	Not Recovered					1000										
2	8 27 43	same as 85189	75			CT-19	100	100			• •						
	803 84			\$			W.C.N.										
	28.96	same as 85'-89 ice at 97-5'	75° 3° elongated smoky														
<u>ş</u> 3	0			in the		CT-20	X SALE	96									
21.55	30 42	Not Recovered		6 0 0			1.000										
200-3 3	1 30 48	dark gray moist with sand and s	very hard clayey SILT ub rounded gravel			CT-21		100					1		\$		
ରୁ ଜୁ 3	2 803 80	non-plastic, Nbr	) no visible rce														
0115	32 00 803 19	Not Passaure		3 '0		07.00									•		
a 3	3 32 55	nor recovered				53-22		40 40								÷	
2 2 2	33 53	dark gray satura	ited loose silty SAND	\$ 			Are and								۵		
<u>941175</u>	* 801 51 34 29	non-plastic no	o cooples and gravel visible ice, Nbn			CT-23	1	100							*		
075-310 3	5 800 75 35 05	dark gray moist with sub-rounde	very hard sandy SILT id cobbles and gravel, no						Í		· ·	-					
01201/6	800-14 35-66	visible ice. Nbn dark arev moist	t stiff, sdiv CLAY with	1		CT.24	1	100									
२ - 3 २ - २२ - २	6 799.22	10-15% coarse	sand ocasional	-		·····											
2015 J	36 58	dark grey moist	stiff, SHLT with 5%				1. arts										
1831 8		subangular coar Nbn	se sand, non-plastic,			CT-25	1. (1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	80									
2 3 3	8 797 70 38 10	same as above dark grev wet s	soft, sity CLAY with sand				A DASS										
1983.		(<3%) weakly p	lastic Nbn		*******	CT-26	18 A.	80		-}			PS (62 0	% e			
<u>8 867</u> 2	9 796 18						1		a produka kurun				u usmm) w = 29.4°	4			
5	39.62	same as above					and a second						P1 = 9%				

[			PR	OJECI	F : Minto	Overt	buider	Drilling	Program 2008	BORE	HOLE: 08SWC273
<b>323</b> 3330	Ŵ	SRK Consulting	SIT	ε:	Minto	Mine	Yuko	n. Canad	a	PAGE	: 3 OF 3
	<b>V</b>	Engineers and Scientists	FIL	E NO :	MINTO	) (20	CM023	2003)		DRILL	A# Rotary
			80	RING I	DATE :		2008	03-14	TO 2008-03-	18 CORE	BARREL :Tople tube (HQ)
	]	BORING LOG	DA	TUM :	NAD	13 Zor	ne 8V		COORDINATES	6944750	00 N 384150 00 E
SAI	MPLE CO	NDITION TYPE OF SAMPLER	L			ATO	RY AI	ID IN SI	ΓU TEST	Torvane	(Su) intact
	. Reme 🔆 Unde	turbed ST Thin walled shelby tube			w W	ater c	size a conten	inerysis I			(Sur) 🔶 remoulded
	Lost	PS Piston sampler			D U	ut we:	:ght (k	N/m ³ )		Ground Temp	erature všvk
	Soil c	STRATIGRAPHY			КР	sami SAMi	PLES	cnivs) S			GROUND
_	ε			- 			%	<u></u>	WATER CONTENT	RY TS	TEMPERATURE
	NO T		Ъ	EVEI	UND ER	NOL	RY %	QD	and LIMITS (%)	ATO d TES	-5 0 5
EPTI	VAT EPT	DESCRIPTION	YMB	R LI	PE A JMB	LIQN	OVE	or R	w. w w	an an iiTU	
ā	ы Ш Ш	UCOURT FIUN	s	/ATE	∑ ĭ	8	REC	z		LAE	STRENGTH (kPa)
				5					20 40 60 80		25 50 75
	795 26	dark grey moist stiff clayey sandy SILT			CT-27	1	100				·
41	41 15	10% sand with subangular coarse gravel mostly Nbn 1% Vs				2.4 HER 8.0					· · ·
42	2	dark grey moist firm sitty CLAY with sand (<3%) ocasional subangular			CT-28	AC ADDRESS	100				
47	793-13 42-67	coarse gravel, weakly plastic, Nbn same as above				water ear					• •
	792 21	days oran march him with CLAM a dh	~ ~		C1-29	Second Second	95				
44	791 60	10% coarse sand locasional subangular	0								an an an an an an an an an an an an an a
45	791 36	rock core	1		CT-30	and the second	100				
	44 81 790 08	10% coarse sand locasional subangular				11000					₩.
46	45 72	dark grey moist stiff silly CLAY with	×		стал	and a start	100				, , , ,
47	788 56	subangular cobbles	. n			1145-1210-23	- *		· · ·		◆
	47 24	with ocasional subangular medium	×		01.00						
48	787.03	same as above			G1-32		70				
49	48 77	dark grey wet from silty clayey SAND									
50		subangular coarse gravet non-plastic	93 		CT-33		50		- -		
ŝ.	785.51 50.29 785.05	same as above	R R								
S 51	50 75	brownish grey saturated very soft SAND with subangular medium gravel	•		C 1-34	and the second	40		, , , , , ,		· · · ·
ୁ ୁ 52	783 98	weathered bedrock subangular cobbies				1			4	PS (7.3% <	
		8			CT-35	er ek er	40			W = 17 8%	
53	782 46	weathered bedrock	()			1000			· · ·		
8 2 54			8		C1-36	かたい	50			-	· · ·
20072	780.94	) Since the second s				1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1					
20 20 20	04 60	weathered detrollx	0		CT-37		70				
56	779.41		8								<b>.</b> .
57	56 39	END OF LOGGING at 56 39m (Borehole Depth # 255 42m)									
9153N											
* 58											
2 59											
8 907 y											
· •	لمحمد بين ويروني		<u> </u>				1				

Γ			PF	ROJEC	T : Minto	Over	burder	Dolling	Program 2008	BORE	EHOLE : 08SWC274
	eese V	SRK Consulting	ş sı	TE:	Minto	Mine,	Υυίκο	n Canac	ja	PAGE	: 1 OF 3
	, and a second sec	Engineers and Scienlists	FII	LE NO	: MINT	O (20	CM022	2 003)		DRILI	.; Air Rolary
		BORING LOG	80 D4	ORING ATUM :	DATE : NAD	83 Zoi	2008- ne 8V	03-18	TO 2008-03- COORDINATES	23 CORE 5 : 6944630	BARREL :Tople tube (HQ) 00 N 384300 00 E
S	AMPLE C	ONDITION TYPE OF SAMPLER			LABO	RATO	RY AN	ID IN ST	TU TEST	Torvane	(Su) intact
	Und Und	isturbed ST Thin walled shelby tub	e.		w W	arricie /ater c	size a	maiysis L			(Sur) 🔶 remoulded
	Losi	PS Piston sampler			D U	nt we	ight (k	N/m²)		Ground Temp	erature 💑 📈
	<b>121</b> 301	STRATIGRAPHY				SAM	PLES	C(1)(S)	······································		GROUND
.oTu	ATION - m PTH - m		MBOL	R LEVEL - m	E AND MBER	DITION	VERY %	r RQD	WATER CONTENT and LIMITS (%)	ORATORY and TU TESTS	TEMPERATURE (°C) -5 0 5
		DESCRIPTION	sγ	WATEI	ΝU	CON	RECO	o Z	W _P W W L I - I 20 40 60 80	LAB( IN SI	UNDRAINED SHEAR STRENGTH (kPa) 25 50 75
	0 00	dark brown saturated very soft organic satury Still non-plastic Nho									
	1 836.68 1.52	Not Recovered		seure puno.	CT 1		18		• · ·		÷.
	2			iow di	CT-2	1997 - 1997 - 19	o				
	3 835 15 3 05 834 39 4 3 81	brownish grey moist very soft sandy (19%) clayey SILT non-plastic Non dark grey moist soft SILT with fine sand		aren 8.12m bu	ст з		90		•	PS (52.0% < 0.08mm) w = 31.4%	
	4 57 5	same as above, only 4 inches recovered in the core-catorier		1. 1.	CT-4		6				
	6 832 10 6 10 831 80 7 6 40	dark grey wet soft graveily sandy SILT non-plastic. Nun Not Recovered			CT-5		20		• •		
	830 58 7 62 8 830 28 7 92	dark grey wet soft sity sandy subangular GRAVEL with subangular cobbles			CT-6	an inder manufactures	20				
	9 829 06 9 14	Not Recovered dark grey wet soft sity gravely SAND				a state and					
1	0 828 14 10 06 828 07 10 13	with subangular cobbles inon-plastic, Non dark grey moist soft, sandy SILT non-plastic, Non	·* • •		CT 7	starti tidan marta	70	-			
1	1 827 53 10 67 2 826 01	Not Recovered dark grey moist solt sandy (3 to 5%) clayey SILT with subangular gravel and occasional subangular cobbles, weakly	4 4 4 4 4		CT 8		100		•		
1	3	plastic Nbh same as above + Vx 3 inches. Vs 5 inches			CT-9	والمراجع المراجع والمراجع	95		· ·	, ,	Ŷŗ
1	4 13 72 823 87 14 33	Not Recovered dark grey moist, soft, sandy (3 to 5%) clavey SiLT with subangular gravel and			CT-10	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	60		· ,		ı .
1	822 96 15 24	occasional subangular cobbles, weakly plastic, Nbn dark grey, moist, soft (when thawed) clayey SILT with 3 to 5% medium sand			CT-11	a and the second second second	86				· ·
1	821 44 7 16 76	Nbn 3mm of clear ice same as above + occasional subangular cobbles. Nbn			C1-12	tion and a subject of	90		<b>.</b>		
1	8 819 91 18 29	same as above + Nbn -Vr = 3 inches				and the second second					
1	818 39				CT 13	and the second	90				· ·

ſ					99	ROJEC	T : Minto	Overt	burden	s Drilling	Program 2008		BORE	HOLE : 085V	VC274
	<b></b>	-V	SRK	Consulting	ଳ SF	TE :	Minto	Mine.	Yuko	n Canac	ia		PAGE	2 OF	3
				Engineers and Scientists	FIL	.e no	: MINT(	D (20	CM021	2 003)			DRILL	. : Air Rolary	
		<i>k.</i>			вс	DRING	DATE :		2008-	03-18	то	2008-03-	23 CORE	BARREL Tripl	e tube (HQ)
		J	BORIN	G LOG	DA	ATUM :	NAD	33 Zo:	ne 8V		COOR		6944630	.00 N 3843	300 00 E
	AN	IPLE CO	NDITION	TYPE OF SAMPLER	l		LABOF	RATO	RY AN	O IN SI	TUTEST		Torvane	(Su) i	intact
		Remo	nulded	SS Split spoon	er nor het sinder met men		PS Pa	article	size a	inalysis				(Sur) 🔶 i	remoulded
		∬ Undis Lost	sturbed	ST Thin walled shelby tut PS Piston saminier	96		IN W	later c nit wa	onteni ant ik	t Nonh			Con and France		¥
	1425	Son c	ore	CT. Core tube sample			k Pé	emea	ibility (	cm/s)			Ground reng	GIATORS AA	**
			STR	ATIGRAPHY		٤		SAM	PLES					GROU	ND
	e	Е Е					-		%		WATER CO	NTENT	RY STS	TEMPERA (°C'	ATURE )
	ŗ	ê ÷			õL	E A B	AND SER	0E	RY	g	and LIMIT	S (%)	ATC	-5 0	5
	L L	EP1	DE	SCRIPTION	YME	L H	E M	ION	O VE	or	w. w	w .	30R ar		DSHEAR
	וכ				Ś	ATE	ζž	8	R C C C	Z		ţ	IN S	STRENGT	H (kPa)
			como ac abour	, Niya		5					20 40 6	0 80		25 50	75
			8800 A3 80070				CT-14	Same Sec.	100						
	21	816 86						der so							
	22	21.30	coarse gravei	Nbn			NY 10	1.100	100		41		w ≈ 14.8%		
		915.34					01/10	12-22	100				PI = 7% PS (48.0% <		
	23	22.86	same as above	NDO				1975 S. 19					0.08mm)		
	34						CT-16	6658 AC-01	50						
	24	813 82	same as above	Nbo				allow-sold							-
	25						CLEZ	trest times of	72						
		812 29						1251.25.41							
	26	25.91	dark grey mois SIL1 interbedd	t soft (when thawed) ed with 5 inch thick lavers				And the second se							
	27		of sand locasio	nal sub-angular coarse			CT-18	1. 1. S. 1.	75		· .			, .	
		810 77	dark grey Sit F	with an occasional				1							
	28		cobble (up to 1 moisture contei	5 in long) frim low int no visi loe. Non	) 9		CT-19	1125 AV	100						
	29	809 24	darb grove CH T	with proper post small	\$			1000							
		20 30	gravel (up to 1)	in long) firm crumbles			CT 20	1000	02					¢	
Į.	30	807 72	Non-less than	bré Vx	я		01.20	e ji veta							
11 12	31	30.48	same as above with death	Non-coarser grained				Alta an							
205-00	- '		arren Shapitiz				CT 21	and so the	98						
N 034	32	806 20 32 00	dark grey (brow	mer with depth) sandy	2 · ·			10.00							
Ö ä	32		SILT crumbles	with pick. Nbn			CT-22	1. ( P. 4.5 %	83					\$	
25 2 2	22	804 67						21.14 M							
8 O/A	34	33 53	brown banding	i grey with some light soft_clayey SILT_Vx			07.00	17 N. 18	0.0					1	
slooply.		803.15	<5% Nbn				5123	and the second	90						
m state	35	35 05	dark grey soft	SILT with increasing sand				19123-11			÷,		w = 17.6%		
o (000/c	36		granitic rock (up	o aano layers, preces of 5 to 2 in long), no visible			CT-24	200	96				0 08:nm)	<b>d</b>	
0,000,0		801.62 36.58	NDn dark grey SILT	with sand soft no visice				1. 1. 1. 1. 1.							
5 1512	37		pieces of grand	ic rock (up to 4 in long)			CT-25	1. See.	77						
147 1	38	800 10	11000								•d		w = 16.8% PS (37.0% <		
86205		38 10	dark grey with b depth silty SAt	rown sections browner at									0 08mm)		
REFE	39		1 in long) no vi	sice Non			CT-26		83						
900 (1) (1)		798 58 39 62	med brown to lig	ght grey with some darker											

•

				PI	SOTEC.	F : Minto	Ove:	burde	n Örlang	Program 2008	BORE	HOLE: 08SWC274
<b>8</b> 8	Ŵ	/ SRH	(Consulting	s	ΤE :	Minto	Mine	Yuko	in Canad	da	PAGE	:: ³ OF ³
	1 <b>1</b>		Engineers and Scienusts	۴II	LE NO	: MINT	O (2	CM02	2 003)		DRIL	. : Air Rotary
			<b>A I A A</b>	в	ORING	DATE :		2008	-03-18	TO 2008-03	23 CORE	BARREL :Tople tube (HQ)
		BORIN	G LOG	D/	ATUM :	NAÐ	83 Zo	ne 8V		COORDINATES	5: 6944630	00 N 384300 00 E
SA	MPLE C	ONDITION roulded	TYPE OF SAMPLER SS Split spoon			LABO PS P	RATO article	RY A	ND IN SI anaiysis	ITU TEST	Torvane	(Su) intact
- 9755 244	Und	isturbed	ST The walled shelby tub	e		w V	Vater i	conter	1. 1.			(Sui) 🗣 removided
	Los Soit	core	CT Core tube sample			D U K P	init we iermea	oget (i ability	(N/m²) (Cm/s)		Ground Temp	erature 😽 😽
		STR.	ATIGRAPHY	T	ε		SAM	PLE	Ş			GROUND
٤	н - е					0	z	%		WATER CONTENT	ORY STS	TEMPERATURE (°C)
Ŧ	10 H			BOL	LEVI	ANE BER	1TIO	ERΥ	ROD	and LIMITS (%)	RAT( nd UTE	-5 0 5
DEP	ELEVA DEP	DE	SCRIPTION	SΥM	WATER	TYPE NUM	COND	RECOV	N or	W _P W W L 1 - 1 20 40 60 80	LABOI a IN SITI	UNDRAINED SHEAR STRENGTH (kPa) 25 50 75
		areas, sandy S 1.5 in long) ino	II.T preces of rock (up to visitice. Non			CT-27		95	*#1.6.7.18147-0.0.7.181			
41	797 05 41 15	same as above	with smaller rock pieces									
42						CT-28	100 C	90				
	795 53 42 67	same as above					1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			Ę		
						CT-29		80				
44	794 00 44 20	highly fractured	granitic rock. SAND with									
45		silt and gravel (	up to 1 in long)	8 0		CT-30	ALC: NO.	98				
46	792 48 45 72	fractured granit	ic rock, veining and	· . (			1.00					
		staming dark ir	V COLOUR	8 9 8		CT-31	100 100 100 100 100 100 100 100 100 100	100				
47	790 96 47 24	same as above		3 2) 4			24.7 × 52.4					· · ·
48		-		8 9 2		CT-32	a series	100				
49	789 43 48 77	END OF LOGG	ilNG at 48.77m (Borehole	÷ (						· · · ·		· · ·
		Depth = 368 81	m)									
50												
51										· · ·		
52												
53												
54												
55												
56								or of the second second second second second second second second second second second second second second se		· · ·		
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A THE PERERTICE MALERIALSYMMED INTERNETINGTION IN THE PLOTTER TIME 65.07 (1) GAME

			PROJE	CT : Minto	Overb	urder	Deating	Program 2008	BORE	HOLE : 085WC275
<b>8</b> 8 30		SRK Consulting	SITE :	Minto	Mine	Yuko	n Canad	iə	PAGE	; 1 OF 2
	<b>P</b>	Engineers and Scientists	FILE N	D : MINT	0 (20	M02;	? 003)		DRILL	, : Air Rotary
			BORIN	G DATE :	:	2008-	03-20	TO 2008-03-	22 CORE	BARREL :Tople tube (HQ)
		BORING LOG	DATUN	I: NAD	83 Zon	e 8V		COORDINATES	s; 6944220.	00 N 383890 00 E
SA	MPLE C	ONDITION TYPE OF SAMPLER		LABOF	RATOR	RY A!	ID IN SI	TUTEST	Torvane	(Su) intact
	Ren	oulded SS Split spoon		PS P	article :	size a	malysis			(Sur) 🔶 remoutded
1220	j⊖: Und Lost	PS Piston samplar		D U	raterico nit weig	anten ant (k	t N/m²)		Ground Temp	erature 💑
E	Soil	core CT Core tube sample		k P	ermeal	oildy (	cavs)			
		STRATIGRAPHY	E		SAMF	PLES	•			GROUND
ε	ι <u>-</u> ε		, 11		z	%		WATER CONTENT	ORY STS	(°C)
ΗË	E E		BOL	ANI BER	Ê	ERΥ	RQD	and chimins (76)	RATI nd J TE	-5 0 5
DEP.	ELEVA	DESCRIPTION	SYMI VATER I	TYPE NUM	COND	RECOV	N or I	W _P W W L	LABOF a IN SITU	UNDRAINED SHEAR STRENGTH (kPa)
	856 60	dark brown organic sandy SILT_Vx	- F	1				20 40 00 00		23 36 13
		(50%) with some Vr (up to 1 in long). lots of visible ice, roots present, pendias in	rtace	CT-1		100				÷.
	1	last 1 ft of run	ns pu							
	854 42		drow		100				PS (68 0% < 0 08mm)	
	2 18	driter feels it is SAND that has washed away	10 001	CT-2	2007	43			w = 189.7%	
	3		Fro		a a a a a a a a a a a a a a a a a a a					
	1 967 77	• • • • • • • • • • • • • • • • • • •		C1-3	100	0				
	4 27	GRAVEL (subangular to subround 0.25	. L.	}	21 X 2 2 X					
	5	0.5 in piece of ice	•	CT-4	al marine	ŋ		· · ·		
,	850 81	grey moist firm sandy SILT with gravel	e 		A. Carlos	, i				
Ì	860 50 6 10	non-plastic. Non same as above	¢							
;			0 	CT-5	- 3E - 1	90				
	848 98 7 62	Not Recovered								
				CT-6		0				
ę	847.46	Mat Onzoluzioni						· · ·		× .
	9 14	NOLKELOVEREU		017		0				
10	845.93				1.000	U U				
11	10 67 845 63	sub-rounded large GRAVEL and small &								
	10.97	dark grey moist soll sandy SILT with		CT-8		90				
12	844 4 1 12 19	ouasional populors in on-prastic Non- dark grey sandy SILT with gravel								
13		(subround to subang up to 0.5 in long with one 2 in long) no visitoe. Noe		CT-9		90				Ve
	842 88								w = 10 ±%	
14	13 72	same as above - decreasing sand  content with depth	a					· · ·	PS (33 5% < 0 08mm)	
10	841.00		ę	CT-10		98				
	841 36 15 24	dark grey sandy SILT some small	*							
16		peobles (up to 0.25 m long) indivisice Nbri	, ]	cru		82		• ·		
	839 84 16 76	same as above								v.
17				CT-12		88				
18	838 31									
	18 29	dark grey clayey SILT with some sandy and gravel layers (3-4 in run)	e S							
19		· · · · · · · · · · · · · · · · · · ·		CT-13	and the second	100		-11	w = 15.4%	
5	836 79	5							PT = 10%	

s og reference materialsig

				PF	ROJEC.	r : Minto	Qve:	burde	n Drilling	Program	2008		BORI	HOLE : (	28SWC	275
<b>893</b> 2012		sr sr k	Consulting	g sr	TE :	Mento	Mine	Yek	on Canad	da			PAGE	: 2	OF	2
		<i>*</i>	Engineers and Scientists	FI	E NO	MINT	0 (2	CM02	2 003)				DRILI	: Air Ro	otary	
				вс	DRING	DATE :		2008	-03-20	T	0 200	08-03-:	22 CORE	BARREL	. ;Triple ti	ibe (HQ)
		BORIN	G LOG	DA	TUM :	NAD	83 Zo	ne 8V			COORDIN	IATES	6944220	00 N	383890	00 E
SA	APLE C	ONDITION	TYPE OF SAMPLER			LABO	RATO	RY A	ND IN SI	TU TEST			Torvane	(Su)	. inta	ict
	Ren CUnd	noulded Isturbed	SS Split spoon ST Thin walled shelby tub	0e		PS P w W	article Zater (	size : conter	analysis M					(Sur)	ren	noulded
	Los	l	PS Piston sampler			ου	nt we	ight (l	(N/m ³ )				Ground Temp	erature	•۶	ž.
	Sort	core STR/	CT Core tube sample			k P	ermea S A M	ability P1 E1	(cm:s)				 	[ 	00000	
	ε				Ę		T			WATE	ER CONTI	ENT	רא א	TEM	PERAT	URE
E -	NO -			L	ΥËΓ	9 %	No	% λ	Q	and	LIMITS (	%)	TOR	r	(°C)	e
PTH	ATN PTH			MBC	3 LE	E AI MBE	DITIO	VER	r RO				and and TUT	-5	v	р 
L L L	DE	DE	SCRIPTION	sγι	ATEP	NUI	NOC	ECO	o N	W _P	w v	۷ L	AB(		AINED S ENGTH (	HEAR kPa)
					ŝ			œ		20	40 60	80		25	50	75
		same as above	with bigger gravel pieces			CT-14	100	83								
21	835 26						1				· ·					
22	21.34	ocasional sub-a	a firm, sandy SRT with angular coarse gravel	•		<i></i>	1102-514									
	833 74	non-plastic		•		164-15		60								
23	22 86	dark grey mois subangular gray	t_firm_sandy S&T with vel_non-ofastic	л												
24				1		GT-16	Actual Long	100								
	832 22 24 38	same as previo	U\$				1000									
25				~ 0		CT 17		100		•	• •		PS (55 0% <			
26	830 69 25 91	angular to subro	ounded medium to coarse	· · ·			14.5411.18						0.08mm) w = 9.6%			
	830 45 26 15	gravel no tines dark grey firm	moist silly SAND			CT-18		22			•			,		
27	829 17	into or poor														
28	21 93	ENU OF BURE	HULE at 27 43m								÷					
29																
30																
													-			
31																· · ·
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E VA REFERENCE URLERINGSYMMER SAMMERSANDENSOMMINTO IN ) 24 PLOTIED 2008.05.22 11 Mars

			PR	OJEC	T : Minto	Overt	burden	BOREHOLE : 08SWC277					
<b>#</b>	en V	SRK Consulting	y SI	re :	Minto	Mine.	Yukor	o, Canad	ta	PAGE: 1 OF 2			
	<b>V</b>	Engineers and Scientist	5 FIL	.e no	: MINTO	) (20	CM022	003)		DRILL Air Rolary			
	γ.		вс	RING	DATE :		2008-	03-23	TO 2008-03-	core	BARREL :Tople tube (HQ)		
	J	BORING LOG	DA	TUM :	NAD	83 Zo	ne 8V		COORDINATES	: 6944211	00 N 384090.00 E		
SA	MPLE CO	NDITION TYPE OF SAMPLER		LABORATORY AND IN SITU TEST							(Su) intact		
	C Reme	oulded SS Split spoon	te	PS Particle size analysis w Water content							(Sur) 🔶 remoulded		
14.8	Lost	PS Piston sampler			DU	ut we	ght (k	<b>N</b> /m²)		Ground Temp	erature 😽 😽		
	Soild	CT Core tube sample			k Pi	eronea S A AA	bility (	cm/s)		00000			
pTH - m	ATION - m PTH - m	STRATISRAFTI	MBOL	s LEVEL - m	E AND MBER	NOITIO	VERY %	r RQD	WATER CONTENT and LIMITS (%)	ORATORY and TU TESTS	TEMPERATURE ('C) -5 0 5		
DE		DESCRIPTION	SΥΙ	WATE	TΥΡ NU	CON	RECO	0 N	W _P W W U   -   20 40 60 80	LAB( IN SI	UNDRAINED SHEAR STRENGTH (kPa) 25 50 75		
	0 00	Brown, wet very soft organic sandy SII.T. non-plastic		Π	-1	100							
		a a san partin			CT-1	and the second	37						
	867 48 \ 52 2	subangular to subrounded coarse to medium gravel ino fines	· · · ·	¥	CT-2	and the second	20		· · · ·				
	865 95		~ *	urtace		11. A.					· · · · ·		
	3 05	Not Recovered		und se	010	5-190 (J) (S)	~						
	<b>1</b> 864 43			o <i>n th</i> o			บ						
	3 4 57	Not Recovered		n nel	CT -								
	00 538			ter 2.4	Ç1-4	140 C 140 C	u						
	8 10	Not Recovered		e.W.		6 APR							
					CT-5		Q		· ·				
	861 38	Not Recovered							- ·		, ,		
					CT-6		0						
	859 86 9 14	subangular to subrounded coarse gravel			a contact of head								
1 1000 I	859 70 9.30 859 09 9 91	no fines brownish grey wet soft sandy SILT with coarse gravel and subangular cobbles	20 A		GT-7	a la compañía	50				· · ·		
1 2 2	858 33	Not Recovered subangular to subrounded fine gravel inc								a, = 21 2%			
1906	10 97 857 42	fines locasional subangular large gravel dark grey moist firm sandy SILT with			CT-8		60			PS (1.5% × 0.08mm)			
2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	11 58 855 81	subangular gravel and ocasional subangular beuider	0.60										
ត្ត ភ្ញុំ 1	12 19 855 66	Not Recovered dark grey, moist, soft to firm sandy	1740		CT-9	1000	73		· · ·	1	<b>\$</b>		
- 27 0	13 32 855.28	gravelly SILT with subangular coboles non-plastic, not frozen			* ****								
	13 72	Not Recovered dark grey moist, firm with narrow soft			CT to		90				*		
352 <b>1</b> :	853 76	zones, SILT with 10% sand non-plastic not frozen	• • •										
104,553	15 24	same as above + ocasional subangular cobbles			CT		90				•		
11	852.24						90						
55 1 1 1	16 76	dark grey moist stiff sandy SILT with 3-5% fine gravel interbedded with clean subangular poorty graded gravel and	а. 		CT-12	1111-111-111-111-111-1	73		• • • •				
4 1) 4 30×3899889 1	3 350 7 1 18 29 850 10 18 90	fine brownish grey sand grey well soft to stiff sity SAND with angular gravel and cobbles non-plastic not frozen	8 . A		CT-13	and the second second	37		• •				
90.9	849 19	Not Recovered				1944 A.							

				PI	ROJEC	r : Mesto	Over	burde	BOREHOLE : 08SWC277						
<b>25%</b> 6267		🥽 SRK	Consulting	I SI	TE :	Minto	Mine	Yek	on Canad	da	PAGE: 2 OF 2				
	<b>P</b>		Engineers and Scientists	FI	LE NO	: MINT	O (2	CM0;	2 003)		DRILL	; Air Rotary			
				в	ORING	DATE :		2008	1-03-23	TO 2008-03	-26 CORE	BARREL :Tople tube (HC			
		BORIN	G LOG	D	DATUM : NAD 83 Zone 8V COORDINATES							3: 694421100 N 38409000 E			
SA	MPLE C	ONDITION	TYPE OF SAMPLER				RATO	RYA	ND IN SI	TU TEST	Torvane	(Su) intact			
	Und	isturbed	ST Thin walled shelby tube	a		w W	vater (	conte	nt M			(Sur) 🔶 remoulded			
	Lost Sol	00/0	PS Piston sample:			D U	loit we	aght (	kN/m²)		Ground Temp	ierature 😽 😽			
	300	STRA	ATIGRAPHY		F		SAM	PLE	(cuvs) S			GROUND			
_	ε				8				1	WATER CONTENT	۲۲ IS	TEMPERATURE			
u - H	NOH-H			5	N EI	N R	NO	RY %	R	and LIMITS (%)	d TES	(°C) -5 0 5			
EPTI	VAT EPT	nr.	CONTION	MB	RLE	PE A	Tidy	UVE E	or R(	160 167 167	OR and				
۵	ພ_ ພ		SCRIPTION	ŝ	ATE	N Z	CO	SEC(	ž		LAB	UNDRAINED SHEAP STRENGTH (kPa)			
		crange wet an	oular oravelly SAND		5		10			20 40 60 80	1	25 50 75			
	846 43 20 57	non-cohesive Not Recovered		« · .		CT-14	1000	48			PS (9.5% <				
21	847 66 21 34	orange wet wa	akly comented andular				1625				G (BBBBP)	· · · -			
22	846 75	gravelly coarse	SAND			CT-15	1000	60		•	w = 11.9% PS /7.0% ×				
22	22 25	Not Recovered	of horizont								0.08mm)				
	22.00	Grange weather	SU DEGROCK	4 U 8		C1.18	10.15 Kef	100							
24	844 62		n s s s fi	2.4		01.10				· ·					
25	24 38	bedrock	Ĩ	* *			1410								
	843.09					CT-17		100							
26	25.91	END OF LOGG Depth = 252.98	fNG at 26.91m (Borehole m)							1 <u>1</u>		: : · · :			
27		·													
28										- · ·					
29												<b>.</b>			
30															
31										• • •		· · ·			
32										·					
33												• •			
34															
36					And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec										
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36										· ·		· · ·			
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REFERENCE IN LEPUN SHOWER INTERPORTING IN SHY PLOTTED TORIONIS IN DATE

	***************	***********	PR	PROJECT : Minto Overburden Drilling Program 2008									BOREHOLE : 08SWC278				
<b>19</b> 1750	×.	srk 🖉	Consulting	y sit	E:	Minto	Mine	Yukar	Canac	ía				PAGE: ¹ OF ³			
	, e	<b>u</b>	Engineers and Scientists	FIL	E NO	: MINTO	D (20	CM022	003)					DRILL : Air Rotary			
	,			во	RING	DATE :		2008-	03-26	Ť	)	2008-0	3-29	COR	E BARREL	:Triple tui	be (HQ)
		BORIN	G LOG	DA	TUM	NAD	33 Zor	ie sV			coo	RDINAT	ES :	6943900	00 N	383940 (	00 E
SA	MPLE CC	DNDITION	TYPE OF SAMPLER			LABO	RATO	RY AN	D IN SI	TU TEST			T	orvane	(Su)	intac	at
1 1 2,755	୍ତି Rem ଅନି Llode	oulded	SS Split speen S1 Then walled shelly tet	50		PS Pi	article later c	size a ontent	nalysis						(Sur)	🔶 rem	pulded
- Nut	Lost	510,020	PS Piston sampler	10		0 0	nit we	ight (kl	N/m³}				G	Ground Tem	perature 🕯	çx	r
l	Soil	9100 	C1 Core tube sample			k Pi	ermea	bisty (e	cm/s)	· · · · · · · ·					1		
	F	SIR/	ATIGRAPHY	1	3		SAM	PLES				ONTEN	τ	א ער	G TEMI	PERATL	JRE
Ę	×ε				ц. Ц		z	% λ	0	and		TS (%)	1	COR'		(°C)	
E	H H			BOI	μ	AN IBE	E	/ER	RQI			, ,		RAT and U TI	-5	0	5
DEP	DEF	DE	SCRIPTION	syn	ATER	TYPE	CON	ECO	N or	W _p	w	w _i		LABO IN SIT	UNDRA STRE	INED S NGTH (I	HEAR kPa)
	870 10				Š			æ		20	40	60 80			25	50	75
	0 00 869 80	orange-brown t organic sandy t	o brown, wet, soft SILT, non-plastic, Nbh		v	lor.	1910 - A 1910			L L L			۶ 0	PS (55.0% ≤ ) 08mm)			
	1 859 59	Not Recovered			face		14114-202	20				• •	t; A	v ≠ 24.9% भ ≠ 5%			
	1 52	brownish grey inclusions of or	wet soft sity SAND with		uns pi		the states										
	183	non-plastic No	e e g		ihaal	CT-2	19/61 19/61	20									
:	3 867 05 3 05	Not Recovered			nejos		1									e e	
	1				1 202	CT-3	244.00	0									
	865 53	arey wat call	enady CH T, walksward of		Antor (		10										
	5	poorly graded n	nedium sand and		2	CT-4	e-mikepie	68		-							
	864 00	non-plastic Nb	u Brassi i i santhur Bishnési. Li Brassi i i santhur Bishnési.				100										
	6 10 863 70	grey wet, soft non-plastic, Nb	sity fine SAND n														
1	863 39 6 71	subangular coa than 3% fines	rse GRAVEL with less			C1-5	50 F20	40								Ĩ	1
6	862 48 7 62	Not Recovered brownish-orang	e poorly graded medium				Sales						Ę	98-0 8% -<			
	862 18	sand, wash-out orey, wet, andu	from hole (no recovery) lar to subrounded well	: •		CT-6		50					0	08mm) 08mm)			
9	8 53 860 96	graded GRAVE	1. (30% coarse, 40 % finn) with traces of sourt				1411111111							¥∾1424;			
ş 10	9 14 860 19	no fines not fro Not Recovered	280	. 12		CT-7	a state	50		-							
3 2 2	9 91 859 43 10 87	grey moist loo	sel weil graded SAND It ad subacquiar graver														
야 11 강 2	859 31 10 79	not frozen Not Recovered				CT-8	2221110V	100									
ହିଁ ଜୁ 12	859 19 10 91 857 01	grey wet, soft \$	SIL Vivita fine sand			- trade data and the											
10%	12 19	grey moist firm	fine SAND with 10 %	. 5		OT 0											
् <u>व</u> ी ¹³	858.28	grey moist me	dium dense SAND with	1997		101.9	× 10.00	60									
2 2 14	13 72	graver and ocas same as above	NUTRE COODIES NOT TOZEN	1. W													
success.		dark grey mois 10% subangula	r grave: non-plastic inc			CT-10	alest o Para	100								ļ.	
velorna 1	854 86 15 24	ice observed same as above					liet isote				·						
200 16 20						CT 11	N States	100									
888757 17	853 34	same as above	+ traces of Vs				1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			•			b F	PS (36.0% ≮ Σ08mm)			
1122	849.97		-			CT-12	an an an an an an an an an an an an an a	100					1	v = 7.2%			
× 18	17 83 851 81	dark grey moist	stiff. Sit T with sand and	4			. e										
25532	18 29	Non, traces of V	is non-pasto, many /s + hanse of Ve			or in		100									
276 9E	850.29	serre 35 duovê	<ul> <li>eaurs or vs</li> </ul>	0.9		C1-13		00									
u.	000 40			5 F				1		1			{		1		

				PR	OJEC.	T : Minto	Over	burder	BOREHOLE: 08SWC278					
<b>100</b> 2000	- U	n SRK	Consulting	s St	TE :	Minto	Mine	Yuko	n Cana	da	PAGE	2 o	)F 3	
			Engineers and Scientists	, 	E NO	: MINT	0 (2	CM022	2 003)		DRILI	Air Rotary		
				вс	DRING	DATE :		2008-	03-26	TO 2008-03-	29 CORE	BARREL TH	inte tube (HC)	
		BORIN	G LOG	DA	TUM :	NAD	83 Zo	ne sV		COOPDINATES	5943900	00 N 38:	3940.00 F	
SA	MPLE C	ONDITION	TYPE OF SAMPLER			LABO	RATO	RYAN		TUTEST				
	Ren	nouided	SS Split speen			PS P	article	size a	malysis		TORVINE	(Sur) •	remoulded	
192	Und	isturbed	ST Thin walled shelby tut PS Piston symplay	e			later o	conten	t Klimsti				_	
	Soil	core	CT Core tube sample			K Pi	ermez	igni (k Bality (	cm/s)		Ground Temp	erature 😽 🗠	<del>-</del> - <del>-</del> - <del>-</del> - <del>-</del>	
		STR/	TIGRAPHY		c		SAM	PLES				GRO	UND	
_ د	8				ם 			2		WATER CONTENT	RY TS	TEMPER	RATURE	
с т	N H			5	E C E	2 a	NOI	24.9	8	and LIMITS (%)	VT01 d TES	-5 (	~} ) 5	
EPT.	VAT			MB	КĽ	MB N	L G	DVE	r Ri		OR/ an TU			
ā	ΞĒ	UE	SCRIPTION	SΥ	ATE	ΣΩ N	Ő	С Ш	z		LAB	UNDRAINE	ED SHEAR ITH (kPa)	
					ŝ			œ		20 40 60 80		25 5	0 75	
		same as above	+ traces of Vs	2.4		CT-14	de spec	100						
21	848 76						100			· · ·		ļ	· ·	
	21.34	same as above		2.4			100							
22	847 85	dark grey mois	t stiff sandy SILT with 5			CT-15	10000	100				· ·		
23	847 24 22 86	to 10% subange Nen_traces of V	ifar gravel non-plastic /s				1							
		same as above	+ traces of Vs			C1-15	100	100						
24	845 72			0 <b>9</b>			10.00						• •	
25	Z4 38	same as above	+ traces of Vs				a last							
	844.10			0 9		CT-17	a felorense a	100						
26	25.91	dark grey clave	y SILT some rocks	A 4										
77		(subrounded lap Nbn?? - ant temp	> to 2 in long), no visitice > 10C			QT 18	an an	28						
21	842 87	dark orev. Stl Y	with cand and manal it								w = 8.5%			
28		pièce granitic (c	ck (~3 in long), 1 25 in	 		CT-19		100			PS (24.0% < 0.08mm)			
	841 14	100 ICHS 110 VIS -	cel wystrik i antieniip 30	о р .,								•		
29	28 95	same as above granitic rock (~ 1	- less rock, 1 piece E5 in long: no visice											
30		unfrozen?? - int	temp 6C	s 4.		C1-20		90						
	30 48	same as above	1 prece of dark rock (mid	77 - 12 1 - 14 1 - 14										
31		run ~4 in long) int temp 8C	no vis ice unfrozen?? -			CT-21		100				· · ·		
32	838 10 32 00	dark diev saom	SIL LIGHTY SAND IDOO	~			-10						-	
		large rocks than	above (0.25 0.5 m			CT.22	Collection of	100						
33	836 57	transition zone o	water the site sand the sand			0,					PS (38.5% +		• •	
34	33 53	below dark grey/black s	sity SAND progressing					Particular Social			v vonien) w × 16.8%			
		to SAND with de rock (avg 1 in lor	pth pieces of granitic light piece at and 3.5 in		a de la desta d	CT-23	<b>KSS</b>	82				(		
35	835 05 35 05	long) unfrozen i dark grewblack (	nt temp 8-12C SAND with modes of				11					. <i>.</i>	· • •	
36		granitic rock - int	temp SC	8	1	CT-24		98						
	833 52	minchester Card	VOLT DUMP DATE	a 0.								: •		
37	30.98	above (SAND) 1	st foot of run is small	0		OT OF	4 A A	30				· ·		
20	832 00	rocks (sub ang to ft SILT layer (dar	sub round) mid run 1.5 k grey) unfrozen int	15		0.30		0.4						
30	38 10	temp 6-8C dark grey interbe	ddec SAND/SiL f							• • •				
39		unfrozen, pieces	of granibe rock (up to 2			CT-25		75		· · · · ·		<i>.</i>	· ·	
	830 48 39 52	11-13C	www.commergrad.commergrad.											

P.V& RESERENCE MATERIASWEERE SWEERE SALERENDARDOWNTO IN JUNY PLOTTED 3538-52-17-03

	443			PF	ROJEC	Ϋ́: Minto	Over	burdei	BOREHOLE : 08SWC278				
<b>88</b> 1985		see SRH	Consulting	s SI	TE :	Minto	Mine	Yuko	n Canac	fa	PAGE	3 OF 3	
	A. Co.		Engineers and Scientists	FIL	LE NO	; MINT	0 (2	CM02	2 003)		DRILL	Air Rotary	
			<b>A 1 A A</b>	вс	DRING	DATE :		2008	03-26	TO 2008-03-	29 CORE	8ARREL :Triple tube (HQ)	
		BORIN	G LOG	DA	ATUM :	NAD	83 Zo	ne 8V		COORDINATES	6943900	00 N 383940 00 E	
SA	MPLE CO Rem	NDITION	SS Sold speed			LABO	RATO article	RY A	ND IN SI	TUTEST	Torvane	(Su) intact	
	Unde	iturbed	ST. Thin walled shelby tob	96		~ V	later o	conter	st , i i i			(аш) 🔶 тенюшаеа	
E	Lost Soif c	ore	PS Piston sampler CT Core tube sample				nd wa ermea	ught (F sbility	(N/m²) (cm/s)		Ground Temp	erature 👬	
		STR	ATIGRAPHY		ء		SAM	PLES	5			GROUND	
Ε	E E						7	%		WATER CONTENT	оry StS	TEMPERATURE (°C)	
Ë	01 E			30L	E V B	AND BER	10L	ERΥ	ζαD	and LIMITS (%)	RATC nd J TE:	-5 0 5	
DEP.	ELEVA DEP	D£	ESCRIPTION	SYMI WATER		TYPE NUM	COND	RECOV	N or I	Wp W W 1 1 20 40 60 80	LABOF a IN SITU	UNDRAINED SHEAR STRENGTH (kPa) 25 50 75	
		(same as abov	ei - int temp 11C			CT-27		58			PS (17.8% <		
41	828 95			8. 9							0.08mm) w = 10.8%	· · ·	
	4:10	down into SAN	D graniec rock broken ID, can break rock pieces			C.F28	(C) SAMPLE	78					
42	827 43	wan bandi unti	0200			<b>.</b>	1						
43	42 67	same as above	3			0.1 10	100					· · ·	
44	825.90					151-28	562 V(C 42)	100					
	44 20	same as above (still very incon	PSRK Consulting Engineers and Scientists  ORING LOG  NON TYPE OF SAMPLER  S S Split spoon  S S Split spoon  S T Thin walled shelby tube PS Piston sampler  CT Core tube sampler  CT Core tube sampler  STRATIGRAPHY  DESCRIPTION  Ime as above - init temp 11C  ry weathered granitic rock broken wh into SAND, can break rock pieces h hand, unfrozen  me as above - iess sand, more rock if very incompetent;  the as above - more competent rock e sand  D OF LOGGING at 47 24m (Borenote pBh = 246 80m)				and the second						
45	104 au	· ·				CT-30	a parte and	97				• •	
46	45 72	same as above little sand	- mare compatent rock			C1-31	ar weiter far	100					
47	822 86 47 24	END OF LOGC Depth = 246.80	SING at 47-24m (Borenole 3m)									· · ·	
40							[						
49												· · · -	
50													
200 C													
						NATE OF COMPANY OF COMPANY							
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999 2													

	50			P	ROJEC	T : Masto	Overl	burdei	• Deiting	Program	1 2008		BOR	EHOLE : 08	SWC280
<b>8</b>		/ SRK	Consulting	y S	TE :	Minto	Mine	Yuko	n Canad	da			PAG	E: }	OF 2
	<b>P</b>	<i>*</i>	Engineers and Scientists	FI	LE NO	: MINT	0 (20	CM02.	2 003)				DRI	L - Air Rotar	ſŸ
	·			в	ORING	DATE :		2008	03-29	ĩ	0	2008-04	01 008	COADOCI JI	fanla (uho (MO)
		BORIN	G LOG	D	ATUM :	NAD	83 Zoi	ne 8V					5. 694395r	100 N 3	1918 (008 (HQ)
SA	MPLE C	ONDITION	TYPE OF SAMPLER			LABO	RATO	RY A		TUTES	соо. г	(DINA) C	7	/0.u)	
	Ren	noulded	SS Split spoon			PS P	article	size a	maiysis	10 120			1 orvane	(Su) (Sur) <b>4</b>	remoulded
6.3	Und 🗄 🖞	isturbed	ST Thin walled shelby lut PS Piston samplar	)e		W W	Vater d	onten	t Ni landi						
	Soil	core	CT Core tube sample			k P	ermea	igni (x ibility (	cm/s)				Ground Tem	perature 🐝	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
		STRA	ATIGRAPHY		- -		SAM	PLES	3					GR	OUND
E	Е ' с							6		WAT	ER CC	NTENT	۲۲ TS	ТЕМРЕ	ERATURE
Ξ	NO H			Ы		N R	NO	۲°,	8	and	LIMI	rs (%)	4 J TES	-5	°C) 0 5
L L L	VAT EPT			MB	RLE	MBI MBI	101	Ш Л	r R(				and TU		
ត	Ш П	UE DE	SCRIPTION	Sζ	ATE	¹ ∠ P	CON		z	W _p	W	w L	AB( N SI	UNDRAIN	IED SHEAR GTH (kPa)
ļ	873 30				₹ N			α		20	40 E	0 80		25	50 75
	0.00	brown moist si sand and grave	off, SILT with traces of Linen-plastic, non-frozen	a 4	5		1						Control of a statistic field of a state and a state and a state of a state		Ť
1	872.08				Surfe	CT 1	100	80							
	87178	Not Recovered Not Recovered			puro.		100								
Ĺ	871 01	Not Recovered			u) and	CT-2		0							
3	870 25	Not Revovored			m 3DC										
	859.34	14011160098160			0.3	01.2							ŗ		¥,
4	3 96	brown, moist, so	oft. SILT with traces of	. v	Froze	01-3	1	40							-
5	4 57 868 12	graver non-plas	lic non frozen	. م •			1. 1. C.			•			w = 10.3% PS (40.0% <		
	5 18 867 81	same as above Not Recovered		P : 1		CT 4		90					0 08mm)		
6	5.49 867 20	dark grey, moist ocasional subroi	soft sity SAND with unded medium gravel	2			Carponi di								
-4	6 10 866 59	non-plastic Nbn dark prev. moist	10056 subrounded and			CT-5	1000	98							
	866 29	rounded coarse	SAND with 5 to 10%				12.50 mm 2.52								Y.
8	865 68	soft SIUT Ince-p	ed with dark grey moist astic, Nbn, traces of Vs				22444								
	864 46	<ul> <li>dark grey moist Iraces of Vs. Nbi</li> </ul>	soft SILT non-plastic			CT-6	100	80							
9	8 84 864 16	dark grey, moist non-plastic, Non	soft sandy SIL1												
10	914	same as above	+ ocasional angular	÷		CT-7	10.0	100		•			PS (33.0% r 0.08mm)		
	862 63	Not Recovered		s. s									w = 8.2%		
11	10.67	20% sand with s	nard to still sandy SILT subangular gravel and	*			New York				•				
12	961.11	occasional cobbi same as above	es non-plastic Non	1.1		CT-8		100							
	12 19	same as above					a insistant								
13	12 80	dark grey moist.	hard to stiff silty SAND			CT-9		100							
	859 58	with subangular ( subangular cobb)	gravel and ocasional les, non-plastic	с. ». Ул. т			2550000								
14	1012	same as above				01.10				•					
15	858.06					UF-10		90				:			
	15 24	dark grey moist.	hard to stiff silty SAND												Å.
16	856 99	cobbles 10% gra	ivel) ivel)			CT-11		100							
45	16 31 856 54	brownish grey wi subangular grave	et loose SAND with						44 H LLL . 19.						
17	16 / 6 855 82	alternate layers o medium dense m	f grey wet, loose to			CT 10	S	BA	Ì						
18	17.68	traces of gravel, I	Non	5		unne -		00					DO 150 144		
	18 29	brownish grey, m	oist medium dense						are screened by A.	•			PS (55 5% < 0 08mm)		
19	853-79	SAND with faces angular cobbles	of lines and occasional			CT-13	1	100		÷			₩≈131%	-	¥ -
	19.51	weathered bedroo	ok												

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			PR	OJECI	Minto	Overt	nurder	BOREHOLE: 08SWC280					
<b>15%</b>	Ŵ	SRK Consulting	SIT	Έ:	Minto	Mine	Yuko	PAGE: 2 OF 2					
	S.	Engineers and Scientists	FIL	E NO :	MINTO	) (20	CM021	2 003)		DRILL : An Rotary			
		DODING LOC	BO	RING (	DATE :		2008-	03-29	TO 2008-04-0	01 CORE BARREL : Tople tube (HQ)			
		BORING LUG	DA	TUM :	NAOS	33 Zoi	ne 8V		COORDINATES	-; 6943950.00 N 383671.00 E			
SA	Rem	oulded SS Split speen			PS Pa	article	RY AN size a	Torvane	(Su) intact (Sur) ♦ remoulded				
1373 1375	Undi Lost	sturbed ST Thin walled shelby tobe PS Piston sample:	w Water content D Unit weight (kN/m²)							Ground Temp	erature 💑		
E	Soit	core CT Core tube sample			k Pe	emea	ibility (	cm/s)	·····				
	E	STRATIGRAPHY		Ę		SAM	PLES		WATER CONTENT	× s	GROUND TEMPERATURE		
e -	NON-		OL EVEL ND ER RY % DD					g	and LIMITS (%)	NTOR d TEST	( ⁴ C) -505		
EPTH	VATI	DC20DIDTION	MB	RLE	PE A JMBE		OVE	or R(		30R₽ ane ITU			
ā	ELE DI	DESCRIPTION	S	VATE	Σĭ	Ö	REC	z		LAE IN S	STRENGTH (kPa)		
	19.81	weathered bedrock		>					20 40 60 80		25 50 75		
2	1				CT-14	1200064	100						
	21 34 851 35	weathered bedrock			non allenation	41 STATI ON							
21	2 21 95	competent bedrock			CT-15	201201-11-0421	100				- · · ·		
2:	3 22 86	END OF LOGGING at 22 86m (Borehole Depth # 265 18m)							· ·		- · · ·		
24	1		******										
	_												
23													
20	3												
27	,												
28	3								· · · ·		· · · · ·		
25	)												
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-39 -39 -30	,												
9							1		1	1	1		

## PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC270-S1
Sample No.:	BH08-SWC270-S1
Depth:	10 - 11 ft
Description**:	SAND AND SILT - some gravel, trace silt

Particle	Percent		Clay	Size	Silt	Size			Sand		G	iravel	
Size	Passing							Fine	Medium	Coarse	Fine	Coarse	-
100 mm													1
75 mm		P	90								<u>,</u>		e van de s
50 mm	100	е											
38 mm	94	r	80								ľ		
25 mm	94	с е											
19 mm	93	n	70										
13 mm	90	t							/	1			
10 mm	88	E	60										
5 mm	82	i											
2 mm	68	n	50										
850 µm	59	e	F										
425 µm	52	r	40				Λ						
250 µm	48	b											
150 µm	45	У	30			1					laterial C	)escriptio	n
75 µm	42	8/									Proport	tion (%)	
31 µm	. 31	a	20							Cla	y Size *	3	
21 µm	24	S				ø					ilt Size Sand	39 40	
12 µm	16	S	10								Gravel	18	
9 µm	12										obbles	0	
6 µm	9		0 L	•				1 2 1	- <u> </u>				
3 µm	5		4	2	Parti	cle Size	80 (um)	4(	10 	2 : Dartia	) In Siza/r	20 mm) -	75 
1 µm	1			<b>`</b>	- rati		- (μιη)		<u></u>	Partic	ie Size(i		
Rem	arks:	* The	- unne	er cla	v size of 2 i	ım ner	the Car	nadian Fou	ndation Fr	aineeri	na Mani	ial	

n, f μ ** The description is visually based & subject to EBA description protocols.

Reviewed By:

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EBA Engineering Consultants Ltd.



Date Tested: 2008/04/23
ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC270-S2
Sample No.:	BH08-SWC270-S2
Depth:	31.2 - 32.2 ft
Description**:	SAND - some gravel, trace silt, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Fine Medium Coarse Fine Coarse 100 100 mm 75 mm Ρ 90 50 mm е r 38 mm 80 С 25 mm е 19 mm n 70 13 mm 100 t 10 mm 99 60 F 5 mm 86 i 2 mm 56 n 50 e 850 µm 40 r 425 µm 27 40 250 µm 18 b 150 µm 11 У 30 Material Description 75 µm 7 Proportion (%) Μ 3 Clay Size ' 36 µm 20 1 а Silt Size 5 2 23 µm S Sand 80 13 µm 1 S 10 14 Gravel 9 µm 1 Cobbles 0 7 µm 1 0 2 400 5 80 2 20 75 1 3 µm Particle Size (µm) €- $\rightarrow \leftarrow$ Particle Size(mm) ~~> 1 1 µm **Remarks**: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

**Reviewed By:** 

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EBA Engineering Consultants Ltd.



Date Tested:

2008/04/23

ASTM D422

Date Tested:

2008/04/23

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC271-S1
Sample No.:	BH08-SWC271-S1
Depth:	0.8 - 1.5 ft
Description**:	SILT - some sand, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Medium Coarse Fine Coarse Fine 100 100 mm 75 mm Ρ 90 50 mm е r 38 mm 80 С 25 mm е 19 mm n 70 t 13 mm 10 mm 60 F 5 mm i 2 mm 100 n 50 e 850 µm 100 r 425 µm 99 40 250 µm 98 b 150 µm 97 у 30 Material Description 75 µm 82 Proportion (%) Μ 33 µm 34 20 Clay Size * 1 а Silt Size 81 21 µm 26 S Sand 18 13 µm 16 s 10 Gravel 0 9 µm 12 Cobbles 0 8 0 6 µm 2 2 80 400 2 5 20 75 3 µm Particle Size (µm) <  $\rightarrow \leftarrow$ Particle Size(mm) ⇒ 0 1 µm Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.

** The description is visually based & subject to EBA description protocols.

**Reviewed By:** 

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC271-S4
Sample No.:	BH08-SWC271-S4
Depth:	17.5 - 18.5 ft
Description**:	SAND AND SILT - some gravel, trace clay

Date Tested: 200

2008/04/23

Particle	Percent	Clay Size			cent Clay				Sil	t Size	Э		Τ	Sand								Gra	avel			
Size	Passing		100								F	ine		Med	ium	Coa	arse	Fir	ne	0	Coarse	9				
100 mm			100																,	-						
75 mm		Р	90																1							
50 mm		е																								
38 mm	100	r	80								ļ						$\boldsymbol{\lambda}$									
25 mm	99	с е																								
19 mm	97	n	70																							
13 mm	93	t																	-							
10 mm	89	F	60																		-	-				
5 mm	83	i																								
2 mm	73	n	50				ļ																			
850 µm	67	e r									8															
425 µm	60	•	40							/	/															
250 µm	54	b								/																
150 µm		У	30													Ī	Ma	iteria	l Des	scri	ptio	1   : n	7			
/5μm	37	M						, e										Prop	ortio	n (9	%)					
33 µm	23	а	20													1	Clay النې	Size	*		2					
21 µm	20	s	• •			هر											S	and	ī		46					
12 µm	10	5	10			1											Gr	avel			17					
9μm Gum	10		0				a na a contra a contra a									Ļ	Co	bbles	; 		$\frac{0}{1}$	111	]			
<u>ομιι</u> 3.μm	10		0.	2						80		4	00		 2	)			<b>·</b>	20	ila	75				
1 um				←		Pari	ticle	Size	ə (µr	n)		>	· «		- 1	Part	icle	Size	∽ ∋(mr	n)	_		≽			
	· · · · ·																		-							
Rema	arks:	* Th	e upp	er cla	ay size	e of 2	μm,	per	the (	Can	adia	n Fou	und	atio	n Eng	jine	erin	g Ma	nual							
	·	** TI	ne de	script	ion is	visua	illy ba	ased	8.8	subj	ect t	o EB.	A d	esci	iptior	n pr	otoc	ols.								
															1		5	>								
									R	evi	ewe	i By:			$\Delta$	$\sim$	` ``	$\checkmark$		~						





ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC271-S9
Sample No.:	BH08-SWC271-S9
Depth:	82.5 - 83.5 ft
Description**:	SILT - sandy, gravelly, some clay

Date Tested: 2008/04/23

Particle	Percent	Clay	y Size	Silt Size		Sand		Gı	avel
SIZE	rassing	100			Fine	Medium	Coarse	Fine	Coarse
100 mm		100							T T
75 mm		<b>P</b> 90							
50 mm	100	e							
38 mm	90	r 80							<b>^</b>
25 mm	86	с е							
19 mm	84	<b>n</b> 70							
13 mm	81	t							
10 mm	79	<b>E</b> 60	×						
5 mm	76	i			_	<b>~</b>			
2 mm	70	<b>n</b> 50							
850 µm	62	e		×					
425 µm	57	r 40							
250 µm	54	b							
150 µm	50	<b>y</b> 30						<u>aterial De</u>	escription
75 µm	46	ħ <i>#</i>		and a second sec			191	Proporti	on (%)
31 µm	35	a 20					Cla	y Size *	11
20 µm	32	S		×				It Size	35
12 µm	28	<b>s</b> 10					G	Favel	24
8 µm	26						Co	obbles	0
6 µm	23	0	II					(III)	
3 µm	14		2	80 Bortiolo Size (um)	) 4(	0 2	2 5	- <b>O</b> lma (	20 75
1µm	8	•	~	marticle Size (µm)		<	Particle	e Size(m	ım) →

** The description is visually based & subject to EBA description protocols.

**Reviewed By:** 





ASTM D422

Project:Proposed Valley DumpClient:SRK Consulting IncProject No.:W14101068.006Location:BH08-SWC272-S1Sample No.:BH08-SWC272-S1Depth:4.0 - 5.0 ftDescription**:SAND - silty, trace gravel, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Fine Medium Coarse Coarse Fine 100 100 mm 75 mm Ρ 90 50 mm е r 38 mm 80 c 25 mm e 19 mm 100 n 70 13 mm t 99 10 mm 97 60 F 5 mm 93 i 2 mm 82 n 50 е 850 um 68 r 425 µm 53 40 250 µm 42 b 150 µm 32 У 30 Material Description 75 µm 23 Proportion (%) M 34 µm 11 20 Clay Size * 2 a Silt Size 22 9 22 µm S Sand 68 7 13 µm S 10 Gravel 8 9 µm 6 Cobbles 0 1 1 1 1 1 1 6 µm 5 0 2 2 80 400 2 5 20 75 3 µm Particle Size (µm) 4 **⇒** ← Particle Size(mm) -> 1 1 µm Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols. **Reviewed By:** 

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Date Tested: 2008/04/23

ASTM D422

Date Tested:

2008/04/23

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC272-S4
Sample No.:	BH08-SWC272-S4
Depth:	37 - 38 ft
Description**:	SILT - gravelly, trace sand, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Coarse Fine Medium Coarse Fine 100 100 mm 75 mm Ρ 90 50 mm 100 е r 38 mm 78 80 С 25 mm 78 e 19 mm 77 n 70 13 mm 77 t 10 mm 76 60 F 5 mm 75 i 2 mm 73 n 50 e 850 µm 71 r 425 µm 70 40 250 µm 69 b 150 µm 67 У 30 Material Description 75 µm 65 Proportion (%) Μ 43 Clay Size * 31 µm 20 6 a Silt Size 59 20 µm 34 s Sand 10 12 µm 27 s 10 Gravel 25 9 µm 22 Cobbles 0 18 0 6 µm 5 75 2 80 2 20 400 9 3 µm Particle Size (µm) -<  $\rightarrow \leftarrow$ Particle Size(mm) .....> 3 1 µm

#### Remarks:

* The upper clay size of 2 μm, per the Canadian Foundation Engineering Manual.
 ** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC272-S5
Sample No.:	BH08-SWC272-S5
Depth:	40 - 41 ft
Description**:	SAND - silty, some gravel, trace clay

Particle	Percent		Clay Size	Silt Size		Sand		Gr	avel
0126	Fassily		100		Fine	Medium	Coarse	Fine	Coarse
00 mm			100					Jene -	
75 mm		Р	90						
50 mm		е							
38 mm		r	80						
25 mm		C							
19 mm	100	n	70						
13 mm	98	t							
10 mm	97	E	60						
5 mm	90	r i							
2 mm	77	n	50						
50 µm	65	е			1				
25 µm	55	r	40						
50 µm	48	b			/				
50 µm	38	У	30					atorial De	
75 µm	27						INIS	Proporti	on (%)
35 µm	20	IVI a	20				Clay	/ Size *	4
22 µm	16	s	·				Sil	t Size	24
13 µm	13	S	10					and ravel	62 10
9 µm	11						Co	bbles	0
7 µm	9		0					1111	
3 µm	5		:	2	80 40	)0 2	2 5		20
1 µm	2		<del>&lt;</del>	Particle Size (µm	)>	<b>«</b>	Particle	e Size(m	m) —

Remarks:

* The upper clay size of 2 μm, per the Canadian Foundation Engineering Manual.
 ** The description is visually based & subject to EBA description protocols.

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EBA Engineering Consultants Ltd.

Date Tested:

2008/04/23



ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC272-S9
Sample No.:	BH08-SWC272-S9
Depth:	72 - 73 ft
Description**:	SILT - trace sand, some cla

Date Tested:

2008/04/23

1 10,000	ropocca randj Danip
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC272-S9
Sample No.:	BH08-SWC272-S9
Depth:	72 - 73 ft
Description**:	SILT - trace sand, some clay, trace gravel



Remarks:

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

**Reviewed By:** 



ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC272-S11
Sample No.:	BH08-SWC272-S11
Depth:	83 - 84 ft
Description**:	SAND AND SILT - some gra

Date Tested: 2008/04/23

lient:	SRK Consulting Inc
roject No.:	W14101068.006
ocation:	BH08-SWC272-S11
ample No.:	BH08-SWC272-S11
epth:	83 - 84 ft
escription**:	SAND AND SILT - some gravel, trace clay

Particle	Percent		Clay	Size	Silt Size		Sand		Gr	avel
0120	Fassing		100			Fine	Medium	Coarse	Fine	Coarse
100 mm		_	100							
50 mm	· · · · ·	P	90					·····		
38 mm		r								
ол Ол		с	80							
25 mm	100	е					/			
19 mm	99	n	70							
13 mm	96	τ					/			
10 mm	94	F	60							
5 mm	88	i					•			
2 mm	76	n	50							
850 µm	66	e				×				
425 µm	57	I	40	· · .	· · · · · · · · · · · · · · · · · · ·					
250 µm	52	b								
150 µm	47	У	30						IIII	
75 µm	41							1 1010	Proportic	scription
32 µm	30	іVі а	20		e e e e e e e e e e e e e e e e e e e			Clay	/ Size *	4
21 µm	27	s						Sil	t Size	37
12 µm	22	s	10						Sand	47
9 µm	19								bbles	0
6 µm	15		0	•					11(1)	
3 µm	7			2	80	40	0 2	5		20 75
1 µm	1			←	Particle Size (µm)		← i	Particle	e <b>Size</b> (mi	n)>
Rema	arks:	* Th ** Tl	e upp ne des	er cla script	ay size of 2 µm, per the Car ion is visually based & sub	adian Foui ject to EBA	ndation Eng	ineerin protoc	g Manua xols.	Ι.

**Reviewed By:** 



ASTM D422

Project:Proposed Valley DumpClient:SRK Consulting IncProject No.:W14101068.006Location:BH08-SWC273-S1Sample No.:BH08-SWC273-S1Depth:2.5 - 3.0 ftDescription**:SILT AND SAND trace of

Date Tested: 2008/04/23



** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC273-S5
Sample No.:	BH08-SWC273-S5
Depth:	48 - 48.5 ft
Description**:	SILT AND SAND - trace clay, tr

Date Tested: 2008/04/23

	- •
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC273-S5
Sample No.:	BH08-SWC273-S5
Depth:	48 - 48.5 ft
Description**:	SILT AND SAND - trace clay, trace gravel

Size	Percent		Clay	/ Size	Silt Size				Gravel								
	1 dooling		100	r	 					Fine	Mec	lium	Coarse	e Fine		Coars	se
100 mm														• • • •			
75 mm		Р	90														
50 mm		е															
38 mm		r	80						-		¢						
25 mm		e								8							
19 mm	100	n	70														
13 mm	99	t															
10 mm	99	F	60						/								
5 mm			:					/	/								
2 mm	96	n	50														ž.
850 µm	90	e															
425 µm	83	4	40				1										
250 µm	78	b					1										
150 μm	. 71	У	30			2	<b>×</b>						T N	l i i i i i laterial [	Desc	riptio	<u>   </u> n
/5 μm	63	М				×								Propor	tion	(%)	
33 µm	37	а	20		 /								Cla	iy Size *		3	
∠1µm 40	31	S			19									lit Size Sand		59 36	
12 µm	25	S	10											Gravel		2	
9 μm	21			•										obbles		0	
ομm	10		0 1	<u>-</u>	 	····	<u>.</u>	1	<u>90</u>	<u>ا نیا ا</u>	0	l		<u> </u>			
οµm 1	0				 Pari	ticle	Size	(µm	80 1) -	40	U €	- I	: Particl	) e Size/i	20 mm)		75 >
ιµm	2				 				·····		-	••••••			)		

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ASTM D422

Date Tested:

2008/04/23

Project:Proposed Valley DumpClient:SRK Consulting IncProject No.:W14101068.006Location:BH08-SWC273-S8Sample No.:BH08-SWC273-S8Depth:73 - 74 ftDescription**:SILT - sandy, some clay, trace gravel

Particle Percent **Clay Size** Gravel Silt Size Sand Size Passing Coarse Fine Medium Coarse Fine 100 100 mm 75 mm Ρ 90 50 mm e r 38 mm 80 С 25 mm 100 e 19 mm 99 n 70 t 13 mm 98 10 mm 96 60 F 5 mm 93 i 2 mm 87 n 50 е 850 µm 82 r 77 425 µm 40 250 µm 74 b 150 µm 70 У 30 Material Description 75 µm 65 Proportion (%) Μ 30 µm 48 Clay Size * 12 20 а 53 Silt Size 19 µm 43 s 28 Sand 11 µm 38 S 10 Gravel 7 34 8 µm Cobbles 0 6 µm 30 0 5 20 2 2 75 80 400 20 3 µm Particle Size (µm) -<  $\rightarrow \leftarrow$ Particle Size(mm) ~~~> 7 1 µm

#### Remarks:

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.
** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC273-S14
Sample No.:	BH08-SWC273-S14
Depth:	126 - 127 ft
Description**:	SILT - sandy, some gravel, so

Т

Date Tested: 2008/04/23

Client	
	SKK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC273-S14
Sample No.:	BH08-SWC273-S14
Depth:	126 - 127 ft
Description**:	SILT - sandy, some gravel, some clay

	Particle Size	Percent		Clay	/ Size		Silt S	Size			Sand	G			
	0120	- assing		100						Fine	Medium	Coarse	Fine	Coarse	
	100 mm														
	75 mm		P	90											
	50 mm		е												
	38 mm		r	80											
	25 mm	100	e												
	19 mm	99	n	70											
	13 mm	93	t							-					
	10 mm	91	F	60					1						
	5 mm	87	i												
	2 mm	82	n	50					/						
	850 µm	74	r r												
	425 µm	70	-	40	н ц.										
	250 μm	67	b	-			y y								
	150 μm	. 04	У	30			8					Ma	aterial De	escription	7
	70 μm 31 μm	30	М	20									Proportio	on (%)	
	20 um	36	а	20		1						Clay	/ Size * t Size	11 51	
	12 um	33	s s	10	X							S	and	25	
	8 um	29	U	10								G	ravel	13	
	6 um	27		0									bbles		
	3 µm	18		U	2				80	40	0 2	5		20 75	
	1 µm	7			<del>~~~~</del>		Partic	le Size (	µm)		← I	Particle	<b>Size</b> (m	m) ~>	>
<b>L</b>	Doma		* ***				- ( 0								
	Rema	arks:	יחו ** דיו	e upp oo do	er cia scripti	y size ( on is v	or 2 µr	n, per the	e Can 2 outri	adian Fou	ndation Eng	ineerin	g Manua	al.	
			11	ie ue:	sonpti		isually	uased č	x SUDJ	ect to EBA	aescription	i protoc	OIS.		
									· ·		X	<	T>		
									Revie	wed By:		<u>a</u> 25		>	







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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S1
Sample No.:	BH08-SWC274-S1
Depth:	10 - 11 ft
Description**:	SAIL AND SAND - trace clay

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Date Tested: 2008/04/23



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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S8
Sample No.:	BH08-SWC274-S8
Depth:	71 - 72 ft
Description**:	SILT AND SAND - some gravel,

Date Tested: 2008/04/23

Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S8
Sample No.:	BH08-SWC274-S8
Depth:	71 - 72 ft
Description**:	SILT AND SAND - some gravel, trace clay

Particle	Percent	с	lay Size	Silt Size		Sand	Gravel		
Size	Passing	10	0		Fine	Medium	Coarse	Fine	Coarse
100 mm		10							
75 mm		P 9	j						
50 mm		е							
38 mm	100	r 80	)						
25 mm	96	e							
19 mm	93	n 7(	)						
13 mm	89	t							
10 mm	87	F ⁶⁰	)						
5 mm	82	i							
2 mm	75	n 5(	)		<b>/</b>				
850 µm	69	e		/					
425 µm	64	4(	)					· · · ·	
250 µm	60	b		× 1					
150 µm	54	<b>y</b> 30	)				M	aterial Desc	cription
75 μm	47	м						Proportion	(%)
<u>31 µm</u>	36	a 20	)				Cla	y Size *	9
20 µm	31	S						It Size Sand	38
12 µm	25	<b>s</b> 10					G	Sravel	18
9 µm	. 22		e.				Co	obbles	0
6 µm	19	(	) []						
3 μm	13		2	8( Particle Size (um)	) 40 	0 2	2 5 Dorticl	20 • <b>Size</b> /mm	75
1 μm	6		<u> </u>				rartice	e size(inm	)

#### Remarks:

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S18
Sample No.:	BH08-SWC274-S18
Depth:	115 - 116 ft
Description**:	SAND AND GRAVEL - silty, trace clay

Date Tested: 2008/04/23

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Fine Medium Coarse Fine Coarse 100 100 mm 75 mm P 90 50 mm 100 e r 38 mm 89 80 С 25 mm 85 е 19 mm 78 n 70 13 mm 77 t 10 mm 73 60 F 5 mm 64 i 2 mm 50 n 50 е 850 µm 41 r 425 µm 35 40 250 µm 32 b 150 µm 28 У 30 Material Description 75 µm 24 Proportion (%) Μ 32 µm 18 20 Clay Size * 2 а Silt Size 21 µm 14 22 S Sand 40 12 µm 10 S 10 Gravel 36 9 µm 8 Cobbles 0 6 µm 7 0 2 80 400 5 3 µm 2 20 4 75 Particle Size (µm) ~  $\rightarrow \leftarrow$ Particle Size(mm) -> 1 1 µm * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. Remarks: ** The description is visually based & subject to EBA description protocols. **Reviewed By:** 



ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S20
Sample No.:	BH08-SWC274-S20
Depth:	126 - 124 ft
Description**:	SAND AND SILT - some grave

2008/04/23 Date Tested:

Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC274-S20
Sample No.:	BH08-SWC274-S20
Depth:	126 - 124 ft
Description**:	SAND AND SILT - some gravel, trace clay



**Remarks:** 

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:Proposed Valley DumpClient:SRK Consulting IncProject No.:W14101068.006Location:BH08-SWC275-S2Sample No.:BH08-SWC275-S2Depth:5 - 6 ftDescription**:SILT - sandy, trace clay

Date Tested: 2008/04/23



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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC275-S9
Sample No.:	BH08-SWC275-S9
Depth:	44 - 45 ft
Description**:	GRAVEL - silty, sandy, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Medium Fine Coarse Fine Coarse 100 100 mm 75 mm Ρ 90 50 mm 100 е r 38 mm 67 80 С 25 mm 67 е 19 mm 67 n 70 t 13 mm 62 58 10 mm 60 F 5 mm 56 i 2 mm 52 n 50 е 850 µm 48 r 425 µm 45 40 250 µm 42 b 150 µm 38 У 30 Material Description 75 µm 33 Proportion (%) Μ 32 µm 23 Clay Size * 6 20а Silt Size 27 19 21 µm S 23 Sand s 12 µm 16 10 Gravel 44 14 9 µm Cobbles 0 0 6 µm 12 2 80 400 2 5 20 75 8 3 µm Particle Size (µm) 4  $\rightarrow \leftarrow$ Particle Size(mm) 1 µm 4

#### Remarks:

* The upper clay size of 2 μm, per the Canadian Foundation Engineering Manual.
 ** The description is visually based & subject to EBA description protocols.

**Reviewed By:** 

Date Tested:

2008/04/23

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC275-S14
Sample No.:	BH08-SWC275-S14
Depth:	64 - 65 ft
Description**:	SILT - sandy, some gravel, some clay

Date Tested: 2008/04/23



Reviewed By:

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ASTM D422

clay

Date Tested:

2008/04/23

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC275-S17
Sample No.:	BH08-SWC275-S17
Depth:	82 - 83 ft
Description**:	SILT - sandy, some gravel, trace

Particle	Percent	CI	ay Size	Silt Size		Sand	Gr	avel	
Size	Passing	100	)		Fine	Medium	Coarse	Fine	Coarse
100 mm		100	,						<b>e</b>
75 mm	1 <b>4</b> 4 1 1 1	<b>P</b> 9(	) .						
50 mm		е							
38 mm		r 80	)						
25 mm	100	e							
19 mm		<b>n</b> 7(	)			•			
13 mm	93	t							
10 mm	90	F ⁶⁰			<b>, , , , , , , , , ,</b>				
5 mm	87	i		×					
2 mm		n 50							
850 µm		·e r							
425 µm	72	40							
250 µm	68	b							
150 µm	62	<b>y</b> 30		8			M	aterial De	escription
75 µm	54	М		Jø -				Proporti	on (%)
31 µm	38	a ²⁰		<b>1</b>				y Size *	8
20 µm	31	S		×				Sand	32
12 µm	28	<b>s</b> 10					G	iravel	13
9 µm	24	~	e					obbles	0
ομm	20	U	· •		<del>، نیست ا</del> ۵ 40		<u>-</u>		20 75
ι σμm 1μm	5		<u>د</u>	Particle Size (µm)	~→	< ÷	Particl	<b>e Size</b> (m	im) →

#### Remarks:

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC277-S9
Sample No.:	BH08-SWC277-S9
Depth:	65 - 66 ft
Description**:	SAND - gravelly, trace silt, trace clay

Date Tested: 2008/04/23

Particle	Percent	c	Clay Size Silt Size						Sand							Gravel								
Size	Passing	10	 ۱۵									Fine	9		Me	dium	С	oarse		Fine		Coars	e	
100 mm		10	×						ſ											×	1			
75 mm		<b>P</b> 9	0																	/				
50 mm		е																			ł			
38 mm		r 8	0																/					
25 mm		C e																/						
19 mm	100	n 7	0													 								
13 mm	96	t																/						
10 mm	93	<b>=</b> 6	0															/						
5 mm	79	г i																						
2 mm	48	n 5	0														¥.							
850 µm	31	е														/	1							
425 µm	22	r 4	0																					
250 µm	17	b														/								
150 µm	13	<b>y</b> 3	0												/	1	1	1 N/		ll iat D		intio	n	-
75 µm	9																	IV	Pro	port	ion (	%)		
36 µm	5	a ²	0				-				ŀ			<b>6</b> .				Cla	ıy Si	ze *		1		
23 µm	4	S											ک					S	ilt Si	ze 4		7		
13 µm	3	<b>s</b> ]	0							,	$\left  \right $							Ċ	Sano Frav	u el		21		
9 µm	3							-	-8	$\left[ \right]$								С	obbl	es		0		
6 µm	3		0														<b>"</b>	1		1	1	1		
3 µm	1	2 80					0		40	)0			2 5			. ,	20		75	5				
1 µm	1	$\leftarrow \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad$																						
Rem	arks:	* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual.																						

** The description is visually based & subject to EBA description protocols.

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Date Tested:

2008/04/23

ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC277-S10
Sample No.:	BH08-SWC277-S10
Depth:	71 - 72 ft
Description**:	GRAVEL AND SAND - trace silt, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Medium Fine Coarse Fine Coarse 100 100 mm 75 mm Ρ 90 50 mm 100 е r 38 mm 73 80 С 25 mm 62 е 19 mm 60 n 70 13 mm 54 t 10 mm 52 60 F 5 mm 43 i 2 mm 29 n 50 e 850 µm 21 r 425 µm 16 40 250 µm 13 b 150 µm 10 У 30 Material Description 7 75 µm Proportion (%) Μ 33 µm 4 20 Clay Size * 1 а 21 µm Silt Size 4 6 S Sand 36 12 µm 3 s 10 Gravel 57 9 µm 3 Cobbles 0 6 µm 2 0 2 3 µm 80 400 1 2 5 20 75 Particle Size (µm) < ⇒∻ Particle Size(mm)  $\rightarrow$ 1 µm 1 **Remarks:** * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols. **Reviewed By:** 



ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC278-S2
Sample No.:	BH08-SWC278-S2
Depth:	0.0 - 1.0 ft
Description**:	SILT - sandy, some gravel, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Medium Fine Coarse Fine Coarse 100 100 mm 75 mm Ρ 90 50 mm e r 38 mm 100 80 С 96 25 mm е 19 mm 96 n 70 93 t 13 mm 10 mm 92 60 F 5 mm 88 i 2 mm 80 n 50 72 е 850 µm r 425 µm 65 40 250 µm 61 b 150 µm 58 У 30 Material Description 75 µm 55 Proportion (%) М 31 µm 39 Clay Size * 5 20 а Silt Size 49 21 µm 27 S Sand 34 19 S 12 µm 10 Gravel 12 9 µm 15 Cobbles 0 13 0 6 µm 2 80 400 2 5 20 75 7 3 µm Particle Size (µm) -¢ > ← Particle Size(mm) ⇒ 1 µm 4

#### Remarks:

* The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

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EBA Engineering Consultants Ltd.



Date Tested: 2008/04/23



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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC278-S7
Sample No.:	BH08-SWC278-S7
Depth:	54 - 55 ft
Description**:	SAND - silty, gravelly, trace clay



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EBA Engineering Consultants Ltd.

Date Tested:

2008/04/23



ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC278-S12
Sample No.:	BH08-SWC278-S12
Depth:	89 - 90 ft
Description**:	GRAVEL - some silt, some san

Date Tested:

2008/04/23

Description**:	GRAVEL - some silt, some sand, trace clay
----------------	-------------------------------------------







ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC278-S17
Sample No.:	BH08-SWC278-S17
Depth:	108 - 109 ft
Description**:	SAND AND SILT - trace gravel, t

Date Tested: 2008/04/23

Particle	Percent	Cla	y Size	Silt Size			Sand		Gravel			
Size	Passing	100				Fine	Medium	Coarse	Fine	Coarse		
100 mm												
75 mm		<b>P</b> 90						ľ				
50 mm		e										
38 mm		r 80										
25 mm		с e										
19 mm	100	<b>n</b> 70										
13 mm	99	t					X					
10 mm	98	<b>F</b> ⁶⁰										
5 mm	93	i										
2 mm	79	<b>n</b> 50		· • • • • • • • • • • • • • • • • • • •								
50 µm	66	e										
25 µm	55	40										
50 µm	49	b										
50 µm	43	<b>y</b> 30						Ma	Iterial De	scription		
75 µm	38	м			۶				Proportic	on (%)		
32 µm	27	<b>a</b> ²⁰		· · · · · · · · · · · · · · · · · · ·				Clay	Size *	3		
21 µm	20	S							Size and	35 55		
12 µm	13	<b>s</b> 10						Gr	avel	7		
9 µm	12		-					Co	bbles	0		
6 µm	9	0	LL									
3 µm	5		2	Particle Siz	08 (um)	40	) 2	25 Dentinia	O in a (ma	20 75		

** The description is visually based & subject to EBA description protocols.

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ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No .:	W14101068.006
Location:	BH08-SWC280-S3
Sample No.:	BH08-SWC280-S3
Depth:	14 - 15 ft
Description**:	SILT - gravelly, sandy, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Fine Medium Coarse Fine Coarse 100 100 mm 75 mm P 90 50 mm е r 38 mm 100 80 С 25 mm 82 e 19 mm 80 n 70 ť 13 mm 75 10 mm 72 60 F 5 mm 66 i 2 mm 61 n 50 е 850 µm 56 r 425 µm 52 40 250 µm 49 b 150 µm 45 У 30 Material Description 75 µm 39 Proportion (%) M 31 µm 27 20 Clay Size * 2 а Silt Size 37 20 µm 21 S Sand 27 S 12 µm 16 10 Gravel 34 9 µm 11 Cobbles 0 6 µm 8 0 3 µm 4 2 80 400 2 5 20 75 Particle Size (µm) < **→** ← Particle Size(mm) ÷ 1 µm 1 Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols. **Reviewed By:** 

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Date Tested: 2008/04/23

#### ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC280-S5
Sample No.:	BH08-SWC280-S5
Depth:	31 - 32 ft
Description**:	SAND - silty, gravelly, trace clay

Particle Percent **Clay Size** Silt Size Sand Gravel Size Passing Fine Medium Coarse Fine Coarse 100 100 mm 75 mm Ρ 90 50 mm е r 38 mm 100 80 С 25 mm 93 е 19 mm 91 n 70 13 mm 88 t 10 mm 86 60 F 5 mm 79 i 2 mm 69 n 50 850 µm е 57 r 425 µm 50 40 250 µm 44 b 150 µm 39 У 30 Material Description 75 µm 33 Proportion (%) Μ 31 µm 31 20 Clay Size * 2 а Silt Size 20 µm 31 24 S Sand 46 12 µm 18 S 10 Gravel 21 9 µm 13 Cobbles 0 9 A 6 µm 2 80 3 µm 400 2 5 4 20 75 Particle Size (µm) ⇐ Particle Size(mm) -> 1 µm 1 Remarks: * The upper clay size of 2 µm, per the Canadian Foundation Engineering Manual. ** The description is visually based & subject to EBA description protocols.

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**EBA Engineering** Consultants Ltd.



Date Tested: 2008/04/23

ASTM D422

Project:	Proposed Valley Dump
Client:	SRK Consulting Inc
Project No.:	W14101068.006
Location:	BH08-SWC280-S8
Sample No.:	BH08-SWC280-S8
Depth:	59 - 60 ft
Description**:	SILT - sandy, some gravel, trace clay

Date Tested: 2008/04/23

Particle	Percent		Clay	y Size	Silt Size				Sand					(	Gravel				
5120	rassing		100								Fine		Medi	um	Coarse	Fine		Coarse	1
100 mm																	2		
75 mm		Р	90														1		
50 mm		е																	
38 mm	100	r	80																
25 mm	98	с е																	
19 mm	95	n	70							1									
13 mm	92	t																	
10 mm	91	E	60																
5 mm	86	r İ								1									
2 mm	77	n	50			-													
850 µm	73	e																	
425 µm	68	r	40																
250 µm	66	b																	
150 µm	62	У	30			,													
75 µm	56	64													I IV	Proport	ion (	iption %)	
33 µm	9	a	20												Cla	y Size *		1	
22 µm	7	s													S	ilt Size		55	
13 µm	4	S	10					العر								Sand Fravel		30 14	
9 µm	3														c	obbles		0	
6 µm	3		0 l	•										[	1 1		1		
3 µm	2			2		Dev		<b>C</b> i	1	80		400	)	2		5	20		75
1 µm	1					rar		SIZE	: (µ:	п)		> < 		•	Partic	le Size(r	nm)		→ 
Rema	ırks: '	* Th ** Tł	e upp 1e de	er cla scripti	y size on is v	of 2 visua	µm, Illy ba	per t ased	the &	Can subj	adian F ect to E	oun BA	datior descri	Eng	ineeri 1 proto	ng Manu cols.	ıal.		

Reviewed By:





### Atterberg Limits Test Form

**ASTM D4318** 

Project: Proposed Valley Dump

Project Number:

Sample Description:

Sample Number: 08-SWC271-S4 Borehole Number: 08-SWC271-S4 Depth: 17.5 - 18.5 ft Date Tested: 6/5/2008 JP Tested By:

Plastic Limit Test						
Trial Number	1	2	3			
Tare Number						
Wt. Wet Soil + Tare						
Wt. Dry Soil + Tare						
Wt. of Tare						
Wt. of Water	0.00	0.00				
Wt. of Dry Soil	0.00	0.00				
Moisture Content (%)	#DIV/0!	#DIV/0!	<u>.</u>			







Soil Description: Non-plastic

USCS Symbol:

EBA Engineering Consultants Ltd.





W14101068.006

### Atterberg Limits Test Form

ASTM D4318

Project:	Proposed Valley Dump
Project Number:	W14101068.006
Sample Description:	

Sample Number:	08-SWC272-S4
Borehole Number:	08-SWC272-S4
Depth:	37 - 38 ft
Date Tested:	6/5/2008
Tested By:	JP

Plastic Limit Test						
Trial Number	1	2	3			
Tare Number						
Wt. Wet Soil + Tare	7.19	6.78				
Wt. Dry Soil + Tare	6.71	6.33				
Wt. of Tare	4.08	3.83				
Wt. of Water	0.48	0.45				
Wt. of Dry Soil	2.63	2.50				
Moisture Content (%)	18.3	18.0				

Liquid Limit Test			
Trial Number	1	2	3
No. of Blows	15	20	28
Tare Number	A-1	A-2	A-3
Wt. Wet Soil + Tare	37.48	31.59	41.98
Wt. Dry Soil + Tare	31.00	26.36	35.10
Wt. of Tare	3.93	3.88	4.15
Wt. of Water	6.48	5.23	6.88
Wt. of Dry Soil	27.07	22.48	30.95
Moisture Content (%)	23.9	23.3	22.2






#### ASTM D4318

Project: Proposed Valley Dump

Project Number:

W14101068.006

Sample Description:

Sample Number:08-SWC272-S5Borehole Number:08-SWC272-S5Depth:40 - 41 ftDate Tested:6/5/2008Tested By:JP

Plastic Limit Test			
Trial Number	1	2	3
Tare Number			
Wt. Wet Soil + Tare			
Wt. Dry Soil + Tare			
Wt. of Tare			
Wt. of Water	0.00	0.00	
Wt. of Dry Soil	0.00	0.00	
Moisture Content (%)	#DIV/0!	#DIV/0!	

Liquid Limit (W_i)

Liquid Limit Test			
Trial Number	1	2	3
No. of Blows			
Tare Number			
Wt. Wet Soil + Tare			
Wt. Dry Soil + Tare			
Wt. of Tare			
Wt. of Water	0.00	0.00	0.00
Wt. of Dry Soil	0.00	0.00	0.00
Moisture Content (%)	#DIV/0!	#DIV/0!	#DIV/0!



Soil Description: Non-plastic

USCS Symbol:

EBA Engineering Consultants Ltd.



Number of Blows

Remarks:

Non-plastic

ebo

ASTM D4318

Project:	Proposed Valley Dump
Project Number: Sample Description:	W14101068.006

Sample Number:	08-SWC272-S9
Borehole Number:	08-SWC272-S9
Depth:	72 - 73 ft
Date Tested:	6/5/2008
Tested By:	RC

Plastic Limit Test			
Trial Number	1	2	3
Tare Number	PL3	PL4	
Wt. Wet Soil + Tare	2.78	4.98	
Wt. Dry Soil + Tare	2.54	4.31	
Wt. of Tare	1.38	1.41	
Wt. of Water	0.24	0.67	
Wt. of Dry Soil	1.16	2.90	
Moisture Content (%)	20.7	23.1	

Liquid Limit Test			
Trial Number	1	2	3
No. of Blows	14	24	27
Tare Number	U-1	U-2	U-3
Wt. Wet Soil + Tare	23.02	21.41	23.72
Wt. Dry Soil + Tare	18.53	17.49	19.29
Wt. of Tare	3.92	3.97	3.88
Wt. of Water	4.49	3.92	4.43
Wt. of Dry Soil	14.61	13.52	15.41
Moisture Content (%)	30.7	29.0	28.7



Number of Blows

#### Remarks:

. . . . .

**ASTM D4318** 

Proposed Valley Dump Project: Project Number: W14101068.006 Sample Description:

Sample Number: 08-SWC272-S11 Borehole Number: 08-SWC272-S11 Depth: 83 - 84 ft Date Tested: 7/5/2008 Tested By: RC

Plastic Limit Test			
Trial Number	1	2	3
Tare Number	PL1	PL2	
Wt. Wet Soil + Tare	5.31	6.92	
Wt. Dry Soil + Tare	4.73	6.11	
Wt. of Tare	1.43	1.47	
Wt. of Water	0.58	0.81	
Wt. of Dry Soil	3.30	4.64	
Moisture Content (%)	17.6	17.5	

Moisture Content (%)

Liquid Limit Test			
Trial Number	1	2	3
No. of Blows	17	25	31
Tare Number	U-1	U-2	U-3
Wt. Wet Soil + Tare	31.97	20.79	19.57
Wt. Dry Soil + Tare	26.71	17.70	16.80
Wt. of Tare	3.91	3.79	4.01
Wt. of Water	5.26	3.09	2.77
Wt. of Dry Soil	22.80	13.91	12.79
Moisture Content (%)	23.1	22.2	21.7





5 PLASTICITY INDEX (%)

Soil Description: Low Plasticity

USCS Symbol: CL

EBA Engineering Consultants Ltd.



ASTM D4318

Project:	Proposed Valley Dump
Project Number:	W14101068.006
Sample Description:	

Sample Number:08-SWC273-S8Borehole Number:08-SWC273-S8Depth:73 - 74 ftDate Tested:5/5/2008Tested By:JP

Plastic Limit Test			
Trial Number	1	2	3
Tare Number			
Wt. Wet Soil + Tare	5.21	5.10	
Wt. Dry Soil + Tare	5.01	4.92	
Wt. of Tare	3.93	3.92	
Wt. of Water	0.20	0.18	
Wt. of Dry Soil	1.08	1.00	
Moisture Content (%)	18.5	18.0	

Liquid Limit (W_i)

34

32

30

28

26

24

22

Moisture Content (%)

Liquid Limit Test			
Trial Number	1	2	3
No. of Blows	20	23	31
Tare Number	с	d	е
Wt. Wet Soil + Tare	13.02	18.37	20.09
Wt. Dry Soil + Tare	10.86	15.05	16.50
Wt. of Tare	3.86	4.06	3.99
Wt. of Water	2.16	3.32	3.59
Wt. of Dry Soil	7.00	10.99	12.51
Moisture Content (%)	30.9	30.2	28.7





#### ASTM D4318

Project:	Proposed Valley Dump
Project Number:	W14101068.006
Sample Description:	

Sample Number:	08-SWC273-S14
Borehole Number:	08-SWC273-S14
Depth:	126 - 127 ft
Date Tested:	6/5/2008
Tested By:	RC

Plastic Limit Test				
Trial Number	1	2	3	
Tare Number	PL1	PL2		
Wt. Wet Soil + Tare	3.68	6.02		
Wt. Dry Soil + Tare	3.25	5.16		
Wt. of Tare	1.34	1.39		
Wt. of Water	0.43	0.86		
Wt. of Dry Soil	1.91	3.77		
Moisture Content (%)	22.5	22.8		

Liquid Limit Test				
Trial Number	1	2	3	
No. of Blows	22	30	16	
Tare Number	A-1	A-2	A-3	
Wt. Wet Soil + Tare	28.33	34.48	29.52	
Wt. Dry Soil + Tare	22.42	27.32	22.98	
Wt. of Tare	4.07	4.06	3.91	
Wt. of Water	5.91	7.16	6.54	
Wt. of Dry Soil	18.35	23.26	19.07	
Moisture Content (%)	32.2	30.8	34.3	





Soil Description: Medium Plasticity

USCS Symbol: CI

PLASTICITY INDEX (%)

EBA Engineering Consultants Ltd.



9

**ASTM D4318** 

Project:

Proposed Valley Dump

Project Number:

W14101068.006

Sample Description:

Sample Number:	08-SWC274-S1
Borehole Number:	08-SWC274-S1
Depth:	<u> </u>
Date Tested:	6/5/2008
Tested By:	JP

Plastic Limit Test				
Trial Number	1	2	3	
Tare Number				
Wt. Wet Soil + Tare				
Wt. Dry Soil + Tare				
Wt. of Tare				
Wt. of Water	0.00	0.00		
Wt. of Dry Soil	0.00	0.00		
Moisture Content (%)	#DIV/0!	#DIV/0!		





Soil Description: Non-plastic

USCS Symbol:

EBA Engineering Consultants Ltd.



Remarks: _____ Non-plastic



#### ASTM D4318

Project:	Proposed Valley Dump		
Project Number:	W14101068.006		
Sample Description:			

E

Sample Number:	08-SWC274-S8
Borehole Number:	08-SWC274-S8
Depth:	71 - 72 ft
Date Tested:	6/5/2008
Tested By:	JP

Plastic Limit Test				
Trial Number	1	2	3	
Tare Number	A-4	A-5		
Wt. Wet Soil + Tare	5.25	6.06		
Wt. Dry Soil + Tare	5.07	5.79		
Wt. of Tare	3.97	4.00		
Wt. of Water	0.18	0.27		
Wt. of Dry Soil	1.10	1.79		
Moisture Content (%)	16.4	15.1		









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ASTM D4318

Project:	Proposed Valley Dump		
Project Number: Sample Description:	W14101068.006		

San Conta

Sample Number: 08-SWC275-S14 Borehole Number: 08-SWC275-S14 Depth: 64 - 65 ft Date Tested: 5/5/2008 Tested By: JP

Plastic Limit Test				
Trial Number	1	2	3	
Tare Number	A-4	A-5		
Wt. Wet Soil + Tare	5.69	5.62		
Wt. Dry Soil + Tare	5.38	5.34		
Wt. of Tare	3.89	3.91		
Wt. of Water	0.31	0.28		
Wt. of Dry Soil	1.49	1.43		
Moisture Content (%)	20.8	19.6		

Liquid Limit Test				
Trial Number	1	2	3	
No. of Blows	17	22	38	
Tare Number	A-1	A-2	A-3	
Wt. Wet Soil + Tare	24.59	25.69	27.79	
Wt. Dry Soil + Tare	19.68	20.57	22.41	
Wt. of Tare	4.05	4.02	3.97	
Wt. of Water	4.91	5.12	5.38	
Wt. of Dry Soil	15.63	16.55	18.44	
Moisture Content (%)	31.4	30.9	29.2	



Soil Description: Medium Plasticity

CI

EBA Engineering Consultants Ltd.



Plastic Limit Test								
Numbe	\r			1		2		



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Remarks:

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ASTM D4318

Project:	Proposed Valley Dump		
Project Number:	W14101068.006		
Sample Description:			

Sample Number:	08-SWC278-S2		
Borehole Number:	08-SWC278-S2		
Depth:	0.0 - 0.1 ft		
Date Tested:	5/5/2008		
Tested By:	JP		

Plastic Limit Test				
Trial Number	1	2	3	
Tare Number	A-4	A-5		
Wt. Wet Soil + Tare	6.22	5.89		
Wt. Dry Soil + Tare	5.83	5.59		
Wt. of Tare	3.86	3.96		
Wt. of Water	0.39	0.30		
Wt. of Dry Soil	1.97	1.63		
Moisture Content (%)	19.8	18.4		

Liquid Limit Test					
Trial Number	1	2	3		
No. of Blows	16	24	37		
Tare Number	A-1	A-2	A-3		
Wt. Wet Soil + Tare	14.40	26.46	25.15		
Wt. Dry Soil + Tare	12.31	22.02	21.11		
Wt. of Tare	4.02	4.00	4.05		
Wt. of Water	2.09	4.44	4.04		
Wt. of Dry Soil	8.29	18.02	17.06		
Moisture Content (%)	25.2	24.6	23.7		





